Is the Canadian Equalization Payments System fair? ☆,☆☆

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Abstract

The idea of this article is to outline a simple analysis connected to the fairness of the Canadian equalization payments system. This is definitely one of the hottest topics in the public opinion and political debates which has been many times raised and discussed over the years. After a brief introduction about the conceptual framework linked to the current equalization system, a more "pragmatic" model is introduced. This approach takes into consideration a new, theoretical equalization payments system directly tied to the actual cost of living in each Canadian Province and captured by several key factors. Not only the proposed model is comprehensively fairer but also it is superior in allocating resources from the Federal government to eligible Provinces than the current equalization transfers.

Keywords: *Equalization Payments*, *Cost of Living*, *System Fairness*, *Resources Allocation*

1. Introduction

There has always been lots of rumor around the Federal government equalization payments system across Canadian Provinces. The real question is: *Do the numbers and empirical evidence justify fund transfers from economically advanced Provinces to less "prosperous" ones?* In this article I am going to shed some light on this complicated topic and provide a personal assessment as to whether or not structural changes to the equalization system should be performed at federal level.

Additionally, I am going to provide a brief background to the less informed reader as to what the whole idea behind the Federal equalization payments system is: When it has been amended, its rationale, the factors that are deemed important in the overal formula, which Province gets the greatest portion of funds and which Province instead gets nothing.

On a more personal level, the motivations which pushed me to write this article are fundamentally related to the concept of *fairness*: In this context - as in life - different dynamics and situations can easily lead to unfavourable positions where one party gains at the expense of the other, *unfairly*. "Unfairly" in this circumstance means "*without a concrete basis*" because numbers prove otherwise. With this being said, I do not want the reader to consider this article as a sort of "philosophy of equalization payments". It is just a document providing as much evidence as possible connected to the abovementioned topic by factoring in objective research.

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☆☆This article is the result of the author's genuine and sincere interest in the Canadian equalization payments system. The author does not earn any income in any form connected to this article. In its first Version this article has not been published in any Journal nor website other than the author's personal LinkedIn profile. If any reader is interested in publishing this article please reach out the author via the email address below. Finally, please bear in mind that any comment, suggestion or proposition outlined in this article represents the author's personal opinion about the Canadian equalization payments system. This article has been created during the author's personal free time as a one-off project.

*Principal and only author of this article. I eagerly welcome future collaborations or feedback on this or other related/unrelated topics. Additionally, I am open to provide objective research on ad-hoc subjects requested by the curious reader. Ultimately, I can also provide the R scripts connected to any plot in this or future articles provided explicit mention in your personal projects. Please submit any of your inquiry via the below email address.

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Throughout the whole article I additionally try to incorporate both "traditional" forms of economic means produced and owned by each single Province and *unconventional* drivers of "shadow wealth". The beauty of the shadow wealth is that "under-the-radar" sources of personal (or family) wellness are taken into account in the overall assessent of the equalization system. For example, prices of grocery across different Provinces are incorporated in the final assessment. Equally, car ownership costs, minimum wages and so on are additionally included in the overall assessment.

As this is not a scientific paper - nor it is intended to be one - I apologize in advance to the careful reader if he/she spots any inconsistency with respect to the form of the document (structure, citations, etc.). I am more than happy to receive any constructive feedback or suggestion related to this article and eventually incorporate it in future document Versions.

Furthermore, data has mostly been collected by downloading panel data (both time-series and cross-sectional data) from Statistics Canada. Each and every single time a plot is displayed, the reference to the specific Statistics Canada table is provided. On the other hand, several unstructured data has additionally been used in assembling ad-hoc plots. In those cases too, specific mention as to where the data has been pulled from is provided.

This article is organized as follows: Section 1 provides an introduction, Section 2 covers the structure around the current Federal equalization payments system and its logic. Conversely, Section 3 provides in-depth evidence connected to several cost of living measures linked to each Province and outlines an alternative equalization payments system. Results generated by this newly proposed model are also summarized in Section 3. Section 4 wraps-up around the fairness of the actual Federal equalization transfers and concludes by condensing the overall findings.

2. Equalization Payments in Canada: The Basics

The whole idea surrounding the equalization payments system in Canada is fairly straightforward. Conceptually, *equalization is one of the Government of Canada's transfer programs specifically dedicated for addressing fiscal disparities among Provinces*[1].

Back in 1982, the Federal government looked at different programs to support Provinces across the country. What they came up with was an equalization method[2]: Essentially, what the government tried to achieve was a way to help Provinces that did not have the revenue capacity (whether it is corporate taxes, personal taxes, royalties, consumption taxes, ...) to generate enough funds and sustain core programs like education, healthcare, security and so on which formally are handled at provincial level. In other words, without equalization payments Provinces with weaker fiscal capacities would be unable to provide their residents a mixture of tax burdens and public services as attractive as those in other Provinces with higher fiscal capacities.

Interestingly, it was established that an equalization payment is an *unconditional* movement of funds from the "giving" Province to the "receiving" Province. The adjective unconditional makes a big difference. The receiving Province is absolutely free to spend the funds according to its own priorities without the need to justify how the funds will be distributed. This creates what in the insurance business is called a "moral hazard": Why would a receiving Province increase its fiscal capacity knowing that it

[1] For the sake of completeness, other forms that the Government of Canada uses to "level the playing field" between more economically wealthy Provinces and those requiring more financial help are Health Transfers, Social Transfers and Territorial Formula Financing. The last type of transfer is exclusively dedicated to the three territorial governments of Yukon, the Northwest Territories and Nunavut to support the provision of public services, being the three Territories excluded by the equalization payments system. More information can be found here: https://www.fin.gc.ca/fedprov/eqp-eng.asp

[2] The equalization payments system has substentially amended with the change of the Canadian Constitution in 1982. Please refer to the Subsection 36(2) of the Constitution Act, 1982 for more information.

will receive money from the Federal Government anyway? In 2001, Professor James Buchanan[3] (Nobel Laureate in Economic Sciences and essentially the inventor of the equalization payments formula) came out with an interesting paper called "*Fiscal Equalization Revisited*". In his paper, he clearly pointed out the flaw of the Canadian equalization payments system in creating "*dependency*" effects "*on the part of the citizenry and their political leaders in Provinces with relatively low fiscal capacities*". Since the identity "less Provincial revenues $\equiv$ more equalization transfers" holds, why would a Provincial Government rationally try to take more actions to change the status quo? The answer to the above questions is still unclear and most likely very hard to prove.

With the above being said, equalization is really a process to correct fiscal imbalance which boils down to fiscal capacity. The Government defines different sources of fiscal capacity which I am going to call "revenue drivers" and that are listed below:

- Personal income taxes;
- Business income taxes;
- Consumption taxes;
- Up to 50% of natural resoruce revenues;[4]
- Property taxes and miscellaneous.

Theoretically, the higher the amount of funds flowing into each Province based on the above revenue drivers, the lower the amount of equalization payments received by the Province throughout the year.

Let us get more technical. The equalization payments system uses a mathematical formula to assess whether a Province is eligible for an equalization transfer and - if so - how much of it. Since 2009, the ***total amount*** of equalization payments has increased annually based on a three year moving average of the Canadian's growth rate and captured by the nominal Gross Domestic Product (GDP)[5]. Moving one step forward, the equalization system determines ***on a per-capita basis*** a Province's ability to generate revenues and compares that fiscal capacity to the ***average*** fiscal capacity for all Provinces. Excluding fees for using public services, all provincial fiscal capacities are allocated to the above-listed revenue drivers.

With the exception of natural resources revenues, the formula calculates the fiscal capacity by factoring in the amount of per-capita revenue that each Province could generate if all Provinces had identical tax rates.

Mathematically:

$$\alpha = t_1 X_1 + t_2 X_2 + t_3 X_3 + t_4 X_4 + 0.5NR \tag{1}$$

$$\beta = t_1 x_1 + t_2 x_2 + t_3 x_3 + t_4 x_4 + 0.5nr \tag{2}$$

Where the lowercase t-s represent the national average of provincial tax rates applicable to personal income, business income, consumption expenditure and property, respectively. Capital X-s capture the corresponding amount of the specific tax base sumed across all Provinces and expressed on a per-capita basis. NR instead is the summation of all natural resource revenues collected by provincial governments,

[3] More information can be found on: https://en.wikipedia.org/wiki/James_M._Buchanan

[4] According to the Department of Finance, *"Provinces get the greater of the amount they would receive by fully excluding natural resource revenues, or by excluding 50 per cent of natural resource revenues."*

[5] It would be nice if the amount of transfers was based on a *nominal* base instead of a *real* measure such as the real GDP growth. This would remove the artificial effect of the inflation in the final formula calculation.

once again, on a per-capita basis. The lowercase x-s and nr are the equivalent amounts for a particular Province. Therefore, α will stay the same for each Province whereas β will vary from Province to Province.

The treatement of natural resource revenues merits a special consideration. Indeed, half of the Province's natural resoruce revenues should be incorporated in the overall formula calculations. This is the reason why the equalization payment is based on actual revenues and not fiscal capacity and the reader does not see the same national average tax rate in Equation (1) and (2) as for the other revenue drivers.

