VALUE OF THE FMA TO FIRST NATIONS

RESEARCH REPORT

First Nations FINANCIAL MANAGEMENT BOARD

CONSEIL DE GESTION FINANCIÈRE des Premières Nations

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Executive Summary

This report evaluates the progress that First Nations governments have made while collaborating with the First Nations Fiscal Management Act (FMA) institutions. By looking at important social and demographic indicators from 2006 to 2021, we identify positive community outcomes when First Nation governments engage more actively with the FMA. We also find a link between stronger financial health and increased involvement with the FMA. To simplify our analysis, progress with the FMA is evaluated with three criteria: the adoption of a Financial Administration Law (FAL), the achievement of a Financial Performance Certification (FPC), and receipt of a Financial Management System Certification (FMSC).

Many of the First Nations that work with FMB also pursue financing and taxation opportunities through the First Nations Finance Authority (FNFA) and the First Nations Tax Commission (FNTC). While this report evaluates progress level with FMB – in many cases this also measures the First Nations' engagement with the other FMA institutions. First Nations governments are driving positive change within their communities and are utilizing the optional tools of the FMA to realize economic growth, stronger financial health, and positive community outcomes.

Research Approach

The research employs a comparison of means by progress level with FMB, evaluating indices for formal education, quality of housing, own-source revenue, and operating margins. The baseline education & housing data from the 2006 Census is compared with the 2021 Census data to observe changes in selected community outcomes. When evaluating financial health, the study uses 446 sets of audited First Nations government financial statements from 2016 to evaluate the financial ratios.

Key Findings

Selected Community Outcomes:

1. Formal Education:
    - First Nations communities working with FMB have significantly higher levels of formal education.
    - Communities with FMSC observed the highest increase in the education index of 21.7 – between the years 2006 and 2021 (compared to 9.7 for Nations without FALs).
2. Housing Quality:
    - Significant improvement in residential housing quality is observed for communities with FMSC, which saw a 19.5 increase in their housing index (compared to 10.0 for Nations without FALs).

Financial Health of First Nations governments:

3. Earned Revenue Ratio:
    - Progressive increase in own-source revenue for communities that work more progressively with FMB.
    - Communities with FMSC have the highest average ERR of 0.28 (compared to 0.16 for Nations without FALs).
4. Operating Margin Ratio:
    - Communities with FMSC have a higher OMR of 0.085 (compared to 0.029 for Nations without FALs). This indicates better financial health and a higher likelihood of avoiding deficit spending.

Conclusion and Implications

The report demonstrates the positive and statistically significant impact on community outcomes and financial health that First Nations governments have realized across Canada while using the tools and supports of the FMA institutions. Communities that have achieved Financial Management Systems Certification (FMSC) stand out, showcasing notable advancements. This achievement underscores the role of robust financial administration and management systems. Higher levels of formal education can pave the way for enriched opportunities for individuals and a robust pool of skilled candidates for community organizations and businesses. Improved housing quality, another significant gain, addresses a critical concern for communities and policymakers.

In the realm of financial health, the increase in own-source revenue and higher operating margins, as observed in the report, empower First Nations governments and facilitate greater fiscal autonomy. These tangible benefits affirm the value of strong financial management systems – which are driven by First Nations governments with the supports of the FMA institutions. Looking ahead, FMB is committed to adding further value for First Nations governments – particularly in harnessing data and analytics to bolster its contributions to First Nations communities.

Introduction and Research Approach

Introduction

There is an interest to better understand the impact that the FMA institutions' work has on First Nations communities. While a strong body of testimonies demonstrates that FMA is having a positive impact on First Nations communities – less research exists that evaluates the value of FMA from a quantitative perspective. This report addresses the quantitative research gap – and evaluates whether First Nations that choose to work with the FMA institutions see positive community and financial outcomes.

The report will consider the impact of First Nations governments working with FMA – both in the areas of selected community outcomes and the financial health of First Nations governments. The impact of the FMA is evaluated using the degree of progress with FMB. We evaluate advancement on selected community outcome indicators by comparing the change in these indicators between the years 2006 and 2021, by progress level with FMB as of 2021. FMB progress will be measured by the following categories: First Nations without a Financial Administration Law (FAL), with FAL, with Financial Performance Certification (FPC), and with Financial Management Systems Certification (FMSC). The community outcome indicators analyzed include a measure for formal education levels and the quality of residential housing.

The financial health of First Nations governments will be evaluated by comparing key financial ratios from the year 2016 – compared by progress level with FMB as of 2021. The financial ratios analyzed include the earned revenue ratio and the operating margin ratio. There are 446 sets of quality First Nation government audited financial statement used in this study from the year 2016.

This research report will provide new and evidence-based insights, and will answer the following questions:

1. Do First Nations that work with FMB see positive community outcomes? Specifically:
    a. Do we observe higher levels of formal education (between 2006 and 2021) when First Nations governments work with FMB?
    b. Do we observe higher quality of residential housing (between 2006 and 2021) when First Nations governments work with FMB?
2. Is there a higher level of own-source revenue (evaluating 2016 financial figures) when First Nations governments work with FMB?
3. Are there higher operating margins (evaluating 2016 financial figures) when First Nations governments work with FMB?

Answers to these questions will provide deeper insights into the value of the FMA institutions for First Nations communities throughout Canada. It is important to recall that many of the First Nations that work with FMB also work with FNFA and FNTC. To date, there are 154 First Nations that are members of FNFA (First Nations Finance Authority, 2023). Likewise, 147 First Nations maintain property tax regimes with FNTC (First Nations Tax Commission, 2023, p. 13). All of the FMA institutions provide critical tools, supports, and new options for First Nations.

