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Survival Rate and Performance of Indigenous-owned Businesses

by Landry Kuate

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by

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Economic Analysis Division
Statistics Canada

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Abstract

This paper quantifies the economic performance including the survival rate of Indigenous-owned businesses relative to their non-Indigenous-owned counterparts over recent decades in Canada. It builds on the growing interest of policy makers in designing policies that support the social and economic integration of racialized groups and Indigenous Peoples.

This analysis leverages the Canadian Employer–Employee Dynamics Database (CEEDD) with measures of business ownership characteristics including Indigenous identity from 2005 to 2018. The empirical analysis exploits the multiple imputation estimation of a panel data model, along with descriptive statistics to assess socioeconomic characteristics including gaps in labour productivity and revenue by subgroup of Indigenous-owned businesses, compared with non-Indigenous-owned ones.

Results suggest that, despite a closing gap over time, Indigenous-owned businesses were 7.5% less productive and have experienced 2.7% lower revenues, on average, than their non-Indigenous-owned counterparts. This performance gap is more than two times higher in rural areas compared with urban areas. Furthermore, findings from the survival analysis indicate that Indigenous-owned businesses were 18.41% more likely to exit the market, on average, compared with non-Indigenous businesses.

Finally, the paper documents possible factors driving the relative weak performance among Indigenous-owned businesses, compared with non-Indigenous-owned businesses. Financial and capability constraints stand as the key barriers to Indigenous-owned enterprises' economic participation and development.

1 Introduction

Policy makers are concerned about how to socially and economically support individuals from racialized groups, those with disabilities, Indigenous Peoples and women, who make up the employment equity (EE) groups. This can be partially achieved by promoting business ownership among EE, because it is an important driver of economic growth and job creation (Picot, Manser, & Lin, 1998; Papadaki, Chami, & Branch, 2002; Green, Liu, Ostrovski, & Picot, 2016; Grekou & Liu, 2018). A large body of literature examines different aspects of the performance of businesses that are majority owned by individuals in EE groups. Whether the focus is on labour productivity (Grekou, 2020; Grekou & Watt, 2021), business ownership rates (Gueye, Lafrance-Cooke and Oyarzun, 2022), export activity (Canadian Council for Aboriginal Business and Global Affairs Canada, 2023[1]; Sekkel & Wang, 2024), survival rates (Robb, 2002; Du Rietz & M. Henrekson, 2000; Fairlie & Robb, 2009; Couture & Houle, 2020) or financial performance (Gueye B., 2023; Bemrose & Lafrance-Cooke, 2022), prior studies find that businesses owned by EE groups are, on average, underrepresented and likely to underperform, compared with those owned by Canadians who are not in EE groups. This study contributes to the literature by examining the economic performance of Indigenous-owned businesses, a population with a growing participation in the Canadian economy.[2]

Indigenous Peoples make up 5% of the population and have contributed to roughly 2.2% of Canadian gross domestic product (GDP) in 2020 (Ayotte & Bridger, 2022). The Indigenous business sector plays an important role in generating wealth and jobs for local communities. In 2018, the number of Indigenous-owned businesses in Canada was estimated at 37,000, an increase of about 36% relative to 2005 (Gueye, Lafrance-Cooke and Oyarzun, 2022). However, socioeconomic gaps between Indigenous Peoples (especially those living on reserves) and non-Indigenous people in Canada have limited the likelihood of entry and survival of Indigenous-owned businesses (Leach, Baer, & Yu, 2020). These gaps are predominant in rural and remote areas and are related to income, education and employment, among other factors (Wilson & Macdonald, 2010; Leach, Lars-Anders Baer, & Yu, 2020). The government has introduced several initiatives and programs aimed at narrowing the economic disparities between Indigenous and non-Indigenous people in Canada and promoting economic reconciliation.[3] According to the National Aboriginal Economic Development Board 2016 report, closing the gap in opportunities for Indigenous communities across Canada would have added $27.7 billion to the gross domestic product in 2015.

Various features of the Indigenous economy, including state of infrastructure and lack of access to capital in addition to historical and long-lasting structural inequalities, have been identified as key barriers responsible for its lagged development (Buckland, Mckay, & Reimer, 2016; Buckland, 2017; and Collin, 2011). Another important constraint for Indigenous-owned business performance is the geographic location because it determines the degree of connectivity with markets. In fact, from a business perspective, being located near metropolitan areas and close to services and infrastructures may offer considerable economic benefits, compared with rural and remote areas (Agarwal, Rahman, & Errington, 2009; Martin, McHugh, & Johnson, 1993). For instance, Haaris & Alessandro (2019) find that profits, revenues and the count of businesses per resident all tend to be considerably lower for businesses located in Indigenous census subdivisions (CSDs), typically in rural low density or remote areas, relative to businesses in non-

1. For details, see: report-adawe-rapport-fra.pdf (international.gc.ca).
2. According to the 2021 Census of Population, the Indigenous population continues to grow in Canada, at 1.8 million, corresponding to a growth rate of 9.4% from 2016 to 2021 (Statistics Canada Catalogue number 98-510-X2021001.). The census indicated that, over the same period, the First Nations population has grown by 9.7%, Inuit by 8.5% and Métis by 6.3%.
3. Multiple programs have been launched by the government to support community economic development and Indigenous entrepreneurs and business owners throughout Canada. See: Business and economic development for Indigenous Peoples - Canada.ca.

Indigenous CSDs with similar population sizes.[4] Further, the Canadian Council for Aboriginal Business and Global Affairs Canada (2023) documented that Indigenous-owned exporting small and medium-sized enterprises (SMEs) are less likely to export, compared with the Canadian average, by 42% for firms located in Indigenous communities and by 65% in remote regions.

Unfortunately, due to a lack of appropriate data, attempts by researchers to measure and track the performance of businesses managed by Indigenous Peoples remain scarce (Chernoff & Cheung, 2023). Drawing on the most recent data sources and research, Chernoff & Cheung (2023) find that economic outcomes have improved for Indigenous Peoples in recent decades. Moreover, their study indicates that institutional settings, such as property rights restrictions and gaps in infrastructures and financing, continue to hinder economic progress. While meaningful for the related literature, Chernoff & Cheung's (2023) work remains essentially descriptive and does not allow for the measurement of the performance gap between businesses based on Indigenous majority owned identity.

Using recent data on business ownership characteristics including Indigenous identity, the purpose of this article is to quantify the economic performance gaps between Indigenous-owned businesses and non-Indigenous-owned ones over recent decades in Canada. In other words, this paper attempts to determine the performance gap between Indigenous-owned and non-Indigenous-owned businesses. A supplementary analysis also documents the potential factors driving the findings.

This paper contributes to the literature in several ways. First, it provides an estimate of the economic disparities between Indigenous-owned and non-Indigenous-owned businesses ones based on longitudinal data. In addition to usual economic performance indicators such as labour productivity and revenue, a survival analysis is conducted to shed light on the survival likelihood over the sample period. Second, the contribution of this paper is methodological. It makes use of multiple imputation (MI) technique to minimize errors when filling in the missing information and goes beyond a descriptive analysis, as done in prior studies. Instead, the findings are obtained from an econometric model and survival analysis. Finally, a discussion is presented on the potential factors and mechanisms that drive the results. This discussion helps provide a comprehensive picture of drivers or barriers to economic performance among Indigenous-owned businesses.

To investigate the research question, this study uses the Canadian Employer–Employee Dynamics Database (CEEDD), covering the period from 2005 to 2018 to track business survival likelihood, productivity, and revenue. It incorporates a new indicator developed by Gueye, Lafrance-Cooke, and Oyarzun (2022) that identifies and classifies Indigenous-owned businesses as either First Nations, Inuit, Métis or other Indigenous Peoples. With the CEEDD, it is also possible to identify other ownership characteristics, such as top owners' sex and age.

The empirical analysis consists of two components: descriptive statistics and econometric modelling. The latter component includes Kaplan-Meier survival analysis, Cox proportional hazard regression analysis, and a panel data regression model. The first two models are used to evaluate business survival, while the third examines both business revenues and labour productivity, conditional on the Indigenous identity of the majority group ownership.

The remainder of the paper proceeds as follows. Section 2 describes data and methodology pertaining this study. Sections 3 and 4 outline the results and discusses the possible factors explaining them. Section 5 concludes the paper.

4. The analysis presented in this paper that is classified into Indigenous-owned and non-Indigenous-businesses is based on those majority owned by Indigenous people, not businesses located in Indigenous communities as in Haaris & Alessandro (2019).

2 Data and methodology

2.1 Data

This study uses data from Statistics Canada's Canadian Employer–Employee Dynamics Database (CEEDD) from 2005 to 2018. The CEEDD is a set of linkable files maintained by Statistics Canada to provide linkage between employees and employers in the Canadian labour market. This dataset is based on processed administrative data sources from Statistics Canada, the Canada Revenue Agency, Employment and Social Development Canada and Immigration, Refugees and Citizenship Canada. The CEEDD is created from the component files, which allow researchers to perform analysis at the individual, family, job and firm level. The primary component file used in this study is the National Accounts Longitudinal Microdata File (NALMF), a comprehensive longitudinal database of Canadian enterprises derived from the statements of remuneration paid (T4), the Payroll Account Deductions (PD7), and the Corporate Income Tax Return (T2).

Identifying Indigenous-owned businesses

The data on business owners are used to determine Indigenous ownership of businesses after a novel linkage which combines the CEEDD, the Census of Population (2001, 2006, 2016) and the National Household Survey (2011). Business owners are identified by linking the individual-level tax file (T1PMF) with the ownership share of both the incorporated (T2S50) and unincorporated (T1FDBD) businesses.[5] The linkage provides demographic characteristics of the business owners, including their Indigenous identity and the identity of the majority ownership. Following Gueye, Lafrance-Cooke and Oyarzun (2022), this paper considers a business to be Indigenous owned if more than 50% of the shares are held by individuals who identify as either First Nations, Métis, Inuit or "other Indigenous." The latter group consists of businesses owned by individuals with multiple Indigenous identities, or businesses that are jointly owned by individuals who identify with one of the three Indigenous groups, but no one group controls more than 50% of the shares. Finally, this paper does not distinguish Indigenous Peoples on reserve from those living off reserve.

Firm-level data and ownership shares by Indigenous identity

The NALMF firm-level data consists of information at the enterprise statistical unit for a range of variables including firm size, as measured by the number of employees, as well as revenues, industry, province, firm age and labour productivity—as measured by value added divided by employment—among others. The dataset only includes businesses with at least one employee and makes it possible to follow unincorporated and incorporated enterprises and their economic outputs and share of ownership by Indigenous identity over the sample period from 2005 to 2018. The primary approach of the analysis builds on the longitudinal nature of the dataset to understand the trends in economic outcomes within a set of enterprises owned by Indigenous Peoples. These outcomes include revenue, labour productivity and survival rate. Trends by sociodemographic and economic characteristics of the enterprise are also examined. For instance, outcomes of interest are compared, controlling for enterprise size, business age, North American Industry

5. Incorporated business owners are identified through T2 Schedule 50 with direct ownership information on shareholders who hold at least 10% of common or preferred shares for all corporations that have identified themselves as Canadian-controlled private corporations or other private corporation in field type of corporation (L0040_0) on Schedule 200. For unincorporated business owners, before 2005, identification can only be done with the T1 (T1H or T1PMF). From 2005 onwards, information about unincorporated business owners can be identified from the T1 files and the T1 financial declaration files (T1FD).

Classification System industry, profile of business owners and geographic location (urban vs. rural), among others.

The main dataset provides different indicators for each group of Indigenous-owned businesses. Furthermore, MI technique is used to fill incomplete Indigenous identity data.[6] MI method has been developed to address empirical concerns driven by incomplete data. Based on an iterative procedure (instead of filling in a single value), the MI technique uses the distribution of the observed data to estimate multiple values that reflect the uncertainty about the true value (see Young, 2011 for more details). Each imputed value includes a random component with a magnitude that reflects the extent to which other variables in the imputation model cannot predict its true values (Young & Johnson, 2011) this paper uses 30 iterations at random to perform the MI procedure.[7] The resulting dataset with imputed values is used to perform both the descriptive statistics and the econometric analysis of this paper.

6. Following Gueye, Lafrance-Cooke and Oyarzun (2022), about 40% of business owners were imputed an Indigenous identity. Multiple imputation is, therefore, required in estimation models to minimize errors driven by the uncertainty about the true value of the data.
7. Historically, the recommendation in selecting the number of iterations was three to five multiple imputation datasets. However, depending on computing power, larger values of iterations are often recommended in the literature (Young, 2011). This paper chose 30 iterations at random to perform analysis.

