"A Bird in the hand *may be* worth two in the bush"

Canada's Equalization System and the Natural Resource Dilemma: A Review and Reform Proposal

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Major Paper Presented to the

Department of Economics of the University of Ottawa

In partial fulfillment of the requirements of the M.A Degree

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Ottawa, Ontario

Date: August 9th 2013

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Acknowledgement

The research conducted in this paper has been supported through data received from Finance Canada. The author wishes to thank her research supervisor Professor Leslie Shiell of the University of Ottawa and Arndt Vermaeten, Chief of Transfer Research at Finance Canada for their guidance and helpful observations. I am also grateful to Jean-François Tremblay, the author's second reader, for several observations he made regarding the analysis, which led to a more nuanced assessment. The views expressed in this paper are those of the author and do not represent those of Finance Canada or any other Government of Canada agency. All remaining errors in this paper are the author's own.

Introduction

As we celebrate Canada's 146th birthday, it is hard not to think about two major characteristics that have moulded and influenced her creation: the abundance of natural resources and the distinct federal nature of her construction. Recently, however, the relationship between these features has led to tensions in this country. On the one hand, like other federal states, Canada provides significant financial support to its provinces with the objective of addressing fiscal disparities between them. These transfers, known as fiscal Equalization payments, stem from a basic commitment to ensuring equity and efficiency across Canada. The transfers enable "have-not" provinces to boost their fiscal capacities and provide "comparable levels of public services at comparable levels of taxation" (Department of Finance Canada, 2011). On the other hand, the distribution of natural resources, with fossil fuels concentrated heavily in the Western provinces, is a source of considerable disparity between the provinces. Notably, the treatment of natural resource revenues in the Equalization program may even exacerbate these inequalities, given the federal government's restricted access to this revenue source. The demand for natural resources and the supposed inexhaustibility of these resources coupled with electoral considerations have only fanned the flames by enticing governments in power – both provincial and federal – to spend excessively now rather than save for later (Drohan, 2012, p.15).

As noted by Busby (2008), a comprehensive fiscal framework should attempt to maximize the benefits from developing natural resources, especially non-renewable ones, while also maintaining the ability to distinguish between income produced by renewable resources and the extraction of wealth from non-renewable sources. With this principle in mind, countries such as Norway, Kuwait, and Saudi Arabia have constructed consolidated savings funds – better known as Sovereign Wealth Funds (SWFs) – to aid in the management of and address the challenges

stemming from large influxes of resource revenue. Unfortunately, no such strategy is in place in the Canadian federation. What follows is an examination of a potential blueprint that can reconcile the competing dynamics.

The objective of this paper is to analyze the suitability of the prevailing Equalization system in the context of interprovincial disparities, volatile world energy prices, economic insecurity, and future carbon supply uncertainty. I argue that the current program does not achieve its objectives with regard to efficiency or horizontal equity, and consequently, requires specific reforms designed to address the management of natural resource revenues. By providing provincial governments with an incentive, through the Equalization program, to save non-renewable natural resource revenues in Sovereign Wealth Funds, specific federal reforms can mitigate challenges introduced by the "resource curse[1]." This study will build on models presented in existing literature and examine the partial equilibrium effects of changes to specific parameters governing fiscal capacity calculations – specifically the natural resource base. The author provides justification for a proposed reform which, if successful in incentivizing all provinces to invest the entirety of their non-renewable resource revenues in SWFs, would save the federal government $14.6 billion over the six-year period analyzed. Furthermore, one of the foreseen results of the proposed reform is that the estimated overall natural resource fiscal capacity of provinces will be significantly reduced compared to that which prevails under the current Equalization program, and as expected, the model predicts less volatility in the natural resource revenue base.

This study comprises both a theoretical examination of the current program and the simulated empirical application of a reform. The paper begins with a brief examination of the

[1] The "resource curse" is commonly defined as the paradox that countries rich with non-renewable natural resources like oil and gas tend to experience slower economic growth compared to countries with smaller resource sectors. It has been hypothesized that declines in other sectors resulting from appreciation of the real exchange rate and volatile resource prices are the main causes of the inverse relationship between reliance on natural resources and economic growth (Neumayer, 2004).

current Equalization program. The second section provides a detailed look at the treatment of natural resource revenues by the current program and within Canada, while the third explores the inefficiencies that have arisen and the rationale for the suggested reform. The subsequent section provides an outline of the reform put forth in this study. The fifth section explores Sovereign Wealth Funds and examines the two examples of Norway's and Alberta's funds. The empirical section of the paper provides information regarding data sources and the methodology employed. The final three sections provide the results from the model while also providing a discussion and analysis of these results and concluding remarks.

Canada's Equalization Program

Canada's Equalization program officially began in 1957 under the St. Laurent administration with only three tax bases being equalized: personal income tax, corporate income tax and succession duties (Davenport, 1982, p.117). This unconditional transfer program was designed to help poorer provinces pay for their public services without having to impose relative tax levels higher than those of other provinces (Mintz and Poschmann, 2004). The purpose of the program was entrenched in the Canadian Constitution in 1982 and has evolved through a series of incremental adjustments.

The federal government utilizes the Representative Tax System (RTS)[2], an approach involving four simple steps to calculating the Equalization payments to provinces. Firstly, a given province's per-capita fiscal capacity is determined by modelling how much revenue the province would raise if all the tax rates it imposed (i.e., the business income tax rate; the consumption income tax rate; the property tax rate; the personal income tax rate; and natural resource revenues) corresponded to their respective national average rates. The formula then calculates each province's

[2] The RTS is a representation of current fiscal practices of all ten provinces. The system decides how much revenue a province could collect if it levied national average tax rates on all revenue sources, with the notable exception of natural resource revenue base (Expert Panel on Equalization and Territorial Formula Financing, 2006, p. 89).

total fiscal capacity as the sum of its ability to raise revenues across the five tax bases (Expert Panel on Equalization and Territorial Formula Financing, 2006). Secondly, the total fiscal capacity of each province is evaluated against a benchmark Equalization "standard." If a province exhibits a below-average per-capita fiscal capacity (compared to the national average of all 10 provinces) it is then entitled to an Equalization payment. These payments are equivalent to the difference between the "standard" and the province's total fiscal capacity. Thirdly, to ensure equity across all provinces, the receiving or "have-not" provinces with above-average natural resource revenues must be subject to a "fiscal capacity cap[3]." Finally, equalization payments will be decreased or raised with the use of a ceiling or floor[4]. Table 1, presented below, provides information on Equalization entitlements of provinces for the past twelve years. In addition, Figure 1 illustrates the evolution of Equalization payments, as a percentage of Total Equalization payments.