The following section provides further details about the research approach.

Research Approach

This study conducts a comparison of means (averages) by progress level with FMB – specifically First Nations without a FAL, with a FAL, with FPC, and with FMSC. Averages for these categories are evaluated for:

- Education index: formal education levels
- Housing index: quality of residential housing
- Earned revenue ratio (ERR): earned revenue divided by total revenue
- Operating margin ratio (OMR): (total revenue less total expenses) divided by total revenue

The education and housing indices are evaluated first by calculating baseline average index values, for all First Nations, from the 2006 Census. As FMB was formed in 2006, no First Nations had FALs, FPC, or FMSC in 2006 – making 2006 an effective baseline reference. The average education and housing index values are then calculated based on 2021 Census data by progress level with FMB (progress level as of 2021). The difference between the 2006 baseline amount (for all First Nations) is then compared to the 2021 average amounts (by FMB progress subgroups).

This analysis will allow us to answer the research questions. We can determine if there is a statistically significant difference between the baseline 2006 community outcome index values and the distinct index values in 2021 grouped by progress level with FMB. Note that statistical t-tests are prepared, which can be viewed in Appendix II: Statistical Analysis – Selected First Nations Community Outcomes.

The earned revenue ratio (ERR) and operating margin ratio (OMR) will also be evaluated for the year 2016. There are 446 sets of quality audited First Nations government financial statements used in this study. The study evaluates the average ERR and OMR for First Nations governments by progress level with FMB. This will answer research questions 2 and 3 – and will shed new insights as to whether working with FMB is associated with greater earned revenue and higher operating margins. Statistical t-tests and descriptive

statistics are prepared and can be viewed in Appendix I: Statistical Analysis – First Nations Government Financial Health.

This study has a few limitations. Approximately 25%-30% of the First Nations in Canada are excluded from the analysis due to the data being unavailable, or due to poor quality datasets. This has the potential to introduce bias into the results. A second limitation relates to the fact that this study relies on observational data. Due to this, it is not possible to draw causal conclusions. Once a more comprehensive dataset is available, further research could address these limitations.

The following sections review the key findings of how the work of the FMA is associated with First Nations community outcomes, First Nations government financial health, and concludes with the implications of this research.

Link Between Progress with the FMA and Selected First Nations Community Outcomes

We now consider how community outcomes can be impacted when First Nations governments choose to work with FMB and other FMA institutions. By evaluating changes in formal education levels and quality of residential housing between the years 2006 and 2021, we focus on key areas of value for First Nations. Refer to Appendix III: Calculation of Variables, Details of Datasets Used, and Limitations of the Research, for further details about the datasets used and the formulas for the indices and ratios used.

Higher Formal Education Levels

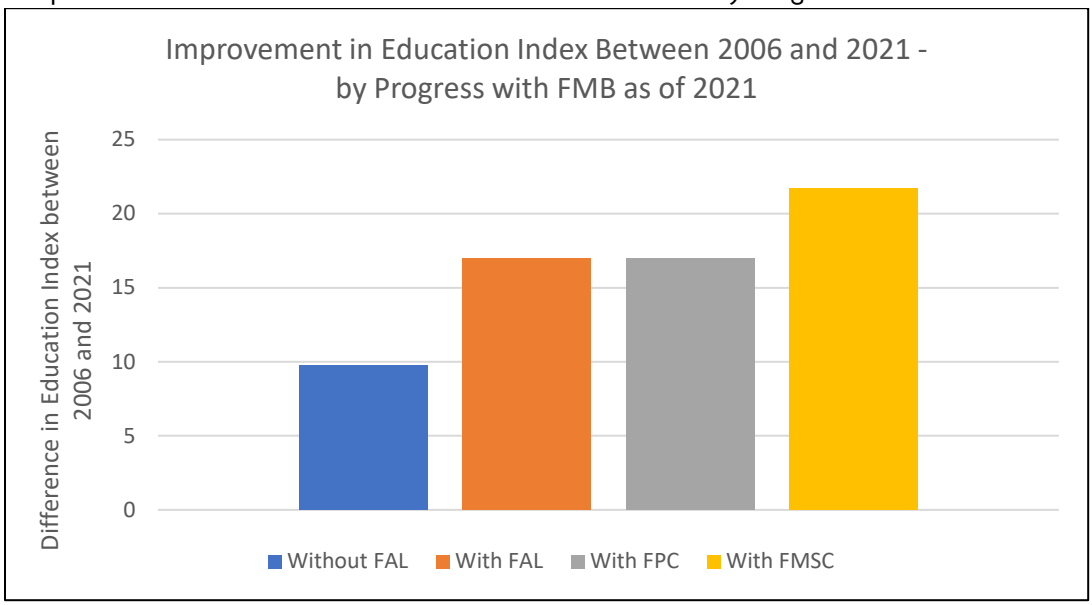
Figure 1 evaluates the change in formal education levels (via the education index) between the years 2006 and 2021. As FMB was formed in 2006, no First Nations maintained FALs, FPC, or FMSC at this time. Due to this, using the average of all First Nations' education index from 2006 is a useful baseline to compare changes to 2021. The average change in the education index between 2006 and 2021 is presented for First Nations by their progress with FMB (as of 2021).

We observe progressively higher increases in formal education levels for First Nations that have advanced in FMB's service offerings. The highlights from Figure 1 include:

- First Nations without FALs observed, on average, an education index increase of 9.7
- Nations with a FAL see an education index increase of 17.0
- Nations with FPC have an education index increase of 17.0
- Nations with FMSC having an education index increase of 21.7

A clear trend emerges from Figure 1 – First Nations that work with FMB see progressively higher increases to their formal education levels. ***This answers the research question 1a – First Nations communities that work with FMB see a statistically significant higher level of formal education*** (at the 0.05 level) compared to First Nations that do not work with FMB. This association is important, as higher formal education levels often provide greater opportunities for individuals in their career opportunities, as well as in providing a strong pool of skilled candidates for in-community organizations and businesses.