Table 1
Definitions and measurements of key variables

Variables	Definitions and Measurements
Indigenous owned	A business is Indigenous owned if more than 50% of the shares are held by individuals who identify as either First Nations, Métis, Inuit or other Indigenous.
Business age	Number of years the business has been in operation, based on the Business Register.
Business size	Firm size based upon employment, measured by T4 slips
Gender of Business	For Canadian-controlled Private Corporations (CCPCs) where gender of ownership of business can be identified. Business ownership by gender is grouped into:
Ownership	(1) Majority men-owned: 51%+ shares owned by men. (2) Majority women-owned: 51%+ shares owned by women. (3) Equally owned: 50%-50% shares equally owned between men and women; and (4) Under-defined: The dominance of business holdings cannot be determined due to insufficient information in Schedule 50. (5) Missing definition: CCPCs with mis-filed T2 Schedule 50, or non-CCPCs (e.g., foreign controlled or publicly traded) where ownership information is unavailable in T2 Schedule 50.
Rural/Urban area	Rural area is a dummy equal to 1 if for a given six-digits postal code the second digit is "0" and 0 otherwise. Urban area corresponds to a value of zero of the dummy Rural area.[1]
Revenue	Non-farm total revenue. The sum of all revenue amounts reported (items 8000 to 8250). Information is collected from T2 schedule 125-income statement information.
Survival rate	Survival rate is the ratio of the difference between number of active businesses and exits over the total for a given group, in a specific year.
Debt-asset-ratio	Ratio of total liabilities over total assets: Total liabilities / Total assets
Labor productivity	(Payroll + Net income or loss after tax + Gross profits) / Employment, deflated by industry specific price deflators.
Capital	Capital corresponds to the total assets, as a proxy of capital input factor in business production.

Note: In this paper, rural/urban areas refer to delivery areas to avoid confusion with the Statistics Canada usage of the term's rural areas and urban areas. The postal code measure has some limitations, as it can treat communities that are very close to urban areas as being rural so it's hard to differentiate between those that are extremely far away and those that could effectively be in a suburb of a city. However, the main benefit of using delivery rural areas, is that the scale of rural is captured, that is, whether it is local, community or regional.

Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

2.2 Methodology

The methodology of this paper primarily relies on descriptive analysis to examine the economic performance of businesses by the Indigenous identity of the majority group ownership. The key variables used to assess the performance are (i) revenue, (ii) labour productivity and (iii) survival rate on the sample period. Following Couture and Houle (2020), survival rate is constructed using

information from active enterprises at the beginning of the sample period (refers to the 2005 cohort hereafter) and the number of T4 slips submitted each year. A business is alive if it is found in both the current year, T, and in the following year, T+1. If the business does not exist in T+1, it is deemed to be an exit in T.[8] Survival time is then obtained as the number of years alive by a given enterprise, starting from its first date of occurrence in the sample to the year when there is missing information on the number of T4 slips submitted. Furthermore, the descriptive analysis explores the potential drivers of economic performance by characterizing the social and demographic profiles of the Indigenous-owned businesses and business characteristics, including enterprise size and industry. It is acknowledged that there are outliers in the sample, which might prevent a robust analysis. To cope with that possibility, the sample is restricted to businesses with a non-negative revenue outside of the 99th and 100th percentiles of the sample revenue distribution. This restriction does not exclude many Indigenous-owned businesses.

In addition to descriptive statistics, econometric analysis using MI technique applied to the pooled ordinary least squares (OLS) model to examine the relationship between business performance and Indigenous identity of ownership. Using the imputed data obtained from 30 rounds of iterations, this paper estimates the following equation (1) :

$$\begin{aligned} Log\left(y_{it}\right) \;=\; & a_1 Id\_Ownership_{it} + a_2 Business\_age_{it} + a_3 Log\left(Business\_size_{it-1}\right) + \\ & a_4 Log\left(Deb\_asset\_ratio_{it}\right) + a_5 Log\left(Capital_{it}\right) + rural_i + province_i + industry_i + \\ & year_t + \varepsilon_{it} \end{aligned} \tag{1}$$

Where y_{it} denotes a given economic performance indicator for enterprise i in year t. This includes revenue and labour productivity. $Id\_Ownership_{it}$ is a categorical variable of subgroups of Indigenous-owned businesses (First Nations, Métis, Inuit and other Indigenous) with the non-Indigenous-owned group as a reference category. $Business\_age_{it}, Business\_size_{it-1}, Deb\_asset\_ratio_{it}$ and $Capital_{it}$ represent business age, number of employees, debt asset ratio and capital,[9] respectively. Controlling for business size in the regression may lead to bias estimates because revenue is an indicator of business size. To avoid the reverse causality concern, business size from the previous period was introduced into the set of regressor variables. Finally, rural, province, industry and year fixed effects are included. Logarithm terms of variables are employed.

The coefficient of interest is a_1, which corresponds to the percentage change in performance of a given type of Indigenous-owned business relative to their non-Indigenous-owned counterparts. In a supplementary analysis, equation (1) is estimated using restricted sample based on the geographic location, urban and rural areas. The latter analysis is an attempt to assess the role of geography, especially the so-called “remoteness issues,” in the size of the performance gap between Indigenous-owned and non-Indigenous-owned businesses.

As a robustness check exercise, the MI pooled OLS model is estimated with the simple OLS model (without imputed data). Both results are reported.

To evaluate the business survival rate, a non-parametric Kaplan-Meier (KM) survival analysis and Cox proportional hazard model are employed. The KM survival analysis examines the survival distribution among businesses by Indigenous identity. For each time interval, survival probability

8. A robustness exercise was performed using the predecessor-successor files over the sample period to ensure that missing business results from the enterprise being closed, rather than still alive but operating under a different name after a business merger.
9. Capital corresponds to total assets, which are used as a proxy for physical capital—a key input factor for business production.

of the 2005 cohort (the cohort observed the longest in the sample period) is calculated as the fraction of businesses that survived.

$$S_t = \left(Number\ of\ Businesses\ at\ the\ start - Number\ of\ Businesses\ exited\right) / Number\ of\ Business\ at\ the\ start \quad (2)$$

The survival distribution among subgroups of Indigenous-owned businesses is tested using Log-Rank test or stratified Log-Rank test for statistical differences.

Cox proportional hazards regression analysis examines the hazard of business exit, accounting for characteristics of businesses and their owners.

The Cox proportional hazards model can be expressed as

$$h(t) = h_o(t) exp(\beta X_i),$$

Where $h(t)$ denotes the risk of business exit as the risks/hazard at time t and $h_o(t)$ denotes the baseline hazard rate. X_i denotes the observable characteristics of business i and its ownership. β denotes the coefficient matrix of X_i. These characteristics include industry sector, geographic region, business age, business size proxies by number of employees, debt-asset ratio, labour productivity, business ownership by gender and Indigenous identity of ownership. In addition, the model controls for year fixed effect.

From the Cox model, the hazard ratio can be rewritten as

$$h(t) / h_o t \ = \ exp\ (\beta X_i) \quad (3)$$

Three assumptions are imposed: 1) survival time is independent across businesses, 2) the relationship between control variables and the hazard is multiplicative, as defined by equation (3) and 3) there is a constant hazard ratio over time. Weibull distribution of the survival function is assumed. The proportional hazard assumption is tested.

3 Results

3.1 Descriptive analysis

1. First Nations people and Métis represent nearly identical shares of Indigenous-owned businesses.

The main sample consists of an average of 1,200,867 enterprises with employees from 2005 to 2018, with 16,431 Indigenous-owned businesses. This corresponds to 1.36% of the total sample, as shown in Table 2. Albeit slightly lower, this average number of Indigenous-owned businesses is in line with published data of private enterprises by Indigenous identity of ownership (Statistics Canada, Table: 33-10-0631-01). Table 2 shows that First Nations people and Métis represented the largest group of Indigenous-owned enterprises, with a yearly average of 7,652 and 7,616 enterprises, respectively. These proportions are roughly 20 times higher than the number of Inuit-owned businesses and roughly 10 times higher than the number of other Indigenous-owned businesses.

Table 2
Sample composition, 2005 to 2018

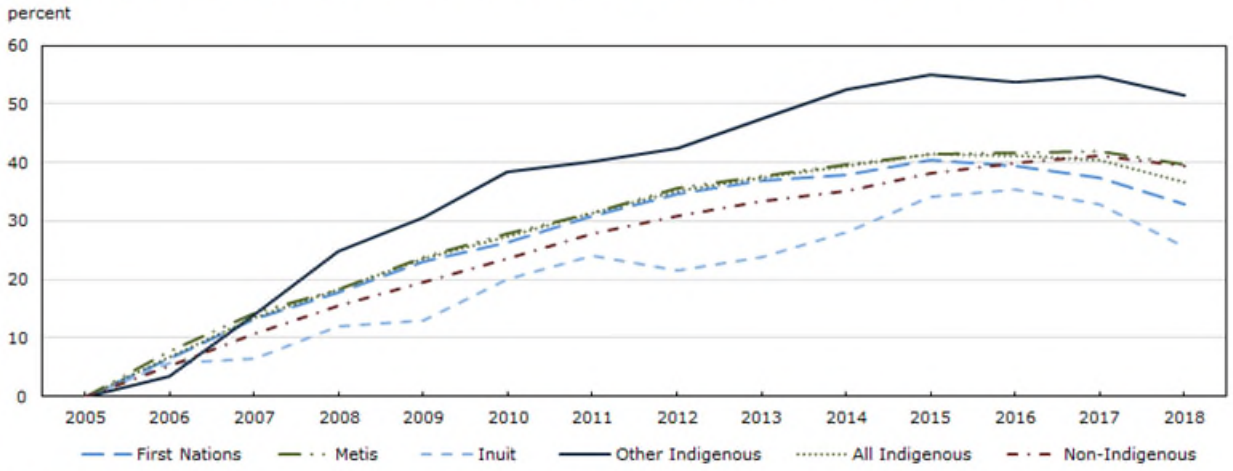
Identity of ownership	Average number of enterprises	Percentage
All Indigenous	16,431	1.36
First Nations	7,652	0.63
Metis	7,616	0.63
Inuit	316	0.02
Other Indigenous	847	0.07
Non-Indigenous	1,184,436	98.63
Total	1,200,867	100.00

Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

2. The number of Indigenous-owned businesses grew by 37% from 2005 to 2018, two percentage points lower than the growth rate of non-Indigenous-owned businesses.

Chart 1 shows the percentage change, relative to 2005, of the number of enterprises by Indigenous identity of ownership over time. It reveals that, regardless of the identity of ownership, these enterprises have observed an upward trend with a similar rate for Indigenous-owned businesses. The number of Indigenous-owned businesses has grown by 37% from 2005 to 2018, two percentage points lower than the growth rate of non-Indigenous-owned businesses. Except for Inuit-owned businesses that experienced a slight decrease in number of enterprises around 2012, the other group entry and exit dynamics of Indigenous-owned businesses remained positive (i.e., relatively more entries than exits) on the market until 2017, when the number declined. Overall, the growth rate of Indigenous-owned businesses remained low, compared with non-Indigenous-owned ones, during the sample period.

Chart 1
Percentage change of number of enterprises by identity of the ownership relative to 2005



Notes: The figure describes the percentage change relative to 2005 of number of enterprises by identity of the ownership over the period 2005 to 2018.
As shown on the graph, the fraction of businesses owned by First Nations people and Métis has followed the same pattern.
Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

3. Nearly one in five Indigenous-owned businesses operate in construction.

Table 3 shows the sectors that Indigenous Peoples are more likely to own a business in and describes the distribution of average number and percentage of enterprises by economic sectors and Indigenous identity of majority group ownership. Of the total sample, a relatively significant proportion of Indigenous-owned businesses were likely to operate in the construction (18.89%)

and professional, scientific and technical services (15.49%) sectors. The order is reversed for non-Indigenous-owned businesses regarding the professional, scientific and technical services (18.32%) and construction (13.38%) sectors. According to Table 3, almost one-third (33%) of both Indigenous-owned and non-Indigenous-owned businesses were concentrated in the construction and professional, scientific and technical sectors.