Table 1: Provincial Equalization Payments: 2000–01 to 2012–13

Year	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	Total
2000-01	1,112	269	1,404	1,260	5,380	-	1,314	208	-	-	10,948
2001-02	1,055	256	1,315	1,202	4,679	-	1,362	200	-	240	10,310
2002-03	875	235	1,122	1,143	4,004	-	1,303	106	-	71	8,859
2003-04	766	232	1,130	1,142	3,764	-	1,336	-	-	320	8,690
2004-05	762	277	1,313	1,326	4,155	-	1,607	652	-	682	10,774
2005-06	861	277	1,344	1,348	4,798	-	1,601	82	-	590	10,900
2006-07	632	291	1,386	1,451	5,539	-	1,709	13	-	260	11,282
2007-08	477	294	1,465	1,477	7,160	-	1,826	226	-	-	12,925
2008-09	-	322	1,465	1,584	8,028	-	2,063	-	-	-	13,462
2009-10	-	340	1,391	1,689	8,355	347	2,063	-	-	-	14,185
2010-11	-	330	1,110	1,581	8,552	972	1,826	-	-	-	14,372
2011-12	-	329	1,167	1,483	7,815	2,200	1,666	-	-	-	14,659
2012-13	-	337	1,268	1,495	7,391	3,261	1,671	-	-	-	15,423

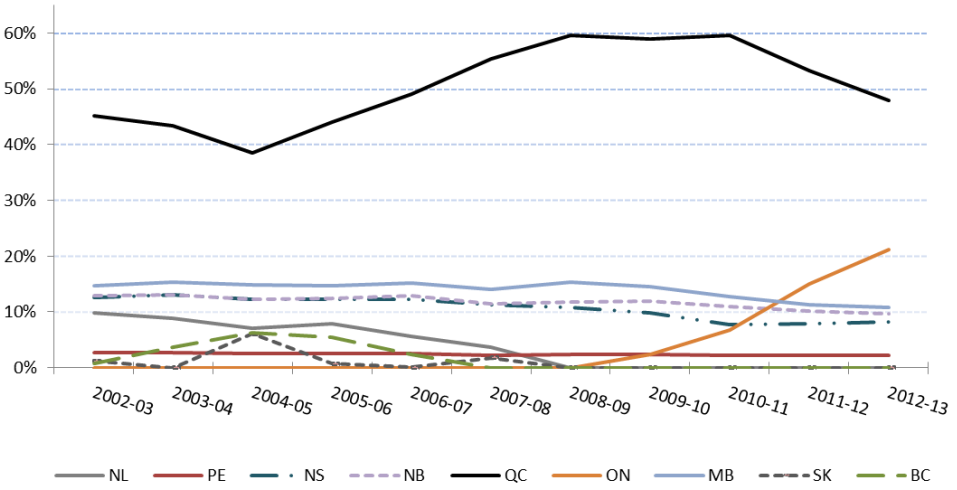
Note: Figures do not include Offshore Accord Offsets. Alberta did not receive any equalization payments during this period. In $ millions
Source: Department of Finance

[3] Partial exclusion of resource revenues sometimes results in a resource-rich receiving province obtaining a post-Equalization fiscal capacity that significantly surpasses a resource-poor receiving province's fiscal capacity or even a non-receiving province's fiscal capacity. The omission of resource revenues lowers a province's measured capacity and can raise its Equalization entitlement. This creates a situation that is inequitable to residents of other provinces. To prevent this situation, the program includes two "fiscal capacity caps": (1) If receiving provinces consists of more than half of the Canadian population, the cap is equal to the average total fiscal capacity of the receiving provinces including 100 percent of natural resource revenues; (2) the fiscal capacity cap is equivalent to the total capacity of the lowest non-receiving province (Department of Finance, 2010).

[4] The current Equalization formula is presented in appendix A.

However, the Canadian Equalization program is not a gross-basis-system (i.e., self-financing). While provinces below the average receive a transfer from the program, those with above-average fiscal capacities are not required to limit their revenue raising capacity. These provinces also do not directly finance the transfer to "have-not" provinces. Instead, the transfer is financed through general revenues collected by the federal government (Smart, 2005, pp. 12-13).

Figure 1: Provincial Equalization Payments as a Percent of Total Payments 2002–03 to 2012–13



Note: Figures do not include Offshore Accord Offsets. Alberta did not receive any equalization payments during this period.
Source: Department of Finance

Natural Resources

Consideration of natural resource revenues only became part of the Equalization program in 1962. At that time, the benchmark criterion, which was based on the two richest provinces, was changed to a 10–province or national–average standard (Boessenkool, 2001, p.26). Since then, the inclusion rate of resource revenues has been repeatedly modified, with the equalization standard changing along with it. The inclusion rate has fluctuated from 0 percent to 50 percent, subsequently varying through 100 percent, 33.3 percent, 50 percent, 100 percent, and 70 percent before reverting

to 50 percent where it currently remains (Bernard, 2012, p.6). The federal government has previously used a variety of measures including the Representative Tax System with 14 tax bases and actual revenues to include natural resource revenue calculations.

After the revisions from the O'Brien Commission[5] were implemented, there has been a noticeable difference between calculations of fiscal capacity in the four other tax bases (the business income tax base; the consumption income tax base; the property tax base; and the personal income tax base) and the resource revenue base. While the fiscal capacity of a province for the other tax bases is assessed by how much the province would collect if it applied the Representative Tax System, resource revenues are evaluated on the basis of 50 percent of the actual revenues collected by each province. It is interesting to note that although the program uses actual revenues from the resource base, the federal government indicates that the reason behind utilizing the RTS fiscal capacity measure is to avoid having the Equalization program reward provinces for choosing to impose lower tax rates (Department of Finance, 2010). Nevertheless, revenues accrued from primary auctions of land grants, royalties charged on these sales, taxes from exploration and development, profit-sharing agreements and dividends from government-owned enterprises are all included in the formula (Bernard, 2012, p.15).

As previously mentioned, the current Equalization program includes a resource cap, where a receiving province's fiscal capacity cannot exceed the lowest non-receiving province's capacity after the transfer. The program also imposes a "growth ceiling" or "floor" such that each receiving province's Equalization payment is reduced or increased proportionately in the event that entitlements collectively exceed or fall below, respectively, the total pool of Equalization funds

[5] The O'Brien Commission, also known as The Expert Panel on Equalization and Territorial Formula Financing, was formed under the guidance of then Canada's Finance Minister Goodale in 2005. The Commission was led by Al O'Brien, retired Deputy Provincial Treasurer of Alberta. Its mission was to conduct an independent review of the Equalization and Territorial Formula Financing system that existed at the time and provide recommendations for reform (Expert Panel on Equalization and Territorial Formula Financing, 2006).

(Vermaetan, 2012). These nuances, and the 50 percent inclusion rate of natural resource revenues, have been adopted to cope with the increases to the cost of the program incurred by the federal government due to volatile resource prices. It is also worthwhile to note that the current program, through the Atlantic Accords[6], allows for the distribution of further benefits to the provinces of Nova Scotia and Newfoundland and Labrador (Department of Finance, 2012). The Atlantic Accords ensure that any revenues received by these provinces from offshore oil and gas would have little or no effect on their Equalization entitlements since they are not included in the calculation of their fiscal capacities – i.e., the natural resource inclusion rate is effectively zero percent (Stevenson, 2006, p.11).