Figure 1: Improvement in Education Index Between 2006 and 2021 – by Progress with FMB as of 2021



Better Quality Residential Housing

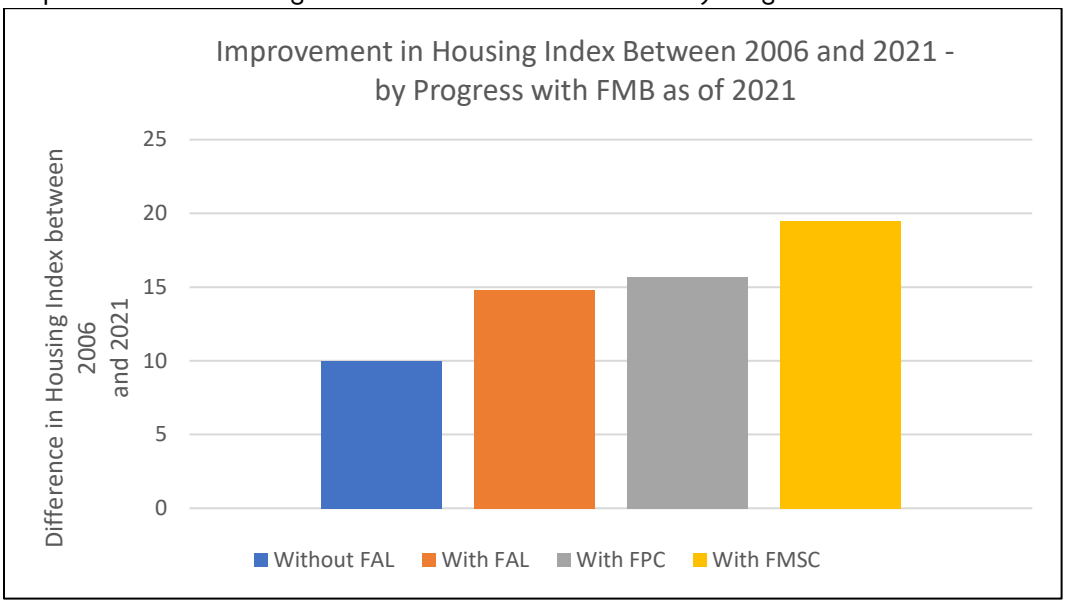
Figure 2 measures the change in the quality of residential housing between 2006 and 2021 – using a similar comparison of averages approach as was used with the education index in the previous section. The average change in the housing index between 2006 and 2021 is presented for First Nations by their progress with FMB (as of 2021).

First Nations without FALs saw the quality of their residential housing increase by 10.0 between 2006 and 2021. First Nations with FALs saw an increase by 14.8, and those with FPC an increase of 15.7. All of these increases are statistically significant at the 0.05 level (refer to statistical t-tests in Appendix II for further details).

A striking observation is how First Nations with FMSC see an average increase in their housing index by 19.5 between 2006 and 2021, which is approximately twice the increase compared to First Nations with a FAL. This difference on average is statistically significant at the 0.05 level. This finding is very important, as policies to address in-community housing in First Nations is a top priority for policymakers.

It is important to recall that the housing stock in many First Nations is owned or significantly influenced by First Nations governments. It makes intuitive sense that First Nations governments with stronger internal financial controls and financial governance would see positive outcomes from their Nation's housing departments. While the association noted in this study is intuitive, this report identifies this link to be statistically significant. Policymakers, from both the financial and housing sectors, should take note that the quality of residential housing is significantly higher for First Nations governments as they progress more with FMB. ***The research question 1b is clearly answered – we observe a significantly higher quality of housing for First Nations that work progressively more with FMB.***

Figure 2: Improvement in Housing Index Between 2006 and 2021 – by Progress with FMB as of 2021



Link Between Progress with the FMA and the Financial Health of First Nations Governments

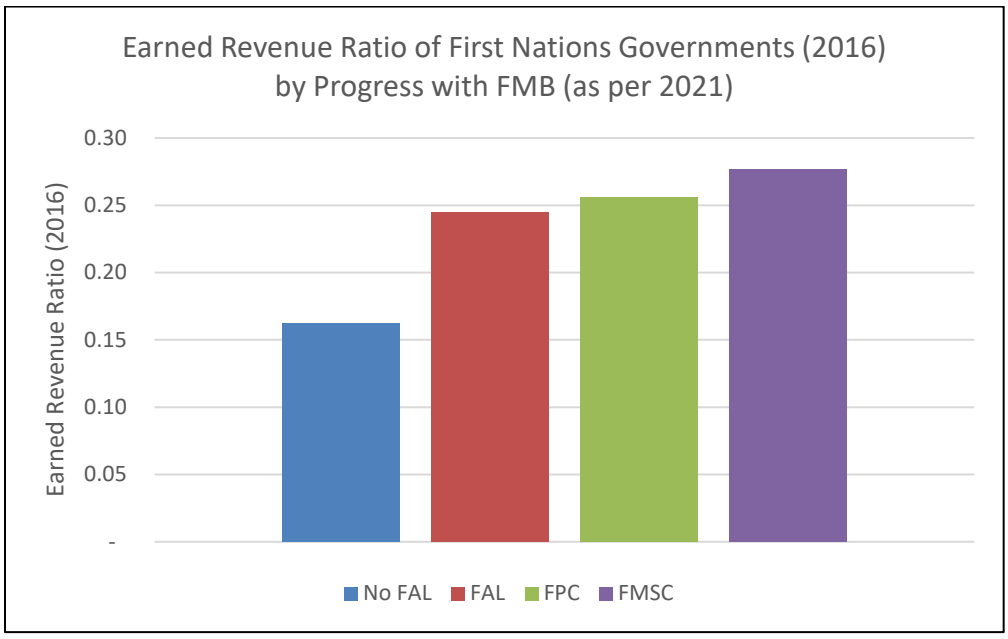
We now evaluate the impact that working with FMB and the FMA institutions can have on the financial health of First Nations governments. We conduct this analysis by evaluating two key financial ratios from the year 2016. This analysis uses 446 sets of First Nations government audited financial statements and compares the averages of the earned revenue ratio (ERR) and the operating margins ratio (OMR) by progress with FMB (as of 2021). Both the ERR and OMR are indicators of financial health of First Nations governments and are useful metrics to evaluate the connection of working with FMB and overall First Nations government financial health. Refer to Appendix III for further details about the datasets used, formulas for the financial ratios, and limitations of the research.