Table 3
Average number and percentage of Indigenous-owned enterprises by industry, 2005 to 2018

	First nations		Métis		All Indigenous		Non-Indigenous	
Industry	Average number	Percent	Average number	Percent	Average number	Percent	Average number	Percent
Agriculture, forestry, fishing and hunting	459	8.56	449	7.84	956	7.99	46,410	5.03
Mining, quarrying, and oil and gas extraction	167	3.11	160	2.79	346	2.89	9,878	1.07
Utilities	X	X	60	1.04	X	0.06	376	0.04
Construction	1,017	18.98	1,079	18.85	2,260	18.89	127,993	13.38
Manufacturing	194	3.62	180	3.14	406	3.39	38,144	4.13
Wholesale trade	172	3.21	198	3.45	404	3.37	44,834	4.86
Retail trade	416	7.76	431	7.53	924	7.72	79,314	8.6
Transportation and warehousing	408	7.61	423	7.39	887	7.41	62,128	6.74
Information and cultural industries	92	1.71	54	0.94	158	1.32	13,725	1.48
Finance and insurance	177	3.3	186	3.25	396	3.31	48,676	5.28
Real estate and rental and leasing	X	X	278	4.85	X	4.47	51,941	5.63
Professional, scientific, and technical services	820	15.3	866	15.13	1,853	15.49	168,908	18.32
Management of companies and enterprises	103	1.92	102	1.78	220	1.83	20,370	2.21
Administrative and support, waste management and remediation services	257	4.79	265	4.63	562	4.69	41,447	4.49
Educational services	50	0.93	44	0.76	105	0.87	9,552	1.03
Health care and social assistance	213	3.97	269	4.7	522	4.36	56,335	6.11
Arts, entertainment and recreation	85	1.58	71	1.24	166	1.38	11,380	1.23
Accommodation and food services	209	3.9	203	3.54	455	3.8	40,671	4.41
Other services (except public administration)	346	6.45	405	7.07	799	6.67	49,579	5.37

x suppressed to meet the confidentiality requirements of the *Statistics Act*

Notes: This table is obtained from a sample in which only non-missing information on business industry is considered. Inuit and other indigenous owned businesses are dropped to meet confidentiality rules. "X" denotes suppressed values, i.e., numbers below 10. Finally, numbers reported in this table are rounded up to the integer.

Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

Industry is an important determinant of business performance, especially for those with different ownership characteristics. For instance, examining the survival and performance of start-ups by majority gender of ownership, Couture and Houle (2020) find different results depending on whether the industry is taken into account. Women-owned start-ups had an overall lower survival rate and lower labour productivity than equally owned and men-owned start-ups. However, when industry was controlled for, women-owned start-ups were more productive and more likely to survive in industries with a higher concentration of women-owned start-ups, relative to men-owned start-ups in the same industries. Similarly, to determine the economic performance of Indigenous-owned businesses relative to non-Indigenous-owned ones, the empirical analysis below controls for the industry in which the business operates.

4. Nearly 30% of Indigenous-owned businesses, on average, are owned by people aged 45 to 54, while more than two-thirds (73%) are majority-owned by men.

In addition to the racial profile of the business owner, other demographic factors such as gender and age have been documented in the literature as key determinants of performance (Fairlie & Robb, 2009; Isaga, 2015; Couture & Houle, 2020). Table 4 reports the distribution of total observations by age and sex of the top owner among the different Indigenous-owned businesses.[10] It reveals that nearly one-third of businesses (30%), regardless of Indigenous identity, are owned by individuals aged 45 to 54 years. Moreover, Table 4 indicates that, in general, a higher concentration of Indigenous-owned businesses is owned by individuals aged younger than 45 (37.6%), compared with non-Indigenous-owned businesses (32.0%). Métis-owned businesses are more likely to be owned by younger individuals, accounting for about 14.75% of the total owners within this group, while non-Indigenous owners have the highest share of older owners at 16%.

Regarding the sex of the top owner, most businesses are owned in majority by men, by an average of about 73% for Indigenous-owned businesses and 64% for non-Indigenous-owned businesses. Notably, women are better represented among Indigenous-owned businesses (23.5%) than among non-Indigenous-owned businesses (19.8%). Also, Métis businesses were more likely to be owned by men (about 75.74%), while there were relatively more women in First Nations enterprises (about 34.75%). Few Indigenous-owned businesses were equally owned by both men and women. Overall, numbers from Table 4 are consistent with the published data of private enterprises by Indigenous identity of ownership, sex and size (Statistics Canada, Table: 33-10-0631-01).

Table 4
Percentage of enterprises by individual ownership characteristics, 2005 to 2018

	First nations	Métis	Inuit	Other indigenous	All Indigenous	Non-Indigenous
			percent			
Panel (a): Top owner age						
Less than 35	13.28	14.75	11.87	9.88	13.88	10.67
35 to 44	24.43	22.98	25.00	20.62	23.73	21.35
45 to 54	29.75	28.23	27.18	30.79	28.97	28.09
55 to 64	21.13	22.37	22.18	25.98	21.84	23.86
65 and older	11.38	11.65	13.75	12.71	11.55	16.00
Panel (b): Top owner sex						
Men-owned	72.07	75.74	64.24	61.03	73.03	64.29
Women-owned	34.75	21.83	31.01	21.25	23.48	19.76
Equally owned	2.87	2.41	4.74	17.70	3.44	15.94

Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

5. A large percentage (about 90%) of Indigenous-owned businesses is small businesses (less than 10 employees), with roughly one in three (31.4%) located in rural areas.

Chart 2 depicts the distribution of the percentage of enterprises by identity of ownership, enterprise size and geographic location over the sample period of 2005 to 2018. It shows that about 9 out of 10 of both types of businesses is small, i.e., with less than 10 employees. Additionally, the difference in average number of employees between Indigenous-owned and non-Indigenous-owned businesses is statistically significant.[11] The Canadian economy relies heavily on small businesses. They create jobs, improve local communities, provide over a third of

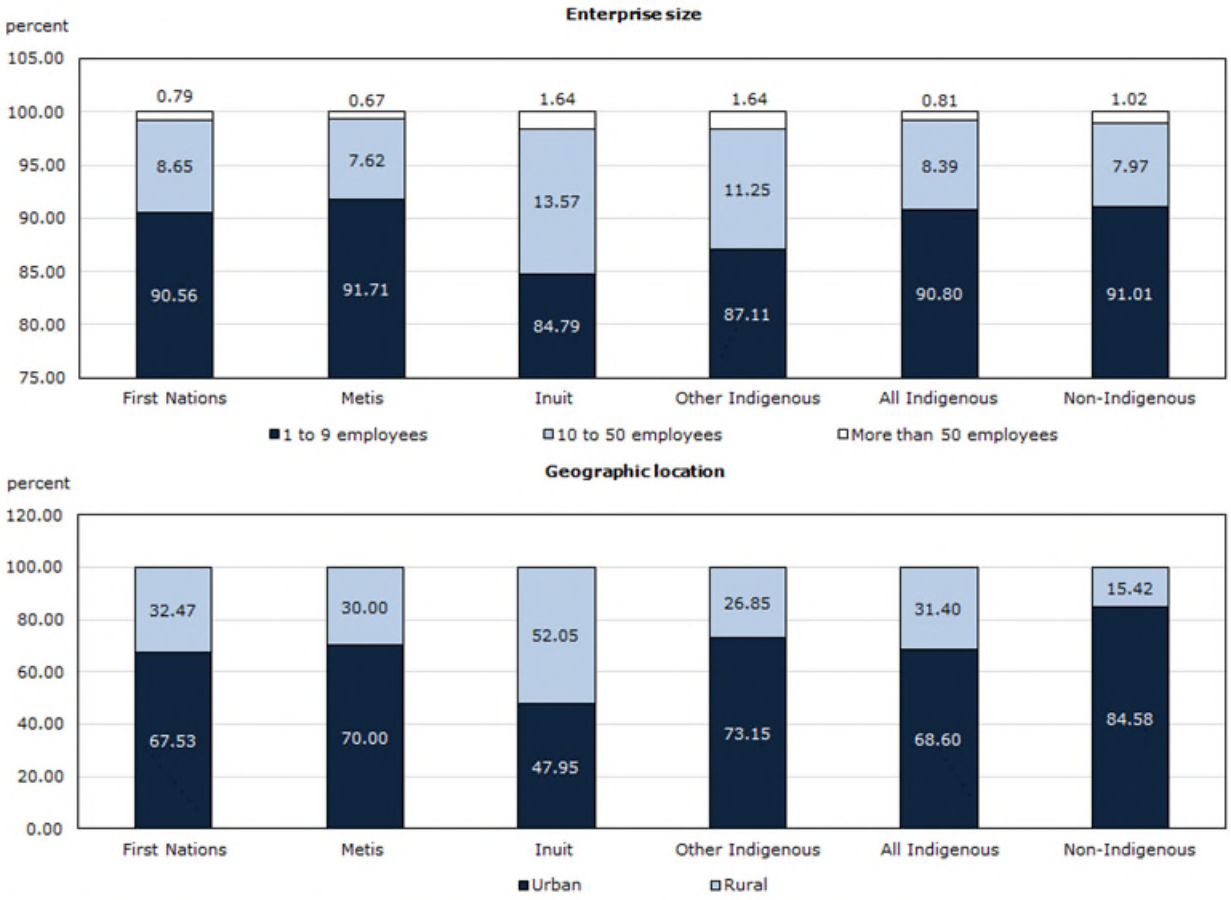
10. Top owner age is defined as the age category of the business majority owned persons. For example, 29.75% of First Nations majority owned businesses are led by individuals aged 45 to 54 years. Sex refers to sex at birth. Sex-specific ownership is constructed from the Canadian Employer-Employee Dynamics Database. It is available only for unincorporated businesses (with employees) and privately held corporations (mostly Canadian-controlled private corporations) where information on ownership and sex of owners are available.
11. The corresponding p-value is reported in Table 5.

Canada's GDP, fuel innovation and inspire competitiveness. However, compared with their larger counterparts, smaller businesses were more likely to have lower revenues in 2021 (Tam, 2022). In addition, previous studies have found small businesses to be more likely to exit the market (Grekou and Liu, 2018).

Geographically, when comparing business distribution by urban and rural areas, Chart 2 suggests that, except for Inuit-owned businesses for which the share is nearly identical between urban and rural areas, distribution for the remaining businesses shows a higher percentage in urban areas than in rural areas. However, about one in three (31.4%) Indigenous-owned businesses were in rural areas, compared with 15.42% of non-Indigenous-owned businesses. In other words, Indigenous-owned businesses are more than twice as likely to be in rural areas than non-Indigenous-owned ones. Compared with a broad picture of Canada, the business distribution by geographic location depicted in Chart 2 is in line with findings from Ha, Wong, & Khodja (2023): in 2020, 15.5% of small businesses in Canada were in rural and small-town areas.

Geography can play an important role in business economic participation and development. For instance, urban areas allow businesses to access a large workforce pool, as well as benefiting from better infrastructures (both physical and digital), compared with rural areas. If remote businesses have lower installation costs (for example, the price of real estate), they may support additional charges to access remote markets, which may limit their economic activity and expansion (Leach, Lars-Anders Baer, & Yu, 2020).

Chart 2
Percentage of enterprises by identity of ownership, enterprise size and geographic location, 2005 to 2018



Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

6. Summary statistics: Average value of economic indicators by Indigenous identity of enterprise ownership

The final sample used to perform the subsequent analysis consists of 12,934,887 observations from 2005 to 2018, restricted to businesses with non-negative revenue. To assess the relationship between Indigenous identity of enterprise ownership and its performance, some economic indicators are considered, including revenue, business age, debt asset ratio, labour productivity and number of employees (business size). For econometric analysis, logarithm terms of variables are employed. Table 5 reports the average values of these variables by Indigenous identity of businesses. It also shows the p-values to check whether the values obtained for all Indigenous and non-Indigenous groups are statistically significantly different. Average values of economic indicators reported in Table 4 are statistically significantly different between all Indigenous-owned and non-Indigenous-owned businesses.

On average, Indigenous-owned businesses have a lower annual revenue of $640,000, compared with $751,000 for non-Indigenous-owned businesses. Similarly, for labour productivity, the findings indicate that Indigenous-owned businesses were less productive than their non-Indigenous-owned counterparts. Descriptive statistics also suggest that Indigenous-owned businesses were smaller, with an average of 6.5 employees per enterprise, compared with 7.2 employees in non-Indigenous-owned businesses. Regarding debt asset ratio, both types of businesses had, on average, total liabilities of more than half the total assets, suggesting that they were indebted. However, the debt was lower for non-Indigenous-owned businesses (a ratio of 0.5) than that of Indigenous-owned ones (ratio of 0.6), with a statistically significant difference. There was also a statistically significant difference for both types of businesses regarding geographic (urban or rural) location. Finally, there is no statistically significant difference between Indigenous-owned and non-Indigenous-owned businesses in terms of business age, with an average of 10 years.