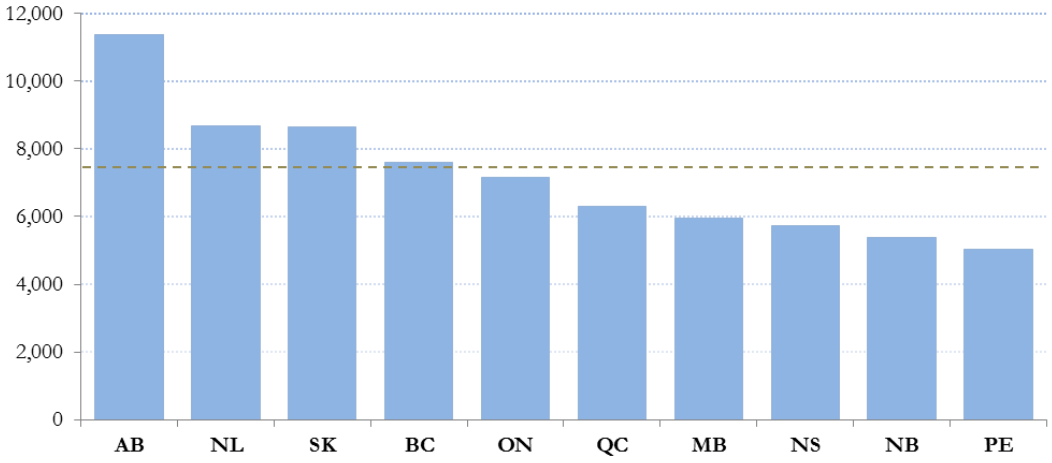
To further inform this discussion, it is beneficial to review two fundamental characteristics of natural resource ownership and distribution in the Canadian context. Firstly, though the principles underlying the Equalization program are clearly set out in Section 36 of the *Constitution Act of 1982*, Sections 92, 109, 117, and 125 of the Constitution also confer the ownership of and other rights associated with natural resources to the provinces (Boadway, 2006). Much of the controversy over the Equalization program stems from the incompatibility between sections 36 and 92 of the Constitution (please refer to Appendix C for sections in the Constitution governing the Equalization program). On the one hand, the federal government must provide Equalization transfers to provinces given the fiscal disparity between them caused by natural resource distribution. While on the other hand, the federal government does not have access to or control over the revenues generated by natural resources to distribute them (Usher, 2007, p.2).

[6] The Atlantic Accord was initially signed between the Federal Government and the Government of Newfoundland and Labrador in 1985, in order to manage offshore oil and gas. The Accord was extended in 2005 to include the Government of Nova Scotia. The Accord allows these provincial governments to receive 100 percent of offshore resource revenues, eliminating the distinction between land-based and offshore resources. Additionally, the Accord provides these provinces with offset payments to mitigate the reduction in Equalization caused by offshore-related fiscal capacity increases (Department of Finance, 2010).

To summarize, according to the O'Brien Commission, the Constitution grants provincial governments the following with respect to natural resources: (1) ownership; (2) the right to development; (3) the right to determine the degree of development; (4) the right to determine the price at which the resulting yield will be sold; and (5) the right to the net benefits generated from these resources (Expert Panel on Equalization and Territorial Formula Financing, 2006, p.107). Accordingly, many scholars argue that complete equalization of resource revenues is analogous to "confiscating property" that under the constitution primarily belong to the provinces (Boadway, 2005, p.11). Furthermore, the federal government's share of natural resource revenues is minute compared to the provinces. Having a small share of the resource pie implies that Equalization (and other transfers) has to be funded almost exclusively from non-resource tax revenues (Davenport, 1982, p.138).

Figure 2: Per-Capita Total Fiscal Capacity in Canada

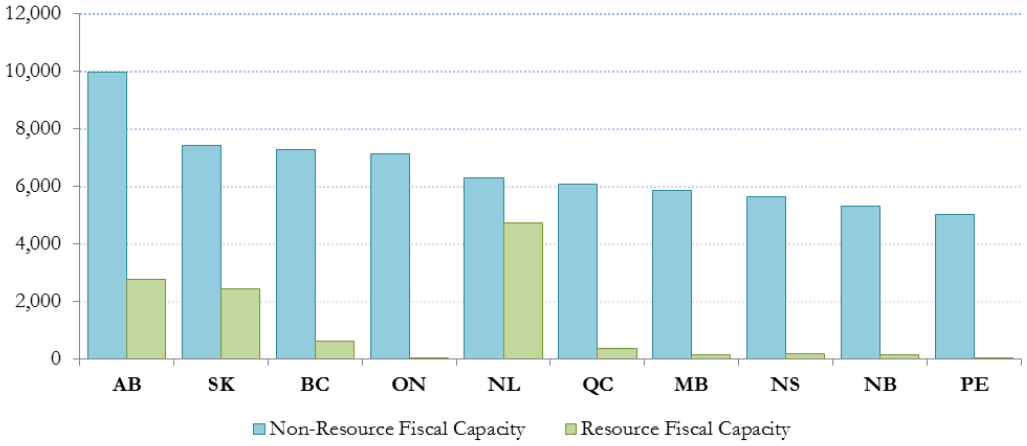
2011–12



Source: Department of Finance
Note: Total fiscal capacity including 50 percent of natural resource revenues.

Figure 3: Per-capita Fiscal Capacity by Resource Type

2011–12



Source: Department of Finance
Note: Total fiscal capacity, including 50 percent of natural resource revenues.

Most importantly, no other major revenue source is dispersed quite as unequally as natural resources – the resource sector is heavily concentrated in Western Canada (with the notable exception of the forestry and hydroelectric industries in Quebec and Offshore oil in Newfoundland and Labrador). Accordingly, it is no surprise that resource-rich provinces have the highest fiscal capacities, as these resources are a significant source of revenue. In 2011–12, Alberta, Newfoundland, and Saskatchewan had the highest per-capita fiscal capacities, while, Nova Scotia, New Brunswick, and Prince Edward Island had the lowest per-capita fiscal capacity in Canada (see Figures 2 and 3 above).

As previously mentioned, one of the most important sources of revenue determining a given province's fiscal capacity is the category of natural resource revenues. For economic calculations, natural resources are usually defined as "anything that nature has provided and has value in the market" (Searle, 2007, p.13). However, for the purposes of fiscal capacity and Equalization, this definition is too broad, and we shall only consider specific "types" of natural resources including oil, gas, minerals, forests, fisheries, and falling or flowing water from which hydroelectricity can be

generated. Natural resources that restock themselves during a period of time that is pertinent to human activity can be classified as renewable resources (Plourde, 2005, p.2). Likewise, revenues attained from these types of resources can be regenerated in each replenishment cycle. On the other hand, natural resources that either do not have a replenishment cycle or one that occurs in geological time can be categorized as non-renewable resources. As long as the supply of these resources persists, they can generate streams of revenue (Plourde, 2005, pp. 4-5). The Canadian Equalization program currently does not make a distinction between renewable and non-renewable resource revenues; however, such a differentiation will be critical for the reform recommended in the subsequent section.