Greater Own-Source Revenue

Figure 3 evaluates the average earned revenue ratio of First Nations government – by progress with FMB. We see a progressively higher percentage of own-source revenue from First Nations that work with FMB. Nations without FALs maintain an average earned revenue ratio of 0.16, and we observe a large increase to 0.24 for Nations with FALs. This rises slightly to 0.26 for Nations with FPC, and finally the earned revenue ratio increase to 0.28 for Nations with FMSC. ***This answers research question 2 – we see a statistically significant increase in own-source revenue as Nations work more progressively with FMB***. Refer to Appendix I: Statistical Analysis – First Nations Government Financial Health for detailed descriptive statistics and t-tests that demonstrate statistical significance at the 0.05 level.

The higher levels of own-source revenue are important, as this can provide greater fiscal autonomy for First Nations governments. At the same time, greater fiscal autonomy can often provide the best results for community members when effective financial controls are in place. The tools and supports of the FMA institutions can empower First Nations governments to grow their own-source revenues and provide an atmosphere of accountability and transparency for their citizens.

Figure 3: Earned Revenue Ratio of First Nations Governments (2016) by Progress with FMB (as per 2021)



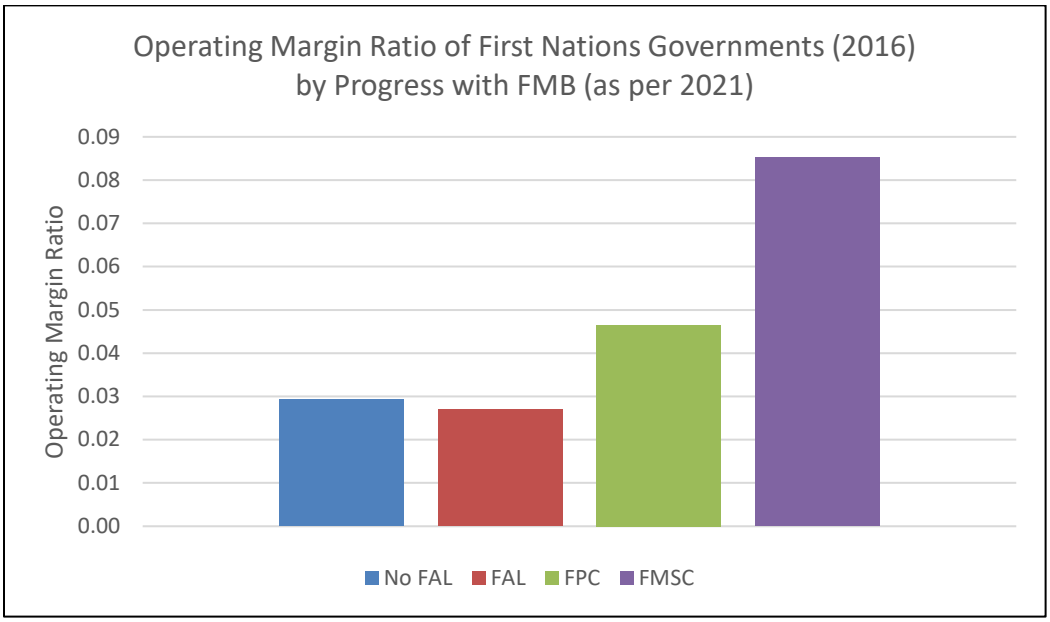
Higher Operating Margins

Figure 4 presents the operating margins ratio (OMR) for First Nations – by progress level with FMB. Operating margin measures total revenues less total expenses, divided by total revenues. OMR is an effective measure for determining the overall financial health of the Nation – specifically whether the Nation is avoiding deficit spending. The findings indicate that there is little differentiation between Nations with FALs, without FALs, and with FPC. While a minor difference is noted, these variables do not present a statistically significant difference in averages.

A statistically significant increase in OMR is identified for Nations that have achieved a FMSC. Nations with FMSC maintain an average OMR of 0.085, while Nations without a FAL maintain an average OMR of 0.029. This demonstrates that First Nations with FMSC are more likely to avoid deficit spending – which is a positive indicator of financial health for the Nation's government. It is interesting to note that this higher level of OMR is only attained, at a statistically significant level, when First Nations obtain their FMSC. This demonstrates the importance of First Nations' continued efforts to bring their FAL to life – and the important work of the First Nations' staff and leadership as their financial capacities are advanced. While it does take a notable amount of effort to bring the Nation's FAL to life – there are concrete and measurable benefits when First Nations achieve their FMSC.