Ultimately, to assess if a Province is entitled to an equalization payment and - if the case - how much for, each Province's per-capita fiscal capacity in the 5 revenue drivers is compared to the average fiscal capacity of the 10 different Provinces. If the Province exhibits below-average fiscal capacity ($\alpha - \beta > 0$), then it is eligible for an equalization payment to make up the gap. Conversely, if the Province shows above-average fiscal capacity ($\alpha - \beta < 0$), then it is not eligible for an equalization payment.

Unfortunately, there are some provisions which must be mentioned.

A fiscal capacity ***cap*** on equalization payments to the ***recipient*** Province needs to be taken into consideration. How does the fiscal cap get calculated? The lowest β value in Equation (2) above among the subset of ***non-recipient*** Provinces constitues the fiscal cap. Therefore, for any recipient Province, its equalization entitlement would be reduced to the extent that its β value ***plus*** its equlization payment exceeds the cap.

In mathetatical formulas, an eligible Province's per-capita equalization payment is given by:

$$Per\ Capita\ Payment = (\alpha - \beta) - \gamma \tag{3}$$

where γ represents the per-capita adjustment generated from the application of the fiscal capacity cap. The gamma value is zero if the fiscal capacity cap did not apply or a positive number if triggered[6].

Although equation (3) above worked for few years without any particular issue, the total amount of equalization payments suffered a dramatic increase when Ontario first became a recipient Province. Indeed, when the abovementioned fiscal capacity gap was introducted, Ontario's fiscal capacity was always the cap. Nevertheless, the year the Province of Ontario was no longer a non-recipient, the fiscal capacity cap switched to the one connected to British Columbia which was much higher. To this end, the fiscal capacity cap became less restrictive for recipient Provinces thus increasing the overall total amount of equalization transfers.

The concatenation of events led the Federal government to redefine how the fiscal capacity cap is calculated[7]. As of 2009, the fiscal capacity cap is calculated as the average of the sum of β as in Equation (2) above and the per-capita equalization payment for the eligible Provinces. The idea behind this amendment was to avoid a large increase in total equalization payments over the years.

On the same note, another major change was introduced by the Federal government in 2009. This was still linked to the desire to limit the total amount of equalization payments from one year to another. As outlined in the preceeding paragraphs, the Federal government imposed a fixed rate of growth in total payments equal to the three year moving average of the Canadian's GDP growth rate in nominal terms.

We then need to modify Equation (3) above by taking into consideration the latest developments in the equalization saga. It follows that:

$$Per\ Capita\ Payment = (\alpha - \beta) - \gamma^* - \varepsilon \tag{4}$$

[6] For example, given an amount $\delta = \min(\beta) \subset$ non-recipient Provinces, the γ value for a generic P recipient Province will be equal to $(\alpha - \beta) + Per\ Capita\ Payment_P - \delta$ if and only if the last expression is greater than 0. γ will be 0 otherwise.

[7] The latest significant changes in the equalization formula have been introduced in 2009.

In the above Equation (4), α and β assume the very same meanings as in Equation (1) and (2). Conversely, the newly defined γ^* now denotes an updated version of the fiscal cap[8]. Finally, ε captures the reduction in the payment necessary to keep the total equalization payments below a certain level which in turn is dictated by the three-year MA growth rate in GDP. Please note that if the total budget limit is crossed, an ***equal per-capita amount***, ε, is subtracted from each Province's $(\alpha - \beta) - \gamma^*$, sufficient to achieve the budget limit.

For the sake of illustration, let us have a glance at how the equalization payments by Province changed over the years as well as how the 2018-2019 total payments look like:

t	NL	PEI	NS	NB	QC	ON	MB	SK	AB	BC	$\sum$
2010-2011	0	330	1,110	1,581	8,552	972	1,826	0	0	0	14,361
2011-2012	0	329	1,167	1,483	7,815	2,200	1,666	0	0	0	14,660
2012-2013	0	337	1,268	1,495	7,391	3,261	1,671	0	0	0	15,423
2013-2014	0	340	1,458	1,513	7,833	3,169	1,792	0	0	0	16,105
2014-2015	0	360	1,619	1,666	9,286	1,988	1,750	0	0	0	16,669
2015-2016	0	361	1,690	1,669	9,521	2,363	1,738	0	0	0	17,342
2016-2017	0	380	1,722	1,708	10,030	2,304	1,736	0	0	0	17,880
2017-2018	0	390	1,779	1,760	11,081	1,424	1,820	0	0	0	18,254
2018-2019	0	419	1,933	1,874	11,732	963	2,037	0	0	0	18,958
$\sum$	0	3,246	13,736	14,749	83,241	18,644	16,036	0	0	0	149,652

Table 1: Equalization payment amounts by Province between 2010 and 2019. Amounts in millions of CAD dollars. Source: Department of Finance Canada

In Table 1 above, the distribution of equalization payments is tremendously skewed toward the Province of Quebec which saw its equalization transfers totaling about C$83 billions over the past 10 years. On a relative basis, this figure represents approxiately $^{83}/_{150} = 55\%$ of the total C$150 billions equalization payments over the last decade. The second biggest "receiving" Province between 2010 and 2019 is Ontario with its C$18.6 billions of equalization transfers followed by Manitoba and New Brunswick with C$16 billions and C$14.7 billions, respectively.

On the other hand, there are four Provinces which have not been in a position to receive any equalization payments. These are Newfoundland & Labrador, Saskatchewan, Alberta and British Columbia. They literally received 0 dollars due to how equalization formula calculations have initially been established and subsequently amended.

Although the abovementioned equalization transfers seem tremendously high, let us look at how much amount of equalization per-capita each Province obtains. Calculations have been made by considering the estimates of population per each single Province:

[8] To be more precise, the "pure" fiscal capacity and the natural resoruce revenues are treated as independent elements. Therefore, how $\gamma^*$is calculated becomes: $\frac{(t_1x_1+t_2x_2+t_3x_3+t_4x_4)+0.5nr+Per\ Capita\ Payment}{3}$. The divisor is 3 and not 2.

t	NL	PEI	NS	NB	QC	ON	MB	SK	AB	BC	$\sum$
2010-2011	0	2,329	1,168	2,099	1,079	74	1,496	0	0	0	8,244
2011-2012	0	2,284	1,236	1,963	976	166	1,350	0	0	0	7,975
2012-2013	0	2,323	1,342	1,975	914	243	1,337	0	0	0	8,134
2013-2014	0	2,342	1,546	2,002	961	234	1,416	0	0	0	8,500
2014-2015	0	2,467	1,718	2,207	1,131	145	1,366	0	0	0	9,036
2015-2016	0	2,459	1,795	2,214	1,153	171	1,342	0	0	0	9,134
2016-2017	0	2,542	1,815	2,255	1,205	165	1,317	0	0	0	9,300
2017-2018	0	2,565	1,865	2,317	1,320	100	1,360	0	0	0	9,528
2018-2019	0	2,729	2,023	2,464	1,386	67	1,502	0	0	0	10,171
$\sum$	0	22,041	14,508	19,497	10,126	1,366	12,486	0	0	0	80,022

Table 2: Per-capita equalization payment amounts by Province between 2010 and 2019. Amount in CAD dollars. Since population statistics per Province are provided only up to 2017, I used a geometric mean of the previous 10 years as an estimate for the population growth between 2018-2019. Sources: Department of Finance Canada, Statistics Canada Table 17-10-0005-01 Population estimates on July 1st, by age and sex.

Table 2 is quite reveling. On a per-capita level, the Province that benefited the most in terms of equalization payments is Prince Edward Island whose total equalization transfers in the last decade totaled C$22,041 per person. New Brunswick is the second largest recepient of per-capita equalization payments with approximately C$19,500 of transfers accrued between 2010 and 2019 followed by the Province of Nova Scotia (C$14,508). Given its second biggest population in the country, Quebec accumulated "only" C$10,126 per capita of equalization payments in the last decade.