Non-renewable resources, as noted above, represent a stock rather than a replenishable resource. Once extracted, it is assumed that units of non-renewable resources are completely consumed, and "physical exhaustion" or "economic exhaustion" of the entire resource will eventually follow (Plourde, 2005, p.4). Some authors have characterized the sale of these resources as a balance sheet transaction, where an exchange is being made from a physical asset to a financial asset (Crowley and O'Keefe, 2006, p.2). Consequently, the revenues obtained from this type of sale will not represent a stream of ongoing income, even if revenues appear to be "ongoing" during the period of time that the resource persists. It is also widely recognized that non-renewable resource revenues are volatile as a result of price fluctuations, whereas government spending levels should theoretically remain relatively consistent. Hence, it is a mistake to consider non-renewable resources as a source of stable income (Crowley and O'Keefe, 2006).

Rationale for Reforms

Although there are substantial benefits associated with natural resources, federalism in Canada has given rise to some other major policy concerns relating to increased factor mobility,

strategic decision making on the part of provincial governments, and inter-provincial equity. The Equalization program was established specifically with the objective of managing these policy issues (i.e., inefficiency and inequity). However, it appears that in reality, the prevailing system does not correct for these inefficiencies and may in fact further aggravate them. From an efficiency perspective, the inability to equalize Net Fiscal Benefits gained through natural resource revenues causes, in theory, fiscally-induced migration and therefore a misallocation of labour. Furthermore, tax competition and fiscal competition between provinces appear to be encouraged rather than discouraged by the current system. The increasing gap in vertical and horizontal equity – defined below – has yet to be addressed through this system. Finally, the sustainability – or even the current affordability – of the program, given the escalating cost to the federal government, is yet another area of concern.

Inefficiency: Factor Mobility, Fiscal Competition, and Tax Competition

Boadway, Flatters and Leblanc (1983) argue that economic efficiency arguments for Equalization are based on the differences between real and market income. Real income is usually considered to be equal to market income plus Net Fiscal Benefits (NFB). NFB represents the difference between what individuals pay in taxes and what they receive in public goods and services. Moreover, if wages are approximately equal to the marginal product of labour then both the marginal product of labour (i.e., wages) and NFB will be factored into the migration decisions of workers (Boadway, Flatters and Leblanc, 1983, p.175) [7]. Therefore, if Net Fiscal Benefits are not equalized across regions, the decision to migrate will reflect provincial differences in Net Fiscal Benefits rather than differences in the marginal product of labour.

[7] The migration decisions only apply in the absence of migration costs, and then economic efficiency would require that labour's marginal product be equal across provinces.

This appears to be the current situation in Canada. The resulting migratory patterns can be partially observed by surveying the population growth rates of the provinces. Resource-rich provinces located in Western Canada, such as Alberta and Saskatchewan, appear to have higher population growth rates than provinces where the resource sector is less prominent (Statistics Canada, 2011). While this is not a systematic observation, and could not be solely attributed to natural resource revenue distribution, the apparent emerging pattern necessitates further research[8].

Natural resource revenues are one of the most significant sources of Net Fiscal Benefits, a reality exemplified by resource-rich provinces such as Alberta and Saskatchewan. These provinces tend to have high average Net Fiscal Benefits compared to resource-poor provinces. This advantage allows these provinces to provide additional public goods and services to their citizens. The above benefit is further intensified given that the Canadian Equalization program is based on a gross rather than a net mechanism (i.e., the program equalizes up but not down). Provinces achieving high Net Fiscal Benefits are not required to contribute more to the program. The differences in Net Fiscal Benefits are represented as relative fiscal capacities, and although the current system raises the averages of the "have-not" provinces (in 2011–12, Equalization brought average fiscal capacities of receiving provinces up to approximately 95 percent of the national average), the fiscal capacities of the three biggest resource-rich provinces remain significantly above the average. The fiscal capacities of Alberta, Saskatchewan, and Newfoundland, were 166 percent, 153 percent, and 133 percent of the national average, respectively (Boadway, Coulombe, and Tremblay, 2012, p.30). These high fiscal capacities put additional pressure on the Equalization system, by driving up the national average and increasing the cost of the program to the federal government.

[8] It has also been observed that resource-rich provinces experience higher-than-average wages (or high marginal product of labour) along with higher NFB. This may suggest that there has not been sufficient migration to these provinces. Federal EI benefits and other transfer programs, such as the Canada Health and Social Transfer, can also work to redistribute NFBs among provinces. Further research, where all transfers to provinces are combined and assessed simultaneously, is warranted to examine the effects of NFB distribution.

Increased resource revenues can also become a potential incentive for provinces to engage in "single-minded proactive province-building policies," to the disadvantage of the nation as a whole (Boadway, 2006, p.10). The incentive exists for resource-rich provinces to engage in fiscal competition by participating in spending on infrastructure and other types of public goods and services. While the interprovincial competition is not necessarily intentional, provincial governments implement these projects with the hope of diversifying and boosting their economies largely at the expense of resource-poor provinces. Boadway (2011, p.193), in his examination of resource shocks, argues that this type of province-building is inefficient given that it is not based on the "economic geography rationale[9]" but only on the availability of natural resource revenues and the interests of individual provinces. In other words, the Equalization program is unable to fully equalize the Net Fiscal Benefits of all provinces.

Additionally, a likely reaction of the private sector to a significant increase in the value of natural resources in one region is to expand the influx of capital and labour to the resource sector in that region (Boadway, 2006, p.3). A growth in economic activity in the resource sector will be accompanied by a decline in investment in other industries, which consequently experience a decrease in productivity growth. Furthermore, the resulting increase in government spending on current consumption not only crowds out other sectors – especially the manufacturing sector – by virtue of the mobility of factors but also through an appreciation of the exchange rate, which leads to a decline in the competitiveness of other sectors (Boadway, Coulombe, and Tremblay, 2012, p.11). If these "symptoms" are left untreated through a mechanism such as the Equalization system,

[9] Economic geographic theories are based on the study of the distribution and spatial organization of economic activities.

they may be aggravated to the point that they constitute "Dutch Disease[10]." It is precisely these fiscal inefficiencies and inequities that the Equalization system is meant to address.

On the other hand, from a taxation perspective, Smart (2005) argues that an efficient Equalization formula that creates a gap between the royalty rates paid by the firm and the rate received by the provincial government (the gap being the standard tax rate, paid to the federal government) should lessen the incentive for provincial governments to engage in strategic tax policy manipulations through subsidies for resource exploitation (p.4). In fact, the preceding Equalization system[11], with full inclusion of natural resource revenues, punished receiving provinces that reduced royalty rates to subsidize resource developments at the cost of own-source revenues (Smart, 2007, p.5). However, the current system, which only includes 50 percent of resource revenues, reduces the average standard tax rate, thereby inducing provincial governments to consent to lowering royalty tax rates further in exchange for increased resource development in the hope that overall revenues will be increased. The problem is intensified as federal corporate tax policies favour the natural resource sector through substantial deductions for capital expenditures and by allowing deductibility of provincial royalties (Boadway, Coulombe, and Tremblay, 2012, p. 38).