We have a clear answer to the research question 3: while obtaining a FAL will not in itself result in a higher OMR – obtaining FMSC is associated with higher OMR and financial health for First Nations governments.

Figure 4: Operating Margin Ratio (OMR) of First Nations Governments (2016) by Progress with FMB (as per 2021)



Key Findings and Conclusion

We opened this report with several research questions – questions that will demonstrate whether or not First Nations that choose to work with FMB and the FMA institutions observe measurable advances in their financial health and other community outcomes. Let us review the key findings and consider the type of value that First Nations realize when they choose to work with the FMA institutions.

The first key finding is the progressively higher increase to formal education levels between 2006 and 2021 as First Nations governments progress with FMB. Nations without FALs maintain an average education index increase of 9.7, with FALs of 17.0, with FPC of 17.0, and with FMSC of 21.7. This greater increase to formal education levels is significant and demonstrates a positive association when Nations choose to work with the FMA institutions. Given the importance of formal education in advancing opportunities for both First Nations governments and individual citizens, this finding demonstrates the type of value that First Nations can realize when using the tools of the FMA.

The second key finding is how First Nations with FMSC maintain a higher quality of residential housing. Nations with FMSC have seen an increase to their housing index of 19.5 between 2006 and 2021. First Nations with FALs saw an increase of 14.8, with a similar increase for Nations with FPC, and Nations without a FAL saw an increase of 10.0. This indicates that First Nations with FMSC had an increase in their quality of housing at twice the level of First Nations without FALs. This demonstrates the importance of fully bringing the Nation's FAL to life – as shown when Nations achieve their FMSC. Given the importance of the housing crisis in many First Nations communities – this finding should be duly noted by policy makers in the financial and housing sectors.

The third finding demonstrates that First Nations with greater progress with FMB have progressively higher levels of own-source revenue – as measured by the earned revenue ratio (ERR). Nations without

FALs have, on average, an ERR of 0.16, with FALs of 0.24, FPC of 0.26, and FMSC at 0.28. This is an important finding, as Nations with higher ERR have greater fiscal autonomy to pursue their own local priorities with these funds. It is in these situations where effective financial controls are critical to provide an atmosphere of accountability and transparency – enabling these own-source revenues to provide the greatest benefit for citizens of the Nation.

The fourth key finding shows how Nations with FMSC have, on average, a higher operating margin ratio (OMR) compared to Nations without. The OMR for FMSC Nations is 0.085, whereas Nations without FALs is 0.029. The higher OMR is only observed for Nations with FMSC and not with Nations with a FAL or FPC that hadn't yet obtained FMSC. This demonstrates the importance of fully bringing the FAL to life.

After observing the key findings – it is clear that First Nations that choose to work with FMB and the FMA institutions have a significant, positive, and measurable impact on their financial health and other community outcomes. The value of the FMA has been communicated through numerous testimonies - this report goes a step further and identifies specific ways that the FMA adds value for First Nations governments, using an evidence-based approach.

The results of this report provide an affirmation of the value that FMA provides for First Nations. First Nations themselves are driving these positive outcomes and are using the tools of the FMA to achieve tangible outcomes within their communities. In this environment, FMB continually seeks to improve how it serves First Nations communities across Canada. FMB will continue to work with our partners to use data and analytics to better serve First Nations and develop evidence-based policy recommendations. Aligned with the principles of the RoadMap Project – data and statistics will be a guiding light as we walk on the path towards reconciliation.

References

Blankinship, S. & Lamb, L. (2022). Exploring First Nation community wellbeing in Canada: The impact of geographic and financial factors. *Economic Papers, 41 (2), 128-154*. Retrieved from: https://onlinelibrary.wiley.com/doi/abs/10.1111/1759-3441.12358

First Nations Finance Authority. (2023). *Canada*. Retrieved from: https://www.fnfa.ca/en/canada/

First Nations Tax Commission. (2023). *Annual Report 2022/2023*. Retrieved from: https://fntc.ca/wp-content/uploads/2023/08/2022-2023_annual_report-1.pdf

Indigenous Services Canada. (n.d). *Search by First Nation*. Retrieved from: https://fnp-ppn.aadnc-aandc.gc.ca/FNP/Main/Search/SearchFN.aspx?lang=eng

Statistics Canada. (2022). *Census Profile, 2021 Census of Population – Download Files*. Retrieved from: https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/download-telecharger.cfm?Lang=E&SearchText=&DGUIDlist=2021A000011124&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0

Appendix I: Statistical Analysis – First Nations Government Financial Health - 2016

Descriptive Statistics and T-Test Analysis for Earned Revenue Ratio (ERR) of First Nations Governments - 2016

Table A1: Descriptive Statistics of Earned Revenue Ratio of First Nations Governments - 2016

FMB Progress Status	Mean	Median	Standard Deviation	Coefficient of Variation	Number of First Nations (data observations)
All First Nations (FNs)	0.199	0.148	0.202	1.016	446
FNs without FAL	0.162	0.110	0.182	1.122	247
FNs with FAL	0.245	0.186	0.216	0.885	199
FNs without FPC	0.166	0.111	0.189	1.139	282
FNs with FPC	0.256	0.199	0.212	0.827	164
FNs without FMSC	0.190	0.139	0.198	1.041	400
FNs with FMSC	0.277	0.202	0.224	0.810	46