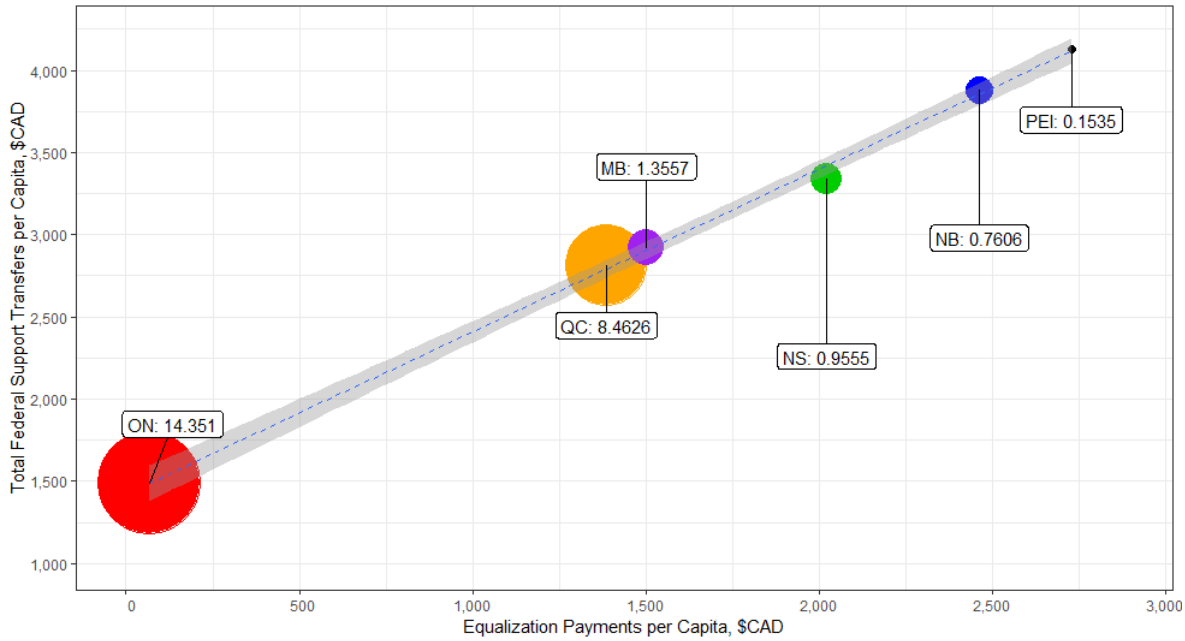

Figure 1: **Total Federal Support Transfers** as a function of Equalization Payments ($CAD, per-capita). Bubble size captures the population of each **receiving** Province. The Province's population (in millions) is reported within each rectangular box. Trend line coupled with its 95% confidence intervals show the quasi-perfect linearity of the equalization payment calculations, i.e. the greatest a Province's population, the smaller the equalization payments as well as total federal support transfers. Non-receiving equalization payments Provinces are not shown. 2018 data. Sources: Department of Finance Canada, Statistics Canada Table 17-10-0005-01 Population estimates on July 1st, by age and sex.

Before concluding this section I would like to make a comment that captured my attention when

consolidating the figures in Table 2. The pattern that I personally extracted from the last statistics is that the less population a Province has, the more equalization payments it obtains on a per-capita level. This pattern obviously is a mathematical result. However, can this mere fact be considered unfair towards Provinces that conversely have more residents living in it? The amount of population in each Province - among other things - should not be considered *the ultimate* determining factor in calculating the amount of equalization payments distributed across Canadian Provinces. Therefore, ***if*** the per-capita equalization transfers are what ultimately really matters, I strongly believe that to be fair an equalization system should look at more concrete measures. These measures should include the *actual cost of living* in every single Province. If the cost of living in a specific Province is above the national average due to special circumstances and conditions then that Province deserves an equalization payment.

Measures that capture an actual cost of living are presented in Section 3 below coupled with a conceptual framework around an alternative equalization payment calculation.

3. An Alternative Equalization System: The Actual Costs of Living in a Province

This Section is going to show how the cost of living, captured by certain ah-hoc measures, is distributed across Canadian Provinces. The idea behind these metrics is that they should ultimately depict a *true representation* of what the *average* Canadian family spends in its day-to-day living.

The rationale underpinning equalization payments should then shift from the concept of fiscal revenue capacity at Provincial level to a more "pragmatic" approach directly linked to cost of living expenses absorbed by the average family.

After all, what would an individual's value added gained through equalization transfers be if he/she lives in a high cost of living Province? Most likely very marginal. Conversely, if one lives in a Province where the cost of living is low, any additional trasnfer represents a more-than-proportional increase in the purchasing power: The ultimate beneficiary is the family the individual belongs to.

Households always have to make a choice between present consumption and future consumption. In economics, the difference between income perceived and present consumption is referred as saving. Rationally, an individual will tend to postpone today's consumption because he/she expects a higher *utility* tomorrow: The utility of future consumption is greater than today's value. The real problem is to model and quantify utility given its very abstract meaning.

Nevertheless, if the income perceived by a household goes up, invevitably either the individual's consumption or savings are going to go up too when costs are held constant.

A fair equalization payments system should indeed consider the abovementioned observations: ***Assuming a certain cost of living, what should the amount of equalization transfers that each household is entitled to obtain from the Province be so that its consumption or saving decisions can reach an average country level?***

In an age where old-fashioned economic indicators are considered outdated, more "unconventional" measures of actual cost of living should be incorporated in the model as well.

According to personal experience measures that represent a true, underlying cost of living for each individual are:

1. House prices;
2. Minimum wage;
3. Median employment income[9] of families with children;
4. Car ownership costs (price to buy the most sold passenger car in Canada as of 2018);

[9]The use of the median as a source of employment income is purely a statistical one: I wanted to avoid the presence of outliers in the data due to incredibly high or low values for employment income connected to mean calculations.

5. Monthly recommended minimum amount of money of food per person;
6. Gasoline costs (regular unleaded gasoline at self service filling stations).

The model can conceptually be summarized as follows:

$$\Lambda_i = f(F_1; F_2; F_3; F_4; F_5; F_6)$$

$$\Lambda_i = \frac{1}{1000} \cdot HP_{i,1} - MW_{i,2} - \frac{1}{100} \cdot Y_{i,3} + \frac{1}{100} \cdot CO_{i,4} + P_{i,5} + U_{i,6} \tag{5}$$

Equation (5) above captures the essence of the cost of living burden suffered by the representative Canadian household: Λ is a function of 6 different Factors as listed in the previous paragraph. These factors are then summed up to obtain an approximation of the Provincial cost of living. i is just an indicator that goes from 1 to 10 capturing the "i" Canadian Province. Furthermore, three out of the five factors are adjusted by a coefficient. This coefficient is critical in making the total equalization payments "*finite*" thus avoiding divergence to $+\infty$ (infinte). Since we are positioning ourselves from a "cost" perspective, cash outflows have a positive sign whereas cash inflows have a negative sign. Intuitively, cash outflows increase the financial burden (hence + sign) whereas cash inflows decrease such constraint (hence - sign).

Ultimately, a "Canada-wide" cost of living estimate is calculated. In turn, this value will be used as a benchmark to determine whether the Province is eligible for an equalization transfer or not. From a mathematical standpoint, this benchmark is calculated either as an average or as a median of the ten $\Lambda_i s$ assocaited to each Province. The "Canada-wide" cost of living measure is indicated as Λ_C^*. Hence, a Province is eligible for an equalization payment *if and only if*:

$$\begin{cases} \Lambda_C^* < \Lambda_i : \textit{ Eligible for Equalization} \\ \Lambda_C^* > \Lambda_i : \textit{ Otherwise} \end{cases} \tag{6}$$

What Equation (6) states is that if a Province's cost of living measure Λ_i is greater than the average or median Canada-wise cost of living estimate Λ_C^* then that specific Province is entitled for an equalization transfer. The opposite holds true if Λ_i is smaller than Λ_C^*.

Finally, to calculate how much in equalization payments a Province should receive, its Λ_i value is multiplied by the Labor Force portion of the population[10] of the respective Province. Theoretically, this is the proportion of individuals with the greatest need of additional income. This boils down to:

$$\textit{Equalization Payments}_i = \Lambda_i \cdot \textit{Labor Force}_i \tag{7}$$

Equation (7) is the essence of a new approach of equalization payments based on a practical method and close to "real-world" cost of living conditions. Additionally, what Equation (7) states is that a Province's equalization payment is equal to its cost of living estimate - represented by Λ_i - multiplied by the Province's population proportion belonging to the Labor Force.

Let us now illustrate the breakdown of the abovementioned cost of living items by Province below.

[10] I classify this subset of the population as those individuals who are 15 to 64 year old, both males and females belonging to the Labor Force.

3.1. House Prices by Province

One of the most important factors an average family considers when planning for the future is the price of the house its members are going to live in. The house is primordial in determining the long term plans and budget constraint for a typical household.

As the first of the six items representing the actual cost of living in a specific Province, I managed to retrieve data connected to the average property by Province as of April 2018. The data is depicted in Figure 2 below coupled with a Canadian Average value (red rightmost bar).