Table 5
Average values of economic indicators by identity ownership of enterprises, 2005 to 2018

	First Nations	Métis	Inuit	Other Indigenous	All Indigenous	Non-Indigenous	P-values (All Indigenous/Non-Indigenous)
Total revenue (10^3)	650	584	894	947	640	751	0
Debt asset ratio	0.67	0.57	0.66	0.59	0.62	0.55	0.001
Labor productivity (10^6)	2.56	3.06	2.83	2.91	2.82	3.24	0
Number of employees	6.58	6.18	9.97	8.57	6.59	7.2	0
Business age	10.11	10.27	10.74	10.62	10.23	10.93	0.3112
Rural area	0.32	0.3	0.51	0.26	0.31	0.15	0
Capital (10^3)	482	487	623	660	497	647	0
			number				
Total observations	**77,390**	**79,810**	**3,525**	**9,582**	**170,307**	**12,800,000**	**…**

… not applicable

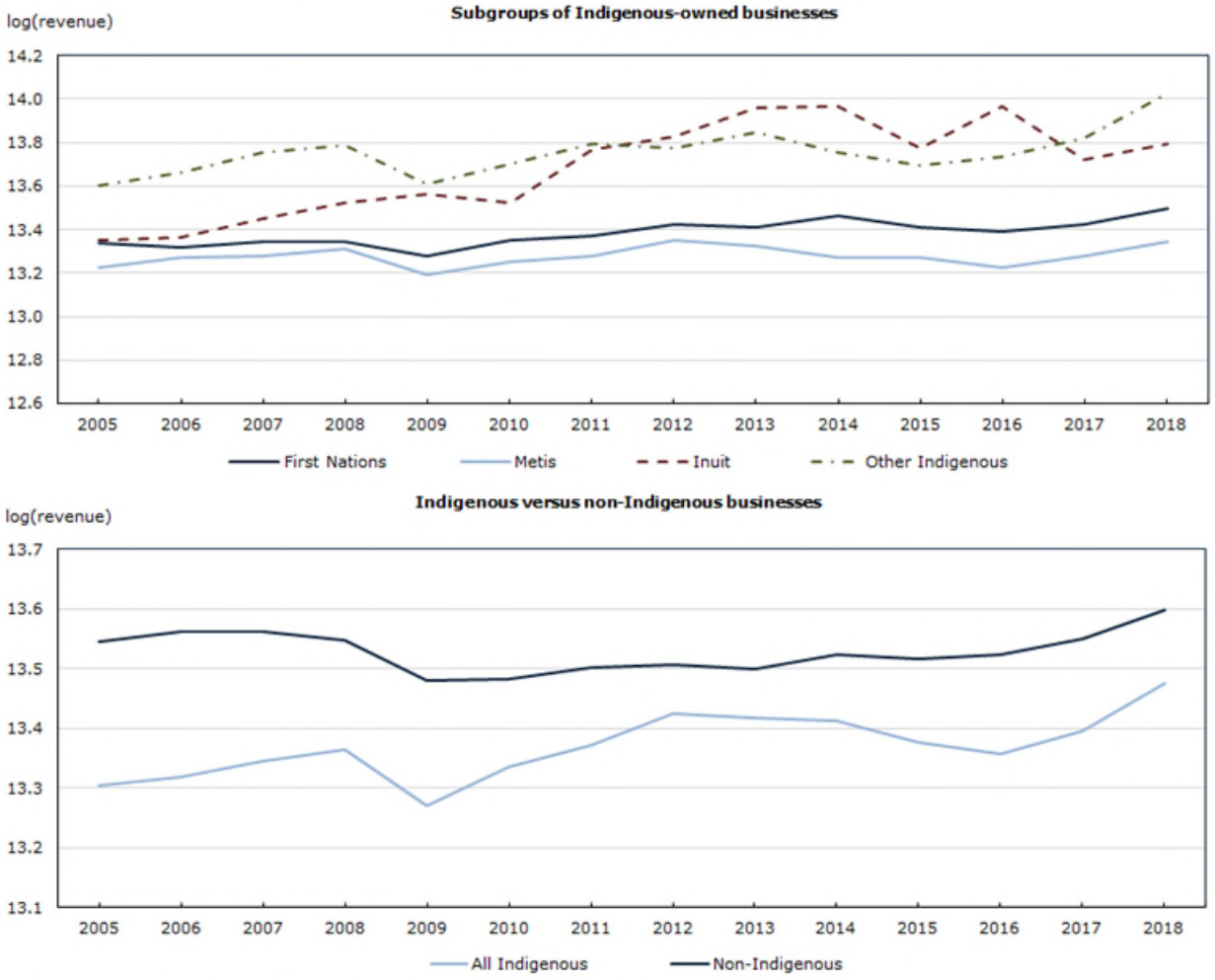
Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

7. Indigenous-owned businesses have grown, on average, at a relatively faster rate in both revenue and labour productivity than non-Indigenous-owned ones.

Following the related literature (Grekou & Watt, 2021; Couture & Houle, 2020), two indicators are employed to evaluate performance: revenue and labour productivity. Chart 3 and Chart 4 compare the trends of revenue and labour productivity in logarithm terms by Indigenous identity of businesses. While the revenues have slightly fluctuated over time following the economic business cycles, they exhibited an upward trend, on average, for both types of businesses, as

shown in Chart 3. However, compared with non-Indigenous-owned businesses, the trend of revenue for Indigenous-owned businesses was lower by 0.2 in logarithm terms. Put differently, the revenue of non-Indigenous-owned businesses was, on average, 1.2 times higher than Indigenous-owned businesses. Among subgroups, the patterns of revenue were similar for First Nations and Métis owned businesses, and also for Inuit and other Indigenous ones. Although they have followed similar patterns, the revenues of Indigenous-owned and non-Indigenous-owned businesses rose at different rates. Indigenous-owned business revenues rose by an average of 1.4%, 10 percentage points higher than for non-Indigenous-owned ones.

Chart 3
Trend of enterprises revenues by identity of the ownership, 2005 to 2018

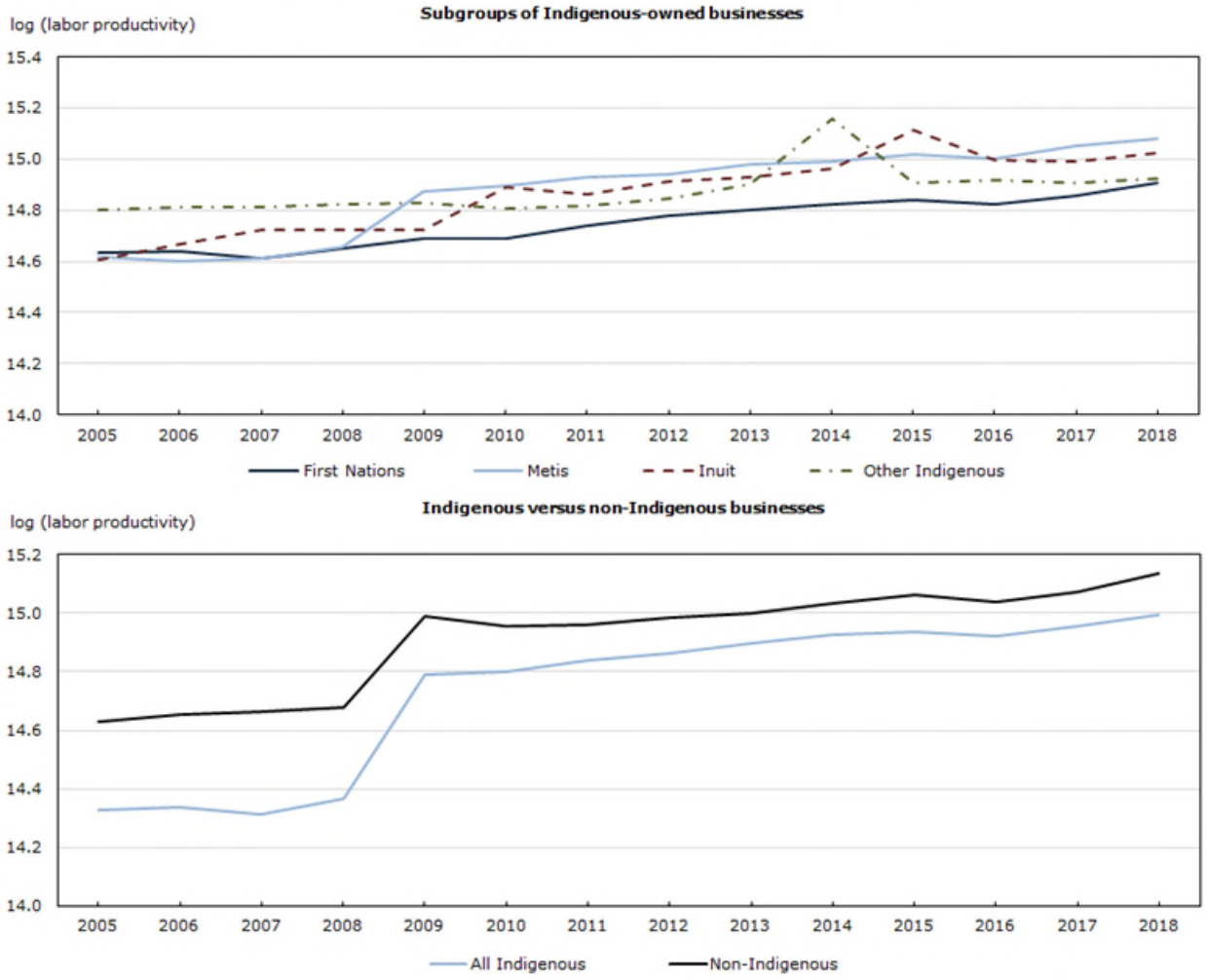


Note: This figure depicts the trend of revenue in logarithm terms over 2005-2018 by identity of the majority-owned group.
Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

Like revenues, both types of businesses experienced an upward trend in labour productivity, as shown in Chart 4. Moreover, over the sample period, Chart 4 reveals a constant gap in labour productivity, with a lower level in Indigenous-owned businesses, compared with non-Indigenous-owned ones. In terms of growth rates, Indigenous-owned businesses experienced a faster labour productivity growth rate of 0.27%, compared with 0.23% for non-Indigenous-owned businesses, which suggests that the gap may be closing.

Among the subgroups of Indigenous identity, there is a significant gap between businesses owned by First Nations people and those owned by Métis.

Chart 4
Trend of enterprises labor productivity by identity of the ownership, 2005 to 2018



Note: This figure depicts the trend of labor productivity in logarithm terms over 2005-2018 by identity of the majority-owned group.
Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

The data analysis described in this subsection leads to some insights. Indigenous-owned and non-Indigenous-owned businesses in this sample share some common characteristics. They are likely to be small and managed in majority by men aged 45 to 54 years. Both types of businesses tend to be similar in business age, i.e., on average, they have spent 10 years on the market. However, substantial differences are found between these two groups of businesses. While they are both more likely to be in urban areas, the concentration is quite different for Indigenous-owned (69%) and non-Indigenous-owned (85%) businesses, respectively. Regarding economic indicators, namely labour productivity and revenue, analysis indicates that there is a statistically significant difference, on average, between Indigenous-owned and non-Indigenous-owned businesses. Finally, despite volatility over time and remaining lower, Indigenous-owned businesses have experienced a relatively faster growth in revenue and labour productivity, on average, than non-Indigenous-owned ones. Although the insights derived from the unconditional descriptive analysis are meaningful for the research question, it is not enough to fully understand the performance gap between businesses. A more convenient analysis which accounts for relevant characteristics of enterprises such as industry, province, size (number of employees) and capital will help better achieve the paper objective. Results of the estimation of equation (1) and survival analysis are presented in the following subsection.

3.2 Results of empirical analysis

3.2.1 Kaplan-Meier survival analysis

8. By 2018, nearly 62% of the 2005 cohort of Indigenous-owned businesses survived, 2 percentage points lower than the survival rate of non-Indigenous-owned ones.