Table A2: T-Test Comparison of Means of Earned Revenue Ratio Between First Nations with and without FALs (0 = without FAL, 1 = with FAL)

```
Two-sample t test with unequal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
       0 |     247    .1620424    .0115716    .1818624    .1392503    .1848346
       1 |     199    .2445871    .0153458    .2164785     .214325    .2748492
---------+--------------------------------------------------------------------
Combined |     446    .1988729    .0095671    .2020456    .1800705    .2176753
---------+--------------------------------------------------------------------
    diff |           -.0825446    .0192196               -.1203322   -.044757
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -4.2948
H0: diff = 0                     Welch's degrees of freedom =  388.332

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table A3: T-Test Comparison of Means of Earned Revenue Ratio Between First Nations with and without FPC (0 = without FPC, 1 = with FPC)

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
0	282	.1657211	.0112428	.1887994	.1435902	.1878519
1	164	.2558779	.0165329	.2117241	.2232317	.2885241
Combined	446	.1988729	.0095671	.2020456	.1800705	.2176753
diff		-.0901568	.0199934		-.1294959	-.0508177

diff = mean(0) - mean(1) t = -4.5093
H0: diff = 0 Welch's degrees of freedom = 311.769

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

Table A4: T-Test Comparison of Means of Earned Revenue Ratio Between First Nations with and without FMSC (0 = without FMSC, 1 = with FMSC)

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
0	400	.1899219	.009884	.1976804	.1704906	.2093531
1	46	.2767078	.0330663	.2242669	.2101088	.3433068
Combined	446	.1988729	.0095671	.2020456	.1800705	.2176753
diff		-.0867859	.034512		-.1559865	-.0175854

diff = mean(0) - mean(1) t = -2.5147
H0: diff = 0 Welch's degrees of freedom = 53.722

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0075 Pr(|T| > |t|) = 0.0149 Pr(T > t) = 0.9925

Descriptive Statistics and T-Test Analysis for Operating Margins Ratio (OMR) of First Nations Governments - 2016

Table A5: Descriptive Statistics of Operating Margins Ratio of First Nations Governments - 2016

FMB Progress Status	Mean	Median	Standard Deviation	Coefficient of Variation	Number of First Nations (data observations)
All First Nations (FNs)	0.028	0.011	0.2004	7.09	446
FNs without FAL	0.029	0.006	0.1731	5.90	247
FNs with FAL	0.027	0.022	0.2303	8.53	199
FNs without FPC	0.018	0.002	0.2043	11.56	282
FNs with FPC	0.047	0.030	0.1929	4.14	164
FNs without FMSC	0.022	0.006	0.2011	9.25	400
FNs with FMSC	0.085	0.054	0.1871	2.20	46

Table A6: T-Test Comparison of Means of OMR Between First Nations with and without FALs (0 = no FAL, 1 = FAL)

```
Two-sample t test with unequal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
       0 |     247    .029329    .0110169    .1731435    .0076296    .0510284
       1 |     199   .0269952    .0163243    .2302829   -.0051967     .059187
---------+--------------------------------------------------------------------
Combined |     446   .0282877    .0094903    .2004228    .0096363     .046939
---------+--------------------------------------------------------------------
    diff |           .0023338     .019694               -.0363957    .0410632
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   0.1185
H0: diff = 0                     Welch's degrees of freedom =  360.952

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.5471         Pr(|T| > |t|) = 0.9057          Pr(T > t) = 0.4529
```

Table A7: T-Test Comparison of Means of OMR Between First Nations with and without FPC (0 = no FPC, 1 = FPC)

```
Two-sample t test with unequal variances

   Group |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
       0 |     282    .0176734    .0121649    .2042841   -.0062726    .0416193
       1 |     164    .0465391    .0150592    .1928513    .0168029    .0762752
---------+--------------------------------------------------------------------
Combined |     446    .0282877    .0094903    .2004228    .0096363     .046939
---------+--------------------------------------------------------------------
    diff |           -.0288657    .0193588               -.0669367    .0092052
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -1.4911
H0: diff = 0                     Welch's degrees of freedom =  358.983

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0684         Pr(|T| > |t|) = 0.1368          Pr(T > t) = 0.9316
```

Table A8: T-Test Comparison of Means of OMR Between First Nations with and without FMSC (0 = no FMSC, 1 = FMSC)

```
Two-sample t test with unequal variances

   Group |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
       0 |     400    .0217446    .0100542    .2010837    .0019788    .0415104
       1 |      46    .0851833    .0275915    .1871344    .0296113    .1407554
---------+--------------------------------------------------------------------
Combined |     446    .0282877    .0094903    .2004228    .0096363     .046939
---------+--------------------------------------------------------------------
    diff |           -.0634387    .0293662               -.1222176   -.0046598
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -2.1603
H0: diff = 0                     Welch's degrees of freedom =   58.186

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0174         Pr(|T| > |t|) = 0.0349          Pr(T > t) = 0.9826
```

Appendix II: Statistical Analysis – Selected First Nations Community Outcomes

Descriptive Statistics and T-Test Analysis for Education Index (2006 & 2021)

Table A9: Descriptive Statistics of First Nations Community Education Index (2006 & 2021)

Population Definition	Mean	Median	Standard Deviation	Coefficient of Variation	Number of First Nations (data observations)
All First Nations (FNs), 2006	29.15	28.57	11.59	0.3976	407
FNs without FAL, 2021	38.88	39.53	13.46	0.3462	227
FNs with FAL, 2021	46.16	46.70	12.79	0.2772	171
FNs without FPC, 2021	39.82	40.44	13.95	0.3502	260
FNs with FPC, 2021	46.13	47.07	12.08	0.2618	138
FNs without FMSC, 2021	41.10	41.67	13.64	0.3317	361
FNs with FMSC, 2021	50.86	48.95	10.30	0.2025	37

Table A10: T-Test Comparison of Mean 2006 Education Index of all First Nations and 2021 Education Index of First Nations without FALs (x = 2006 Education Index of all FNs, y = 2021 Education Index of FNs without FALs)