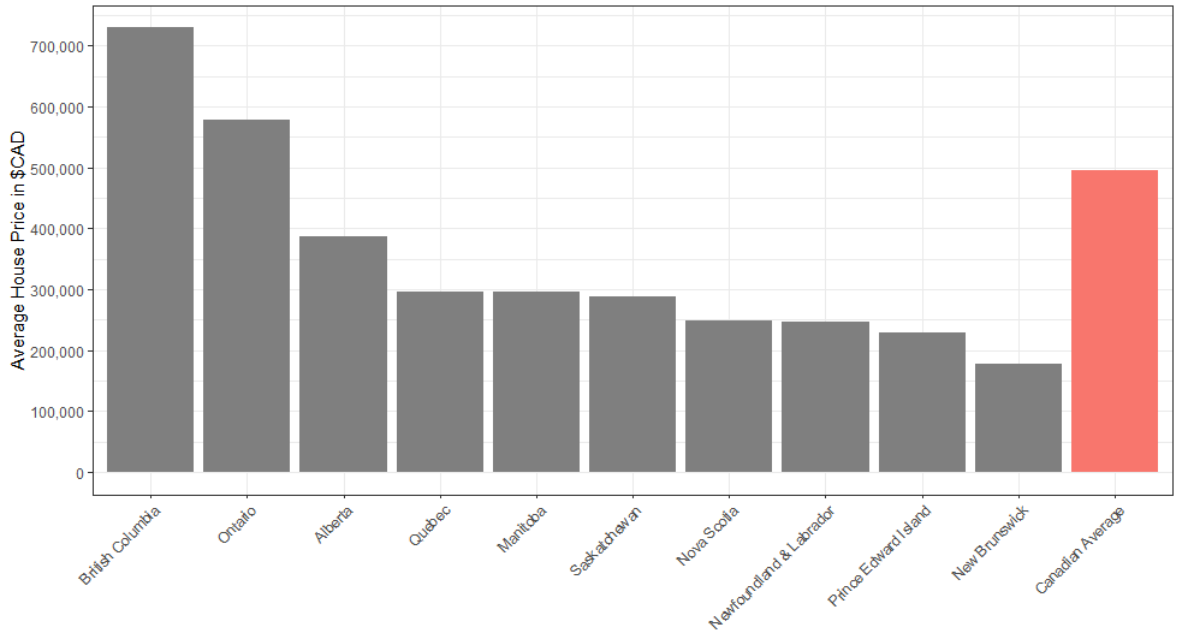

Figure 2: Average House Price by Province in $CAD as of April 2018. Provinces are sorted from the most expensive to the most affordable one with the exclusion of the Canadian Average value. Source: Living in Canada Average House Prices April 2018

As the reader can observe from Figure 2, British Columbia, Ontario and Alberta are the most expensive Provinces in term of house affordability, respectively. A resident of the Province of Quebec can ideally buy a house for an average price of 300,000 dollars thus allowing the typical household to benefit from a much competitive housing market; the same observation holds true for Manitoba. A house in Nova Scotia and Newfoundland & Labrador is priced at about the same level (C$250,000) whereas Prince Edward Island and New Brunswick are the least expensive Provinces a family can buy a house in. The average house in this country can be purchased for about C$500,000.

Do these statistics mean that people living in British Columbia, Ontario or Alberta are all wealthy? Can the average family with children afford to enter into a mortgage of 400, 600 or 700 thousand dollars for the next 25 to 30 years without suffering significant financial repercussions? Most likely not. Yet, equalization payments have proven to be very marginal and rather inexistent in the top 3 Provinces depicted in Figure 2.

3.2. Minimum Wage by Province

The minimum wage is the second factor in Equation (5). Once again, since I am adopting a "cost" perspective, this factor decreases the financial burden of an individual. In other words, the higher the minium wage a person earns from his/her working hours, the less budget constraints he/she suffers. Ideally, more equalization payments should be addressed to those Provinces whose minimum wages are lower than other Provinces across Canada.

In addition, the profile of minimum wage workers has historically been fairly well established. In fact, it is well known, for example, that many minimum wage workers in Canada are under the age of 25 and work in part-time jobs.

I managed to retrieve the time series of data associated to the minimum wage by Province from the Minimum Wage Database. Since the values are very similar, I decided to split the data between "Eastern Provinces" and "Western Provinces" to give the reader a better representation of the trend and reduce the amount of noise in each plot.

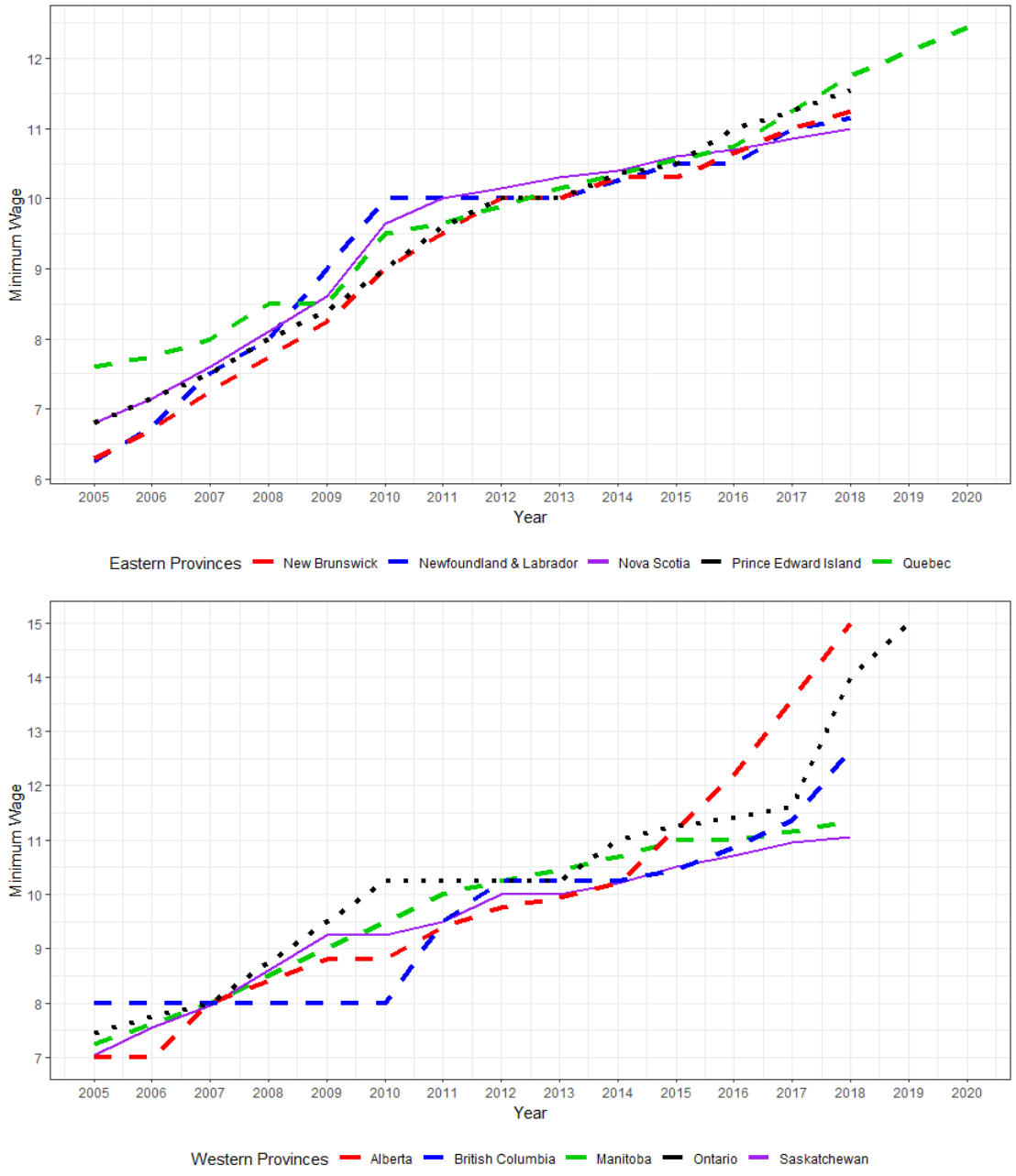

Figure 3: Hourly minimum wage time series by Province between 2005 and 2018. Some Provinces already show values for 2019 and 2020 calendar year. Data in $CAD. Source: Minimum Wage Database

As the reader can see from Figure 3, hourly minimum wages across Canadian Provinces are surely trending up. This may suggest that many papers published by experienced researchers in labour and social economics have convinced Canadian politicians to raise the minium wage in their own Province.

Interestingly, these research papers were motivated by fairness issues, a desire to fight poverty and/or reduce income inequality.

At first glance, one can observe that the correlation between the different series is quite high with few exceptions namely Ontario and Alberta, respectively. Indeed, the second line plot suggests for a divergence of Ontario and Alberta from the evolution of minimum wage series of the remaining Provinces. Additionally, the Province of British Columbia seems to follow the same pattern as its blue dashed line suggests for a trend continuation rather than a reversal. Strong uptrend is also captured by the Quebec green dashed line in the first line chart.

If we only consider the calendar year 2018, the Provinces with the highest minimum wage salary are Alberta (15$/h) followed by Ontario (14$/h) and British Columbia (12.65$/h). On the other side of the distribution we find the Provinces of Nova Scotia (11$/h), Saskatchewan (11.06$/h), Newfoundland & Labrador (11.15$/h) and New Brunswick (11.25$/h), respectively. Ultimately, the Province of Quebec, Prince Edward Island and Manitoba lie in between with 11.75, 11.55 and 11.35 dollars/hour in terms of minimum wage, respectively.

The pattern that emerges from these figures is that "Western Provinces" tend to have a greater minimum wage per hour compared to "Eastern Provinces". Can this statistic also be considered a representation of the true instrinsic cost of living in each Province? If so, Alberta, Ontario and British Columbia should technically represent Provinces where the cost of living for the average household is the greatest. This would also answer why the subsistence income in these Provinces has strongly been trending upwards over the last years.

Let us now turn to the next factor in Equation (5): The median employment income of families with children.

3.3. Median Employment Income of Families with Children

The employment income is perhaps the most important factor in determining saving-consumption allocations for a typical household. The choice of taking the median for this factor is purely a statistical one. In fact, the median is statistically considered an "outlier free" metric and it is not "polluted" by incredibly high or low income values.