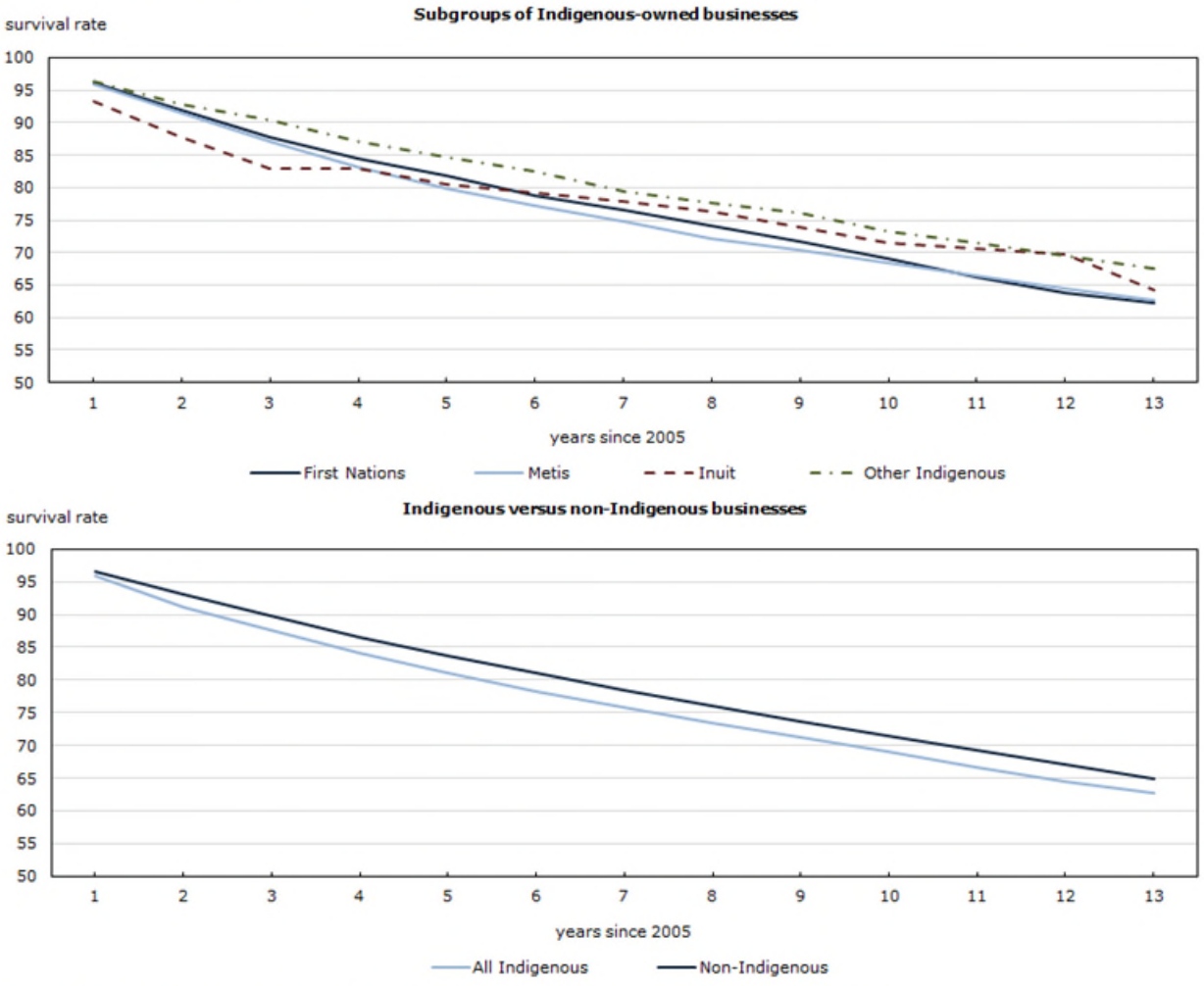
On average, how long do Indigenous-owned businesses stay on the market, compared with non-Indigenous-owned ones? To answer this question, this subsection provides KM survival estimates for Indigenous-owned businesses that estimates the survival time on the market for a given enterprise, as shown on Chart 5. The survival rate was measured for the 2005 cohort of businesses, which could be followed over the longest period in the data. The survival rate is computed between two consecutive years and is obtained as the ratio of number of enterprises that stay active in each of the two years over the total initial enterprises observed in the first year. This approach is repeated throughout the 2005-to-2018 period.[12]

Overall, the KM survival estimates depicted in Chart 5 show a decreasing survival rate over the period for both type of enterprises. While businesses have almost followed the same survival rate a year after the starting period, Indigenous-owned businesses have exited the market at a relatively faster rate than non-Indigenous-owned ones. This corresponds to a constant exit rate that is two percentage points higher for Indigenous businesses, compared with non-Indigenous-owned ones. For instance, by 2018, nearly 62% of the 2005 cohort of Indigenous-owned businesses remained on the market against a survival rate of about 64% for non-Indigenous-owned enterprises.

When the results are broken down by Indigenous group, the survival analysis indicates that businesses owned by First Nations people and Métis have followed a similar pattern and have a lower survival likelihood than Inuit-owned and other Indigenous-owned businesses.[13]

12. Moreover, the survival distribution among groups of businesses is tested using Log-Rank test for statistical differences. The Log-Rank test is used to test the null hypothesis that there is no difference between Indigenous and non-Indigenous owned businesses up to the point of failure. Results from the test indicate that non-Indigenous and Indigenous owned businesses are statistically different in their survival probability over time, as shown in Appendix Table A.1.
13. A detailed breakdown of survival rates is reported in Appendix Table A.2.

Chart 5
Kaplan-Meier Survival estimates for 2005 cohort, by majority group of Indigenous identity ownership, 2005 to 2018



Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

To ensure the robustness of the results, KM survival analysis is repeated for the 2006 and 2007 cohorts. Findings are presented in Appendix Chart A.1. For both cohorts, results are consistent and suggest that, on average, the exit rate is about 25%, with a lower survival likelihood for Indigenous-owned businesses compared with non-Indigenous-owned ones.

3.2.2 Cox proportional hazard model

9. Indigenous-owned businesses were, on average, 18.41% more likely to exit compared with non-Indigenous-owned ones.

This subsection assesses survival probability, controlling for Indigenous identity of the business, as well as a set of business characteristics such as industry, geographic region, business age, business size proxied by number of employees, debt-asset ratio and labour productivity. Equation (3) is estimated for Indigenous-owned businesses (panel A of Table 6) and all Indigenous groups (panel B of Table 6), compared with non-Indigenous-owned ones. This analysis is done only for the 2005 cohort. Table 6 presents the results with associated standard

errors in brackets. The interpretation is as follows: the greater the hazard rate is, the higher the likelihood of exit.[14]

Table 6
Cox proportional hazard model results, 2005 cohort

	Model 1		Model 2	
	coefficient	standard error	hazard rate	standard error
Panel A: All Indigenous owned				
All Indigenous	0.1689 ***	(0.018)	1.1841 ***	(0.042)
Versus non-Indigenous (reference)	…	…	…	…
Panel B: Subgroups of Indigenous owned				
First Nations	0.1644 ***	(0.026)	1.1787 ***	(0.031)
Métis	0.2003 ***	(0.026)	1.2218 ***	(0.031)
Inuit	0.1281	(0.1313)	1.1367	(0.149)
Other Indigenous	-0.066	(0.084)	0.935	(0.079)
Versus non-Indigenous (reference)	…	…	…	…

… not applicable

* significantly different from reference category (p < 0.05)

** significantly different from reference category (p < 0.01)

*** significantly different from reference category (p < 0.001)

Notes: All regressions control for industry sector, geographic region, business age, business size proxies by number of employees, debt-asset ratio. Robust standard errors are in parentheses.

Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

Panel A of Table 6 suggests that on average, Indigenous-owned businesses were 18.41% more likely to exit, compared with non-Indigenous-owned ones.[15] Panel B shows that estimates associated with First Nations (17.87%) and Métis (22.18%) businesses are statistically significant (while this is not the case for the Inuit and other Indigenous subgroups) and indicate that they are more likely than their non-Indigenous counterparts to exit (except for the Inuit and other Indigenous subgroups. Consistent with results displayed in Chart 5, these differences in survival estimates between businesses are in line with findings from the literature. In fact, previous studies document that the individual attributes of entrepreneurs, namely age, sex and marital status, are associated with their likelihood of exit (Chirico et al., 2020; Cho & Orazem, 2020; Harada, 2007). For instance, Chirico et al. (2020) find a higher exit rate among firms managed by individuals from racialized and EE. In addition to the non-economic factors, the importance of antecedents of firm exit such as financial constraints, innovation or performance levels could explain the survival likelihood gap (Ponikvar et al., 2018; Cefis & Marsili, 2019; Chang, 1996). The next subsection examines the economic performance of Indigenous-owned businesses relative to non-Indigenous-owned ones over the sample period.

3.2.3 Pooled ordinary least squares model with multiple imputation

Tables 7 and 8 summarize the results of the multiple imputation (MI) and simple ordinary least squares (OLS) estimation of equation (1) for each outcome of interest, i.e., logarithms of revenue

14. To ensure that the results are valid, preliminary tests are performed to examine whether proportional-hazard assumptions are not violated. A common graphical method of evaluating proportional-hazard assumptions consists of to plot −ln{−ln(survival)} curves for each category of a nominal or ordinal covariate versus ln (analysis time). These are often referred to as “log–log” plots. If the plotted lines are reasonably parallel, the proportional-hazard assumptions have not been violated. As shown in Appendix Chart A.2, the curves are roughly parallel and suggest that proportional-hazards assumptions are not violated and that it would be appropriate to base the estimate for that variable on one baseline survivor function.
15. To interpret the results, the exponential of the coefficients is taken, which provides the hazard rate. For example, for Indigenous-owned businesses, exp(0.1689) is 1.1841. That is, the likelihood of exit is 18.41% higher than their non-Indigenous counterparts.

and labour productivity, respectively. Simple OLS refers to OLS without MI technique. Coefficients are interpreted in terms of percentage change. Columns (1) to (4) of each table estimate a version of equation (1) with (MI) and without (simple OLS) applying MI technique, in which the variable $Id\_Ownership_{it}$ refers to either Indigenous owned (compared with non-Indigenous owned) or First Nations, Métis, Inuit and other Indigenous (compared with non-Indigenous), respectively. All regressions control for logarithm terms of business size (in previous period), debt-asset ratio, capital and business age, and province, industry, rural and year dummies. Finally, results are shown with standard errors in brackets.

10. Indigenous-owned businesses were 7.5% less productive, on average, compared with non-Indigenous-owned ones.

Estimates reported in Table 7 indicate that labour productivity is negatively associated with Indigenous-owned businesses with results consistent for both MI and simple OLS methods. Unsurprisingly, it appears that coefficients are inflated under simple OLS estimation, compared with MI. This is likely because simple OLS estimation uses a single value and less precise technique to fill missing values, instead of an iterative procedure like the MI approach. Column (1) suggests that Indigenous-owned businesses were about 7.5% less productive, on average, compared with their non-Indigenous-owned counterparts. Column (2) reveals that the impact is higher for First Nations- and other Indigenous-owned businesses, and they have experienced an average productivity loss of 15.0% and 3.1%, respectively, compared with non-Indigenous-owned businesses. Overall, econometric results are supportive of the unconditional descriptive statistics presented in Table 5, in which labour productivity among Indigenous-owned businesses was lower than that of their non-Indigenous-owned counterparts. Furthermore, expected signs of coefficients are obtained when controlling for relevant business characteristics such as industry, business size, debt-asset ratio and capital.

Table 7
Main results—Effects on labor productivity

	Log (labor productivity)							
	Multiple imputation				Ordinary least square			
	Model 1		Model 2		Model 3		Model 4	
	coefficient	standard error	coefficient	standard error	coefficient	standard error	coefficient	standard error
Ownership Identity								
All Indigenous	-0.075 ***	(0.0028)	…	…	-0.118 ***	(0.004)	…	…
First Nations	…	…	-0.150 ***	(0.004)	…	…	-0.226 ***	(0.006)
Métis	…	…	-0.015 ***	(0.004)	…	…	-0.035 ***	(0.005)
Inuit	…	…	-0.036	(0.021)	…	…	-0.164 ***	(0.024)
Other Indigenous	…	…	-0.031 ***	(0.012)	…	…	-0.024	(0.017)
Non-Indigenous (reference)	…	…	…	…	…	…	…	…
Controls								
Log (Business size (*t-1*))	-0.189 ***	(0.004)	-0.189 ***	(0.004)	-0.186 ***	(0.006)	-0.186 ***	(0.0006)
Business age	0.004 ***	(0.00004)	0.004 ***	(0.00004)	0.005 ***	(0.00006)	-0.005 ***	(0.0006)
Log (Debt asset ratio)	0.006 ***	(0.0006)	0.006 ***	(0.0006)	0.004 ***	(0.0008)	0.004 ***	(0.0008)
Log (Capital)	0.187 ***	(0.0002)	0.187 ***	(0.0002)	0.18 ***	(0.0003)	0.18 ***	(0.0003)
Rural FE	YES	YES	YES	YES	YES	YES	YES	YES
Province FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	7,111,541	7,111,541	7,111,541	7,111,541	7,111,541	7,111,541	7,111,541	7,111,541

… not applicable

* significantly different from reference category (p < 0.05)

** significantly different from reference category (p < 0.01)

*** significantly different from reference category (p < 0.001)

Notes: FE stands for fixed effects. All regressions control for industry sector, geographic region, business age, business size proxies by number of employees, debt-asset ratio. Robust standard errors are in parentheses.

Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005-2018.

Labour productivity is an indicator that gives a sense for the effectiveness of labour use. However, there are few studies examining labour productivity by enterprise ownership characteristics. Instead, the related literature evaluated performance in terms of revenues, asset turnover, increase in production and volume of sales (Hamzani & Achmad, 2016; Rola-Rubezen, 2011). Following the latter strand of literature, this analysis examines the change in business revenues conditional on the Indigenous identity of ownership.

11. Indigenous-owned businesses have earned about 2.7% less, on average, compared with non-Indigenous-owned ones.

Table 8 suggests that revenues are also negatively correlated with Indigenous identity of ownership and statistically significant. On average, Indigenous-owned businesses earned 2.7% less than non-Indigenous-owned businesses. These results are consistent when considering alternative measures of performance such as net and gross profit margins. Among Indigenous-owned businesses, those owned by Métis experienced the highest impact, i.e., 5.9% less revenue, followed by other Indigenous with 5.0%, compared with their non-Indigenous counterparts. Compared with labour productivity, the performance gap in terms of revenue between Indigenous-owned and non-Indigenous-owned businesses is lower by roughly five percentage points.

Findings from the related literature led to various conclusions regarding performance of Indigenous-owned businesses. Depending on the outcomes of interest, previous works provide evidence of both weaker and good performance of Indigenous-owned businesses, compared with that of non-Indigenous-owned ones. For instance, looking at the asset turnover, Rola-Rubezen (2011) finds that, in Australia, Indigenous-owned businesses reported making more profit than non-Indigenous ones. Comparing Indigenous ethnic micro, small and medium-sized enterprises to non-Indigenous ones in Indonesia, Hamzani & Achmad (2016) find no significant differences in terms of three indicators of performance: increased production, sales volumes and revenues. In Canada, a recent study by Canadian Council for Aboriginal Business and Global Affairs Canada (2023) find that Indigenous-owned SmaSMEs that export are less likely to do so, compared with the Canadian average.

This paper provides new evidence of lower performance in terms of both labour productivity and revenues for Indigenous-owned businesses in Canada.

Table 8
Main results—Effects on revenue

	Log(revenue)							
	Multiple imputation				Ordinary least square			
	Model 1		Model 2		Model 3		Model 4	
	coefficient	standard error	coefficient	standard error	coefficient	standard error	coefficient	standard error
Ownership Identity								
All Indigenous	-0.027 ***	(0.003)	…	…	-0.030 ***	(0.004)	…	…
First Nations	…	…	-0.005	(0.004)	…	…	-0.017	(0.007)
Métis	…	…	-0.059 ***	(0.004)	…	…	-0.071 ***	(0.006)
Inuit	…	…	-0.004	(0.022)	…	…	-0.092 ***	(0.027)
Other Indigenous	…	…	0.050 ***	(0.013)	…	…	0.001	(0.019)
Non-Indigenous (reference)	…	…	…	…	…	…	…	…
Controls								
Log (Business size (t-1))	0.837 ***	(0.0005)	0.837 ***	(0.0005)	0.843 ***	(0.0007)	0.843 ***	(0.0007)
Business age	-0.001 ***	(0.0005)	-0.001 ***	(0.0005)	-0.0004 ***	(0.0007)	-0.0004 ***	(0.0007)
Log (Debt asset ratio)	0.238 ***	(0.0005)	0.238 ***	(0.0005)	-0.24 ***	(0.0007)	-0.24 ***	(0.0007)
Log (Capital)	0.286 ***	(0.0002)	0.286 ***	(0.0002)	0.279 ***	(0.0003)	0.279 ***	(0.0003)
Rural FE	YES	YES	YES	YES	YES	YES	YES	YES
Province FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	**6,788,176**	**6,788,176**	**6,788,176**	**6,788,176**	**6,788,176**	**6,788,176**	**6,788,176**	**6,788,176**

… not applicable

* significantly different from reference category ($p < 0.05$)

** significantly different from reference category ($p < 0.01$)

*** significantly different from reference category ($p < 0.001$)

Notes: FE stands for fixed effects. All regressions control for industry sector, geographic region, business age, business size proxies by number of employees, debt-asset ratio. Robust standard errors are in parentheses.

Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005-2018.

Furthermore, estimates may explain the lower likelihood of survival of Indigenous-owned businesses relative to non-Indigenous-owned ones, as shown by Cox proportional hazard model in the previous subsection. Consistent with descriptive analysis results described in subsection 3.1, one may expect such a gap in economic performance between Indigenous-owned and non-Indigenous-owned businesses, as they reveal significant differences in some relevant economic characteristics.

While differences in economic performance observed among firms owned by employment equity groups (EE) and non-EE are well established in the literature (Gueye B., 2023; Bemrose & Lafrance-Cooke, 2022; A. Robb & Fairlie, 2009; Couture & Houle, 2020), little is known concerning the factors driving such performance gaps. To help understand these gaps, results are broken down by the geographic location of the business, i.e., whether in rural or urban area. This analysis aims to validate the remoteness issues that have been raised in the literature about constraints faced by Indigenous Peoples (especially those living on reserve) and the businesses they manage (Leach, Lars-Anders Baer, & Yu, 2020).

12. Productivity gap between Indigenous-owned and non-Indigenous-owned businesses is more than two times higher in rural areas (13.5%), compared with urban areas (4.8%).

Table 9
Main results—by urban versus rural geographic location

	Log (Labor productivity)				Log(revenue)			
	Model 1 - rural		Model 2 - urban		Model 3 - rural		Model 4 - urban	
	coefficient	standard error	coefficient	standard error	coefficient	standard error	coefficient	standard error
Ownership Identity								
All Indigenous	-0.135 ***	(0.005)	-0.048 ***	(0.003)	-0.002	(0.005)	-0.046 ***	(0.004)
Non-Indigenous (reference)	…	…	…	…	…	…	…	…
Controls								
Log (Business size (t-1))	-0.117 ***	(0.001)	-0.201 ***	(0.0005)	0.821 ***	(0.001)	0.839 ***	(0.0005)
Business age	0.001 ***	(0.0001)	0.005 ***	(0.0005)	-0.005 ***	(0.0001)	0.00004	(0.00005)
Log (Debt asset ratio)	-0.057 ***	(0.001)	0.014 ***	(0.0007)	-0.208 ***	(0.001)	-0.242 ***	(0.0006)
Log (Capital)	0.164 ***	(0.0007)	0.19 ***	(0.0002)	0.341	(0.0006)	0.277 ***	(0.0002)
Province FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	1,135,266	1,135,266	5,976,275	5,976,275	1,090,804	1,090,804	5,697,372	5,697,372

… not applicable

* significantly different from reference category ($p < 0.05$)

** significantly different from reference category ($p < 0.01$)

*** significantly different from reference category ($p < 0.001$)

Notes: FE stands for fixed effects. All regressions control for industry sector, geographic region, business age, business size proxies by number of employees, debt-asset ratio. Robust standard errors are in parentheses.

Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005-2018.

Table 9 reports the estimates of this supplementary analysis. Overall, findings indicate that, irrespective of the geographic location (urban or rural areas), Indigenous-owned businesses are likely to underperform, compared with their non-Indigenous-owned counterparts. In addition, the performance gap (especially regarding labour productivity) is even worse for Indigenous-owned businesses located in rural areas, compared with urban ones. In terms of magnitude, the productivity gap between Indigenous-owned and non-Indigenous-owned businesses is more than two times higher in rural areas (13.5%) than in urban areas (4.8%). Why is the performance gap between Indigenous-owned and non-Indigenous-owned businesses higher in rural areas than in urban ones?

Indigenous-owned firms based in rural and remote areas are more likely to be home-based and operating in primary industries (food and agriculture, forestry, fishing, and aquaculture) to address local demand and livelihood needs (Leach, Lars-Anders Baer, & Yu, 2020). These industries correspond to small markets that are less profitable and vulnerable to economic and commodity fluctuations. In addition, unlike non-Indigenous-owned businesses, Indigenous businesses in rural areas are highly concentrated in Indigenous census subdivisions located in rural low density and remote areas, away from metropolitan areas (Haaris & Alessandro, 2019). As such, they have limited access to a large pool of consumers and market and may experience weaker economic performance relative to those located near metropolitan centres.

These differences in main activities and proximity to major markets between Indigenous-owned and non-Indigenous-owned businesses, along with overall relatively poor rural economic features (compared with urban areas) may explain the results reported in Table 9. This additional analysis complements the study of Haaris & Alessandro (2019) by showing evidence of a larger performance gap between Indigenous-owned and non-Indigenous-owned businesses within rural areas. To get a broad picture of the potential barriers to the growth of the Indigenous economy, the final part of this paper summarizes the related recent literature.

4 Discussion

So far, this paper has attempted to quantify the gap in economic performance between Indigenous-owned businesses and their non-Indigenous-owned counterparts based on longitudinal data. The descriptive analysis reveals that Indigenous-owned and non-Indigenous-owned businesses share some common characteristics (e.g., they are likely to be small, managed in majority by individuals aged 45 to 54 years, and by men) and substantial differences in terms of geographic location and industry concentration. Notably, unconditional descriptive analysis suggests that Indigenous-owned businesses have experienced a relatively faster growth in revenue and labour productivity, on average, than non-Indigenous-owned businesses, suggesting a closing gap over time.

However, results from the empirical analysis with additional controls suggest that Indigenous-owned businesses were likely to experience weaker economic performance, compared with non-Indigenous-owned businesses. This performance gap is higher in rural areas compared with urban ones. In terms of magnitude, the performance gap is estimated to be, on average, about 7.5% for labour productivity and 2.7% for revenue. In addition, this relatively weak performance is also reflected in likelihood of survival, which was lower, on average, by two percentage points for businesses managed in majority by Indigenous people, compared with those managed by non-Indigenous Canadians.

The factors that drive this performance gap are missing from this data analysis. This section summarizes potential barriers to the growth of the Indigenous economy, including the business sector. Key constraints have been identified in the literature, namely, lower educational attainment, lack of access to capital and financing issues, regulation, and institutional constraints such as property rights restrictions (National Indigenous Economic Development, 2021; Chernoff & Cheung, 2023; Leach, Lars-Anders Baer, & Yu, 2020). These constraints are more likely to affect Indigenous peoples living on reserves.

Lower educational attainment

According to the Canadian Council for Aboriginal Business (CCAB) 2016 report, Aboriginal Business Survey found that Indigenous business owners cite attracting quality talent (39%) and retaining valuable employees (29%) as their greatest challenges in conducting business.[16] In fact, having difficulties in accessing highly skilled workers may limit the performance of businesses. Despite recent progress in educational attainment in Indigenous communities, the gap compared with the Canadian average remains significant, especially in rural and remote areas (Leach, Lars-Anders Baer, & Yu, 2020). According to Arriagada & Hango (2016), off-reserve First Nations and Métis adults have lower literacy and numeracy scores than non-Indigenous adults. Just over one-third (35%) of off-reserve First Nations people and 50% of Métis aged 25 to 65 had higher literacy scores (level 3 or higher), compared with 57% among non-Aboriginal adults. This lack of education is reflected in the labour market with Indigenous men and women over-represented in lower-paying jobs than non-Indigenous Canadians, within and across all occupations and industries. In addition, lower level of education is a major challenge that prevents Indigenous people from starting and running a business, as well as accessing government programs and financial support.

Lack of access to capital and financing issues

For many Indigenous communities including the business sector, there is limited access to capital and financial services. This is a major barrier to business development and performance (National Indigenous Economic Development, 2021). Studies document that a large percentage of

16. NIEDB-2019-Indigenous-Economic-Progress-Report.pdf (naedb-cndea.com)

Indigenous businesses (about 65%) relies on personal savings as a primary source of funding (Chernoff & Cheung, 2023). The Canadian government has a range of programs targeted for Indigenous Peoples and their communities that aim to build capability and grow markets for businesses. It provides targeted support in various areas including business development, capital and support services, which focus on Indigenous-owned businesses and includes support from a network of Aboriginal Financial Institutions.