```
Two-sample t test with unequal variances

------------------------------------------------------------------------------
   |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---+--------------------------------------------------------------------------
   x |     407    29.15335    .5746576    11.59328    28.02367    30.28303
   y |     227    38.88469    .8935853    13.46322    37.12387    40.64551
---+--------------------------------------------------------------------------
Comb |     634     32.6376    .5219488    13.14233    31.61264    33.66256
---+--------------------------------------------------------------------------
diff |            -9.73134    1.062415               -11.81974   -7.642937
------------------------------------------------------------------------------
    diff = mean(x) - mean(y)                                      t =  -9.1596
H0: diff = 0                     Welch's degrees of freedom =  413.838

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table A11: T-Test Comparison of Mean 2006 Education Index of all First Nations and 2021 Education Index of First Nations with FALs (x = 2006 Education Index of all FNs, y = 2021 Education Index of FNs with FALs)

```
Two-sample t test with unequal variances
------------------------------------------------------------------------------
             |      Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
-------------+----------------------------------------------------------------
           x |      407    29.15335    .5746576    11.59328    28.02367    30.28303
           y |      171    46.15803    .9782922    12.79283    44.22686     48.0892
-------------+----------------------------------------------------------------
    Combined |      578    34.18415    .5928238    14.25245    33.01979     35.3485
-------------+----------------------------------------------------------------
        diff |           -17.00468    1.134587               -19.23761   -14.77175
------------------------------------------------------------------------------
    diff = mean(x) - mean(y)                                      t = -14.9876
H0: diff = 0                     Welch's degrees of freedom =  294.303

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table A12: T-Test Comparison of Mean 2006 Education Index of all First Nations and 2021 Education Index of First Nations with FPC (x = 2006 Education Index of all FNs, y = 2021 Education Index of FNs with FPC)

```
Two-sample t test with unequal variances
------------------------------------------------------------------------------
             |      Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
-------------+----------------------------------------------------------------
           x |      407    29.15335    .5746576    11.59328    28.02367    30.28303
           y |      138    46.13319    1.027931    12.07545    44.10053    48.16585
-------------+----------------------------------------------------------------
    Combined |      545    33.45283    .5930025    13.84378    32.28798    34.61769
-------------+----------------------------------------------------------------
        diff |           -16.97984    1.177656               -19.30023   -14.65945
------------------------------------------------------------------------------
    diff = mean(x) - mean(y)                                      t = -14.4183
H0: diff = 0                     Welch's degrees of freedom =  229.748

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table A13: T-Test Comparison of Mean 2006 Education Index of all First Nations and 2021 Education Index of First Nations with FMSC (x = 2006 Education Index of all FNs, y = 2021 Education Index of FNs with FMSC)

Two-sample t test with unequal variances

	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
x	407	29.15335	.5746576	11.59328	28.02367	30.28303
y	37	50.86323	1.692951	10.29782	47.42977	54.29669
Combined	444	30.96251	.6149067	12.95689	29.75401	32.171
diff		-21.70988	1.787824		-25.3103	-18.10946

diff = mean(x) - mean(y) t = -12.1432
H0: diff = 0 Welch's degrees of freedom = 45.2029

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

Descriptive Statistics and T-Test Analysis for Housing Index (2006 & 2021)

Table A14: Descriptive Statistics of First Nations Community Housing Index (2006 & 2021)

Population Definition	Mean	Median	Standard Deviation	Coefficient of Variation	Number of First Nations (data observations)
All First Nations (FNs), 2006	60.74	60.00	19.44	0.3201	407
FNs without FAL, 2021	70.72	71.01	15.01	0.2123	233
FNs with FAL, 2021	75.55	75.00	15.31	0.2026	174
FNs without FPC, 2021	70.88	71.15	15.13	0.2134	267
FNs with FPC, 2021	76.42	75.71	15.04	0.1969	140
FNs without FMSC, 2021	72.04	72.22	15.31	0.2126	370
FNs with FMSC, 2021	80.22	77.27	13.30	0.1658	37

Table A15: T-Test Comparison of Mean 2006 Housing Index of all First Nations and 2021 Housing Index of First Nations without FALs (x = 2006 Housing Index of all FNs, y = 2021 Housing Index of FNs without FALs)

Two-sample t test with unequal variances

	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
x	407	60.74	.963605	19.44	58.84572	62.63428
y	233	70.72	.9833378	15.01	68.78259	72.65741
Combined	640	64.37334	.7342182	18.57441	62.93157	65.81512
diff		-9.98	1.376767		-12.684	-7.276002

diff = mean(x) - mean(y) t = -7.2489
H0: diff = 0 Welch's degrees of freedom = 586.138

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

Table A16: T-Test Comparison of Mean 2006 Housing Index of all First Nations and 2021 Housing Index of First Nations with FALs (x = 2006 Housing Index of all FNs, y = 2021 Housing Index of FNs with FALs)

Two-sample t test with unequal variances

	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
x	407	60.74	.963605	19.44	58.84572	62.63428
y	174	75.55	1.160648	15.31	73.25915	77.84085
Combined	581	65.17535	.8093141	19.50766	63.58581	66.7649
diff		-14.81	1.508522		-17.77534	-11.84466

diff = mean(x) - mean(y) t = -9.8176
H0: diff = 0 Welch's degrees of freedom = 412.852

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

Table A17: T-Test Comparison of Mean 2006 Housing Index of all First Nations and 2021 Housing Index of First Nations with FPC (x = 2006 Housing Index of all FNs, y = 2021 Housing Index of FNs with FPC)