The pure definition of employment income consists of amounts of money an individual receives as salary, wage, commission, bonus, tip, gratuity and honoraria. It is definitely a crucial measure of wealth for a typical family household: The higher the employment income, the greater one's ability to purchase or save money in the long-term.

Once again, since we are positioning ourselves from a "cost perspective", the way this factor impacts Equation (5) is "negative": An increase of the employment income decreases the financial burden for a typical household. Therefore, higher levels for this factor translate in ideally lower equalization payments from the Federal government to the single Province.

Why did I consider only the subset of families with children instead of taking the whole employed income for each category of workers? Once again, common sense is the best answer. On paper, these households are financially more exposed than any other category of workers given the additional costs connected to having kids[11].

In order to come up with an estimate for the 2018 median employent income across Canadian Provinces, I collected the latest data from Statistics Canada between 1976 and 2016 (the latter being the latest available information displayed on their website). Since geometric means work better than

[11] Obviously, the reality can be dramatically different. Indeed, there surely are cases where even households without children have very difficult financial situations. On the other hand, elderly people can also suffer from tremendous financial stress. I decided to keep things simple and consider only the typical family with children as a proxy for this factor. Future versions of this paper can incorporate additional types of household in the model.

arithmetic ones in a multi-period setting, I calculated such geometric mean per each Province within the abovementioned time span. To this end, I obtained an estimate for the year 2017 by multiplying 2016's employment income figures by the geometric return between 1976 and 2016 generated in each Province. Finally, I repeated the same procedure for the year 2018 once the estimate for 2017 was ready.

The results can be displayed in Figure 4:

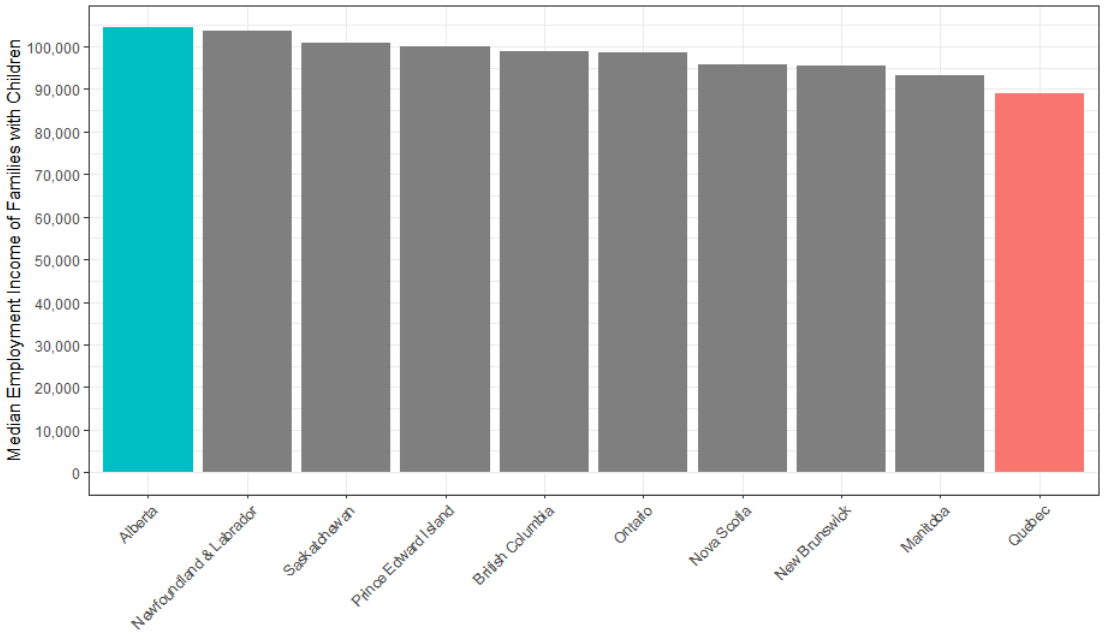

Figure 4: Median employment income across Canadian Provinces. 2018 estimates per Province. The turquoise left most bar depicts the Province with the highest employment income (Alberta) whereas the red rightmost bar captures the Province with the lowest employment income (Quebec). Figures in $CAD. Source: Statistics Canada. Table 11-10-0191-01 Income statistics by economic family type and income source.

The reader can easly see that the distribution of median employment income of families with children in Canada is "fairly" even across the 10 Provinces. Alberta is the leader in this factor with approximately C$104,000 of household income earned in a single year. The Provinces of Newfoundland & Labrador and Saskatchewan complete the podium at about C$103,000 and C$100,000 of employment income, respectively. On the flip side, Quebec is the Province with the lowest level of employment income: The typical family household with children in this Province makes about C$89,000 a year. Nevertheless, as one can see from Figure 4, the variability of this factor does not seem particularly high. In fact, the difference between the median employment income of families with children in Alberta (the max) and Quebec (the min) is only about C$15,400. The standard deviation of this sample is about C$4,700.

Therefore, if the above statistics capture the true underlying representation of the main source of employment income for the typical Canadian household, why do we see a massive skewness in the amount of equalization payments across Provinces? According to the current equalization payment system a Province's fiscal capacity is the main driver in determining the amount of equalization transfers. As one can obseve from Figure 4, C$15,400 is what separates the "wealthiest" Province from the "poorest" one. Yet, the former receives no equalization payments whereas the latter gets about C$11.7 billions.

3.4. Car Ownership Costs

This subsection turns the attention to what I called "Car Ownership Costs" which represent the forth factor in Equation (5). Personally, I strongly believe that owning a car plays a crucial role in everyday life and as such it should be incorporated into the family's medium term spending plan.

To put things into perspective let me give you few valid points why owing a vehicle is important:

1. It allows individuals to be independent. A person will not have to be dependent on his/her family or friends or use public transportation to move from point A to point B;
2. It saves time. A person does not have to remember the bus passing time, the number of needed stops to get to the desired destination or whether there will be seats available on the public transportation;
3. It allows traveling with a large group of people, especially with family members. Additionally, this can even lower the transportation costs on renting vehicles or using public transportation;
4. It provides for a safer transportation method than public transportation. Cars come equipped with numerous safety features such as airbags, tire pressure, safety belts, brake assist just to name a few.

Ultimately, purchasing a car is one of the largest investments a family household will ever make, second only to the purchase of the family's home. Therefore, it definitely is a primordial factor in calculating the cost of living for the average family.

Since the universe of car models available to the public is objectively endless, I decided to make a single assumption on this factor: The most sold passenger car in Canada for 2018 is incorporated in the model. Such car model is based on the following article: "The best offers on Canada's most popular cars". Differences in purchasing price per Province are provided in the Table below:

Province	Base Purchasing Price (ex. taxes)	Source (URL)
Alberta	C$ 26,108	Dealership 01
British Columbia	C$ 25,885	Dealership 02
Manitoba	C$ 27,021	Dealership 03
New Brunswick	C$ 25,845	Dealership 04
Newfoundland & Labrador	C$ 26,761	Dealership 05
Nova Scotia	C$ 24,090	Dealership 06
Ontario	C$ 24,090	Dealership 07
Prince Edward Island	C$ 25,845	Dealership 08
Quebec	C$ 25,845	Dealership 09
Saskachewan	C$ 27,034	Dealership 10
Average Passenger Car Price	C$ 25,852	

Table 3: Distribution of the most sold passenger car in Canada for 2018 as of October 14, 2018. Prices may vary between the date this document has been written and the time the reader clicks the URL links displayed above. The average purchasing price in the country is reported at the bottom of the table.

As it is the case for factor 3 in the preceding subsection, also Car Ownership Costs seem to be fairly distributed across Canadian Provinces. As a matter of fact, the difference between the maximum and the minimum price of the most sold passenger car in Canada as of 2018 is "only" C$2,944. Additionally, based on the data I managed to retrieve from the Web, the most convenient Provinces to buy a passenger car appear to be Ontario and Nova Scotia where one can buy a brand new base model car for C$24,090. On the flip side, the Provinces of Saskachewan and Manitoba lie on the opposite side of the distribution: About C$27,000 is the base price to buy a brand new base model passenger car there. As far as all the remaining Provinces are concerned, an individual will see his/her pocket getting "lighter" on average at approximately C$25,000 in exchange of a brand new base model passenger car.

Therefore, in light of the above findings, Car Ownership Costs do not appear to be a significant

contributor to the differences in the cost of living between Canadian Provinces given their substantial uniform price distribution.

Let us now move to the next factor in Equation (5): The monthly recommended minimm amount of money of food per person.

3.5. Monthly recommended minimum amount of money of food per person

The fifth factor in Equation (5) is captured by the monthly recommended minimum amount of money of food per person - or simply - the "grocery bag" costs. Food costs are among the most important indicators for lifestyle and well being: The lower these costs, the greater the purchasing power of different goods for a typical household.

Let us elaborate a bit more the last point. Food prices pose a material barrier for low-income families who must balance their dietary needs with affordability. Indeed, it is of no surprise that when family members lose their jobs, their income inevitabily drops which in turn lowers the household income and food choices quickly shift towards cheaper alternatives.