Empirical evidence from the 1970s, when partial inclusion of natural resources was implemented, demonstrated that resource tax rates in receiving provinces were about five percentage points lower or about one-fifth of the average in those years compared to non-receiving provinces in

[10] The "Dutch Disease" is the negative relationship between the increase in natural resources development and the ensuing decrease in other sectors, specifically the manufacturing sector in a country. The term originated to describe the decline of the manufacturing sector in the Netherlands after the discovery of natural gas. An increase in revenues from natural resources causes a country's real exchange rate to appreciate, and as a result other exports become comparatively more expensive, making these sectors less competitive.

[11] The Equalization program in place prior to the implementation of the O'Brien Commission's recommendations utilized the Representative Tax System to calculate the fiscal capacity of the natural resource base. The Representative Tax System remained largely the same in its main approach to the current system but the calculations were complex as a result of a series of technical adjustments, where new tax bases were added, predominantly with respect to resource revenues (Department of Finance, 2010).

full inclusion years (the observed effect was also statistically significant) (Smart, 2007, pp. 6-7). An ideal Equalization system should insulate receiving provinces from the pressures of tax competition and allow them to set higher tax rates; however, the current system appears to do the opposite (Smart, 2007).

Lastly, some concerns related to capturing dissipated rents are not being addressed by the current Equalization system. Rather than maximizing dividends and corporate taxes from hydroelectric firms, provincial governments such as Quebec and Manitoba subsidize hydroelectricity by allowing the price to remain below the market rate, thus reducing profits at provincially-owned utility companies. Charging below-market prices permits some of the rents to be captured by consumers (Plourde, 2005, p.22). In turn, this reduces these provinces' fiscal capacities and rewards them with higher Equalization payments. Including these rents – evaluated at a representative market rate – into the Equalization formula would provide a more accurate measure of fiscal capacity (Vermaetan, 2012).

Equity Rationale

Horizontal equity in economics requires that people with identical endowments before government policies take effect should maintain identical endowments after the policies are implemented; while vertical equity demands that the income gap between different individuals be lessened (Boadway and Flatters, 1982, p.630). However, given the inefficiencies discussed above, it is not difficult to demonstrate how the deviations between market and real income generated as a result of Net Fiscal Benefits differentials lead to horizontal inequity between provinces.

Boadway, Flatters, and Leblanc provide an excellent example of this situation (see Table 2 below). In their example, the federal income tax rate is 25 percent and the market incomes of teachers and lawyers are $20,000 and $25,000 respectively, in both Ontario and Alberta. Although

the two teachers each pay $5,000 in federal income tax, the real income – equal to market income plus Net Fiscal Benefits – of the Albertan teacher is higher, owing to Alberta's higher Net Fiscal Benefits. This situation of horizontal inequity is unfortunately not adequately addressed in the current Equalization program. Some argue that this is in part due to the less-than-full inclusion of natural resource revenues, which does not eliminate the Net Fiscal Benefits favouring certain provinces. This situation will remain so long as the program only equalizes "up" and not "down."

Table 2: Comparison of Market and Real Income (Example)[12]

	Market Income	NFB	Real income
Ontario Teacher	20,000	0	20,000
Ontario Lawyer	25,000	0	25,000
Alberta Teacher	20,000	5,000	25,000

Furthermore, as the prices of natural resources increase, the national average fiscal capacity increases as a result and drives up the Equalization entitlements of provinces, which in turn raises the federal tax burden (Smart, 2005, p.13). At the same time, the entitlements being transferred to "have-not" provinces originate mostly from non-resource tax bases. In particular, given that Ontario has a comparatively high population, and also given that the federal government collects almost no resource revenues, the tax burden is assumed in large part by Ontario taxpayers. Ontarians currently pay for approximately 40 percent of the program through their income, consumption and corporate taxes (Plourde, 2005, p.29). Dwight Duncan, the former Ontario finance minister, has criticized this imbalance: "this year, [Ontario will] put in $6-billion and get $2.2-billion back. The system is deeply biased against Ontario" (Ivison, 2012). Further exacerbating this perceived imbalance is the fact that the deterioration of the Ontario manufacturing sector hastened by the 2008 recession and the

[12](Boadway, Flatters, and Leblanc, 1983. p. 176)

growing economies of the Western provinces based on natural resources have shifted Ontario into the "have-not" category (Bernard, 2012, p.8).

In a recent "report card" published by the MOWAT Centre for Policy Innovation at the University of Toronto, Canada's equity benchmark was conferred a C+. The centre states that without full incorporation of natural resource revenues into the Equalization formula, Canada will continue to underachieve on the equity target (Hjartarson, Pearce, and Mendelsohn, 2010, p.7). The organization contends, however, that full incorporation is unlikely to fully resolve equity concerns in Canada, since the federal government has little access to resource revenues in order to redistribute them to those below the average. The inequality in provincial fiscal capacities will likely continue to increase as growing commodity prices augment resource revenues, and the provinces with high resource revenue capacities will continue to be capable of providing better-funded public services to their residents. This could be seen as a violation of Section 36(2) of the Canadian Constitution (Boadway, 2006).

Sustainability of the Program

During the 2007 reform process the O'Brien Commission noted sustainability over time and the affordability of the program as two significant principles that should guide the panel's recommendations for reform (Expert Panel on Equalization and Territorial Formula Financing, 2006). Currently, the federal government maintains jurisdiction over establishing how much it should spend to achieve the goals of the program. However, the issue arises that receiving provinces could be led to expect future payments that are unsustainable in their lack of correlation to federal revenues. This is because, under the current formula, the Equalization program is not self-financing – i.e., the entitlements of "have-not" provinces are paid from federal revenues rather than funded from the "extra" fiscal capacity of the "have" provinces. Therefore, while an increase in the gap

between the "have" and "have-not" provinces' fiscal capacities will lead to a commensurate increase in Equalization entitlements to "have-not" provinces, there is no corresponding reduction in benefits to "have" provinces.

An example of the imbalance that can potentially be created under this system relates to the increase in world oil prices in the 1970s. This event further boosted the fiscal capacity of Alberta, though it had already long been considered a "have" province, while the "oil-poor" provinces experienced no such benefit. The increase in Alberta's oil revenues raised the national average fiscal capacity, while other tax bases remained the same, thereby increasing the Equalization entitlements of "have-not" provinces. As a result, the total disbursement by the federal government to provinces underwent a rapid increase. This increase placed a substantial amount of pressure on the federal government's budget. If the federal government had wanted to maintain control of its deficit spending, federal taxes would have had to increase substantially. Instead, the federal government chose to adjust the Equalization formula. Throughout the lifespan of the program, the federal government has introduced numerous measures that can constrain the growth of the program, including a move to a five-province standard; removing Alberta – the province with the highest fiscal capacity – from the Equalization formula; and installing a growth ceiling. Although the Commission espoused principles of equity, fairness, stability etc., it recommended partial inclusion of natural resources precisely due to the unsustainability of the program.