While there are various federal and provincial programs offered to support Indigenous-owned businesses, they come with administrative barriers which limit or prevent businesses from pursuing economic development opportunities.[17]

Regulation and institutional constraints.

Addressing institutional constraints is another important challenge to economic participation and development of Indigenous-owned businesses, especially those operating on traditional lands. In fact, businesses may face additional transaction costs to meet property rights restrictions under the *Indian Act* (Leach, Lars-Anders Baer, & Yu, 2020; Chernoff & Cheung, 2023). These property ownership restrictions impede firm creation and employment opportunities for the regions.

The above constraints may help explain the performance gap estimated in this paper between Indigenous-owned businesses and non-Indigenous-owned ones. However, because of the limitation of data, especially those on specific needs and challenges faced by Indigenous-owned businesses, this paper cannot directly evaluate any of the latter factors. This could be of interest for future research investigations.

17. For more details, see the Canadian House of Commons 2022 report on barriers to economic development in Indigenous communities. Barriers to Economic Development in Indigenous Communities (ourcommons.ca)

5 Conclusion

Activities conducted by Indigenous Peoples have gained importance over the years in the Canadian economy. This paper examines the economic performance, including survival rate, of Indigenous-owned businesses over the recent decades (2005 to 2018). It builds on CEEDD, which allows a breakdown of Indigenous-owned enterprises by subgroup, i.e., First nations, Métis, Inuit and "other Indigenous" after an imputation procedure. With CEEDD, it is also possible to measure and track business entries and exits, labour productivity, and revenue, conditional on ownership characteristics. To assess the relationship between economic performance and the enterprise's ownership identity, the methodology first describes the Indigenous-owned businesses' social and economic characteristics. It leads to several findings:

(i) Nearly one in five of Indigenous-owned businesses operated in the construction industry. These are dominated by small enterprises and are owned in majority by First Nations people and Métis. (ii) About 30% of Indigenous-owned businesses, on average, are owned by people aged 45 to 54, while more than two-thirds (73%) are majority owned by men. (iii) Indigenous-owned businesses have experienced a relatively faster growth in revenue and labour productivity, on average, than non-Indigenous-owned ones, suggesting a closing gap over time.

In the second part of the paper, the empirical analysis with additional control variables evaluates the economic performance indicators including revenue, labour productivity and survival rate by each subgroup of Indigenous-owned businesses. Results suggest that Indigenous-owned businesses were 7.5% less productive and have experienced 2.7% lower revenues, on average, than their non-Indigenous-owned counterparts. This performance gap is higher in rural areas than in urban ones. Furthermore, findings from the survival analysis indicate that Indigenous owned businesses were, on average, 18.41% more likely to exit the market, compared with non-Indigenous-owned businesses.

This study provides additional evidence that more effort should be made to support economic performance among employment equity groups, especially Indigenous-owned businesses in Canada. From a research perspective, more work on data collection, especially on the specific needs and barriers of Indigenous-owned businesses, could help to better inform policy makers on appropriate reforms.

6 Appendix

Appendix Table A.1
Log-Rank test for equality of survivor functions

Groups	Events observed	Events expected
Non-Indigenous	210,313	210,610.63
All Indigenous	3,109	2,811.37
Total	213,422	213,422

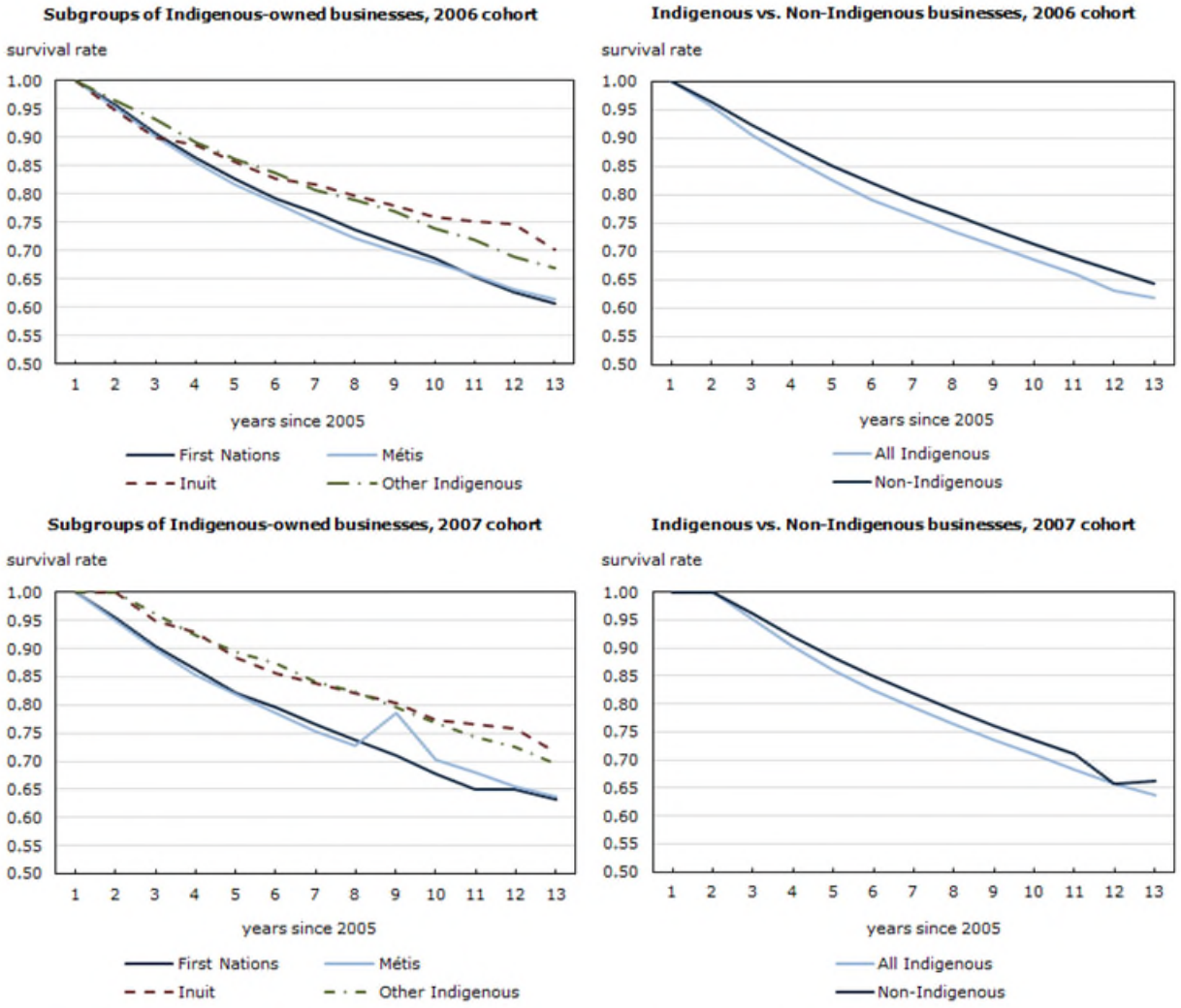
Notes: This table reports the Log-Rank test for equality of survivor functions. The null hypothesis (H0) states that there is no difference betw een the survival functions, against the alternative hypothesis that at least one of the survival functions is different. The test leads to the follow ing statistics: chi2(1) = 33.04; and P-value = 0.0000.
When the test p-value is small, you can reject the null hypothesis and conclude the population survival functions differ. Therefore, the above test suggests that non-Indigenous and Indigenous ow ned businesses groups are statistically different in their survival probability over time. This table reports the Log-Rank test for equality of survivor functions. It suggests that non-Indigenous and Indigenous ow ned businesses groups are statistically different in their survival probability over time.
Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

Appendix Table A.2
Kaplan-Meier survival probabilities for the 2005 cohort, by majority Indigenous identity ownership, 2005 to 2018

Years since 2005	First Nations	Métis	Inuit	Other Indigenous	All Indigenous	Non-Indigenous
			percent			
1	96.04	95.89	93.21	96.39	95.93	96.58
2	91.93	91.41	87.67	92.85	91.09	93.09
3	87.75	87.19	82.89	90.40	87.53	89.70
4	84.52	83.24	82.89	87.02	84.01	86.55
5	81.82	79.93	80.47	84.79	81.05	83.71
6	78.64	77.28	79.20	82.45	78.20	81.07
7	76.47	74.84	77.82	79.31	75.87	78.48
8	74.03	72.15	76.30	77.59	73.37	76.02
9	71.64	70.37	73.99	76.02	71.32	73.70
10	69.14	68.50	71.55	73.25	69.11	71.48
11	66.22	66.51	70.67	71.47	66.73	69.18
12	63.68	64.50	69.69	69.57	64.51	66.98
13	62.14	62.63	64.33	67.53	62.71	64.92

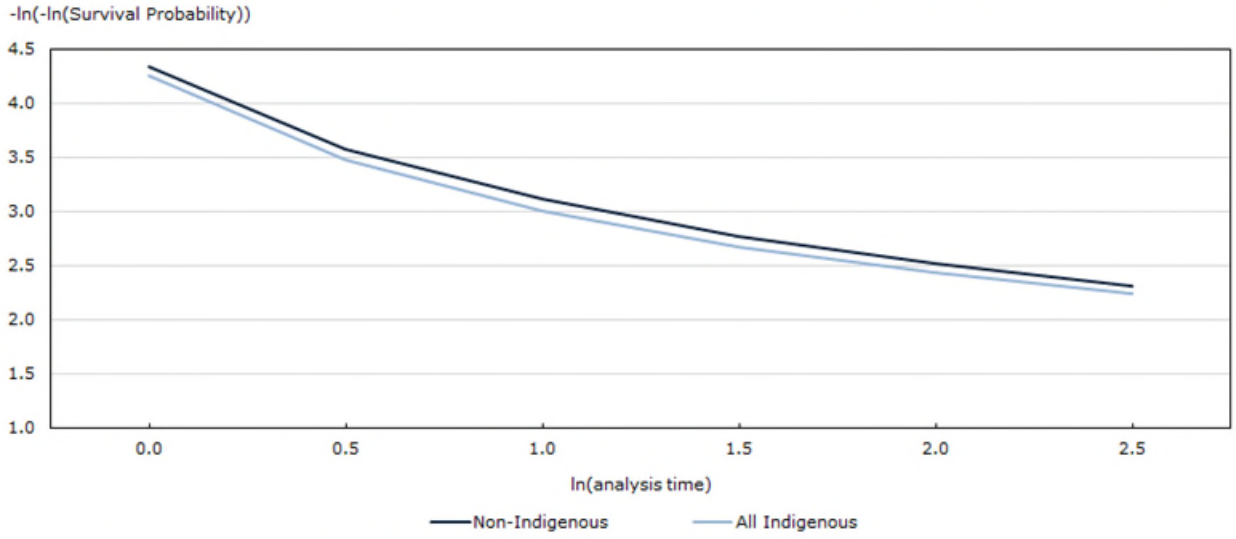
Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

Appendix Chart A.1
Kaplan-Meier survival estimates for 2006 and 2007 cohorts, by majority group indigenous identity ownership, 2005 to 2018



Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005 to 2018.

Appendix Chart A.2
Validation of proportional-hazards assumptions, Log(-Log(survival) versus Log (analysis time)



Source: Author calculations using Canadian Employer-Employee Dynamics Database (CEEDD), 2005-2018.

References

Agarwal, S., Rahman, S., & Errington, A. (2009). Measuring the determinants of relative economic performance of rural areas. *Journal of Rural Studies.* , 1;25(3):309-21.

Alpay, G., Muzaffer, B., Cengiz, Y., Saadet, C., & Lacin, A. (2008). Performance implications of institutionalization process in family-owned businesses: Evidence from an emerging economy. *Journal of World Business*.

Ayotte, C., & Bridger, J. (2022). Indigenous Peoples Economic Account: Methodology and Preliminary. Income and Expenditure Accounts Technical Series. Statistics Canada Catalogue No. 13-604-M2022001, modified December 1.

Bemrose, R., & Lafrance-Cooke, A. (2022). Business ownership among persons with disabilities. *Economic and Social Reports, Statistics Canada, Catalogue no. 36-28-0001*.