Obviously, when the household income is already high, the marginal effect of changing dietary habits is pretty much non-existent. Conversely, a small increase in the price of food can have a series of severe repercussions on low-income families. This is why the amount of money we spend on each and every family member is so relevant as well as important to track.

The goal of Figure 5 is to depict what an average family should spend on each member belonging to its unit on a monthly basis broken down by individual Province:

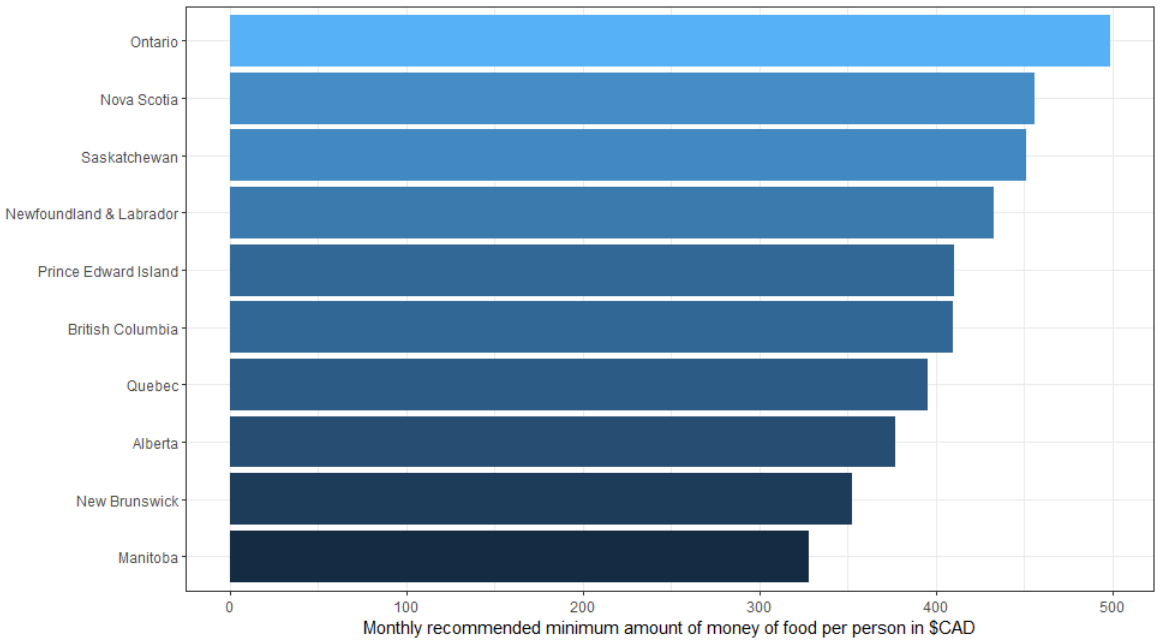

Figure 5: Monthly recommended minimum amount of money of food per person. Higher food costs Provinces have been placed at the top of the plot. Figures in $CAD. Data as of October 2018. Source: Numbeo

In Figure 5, I decided to apply a fading color code to each Province: Lighter blue for "more expensive" food cost Provinces and darker blue for "less expensive" ones. Each "grocery bag" has been collected in such a way that the composition of the goods included in the final bill is the same. For a comprehensive list of the goods included in the calculations above please refer to the Source URL as indicated in the caption of Figure 5 and select a popular Canadian metropolitan area in the search bar.

The results that Figure 5 returns feel a bit mixed and in counter-trend with respect to previous sections. The most expensive Province to buy food for a family member is Ontario (C$498.60) folowed

by Nova Scotia (C$455.93) and Saskatchewan (C$451.51). The Province of Alberta demands a grocery cost of C$377.09 a month for a single family member whereas New Brunswick stands at about C$352.27/person on a monthly basis. In Winnipeg, Manitoba, a family member is properly "fed" at C$328.31 monthly. Somewhere in the middle of the distribution, the Provinces of Newfoundland & Labrador, Prince Edward Island, British Columbia and Quebec require a monthly cash-outflow of C$433.14, C$410.27, C$409.96 and C$395.13 in food costs per person, respectively.

The "country-wide" average monthly minimum amount of money of food per person is C$411.23 (not illustrated in Figure 5 but calculated separately). Instead, the difference between the most expensive Province (Ontario) and the least expensive one (Manitoba) is equal to C$170.29. If compounded for the whole year, the above range represents approximately C$2,040 that families in the Province of Ontario spend more on a single unit member than their peers in Manitoba.

3.6. Gasoline costs

Gasoline costs per Province is the last factor outlined in Equation (5). I strongly believe it represents a "pure" indicator of the cost of living in each Province because used by millions of families across the country to fuel their cars. Additionally, gasoline can provide electricity and is also used for cooking, heating houses and building and heating water.

However, there are different types of gasoline but in this article I focus my attention on regular unleaded gasoline at self service filling stations.

To give the reader the highest degree of information as possible, I consolidated the time-series of the monthly average retail prices for gasoline in the Table below:

t	NL	PEI	NS	NB	QC	ON	MB	SK	AB	BC	$\overline{\mu}$
Jan '18	120.30	115.30	115.20	114.10	127.60	124.50	107.00	107.40	107.50	141.70	118.06
Feb '18	121.80	115.50	114.10	113.90	127.50	123.60	104.20	103.50	104.00	144.50	117.26
Mar '18	122.10	116.90	114.00	113.90	130.00	126.10	106.90	109.40	111.30	151.40	120.20
Apr '18	131.00	123.50	124.20	122.90	137.90	133.70	121.10	117.60	122.50	155.10	128.95
May '18	137.10	131.30	130.40	128.90	142.70	137.30	125.10	123.10	127.50	159.90	134.33
Jun '18	134.30	130.00	125.50	125.70	139.70	134.60	125.30	122.40	124.40	154.30	131.62
Jul '18	134.90	128.90	126.20	126.90	137.60	135.60	123.40	125.80	131.00	155.70	132.60
Aug '18	132.50	126.90	124.00	126.50	138.30	133.60	118.00	122.90	126.20	150.30	129.92
Sep '18	131.20	126.50	123.50	127.00	140.00	129.30	116.60	121.80	126.60	151.90	129.44
YTD μ	129.47	123.87	121.90	122.20	135.70	130.92	116.40	117.10	120.11	151.64	

Table 4: Distribution of monthly average regular unleaded gasoline at self service filling station across Canadian Provinces between January 2018 and September 2018 (the latter corresponding to the latest data available at the time this article has been written). All figures in $CAD per litre of gasoline. "YTD μ" stands for Year-To-Date average of gasoline price per Province. "$\overline{\mu}$ " corresponds to the monthly cross-sectional average of gasoline price across the whole country. Source: Statistics Canada Table 18-10-0001-01 Monthly average retail prices for gasoline.

The Table above depicts an increasing trend in the average monthly gasoline cost across Canada since the beginning of 2018. However, the data does not reflect the month of October and November which enjoy a significant decline in gasoline prices per litre (exact information was not available at the time the article has been written from the Statistics Canada website). At first glance, Table 4 shows that British Columbia is the most expensive Province to fuel your own car with its monthly average gasolie price of C$151.64/litre. This statistics represent a difference of about 30% than the cheapest Province in the

sample and captured by the Province of Manitoba (C$116.40/litre on average). There is therefore a range of C$0.352/litre (on average) across the country. In general, it appears that - on average - Canadian "Prairies" (Manitoba, Saskatchewan, Alberta) enjoy better gas costs than the remaining Provinces. The second most expensive Province for cost of gas is Quebec (C$135.70/litre) whereas the Province of Ontario sits on the third place with C$130.92/litre, on average throughout 2018.

Ultimately, to give the reader a better visual representation of the distribution of gasoline prices across Canadian Provinces, I created in Figure 6 a heat map chart as reported below:

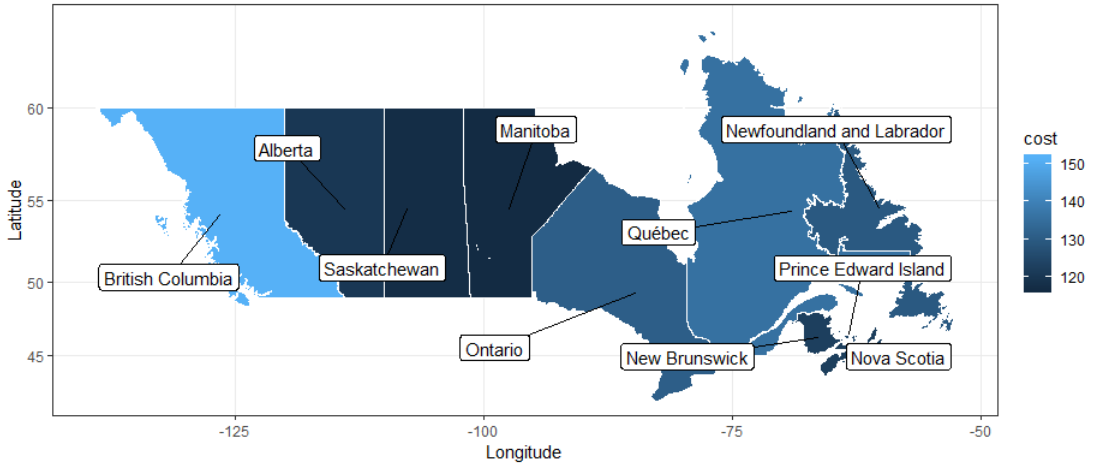

Figure 6: Heat map of Canadian Provinces by average monthly gasoline costs between Jan'18 and Sep'18. Costs are expressed in $CAD per litre of gasoline. Source: Own calulations based upon Statistic Canada Table 18-10-0001-01 Monthy average retail prices for gaoline and fuel oil, by geography

The next subsection consolidates the above findings and provides the final insights on the proposed equalization model outlined in the introductory part of Section 3.