The Proposed Reform

We have observed that since natural resource revenues accrue unequally to provinces, they can lead to substantial horizontal imbalances in a federation. The current equal per-capita transfer scheme cannot by itself mitigate the increasing disparities caused by resource booms in some regions. What is required instead is a change in perspective and reasoning with respect to the

treatment of natural resources and revenues derived from them. It has also been observed that when there is a boom in natural resource development, a bust will eventually follow. Consequently, a change in perspective which calls for long-term fiscal sustainability may allow for a solution that can address the consequences of a resource bust. If Canada is unable to find such a solution, there will eventually be a permanent decline in all provinces' fiscal capacity as resource bases and revenues diminish (Shiell and Busby, 2008).

In order to mitigate the imbalances caused by inequities in the natural resource sector, the reform to the Equalization system proposed here – and espoused by other authors – calls for investing revenues generated from non-renewable natural resources in provincially-owned investment funds, similar to the currently employed concept of a Heritage Fund or Sovereign Wealth Fund (SWF). The income generated from investing these savings should then be factored into the Equalization system to determine entitlements. As such, under the proposed system, direct revenues from non-renewable resources will not be included in the calculation of a given province's fiscal capacity, provided they are invested in a SWF. The savings placed in the fund will be eliminated from the equation, and full Equalization of resource revenues will be restricted to renewable resource revenues and non-renewable resource revenues that are spent rather than saved. Renewable resource revenues, such as hydroelectricity, should be evaluated at market prices and fully equalized given that they are a source of income and not wealth. While this proposition constitutes an incentive for provinces to save revenues generated from natural resources rather than spending them on current consumption, it also reflects the true definition of income, as opposed to wealth. The disproportionate effects of Net Fiscal Benefits generated as a result of spending non-renewable resource revenues can also be mitigated by saving additional revenues for future rather than current consumption (Plourde, 2005, p.10-12).

Sovereign Wealth Funds

Sovereign Wealth Funds (SWF) are a distinct group of government-owned and controlled financial assets (Truman, 2008). The Sovereign Wealth Fund Institute specifically defines them as publically owned investment funds founded on foreign currency operations, balance-of-payments surpluses, government transfers, and/or revenues resulting from resource extraction (SWF Institute, 2013). SWFs have existed since the 1950s, but the total size of the assets they control worldwide has increased most noticeably over the past two decades. The global total currently stands at around US$3 trillion (Caner and Grennes, 2010, p.1). At present, there are two types of SWFs, one commodity-backed and the other not. The most well-known commodity-backed SWFs (most of which are oil-backed) include the Abu Dhabi Investment Authority, Norway's Government Pension Fund Global, Russia's National Welfare Fund, Algeria's Revenue Regulation Fund, and Qatar's Investment Authority (SWF Institute). It is worth noting that the growth of these funds represents a reallocation of international assets from industrial countries, such as the United States and Great Britain, to countries which have-not traditionally been key players in international economics.

These types of funds were created with a few common objectives in mind: stabilization of the economy and fiscal framework against volatile market prices; diversification away from non-renewable commodity exports; intergenerational equity (i.e., increased savings for future generations); and sustainable long-term capital growth (Drohan, 2012, p.19). In addition, some researchers have also been able to use theoretical modelling to demonstrate that if a large enough proportion of the resource revenues are saved in these types of funds, the ill effects of the "Dutch Disease" can be lessened and eventually reversed (Ploeg, 2011, p.122). Further examination of the

funds' economic benefits also reveals that SWFs have been found to impose fiscal discipline on governments as they promote consumption-smoothing practices[13] (Drohan, 2012, p.84).

The revenues earned by SWFs would be relatively more stable than resource revenues themselves given their diversified investments, and as a result they can aid in the stabilization of the economy through periods of booms and busts (Drohan, 2012, p.5; Bernard, 2012, p.15). Volatile natural resource revenues are susceptible to procyclical effects. Even if provinces were to retain some of their resource revenues for current consumption (i.e., contribute less than 100% of non-renewable resource revenues into the fund), governments saving in SWFs would be better able to predict income that is available to them and manage the pro-cyclical effects of resource revenues in the long run through counter-cyclical stimulus spending or stabilization of the domestic currency. The following section looks closely at the two examples of such funds constituted by, Norway and Alberta.

The Norwegian Experience

Currently, the best example of a Sovereign Wealth Fund can be found in Norway. The Government Pension Fund – Global (or more commonly known as the "oil fund") originated in 1990. Initially, none of the resource revenues were transferred into the fund, as the government waited until the budget was in surplus to do this (Caner and Grennes, 2012, p.5). Since the first transfer, however, the fund has significantly expanded in size and scope. It is now ranked as the largest investor in the world, and currently the fund is worth over US$700 billion (SWF Institute; Chambers, Dimson, and Ilmanen, 2012, p.67).

[13] SWF-inspired fiscal discipline has not only been able to regulate government expenditure practices: these funds also promote the balancing of annual budgets. Governments are only able to allocate assets into a SWF if they acquire surplus revenue. Attaining a balanced budget permits a government to obtain the positive benefits of SWFs that cannot be realized if the government is accumulating debt on another account (Shiell and Busby, 2008, p.23).

This fund was created as a sustainable long-term saving vehicle that can cover the "oil-corrected budget deficit"[14] from surplus wealth accrued from the Norwegian petroleum sector. The Norwegian government has stated that it not only has a responsibility to insulate the economy from the resource curse, but it also has an ethical obligation to share the wealth from non-renewable resources with future generations (Chambers, Dimson, and Ilmanen, 2012, p.68). Although the fund's mandate is to maximise its international purchasing power, its managers offer a high degree of transparency in terms of its operations (Chambers, Dimson, and Ilmanen, 2012, p.69). A small proportion, specifically 4 percent, of the accumulated wealth of the fund is integrated annually into Norway's federal budget, and all transactions are reported explicitly in the government's budget documentation. However, the fund is managed at a distance from the political sphere by Norges Bank Investment Management, which was established as a separate branch within the Norwegian central bank to invest the fund's assets. The fund's strict investment strategy proscribes domestic investments and enforces strict limitations on "extra-budgetary withdrawals" in order to avoid appreciation of the Norwegian Kronor (Caner and Grennes, 2012, pp.4-5).