Two-sample t test with unequal variances

	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
x	407	60.74	.963605	19.44	58.84572	62.63428
y	140	76.42	1.271112	15.04	73.90679	78.93321
Combined	547	64.75316	.8395018	19.63429	63.10411	66.40221
diff		-15.68	1.595074		-18.81847	-12.54153

diff = mean(x) - mean(y) t = -9.8303
H0: diff = 0 Welch's degrees of freedom = 311.812

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

Table A18: T-Test Comparison of Mean 2006 Housing Index of all First Nations and 2021 Housing Index of First Nations with FMSC (x = 2006 Housing Index of all FNs, y = 2021 Housing Index of FNs with FMSC)

Two-sample t test with unequal variances

	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
x	407	60.74	.963605	19.44	58.84572	62.63428
y	37	80.22	2.186507	13.3	75.78556	84.65444
Combined	444	62.36333	.9369508	19.74278	60.52191	64.20475
diff		-19.48	2.389424		-24.27472	-14.68528

diff = mean(x) - mean(y) t = -8.1526
H0: diff = 0 Welch's degrees of freedom = 52.0045

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

Appendix III: Calculation of Variables, Details of Datasets Used, and Limitations of the Research

Calculation of Variables

Table A19: Calculation of Variables

Variables	Steps	Calculation	Data Source
Education Index	1: Input education data calculation	[No. of people who have a high school diploma (or equivalent) only] *1 + [(No. of people with trade or apprenticeship or other non-university certification) + (No. Of people with a university certificate below bachelor level) + (No. of people with a university degree bachelor or higher)] * 1.25 = Sum of amounts	2006 and 2021 Census from Statistics Canada (Indigenous Services Canada, n.d.) (Statistics Canada, 2022) (Blankinship & Lamb, 2022)
	2: Divide balance by population 15 years and Over	Sum of amounts / Population 15 years and over * 100 = Unadjusted education index	
	3: Adjust index to a scale of 0-100	Unadjusted education index * (Adjustment factor) = Education Index	
Housing Index	1: Input housing data calculation	1 – (# of dwellings requiring major repairs / total number of dwellings) * 100 = Unadjusted housing index	2006 and 2021 Census from Statistics Canada (Indigenous Services Canada, n.d.) (Statistics Canada, 2022) (Blankinship & Lamb, 2022)
	2: Adjust index to a scale of 0-100	Unadjusted housing index * (Adjustment factor) = Housing Index	
Earned Revenue Ratio (ERR)		Earned revenue / total revenue (Note 1)	2016 audited First Nation government financial statements (Indigenous Services Canada, n.d.)
Operating Margin Ratio (OMR)		(Total revenue less total expenses) / total revenue	2016 audited First Nation government financial statements (Indigenous Services Canada, n.d.)

Note 1: earned revenue relates to all types of own-source revenue of the First Nation government, which can include, but is no limited to: business revenue, profit from Nation-owned enterprises/partnerships, user fees, property tax, economic development royalties, other taxes, etc.

Details of Datasets Used and Limitations of Research

Demographic datasets were utilized from the 2006 and 2021 Census, as prepared by Statistics Canada. The financial datasets used include the 2016 First Nations government audited financial statements, which are available publicly. This section reviews further details about the datasets, as well as limitations of the research.

The 2016 audited financial statements of many First Nations governments are publicly available on the Indigenous Services Canada website. These statements are posted on this website in PDF format. These statements were collected and the financial information was digitized to allow for statistical analysis (Indigenous Services Canada, n.d.). These financial statements were audited by independent auditing firms, and provide a high quality financial dataset that can be used for analysis. Note that the total number of First Nations governments listed in the Indigenous Services Canada website is 637 (as of 2019). Of these, 446 First Nations have financial statements that are publicly available and have clean audit opinion (or audit opinions with minor qualifications). As such, 446 sets of First Nations government audited financial statements are used in this analysis. The raw data from this source was used to calculated the financial ratios outlined in Table A19 of this appendix.

Datasets regarding the progress of a First Nation with FMB (e.g., have a FAL, FPC, or FMSC) was generated from FMB's internal database. This internal database of FMB's clients status enabled the statistical analysis in this report.

The 2006 selected First Nations community outcome datasets were derived from publicly available demographic data that is publicly presented in the Indigenous Services Canada website. This demographic data was prepared by Statistics Canada as part of their 2006 Census. Data tables, with data aggregated by First Nations government, was provided to Indigenous Services Canada. Indigenous Services Canada then posted these data tables on their website, which can be viewed by the public (Indigenous Services Canada, n.d.). The raw data from this source was used to calculated the wellbeing indices outlined in Table A19 of this appendix.

The 2021 selected First Nations community outcome datasets were derived from publicly available data from Canada's 2021 Census, and is available from the Statistics Canada website (Statistics Canada, 2022). The datasets used include the comprehensive 2021 Census data tables – categorized by Census subdivision. First Nations data was presented by individual First Nations reserves. This dataset was collected by FMB, and was then aggregated at the First Nations government level. The raw data from this source was used to calculated the wellbeing indices outlined in Table A19 of this appendix. Note that the education index and housing index formulas are the same as used by Blankinship & Lamb (2022).

Refer to Appendix II (the descriptive statistics tables of the education and housing indices) for details regarding the number of First Nations communities that were included in this study. The study includes all First Nations communities that had quality Census data available from both the years 2006 and 2021.

This study has a few limitations. Approximately 25%-30% of the First Nations in Canada are excluded from the analysis due to the data being unavailable, or due to poor quality datasets. This has the potential to introduce bias into the results. Also, as this study relies on observational data, it is not possible to draw causal conclusions. Once a more comprehensive dataset is available, further research could address these limitations.