3.7. Cost of Living and Equalization Payments: Results

Let us dive right into the results of a newly proposed equalization payment system based upon the cost of living in each Canadian Province. The preceeding subsections present real numbers and evidence about actual cost of living in Canada. In turn, the cost of living is captured by six different factors listed in Equation (5) above. Additionally, in order to provide more insights as to how the distribution of equalization payments can impact different Provinces, four different scenarios will be given below. To this end, these scenarios consider the use of the average and of the median as measures of central tendency as well as the inclusion and exclusion of the *Housing Price* factor regarded as the key item in skewing the final results.

Without further ado, let me provide the reader with a cost of living summary by Province as follows[12]:

[12]Statistics are properly reported by taking into consideration the adjustment factors for Housing Price, Income and Car Ownership Costs as mentioned in Equation (5).

Province	*HP*	*MW*	*Y*	*CO*	*P*	*U*	Λ_i
Alberta	387.00	15.00	104.46	261.08	377.09	120.11	1,025.82
British Columbia	730.00	12.65	98.95	258.85	409.96	151.64	1,438.85
Manitoba	296.00	11.35	93.16	270.21	328.31	116.40	906.41
New Brunswick	178.00	11.25	95.57	258.45	352.27	122.20	804.10
Newfoundland & Labrador	246.00	11.15	103.80	267.61	433.14	129.47	961.27
Nova Scotia	249.00	11.00	95.77	240.90	455.93	121.90	960.96
Ontario	578.00	14.00	98.67	240.90	498.60	130.92	1,335.75
Prince Edward Island	230.00	11.55	99.96	258.45	410.27	123.87	911.08
Quebec	297.00	11.75	89.07	258.45	395.23	135.70	985.56
Saskatchewan	288.00	11.06	100.99	270.34	451.51	117.10	1,014.90

Table 5: Cost of living measure associated to each Canadian Province as a function of Equation (5). All figures are expressed in $CAD. The above statistics represent the basis for determining whether a Province will fall under the "receiving" category or not. Source: Own calculations.

The final results connected to the cost of living measure, Λ_i, and related to each Canadian Province above capture the essence of the newly suggested equalization payments system. This is primordial in establishing an objective and pragmatic approach as to how the equalization payments will be distributed across Provinces. It is also a more comprehensive approach than the mere concept of fiscal capacity and population demographics linked to the current equalization payment system. Indeed, an equalization system which considers the actual and real cost of living makes the overall total payments ***fair*** because based on concrete, measurable and robust factors.

From Table 5, we can infer the following:

1. British Columbia is the Province with the highest cost of living based on the factors outlined in Equation (5) and captured by Λ_i;
2. On the other end of the distribution, New Brunswick is the Province with the lowest cost of living, once again, based on the six listed factors in Equation (5) and captured by Λ_i;
3. The *HP* (*Housing Price*) factor is the variable which has the greatest impact on the final value for Λ_i associated to each Province. The magnitude of this factor in the final skewness gets particularly intense in the Provinces of British Columbia, Ontario and Alberta;
4. Gasoline prices per litre (factor U) are also significantly skewed and not uniform across the country. Provinces which suffer the most in terms of expensiveness of gasoline are: British Columbia, Quebec, Ontario and Newfoundland & Labrador;
5. Surprisingly, the median employment income of families with children is not massively skewed towards specific Provinces. Instead, it is substantially uniform across the board;
6. The average measure of cost of living across Canada captured by Λ_C^* is equal to C$1,034.47. Instead, its median is equal to C$973.42. These two measures of central tendency will be a critical factor in segregating those Provinces eligible for an equalization payment to those instead that do not qualify for any transfer;
7. As a consequence of point 6, when the average measure of Canadian cost of living is taken, only two Provinces qualify for equalization transfers from the Federal government, namely British Columbia and Ontario. In turn, this outcome is due to point 3 above, i.e. the situation of "bubble" housing prices these two Provinces live in. Matter of fact, this is exactly the reason why the median value of Λ_C^* is also calculated: It filters out abnormal values by considering a real measure of central tendency. In this scenario, five Provinces become eligible to obtain an equalization payment from the government.

The above-listed points provide insteresting revelations into the true cost of living associated to each Province. However, since economics is not an exact science, I decided to go one step farther and imagine what the final allocation of equalization transfers looks like when the *HP* factor is taken out from Equation (5). In doing so, the ultimate scenarios get broken down into four cases: Two cases that consider all factors combined (average and meadian) and two cases that consider all factors except the Housing Prices (average and median).

Final transfer allocations will be provided in the following paragraph but before diving into that, I am going to report the Table that highlights whether a Province is eligible for equalization payments or not according to the above-mentioned scenarios:

Province	*All Factors Included*				*Ex HP Factor*			
	$\overline{\Lambda_C^*}$: 1,034.47		$\tilde{\Lambda}_C^*$: 973.42		$\overline{\Lambda_C^*}$: 686.57		$\tilde{\Lambda}_C^*$: 698.71	
	Λ_i	*Is Eligible?*	Λ_i	*Is Eligible?*	Λ_i	*Is Eligible?*	Λ_i	*Is Eligible?*
AB	1,025.82	NO	1,025.82	YES	638.82	NO	638.82	NO
BC	1,438.85	YES	1,438.85	YES	708.85	YES	708.85	YES
MA	906.41	NO	906.41	NO	610.41	NO	610.41	NO
NB	804.10	NO	804.10	NO	626.10	NO	626.10	NO
NL	961.27	NO	961.27	NO	715.27	YES	715.27	YES
NS	960.96	NO	960.96	NO	711.96	YES	711.96	YES
ON	1,335.75	YES	1,335.75	YES	757.75	YES	757.75	YES
PEI	911.08	NO	911.08	NO	681.08	NO	681.08	NO
QC	985.56	NO	985.56	YES	688.56	YES	688.56	NO
SK	1,014.90	NO	1,014.90	YES	726.90	YES	726.90	YES

Table 6: Breakdown of equalization payments eligibility status by each Province. The left part of the Table lists which Province is entitled to obtain an equalization payment according to the average or the median of the benchmark Λ_C^*. The right part of the Table instead, considers all the cost of living factors outlined in Equation (5) except the Housing Prices. As the reader can see, the cost of living in each Province significantly drops after filtering out the results by the *HP* factor. Source: Own calculations.

In light of Table 6 above, one can draw few conclusions:

1. Based on the average of the "*pure-factor*" approach, only two Provinces are entitled to obtain equalization payments from the government given their above-the-average cost of living compared to the rest of the country (Ontario and British Columbia);
2. If the median of the benchmark Λ_C^* is taken, five out of ten Provinces become eligible for transfers. Once again, the median excludes outliers in its calculation thus providing a more objective assessment of the outcome. These five Provinces are Alberta, British Columbia, Ontario, Quebec and Saskatchewan;
3. Once the Housing Price factor is excluded from the calculation of the cost of living across Canadian Provinces, both the average and the median Λ_C^* drops significantly (approximately 33%). Under the assumption that the average of the benchmark Λ_C^* is cosidered a fair measure of segregation between "receiving" and "non-receiving" Provinces, six out of ten Provinces would receive equalization payments. These are: British Columbia, Newfoundland & Labrador, Nova Scotia, Ontario, Quebec and Saskatchewan. Conversely, if the median of Λ_C^* is a representation of the true economic underlying of the Canadian cost of living then five out of ten Provinces would be in a position to obtain equalization transfers. These are: British Columbia, Newfoundland & Labrador, Nova

Scotia, Ontario and Saskatchewan;

4. Ultimately, one thing is to be noted. The "*leitmotiv*" of these results is that whatever scenario we will find ourselves in, Ontario and British Columbia will always receive an equalization payment from the Federal government given their higher-than-average cost of living. Conversely, the Provinces of Nova Scotia, Prince Edward Island, New Brunswick and Manitoba will not receive any transfers regardless of the scenario we decide to consider.

Since the allocation of equalization transfers is what ultimately matters, I retrieved the Labour Force[13] figures from Statistics Canada so that I could assign a total equalization payment to each "receiving" Province. Once again, the portion of the population belonging to the Labor Force is assumed to be the one with the greatest need of additional income from the government. In retrieving the Labor Force statistics, I consider the following criteria: Both sexes are included, the age group is between 15 and 64 years of age, data is seasonally adjusted and belongs to the latest available figure reported on the Statistics Canada website[14].