The Norwegian government has forecasted that the country will soon reach peak oil production. Given the volatility in resource prices and the rapidly diminishing stock of oil in the North Sea, by treating the resource revenues as wealth rather than an income source, the fund will allow the Norwegian government to derive a sustained flow of benefits even after the resource base has been depleted (Caner and Grennes, 2012, p.2). However, Norway does not use the windfall

[14] In order to calculate the "*oil-corrected budget deficit*" total government revenue must be divided into oil-related revenues (R_1) and other revenue (R_2), and similarly, total government expenditures must split into oil-related expenditures (C_1) and other expenditures (C_2). The Sovereign Wealth fund's design also requires the separation of the oil-related elements in the budget. Then the "oil-related net cash flow" would be $R_1 - C_1$. And the overall surplus thus becomes:
$S = R_1 + R_2 - C_1 - C_2$. Finally, the "*oil-corrected budget deficit"* would be: $D_2 = C_2 - R_2 = R_1 - C_1 - S$ (Bjerkholt and Niculescu, 2004, p.172).

gains from resource revenues until they are banked. It restricts its consumption to the accumulated wealth from the fund. This strategy is known as the "bird-in-hand rule" (BIH) (Ploeg, 2011, p.40).

There are at least two approaches to converting the windfall from non-renewable natural resources into a sustained source of income. The Permanent Income Hypothesis (PIH) approach, based on Milton Friedman's hypothesis, deems it necessary for countries to borrow to establish the SWF before the windfall and subsequently reimburse the incurred debt directly from the resource revenues. This approach aims to permanently support an increase in consumption from the interest gained on the wealth even after the end of the resource boom (Ploeg, 2011, p.133). According to Ploeg, the fiscal rule accompanying this approach states that an "increase in public spending should equal the permanent value of the windfall at the time of the discovery and build up sufficient sovereign wealth to ensure that the interest on the fund at the end of the windfall can sustain the permanent increase in consumption" (Ploeg, 2011, p.133).

Shiell and Busby (2008) used this approach and analyzed the potential outcome on fiscal sustainability for Alberta. Their model, entitled Permanent Resource Income Model (PRIM), seeks to explain per-capita spending over time by identifying the highest level of annual government expenditure that can be financed indefinitely from resource wealth. In order to achieve this outcome, the model requires that resource revenues be identified as assets rather than continuous income streams. The model is an attempt to explain how constant income flows can be maintained while coping with the eventual economic and physical exhaustion of the natural resources (Shiell and Busby, 2008). Over time, the stream of resource revenues can be transformed into an alternate stream of revenues from investment as the method suggests (Shiell and Busby, 2008, p.9).

In contrast, the approach used by Norway and many other oil-backed economies has been the more conservative fiscal rule known as the "bird-in-hand" (BIH) approach. Unlike in the

Permanent Income Hypothesis approach, these countries do not use the resource bonanza as collateral for financing current consumption, instead waiting until revenues have been saved in order to determine their permanent income value. All the revenues are invested in a fund, and assets are built up during this period while a fixed return – in Norway's case 4 percent – is extracted from the SWF to back public spending. It is assumed that if a SWF is able to earn high global interest rates, it can induce governments presiding over resource endowments to save and postpone consumption. Consequently, there will be less borrowing and a smaller increase in consumption before the resource bonanza than under the Permanent Income Hypothesis approach. Nevertheless, after the windfall has waned, the interest return on the fund's assets will subsequently allow for higher consumption levels than PRIM because more is saved in the long-run under the BIH approach (Ploeg, 2011, p.134).

The Canadian Experience

Canada's economic growth, like that of Norway, has been underpinned by the natural resource sectors. However, Canada's approach to managing the windfall has been quite different. Only two provinces within Canada have a commodity-backed Sovereign Wealth Fund: Alberta and Quebec. In 2006, Quebec created a SWF entitled "Generations Fund" financed exclusively by hydroelectricity revenues. The revenues contributing to the fund come from royalties, leases, and sales of electricity outside the province (Drohan, 2012, p.18). In the budget speech of 2006, it was stated explicitly that the fund's main goal is to reduce Quebec's substantial public debt, and the fund currently has $ 4.3 billion in assets saved toward achieving this objective. Caisse de dépôt et placement du Québec is responsible for the management of these assets, but unlike Norges Bank, this investment group is a Crown corporation and is likely subject to political influence. The fund is still in its early stages, and should be seen as a political gimmick as long as the Quebec government

continues to accumulate much more substantial amounts of debt in other accounts. Moreover, hydroelectric revenues can be seen to represent current income and not wealth. If hydroelectric resources can be used in a sustainable manner, it is not necessary to invest the income in a fund to achieve a steady flow of income. Also, if hydro rates were charged at the actual (higher) market rate, the province in question would obtain more revenues for the same resource and would not need to invest them in a SWF. As such, the Generations Fund does not warrant further examination in the context of this study.

On the other hand, the comparable Canadian example to Norway's Sovereign Wealth Fund is the Alberta Heritage Savings Fund (AHSF). Established in 1976, it aims to provide "prudent stewardship of the savings from Alberta's non-renewable resources by providing the greatest financial returns on those savings for current and future generations of Albertans" (Alberta Heritage Savings Fund, 2011). Alberta began by depositing 30 percent of non-renewable resource revenues into the AHSF in the first couple of years and the fund grew to over $12 billion by 1987. However, Alberta suffered harsh economic conditions in the early 1990s, beginning a period during which no additional investments were made (Alberta Heritage Savings Fund, 2011, p.4). Subsequently having eliminated its debt in 2005, the Alberta government revitalized the fund by allocating resource wealth once more. However, unlike in Norway, there is no legal requirement for the Albertan government to deposit its non-renewable resources revenues into this fund (Drohan, 2012, p.18). As of 2012, despite being the largest of Canada's commodity-backed SWFs and despite having been established decades before Norway's SWF, the AHSF currently amounts to only $16 billion (Alberta Heritage Savings Fund, 2011). In comparison, since the fund's inception, Alberta has accumulated over $300 billion in natural resource revenues, a proportion of which is likely to have caused the artificial inflation of overall fiscal capacities (Crowley and O'Keefe, 2006, p.10).

The Fund is legislated to preserve a portion of its revenue as a safeguard against inflation. The residual revenue is transferred to the province's "General Revenue Fund," where the transfers help to keep taxes low and pay for public programs (Alberta Heritage Savings Fund, 2011). For example, Alberta does not impose a sales tax and has some of the lowest personal income taxes in the country (McKenzie, 2000). Moreover, from 2003 to 2008 Alberta increased its total annual spending by 6.3 percent over what it had originally planned (Busby, 2008, p.2). In contrast to Norway, Alberta has no regulations on how much the fund can invest within the province, although it does restrict the amount which can be loaned to other provinces (Smith, 1980 p.142).

To allocate the share of the resource bounty equally across a number of generations, models such as those mentioned above require that *all* rents generated by the development of non-renewable resources should be invested in some form of capital. In Canada's case, if SWFs were established by the provinces according to this principle, the resulting income would allow provinces to sustain constant per-capita aggregate consumption levels (Plourde, 2005, p.10). The argument follows that if full ownership of natural resource revenues were conferred to the provinces, then the yet-to-be born provincial residents could also exercise the right to an equivalent share of the rewards (Shiell and Busby, 2008). This idea of intergenerational or intertemporal equity is not currently being discussed in policy circles with respect to Equalization. The following section uses federal government data to inform such a discussion.