Buckland , J., Mckay, D., & Reimer, N. (2016). Financial Inclusion and Manitoba Indigenous Peoples: Results from an Urban and a Rural Case Study*. Canadian Centre for Policy Alternatives.*

Canadian Council for Aboriginal Business and Global Affairs Canada. (2023). Adàwe : export experiences of Indigenous entrepreneurs*. Retrieved from https://www.international.gc.ca/trade-commerce/assets/pdfs/inclusive_trade-commerce_inclusif/indigenous-autochtone/report-adawe-rapport-eng.pdf*

Cefis, E., & Marsili, O. (2019). Good Times, Bad Times: Innovation and Survival over the Business Cycle. *Industrial and Corporate Change.*

Chang, S. (1996). An evolutionary perspective on diversification and corporate restructuring: Entry, exit, and economic performance during 1981-89. *Strategic Management Journal, 587–611.*

Chernoff, A., & Cheung, C. (2023). An Overview of the Indigenous Economy in Canada*. Bank of Canada.*

Chirico, F., Gomez-Mejia, L., Hellerstedt, K., Whithers, M., & Nordqvist, M. (2020). To merge, sell, or liquidate? Socioemotional wealth, family control, and the choice of business exit. *Journal of Management, 46(8), 1342–1379.*

Cho, I., & Orazem, P. (2020). How endogenous risk preferences and sample selection affect analysis of firm survival. *Small Business Economics: 1–24.*

Collin, D. (2011). Aboriginal financial literacy in Canada: Issues and directions. *Paper prepared for the Task Force on Financial Literacy.*

Couture, L., & Houle, S. (2020). Survival and Performance of start-ups by Gender of Ownership: A Canadian Cohort Analysis. *Analytical Studies Branch Research Paper Series*, *Statistics Canada, Catalogue no. 11F0019M, no. 450*.

Du Rietz, A., & M. Henrekson. (2000). Testing the female underperformance hypothesis. *Small Business Economics 14 (1): 1–10.*

Fairlie, R., & Robb, A. (2009). Gender differences in business performance: Evidence from the Characteristics of Business Owners survey. *Small Business Economics 33 (4): 375–395*.

Green, D., Liu, H., Ostrovski, Y., & Picot, G. (2016). Immigration, business ownership and employment in Canada. *Analytical Studies Research Paper Series, Statistics Canada, Catalogue no. 11F0019M, no. 375.* .

Grekou, D. (2020). Labour Market Experience, Gender Diversity and the Success of Women-owned Enterprises. *Analytical Studies Branch research Paper Series, Statistics Canada, Catalogue no. 11F0019M, no. 447* .

Grekou, D., & Liu, H. (2018). The Entry into and Exit out of Self-employment and Business Ownership in Canada. *Analytical Studies Research Paper Series, Statistics Canada, Catalogue no. 11F0019M, no. 407* .

Grekou, D., & Lu, Y. (2021). Gender differences in employment one year into the COVID-19 pandemic: An analysis by industrial sector and firm size. *Economic and Social Reports, Statistics Canada, Catalogue no. 36-28-0001.* .

Grekou, D., & Watt, J. (2021). Examining the Labour-Productivity Gap Between Women-owned and Men-owned Enterprises: The Influence of Prior Industry Experience. *Analytical Studies Branch research Paper Series*, *Statistics Canada, Catalogue no. 11F0019M, no. 464.*

Gueye, B. (2023). Black Business Owners in Canada. *Analytical Studies Branch Research Paper Series, Statistics Canada, Catalogue no. 11F0019M, no. 467*.

Gueye, B. (2024). Survival and growth of women-owned and immigrant-owned businesses during the COVID-19 pandemic. *Economic and Social Reports, Statistics Canada, Catalogue no. 36-28-0001* .

Gueye, B., Lafrance-Cooke, A., & Oyarzun, J. (2022). Identifying indigenous business owners and indigenous-owned businesses. *Analytical Studies Methods and References, Statistics Canada, Catalogue no. 11-633-X, no. 045.*

Ha, J., Wong, J., & Khodja, M. (2023). A profile of businesses in rural Canada, 2020. *Rural and Small Town Canada Analysis Bulletin, Statistics Canada, Catalogue no. 21-006-X.*

Haaris , J., & Alessandro , A. (2019). *A Profile of Businesses in Indigenous Communities in Canad*a. *Reports on special Business projects, Statistics Canada – Catalogue no. 18-001-X.*

Hamzani, U., & Achmad, D. (2016). The performance of micro, small and medium enterprises (MSMEs): indigenous ethnic versus non-indigenous ethnic. *Procedia-social and behavioral sciences, 219, pp.265-271*.

Harada, N. (2007). Which firms exit and why? An analysis of small firm exits in Japan. *Small Business Economics, 29(4): 401–414.*

Hou, F., Picot, G., & Zhang, J. (2020). Transitions into and out of employment by immigrants during the COVID-19 lockdown and recovery. *STATCAN COVID-19, Catalogue no. 45280001*.

Innovation Science and Development, C. (2024). *Key Small Business Statistics 2023*. Retrieved from ic.gc.ca/sbstatistics: https://ised-isde.canada.ca/site/sme-research-statistics/en/key-small-business-statistics/key-small-business-statistics-2023#s2.1

Isaga, N. (2015). Owner-managers' demographic characteristics and the growth of Tanzanian Small and medium enterprises. *International Journal of Business and Management, 10(5), p.168.*

Kalenkoski, C., & Pabilonia, S. (2022). Impacts of COVID-19 on the self-employed. . *Small Business Economics*.

Kurmann, A., Etienne, L., & Lien, T. (2020). The Impact of COVID-19 on US Employment and Hours: Real-Time Estimates with Homebase Data. *http://www. andrekurmann. com/hb_covid (2020).*

Lafrance-Cooke, A. (2021). Starting a business in a pandemic: The experiences of businesses created during COVID-19. *Economic and Social Reports, Statistics Canada, Catalogue no. 36-28-0001*.

Lafrance-Cooke, A., & Leung, D. (2024). New businesses since the beginning of the COVID-19 pandemic. *Economic and social reports, Statistics Canada, Catalogue no. 36-28-0001*.

LaRochelle-Côté, S., & Gilmore, J. (2009). Canada's employment downturn. *Statistics Canada, Catalogue no. 75-001-X*.

Leach, D., Lars-Anders Baer, & Yu, P. (2020). *Linking Indigenous Communities with Regional development.* Organisation for Economic Cooperation and Development. The OECD Observer.

Lemieux, T., Milligan, K., Schirle, T., & Skuterud, M. (2020). Initial impacts of the COVID-19 pandemic on the Canadian labour market. *Canadian Public Policy, 46(S1), pp.S55-S65*.

Leonard, P., Emery, J., & McDonald, J. (2017). Push or pull into self employment? evidence from longitudinal canadian tax data. *New Brunswick Research Data Centre, 21.*

Leung, D., & Liu, H. (2022). The Canada emergency wage subsidy program and business survival and growth during the COVID-19 pandemic in Canada. *Economic and Social Reports, Statistics Canada, Catalogue no. 36-28-0001*.

Leung, D., & Robinson, M. (2011). The Dynamics of Male Self-employment in Canada: Comparing the 1990s to the 2000s. *Available at SSRN 1972265.*

Lin, Z., Picot, G., & Compton, J. (2000). The entry and exit dynamics of self-employment in Canada. *Small business economics, 15, pp.105-125.*

Liu, H., & Zhang, Y. (forthcoming). Update on the Entry in and Exit of Self-employment and Business Ownership in Canada. *Analytical Studies Branch Research Paper Series, Statistics Canada*.

Liu, Y., Wei, S., & Xu, J. (2021). COVID-19 and women-led businesses around the world. *Finance Research Letters, 43, 102012.*

Lyeonov , S., Pimonenko, T., Bilan, Y., Streimikien, D., & Mentel, G. (2019). Assessment of green investments' impact on sustainable development: Linking gross domestic product per capita, greenhouse gas emissions and renewable energy. *Energies, 12(20), p.3891.*

Martin, S., McHugh, R., & Johnson, S. (1993). The influence of location on productivity: manufacturing technology in rural and urban areas. . *Growth and Change, 24(4), pp.459-486.*

National Indigenous Economic Development, B. (2021). *Defining Indigenous Business In canada.* Retrieved from http://www.naedb-cndea.com/wp-content/uploads/2022/07/5.-Defining-Indigenous-Businesses-Report_FINAL-English.pdf

Nichols, L. (2023). Working through the Unknowns: Canadian Youth's Experience of Employment during the COVID-19 Pandemic. *Canadian Journal of Family and Youth/Le Journal Canadien de Famille et de la Jeunesse, 15(3), 113-129.*

Papadaki, E., Chami, B., & Branch, S. (2002). Growth determinants of micro-businesses in Canada. Ottawa: Small Business Policy Branch, Industry Canada.

Pham, D., Do, T., Nguyen, T., & Pham, T. (2021). The impact of sustainability practices on financial performance: empirical evidence from Sweden. Cogent Business & Management.

Picot, G., Manser, M., & Lin, Z. (1998). The role of self-employment in job creation in Canada and the United States. In Canadian Employment Research Forum (CERF)-LEED International Conference on Self-Employment, Burlington, Ontario (pp. 24-26).

Ponikvar, N., Kejzar, K., & Peljhan, D. (2018). The role of financial constraints for alternative firm exit modes. Small Business Economics, 51(1), 85–103.

Qingfang, W., & Cathy, Y. (2015). Transnational activities of immigrant-owned firms and their performances in the USA. Small Business Economics, 345-359.

Robb, A. (2002). “Entrepreneurial performance by women and minorities: The case of new firms. Journal of Developmental Entrepreneurship 7 (4): 383.

Rola-Rubezen, M. (2011). The Anatomy of the Australian Entrepreneur: Understanding micro, small and medium business entrepreneurs in Australia.

Schoar, A. (2010). The divide between subsistence and transformational entrepreneurship. Innovation policy and the economy.

Schumpeter, J. (2013). Capitalism, socialism and democracy. Routledge.

Sekkel, J., & Wang, W. (2024, April 24). Women-owned small and medium-sized enterprises in Canada: Exporting story. Economic and Social Reports, Statistics Canada, Catalogue no. 36-28-000.

Shearmur , R., & Polèse , M. (2007). Do Local Factors Explain Local Employment Growth? Evidence from Canada. Regional Studies.

Siedschlag , I., & Yan, W. (2023). Do green investments improve firm performance? Empirical evidence from Ireland. Technological Forecasting and Social Change.

Siedschlag, I., M. Di Ubaldo, & M. Tong Koecklin. (2018). Comparative performance of indigenous and multinational firms operating in Ireland. Brussels: European Commission, https://www.esri.ie/publications/comparative-performance-of-indigenous-and-multinational-firms-operating-in-ireland.

Slade, M. (2022). Many losers and a few winners: The impact of COVID-19 on Canadian industries and regions. Canadian Journal of Economics/Revue canadienne d'économique, 55, 282-307.

Statistics Canada. (2020). Canadian survey on business conditions: Impact of covid-19 on businesses in canada, march 2020. The Daily pp. 1 – 4. Statistics Canada catalogue no. 11-001-X.

Statistics Canada. (2023). Indigenous Population Profile. 2021 Census of Population. Statistics Canada Catalogue number 98-510-X2021001. Ottawa, Canada. Retrieved from Statistics Canada.

Tam, S. (2022). Analysis on small businesses in Canada, first quarter of 2022. Analysis in Brief, Statistics Canada, Catalogue no. 11-621-M.

Tam, S., Sood, S., & Johnston, C. (2020). Impact of COVID-19 on businesses majority-owned by visible minorities, third quarter of 2020. *StatCan COVID-19, Statistics Canada, Catalogue no. 45280001*.

Unsal, A., Ugurlu, E., & Sankinc, I. (2009). Ownership identity and firm performance in manufacturing companies in Turkey: A multinomial logit model approach. *International Journal of Economics and Finance Studies*, 1(2):23-34.

Wan, L. Y. (2017). Literature Review about the Influence Factors of Self-employment. *American Journal of Industrial and Business Management, 7, 79-92*.

Wang, J., Li, J., & Zhang, Q. (2021). Does carbon efficiency improve financial performance? Evidence from Chinese firms. *Energy Economics, 104, p.105658.*

Weitzman, M. (1974). "Prices vs quantities". *Review of Economic Studies*.

Wilson, D., & Macdonald, D. (2010). The income gap between Aboriginal peoples and the rest of Canada. *Ottawa: Canadian Centre for Policy Alternatives.*

Young, & Johnson. (2011). Towards Best Practices in analyzing Datasets with Missing Data: Comparisons and Recommendations. *Journal of Marriage and Family,*, pp. 73(5): 926-45.