The total final equalization payments generated by the cost of living model and broken down by respective scenario are reported below:

Province	*All Factors, Average*	*All Factors, Median*	*Ex. HP, Average*	*Ex. HP, Median*
AB	0.00	2.47	0.00	0.00
BC	3.59	3.59	1.78	1.78
MA	0.00	0.00	0.00	0.00
NB	0.00	0.00	0.00	0.00
NL	0.00	0.00	0.18	0.18
NS	0.00	0.00	0.34	0.34
ON	9.86	9.86	5.61	5.61
PEI	0.00	0.00	0.00	0.00
QC	0.00	4.28	2.98	0.00
SK	0.00	0.59	0.42	0.42
Total Payments	13.45	20.79	11.31	8.33

Table 7: Total equalization payments as a function of Equation (7) expressed in **Billions** of Canadian dollars broken down by single Province. Each column represent a different scenario. Source: Own calculations.

Table 7 above highlights the final results connected to Equation (7), i.e. the total equalization payments as a function of several cost of living factors within each Province. Let us now wrap up the above numbers in few key findings and observations:

1. As pointed out above, the "baseline" model ("All Factors, Average") is rather skewed towards only two Provinces and would require a cash transfer from the Federal government of approximately C$13.45 billions. This sum of money would be split between Ontario (approximately 75%) and British Columbia (about 25%). Since the idea behind this article is to provide a fairer way of allocating resources across different Canadian Provinces, it does not seem to work well in an environment of heavily skewed factors as outlined in the previous paragraphs;
2. The second scenario ("All Factors, Median") appears to be the best suited to account for all the

[13] The workforce or Labor Force is the sum of employed and unemployed persons. The latter, are also considered part of the Labor Force if and only if they are readily available, willing to work and are actively looking for a job.

[14] As of today, the lastest data available for the Labor Force from the Statistics Canada website is October 2018.

relevant factors. It is also able to capture a real cost of living cost as well as to allocate equalization transfers to five out of ten Provinces throughout Canada. It also behaves similarly to the actual equalization payments system with the only caveat that the total government disbursement would be equal to C$20.79 billions instead of the current C$18.95 billions - an increase of about +9.70%. The real difference from the actual equalization payments system is instead given by which Province is going to receive a transfer: Alberta, British Columbia and Saskatchewan would now be able to receive additional funds as part of the equalization program. These funds would correspond to approximately 2.47, 3.59 and 0.59 billions of Canadian dollars per Province, respectively. Additionally, Ontario would see its equalization transfer surge to C$4.58 billions from the current C$0.93 billions - an astonishingly jump of about +392%. The Province of Quebec would also see its equalization transfer executed at around C$4.28 billions - a significant reduction from the actual C$11.7 billions currently allocated to this Province for the period 2018-2019 (a decrease of about -63%);

3. Excluding the "*polluting*" effect of the Housing Prices in each Canadian Province, the third scenario reveals that the total equalization payments that the Federal goverment should distribute stand at around C$11.3 billions. This scenario is calculated by taking into account the average value of Λ_C^* as the determinant for the segregation of transfers. This is a remarkable reduction from the preceeding scenario and it is even more astonishing that the total equalization payments would still be lower than the actual cash transfer to the Province of Quebec. In addition, this scenario is the most diversified one with six out of ten Provinces entitled to receive some transfers from the government therefore qualifying for the fairest type of equalizations allocation among the four listed here. From a monetary perspective, Ontario would still be the greatest receiver of money (C$5.61 billions) followed by Quebec (C$2.98 billions) and British Columbia (C$1.78 billions). Completing the board are the Provinces of Saskatchewan, Nova Scotia and Newfoundland & Labrador with approximately C$0.42, C$0.34 and C$0.18 billions, respectively;

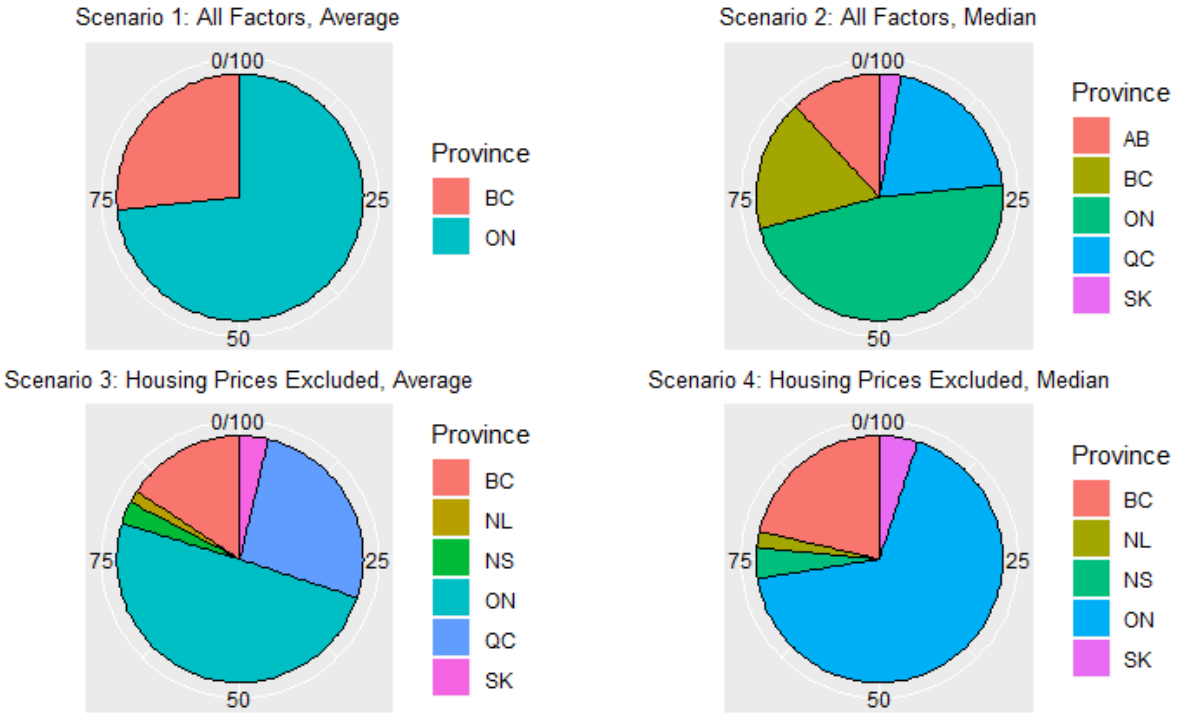

Figure 7: Final breakdown of an equalization payments system based upong the cost of living within each Canadian Province split by respective scenario. Only receiving Provinces are depicted. Source: Own calculations.

4. The fourh and last type of scenario returns the lowest level of total equalization transfers from the Federal governement to eligible Canadian Provinces - about C$8.33 billions. Once again, it is based on the median as a meausre of central tendency for the calculation of Λ_C^*. This scenario substantially removes the Province of Quebec from the overall equalization transfers because considered an "outlier" in the distribution of cost of living captured by Λ_i. The similarity of results for the third and fourth scenario is not a coincidence since the biggest outlier - *HP* factor - has been removed from the sample. This also makes the overall results more robust and proves that the Housing Prices in certain Provinces is really what separates receiving from non-receiving Provinces according to the cost of living model for equalization payments.

Let us now conclude the above-mentioned results in the next and final Section.

4. Conclusions

In this article I addressed the fariness of the current Canadian equalization payments system and provided an alternative to the current status-quo. An alternative model based on a more pragmatic approach connected to the concept of *cost of living* has been presented. History proved us that the actual equalization transfers are outdated and that always the same Provinces are eligible to obtain a payment from the Federal goverment. Although the reason why certain Provinces receive an equalization payment is given by their below-the-average per-capita fiscal capacity, I pointed out a compelling statement to prove otherwise: If the per-capita equalization transfer is what ultimately matters, why can't we look at more persuasive measures than the mere concept of a Province's fiscal capacity? The answer to this question led to the formalization of an equalization payments summarized by Equations (5), (6) and (7).

To this end, I found out that according to the cost of living model the most expensive Provinces to live in are Ontario and British Columbia. Unfortunately, these two Provinces see their cost of living skyrocket because of the "*bubble*" situation their housing market is experiencing over the last few years. Precisely because of this fact, I decided to use the median in the model as a second measure able to segregate receiving from non-receiving Provinces. The outcome was rather satisfactory: Half of the Provinces would receive an equalization payment, former non-receiving Provinces would now become eligible and the rationale behind distributing these resources would finally be fair and not based on a Province's per-capita fiscal capacity anymore. The only drawback of this scenario is that the overall sum of equalization transfers from the Federal government to receiving Provinces would now total C$20.79 billions which is C$1.84 billions above the current equalization budget for the period 2018-2019. Nevertheless, the advantages seem to outclass the disadvantages.

Ultimately, I ran a scenario analysis by excluding the Housing Price factor from the model and repeat the asset allocation again. The results proved that *HP* is indeed the factor with the greatest influence in the overall skewness of the cost of living calculations. This is demonstrated by the substantial stability of the final allocations. Final equalization transfers from the Federal government are also significantly lower than the preceeding scenarios. However, Housing Price is a factor which must be regarded as fundamental in determining the cost of living for the average household. For this reason, I do not fully consider its removal from the model as something wise or safe to do.

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