Empirical Application

Data

The main source of data for this study is from the Department of Finance's data inputs for the official calculations of Equalization entitlements. These workbooks contain information on population distributions; tax bases and revenue sources by province; calculations of all tax bases;

national average tax rates; information regarding Atlantic Accord offset payments for offshore resources; and more importantly, information on actual resource revenues by province. The workbooks therefore contain all the necessary data points to calculate each province's fiscal capacity.

The sample period of analysis, 2003 to 2012, is based on data generated from the recommendations of the O'Brien Commission. This data will be supplemented with information on year-over-year inflation rates for Canada from the CANSIM database on the Consumer Price Index monthly tables 326-0020. The interest rate used to calculate the fund's expected return will be the expected long-term return of the Alberta Heritage Savings Fund[15], which is equal to 4.5 percent above the Canadian inflation rate, as measured by the Consumer Price Index (CPI) (Alberta Heritage Savings Fund, 2011, p.5). It will be assumed that the asset allocation[16] of the SWF portfolio will incorporate diverse ventures to reflect each province's risk aversion and specific objectives, but more importantly will seek to achieve the long-term expected rate of return[17].

Methodology

The reform proposed earlier in this paper calls for a portion[18] or the full amount of non-renewable resource revenues to be invested in a SWF, excluding them from fiscal capacity calculations for the purpose of Equalization. Likewise, non-renewable resource revenues used to retire a province's accumulated debt will also be excluded from equalization - the current Equalization formula does not take into consideration provincial debt repayments. However, non-

[15] It is assumed that all provinces will aim to achieve the same interest rate.

[16] Asset allocation is an investment strategy that balances the risks and rewards of an investment by distributing a portfolio's assets according to the individual's or company's objectives, risk averseness and investment timeframes.

[17] The investments of Norway's "oil fund" are currently distributed in the following manner: 62.4 percent in equities, 36.7 percent in fixed income and 0.9 percent in real estate (Norges Bank Investment Management, 2013).

[18] In this study, it is assumed that all provinces will take the incentive to invest 100 percent of non-renewable resources in a SWF, while a second iteration will check the results of a 30 percent investment level. Furthermore, actual resource revenues will be used to calculate resource fiscal capacity, similarly to the current program

renewable resource revenues not invested in the fund and all renewable resource revenues evaluated at market prices will be fully equalized[19]. Furthermore, under the proposed reform, if a province borrows additional funds above a certain allowance discussed below or cashes in financial assets from its SWF for current consumption, these amounts *will* be fully equalized (only income from the fund is made available for government spending and therefore equalized) – ceteris paribus, all other tax bases of the equalization formula will remain the same. Under this proposed system, provinces that build additional assets by investing the revenues from nonrenewable resources rather than spending on current consumption are rewarded by the Equalization formula as they do not factor into a province's current fiscal capacity. Non-renewable resource revenues tied to long-term financial assets or used to decrease debt are unavailable to finance current public spending (Mintz and Poschmann, 2004).

The proposed BIH model necessitates that a distinction be made between renewable and non-renewable resources[20], as defined above and calls for the full inclusion – in the calculation of fiscal capacity – of revenues generated by all ongoing income streams. Industries such as forestry, fisheries, and hydroelectricity restock themselves, either as a result of human activity or process of nature, within time periods relevant to economic activity and as a result can produce a constant flow of income. Accordingly, revenues from these sectors, which are available for current spending, will be fully integrated into the Equalization system as they give rise to Net Fiscal Benefits (Plourde, 2005, p.12-13). The model advanced in this paper will assume that oil and gas royalties and other revenues generated from non-renewable resources were valued at prevailing market prices.

[19] Calculating renewable resource revenues at market prices would constitute an additional departure from the current formula.

[20] A list of all revenue sources used to calculate actual renewable and non-renewable resource revenues are included in Appendix B.

Additionally, revenues generated from the forestry industry will also be assumed to have been evaluated at market prices[21].

In the case of hydroelectricity, dissipated rents will also be calculated at market prices[22] and, ceteris paribus, by definition provinces that engage in underpricing hydroelectric resources would see an increase in their calculated fiscal capacities by the amount of the total subsidy, and a commensurate decrease in their entitlements under Equalization. Moreover, assessing resources at market prices provides the true income of a province, while preferential rates reflect discretionary spending decisions of a province[23]. The concept of horizontal equity requires that all provinces be treated equally in terms of pricing policies, and accordingly, market income captures the true opportunity cost of discretionary policies. Such a reform would reduce the incentive for provinces to engage in tax/fiscal competition.

While the proposed reform may offer a number of benefits, at least one potential limitation deserves attention. One of the main concerns of the O'Brien Commission of 2007 was the possibility that a province could simultaneously borrow from a different account while setting revenues aside in a SWF (i.e., the government of a "have-not" province could theoretically decide to save all its non-renewable resource revenues in a "Sovereign Wealth Fund" and prevent these revenues from reducing its Equalization entitlements). It could simultaneously choose to borrow additional funds in order to maintain the same Net Fiscal Benefit associated with maximum spending (Plourde, 2005). Thus, there will likely be no net difference in the government's financial

[21] Revenues from the forestry industry only account for about two percent of the total natural resource base

[22] Due to the unavailability of detailed data on hydroelectricity revenues, the author is unable at this point to calculate hydro revenues at market prices. As a result, we will assume the hydroelectricity revenues used in this study to calculate Equalization are evaluated at market prices.

[23] It must be noted that different provinces may receive different prices for their natural resources. For example, where transportation difficulties may result in additional costs, or where resource prices are subsidized, as with Hydro Quebec, the whole value of a resource may not be received by the government.

position. This practice would amount to manipulation of the proposed treatment of non-renewable resource revenues for a province's advantage without actually increasing the province's net wealth. A mechanism is presented below to prevent this type of manipulation.

The other four tax bases will be calculated in the same way as under the current Equalization formula[24]. Province i's equalization entitlement for the tax bases of business income, consumption income, property taxes, and personal income is:

$$E^i_{non-resource\ equalization} = \sum_{j=1}^{4} E^i_j$$

$$E^i_j = NATR_j(b_j - b^i_j)P^i$$

Where,

E^i_j = Equalization entitlement of province i on tax base j
$NATR_j$ = The National average tax rate for base j
P^i = Population in province i
b_j = Per-capita standard or the average per-capita tax base j at the national level
b^i_j = Per-capita size of the tax base j for province i

The per capita fiscal capacity of a province in terms of the non-renewable resource revenue base is defined below:

$$FC^i_{NRR} = \frac{C^i_{NRR} + I^i_{NRR} + WR^i_{NRR}}{P^i}$$

Where,

FC^i_{NRR} = Per-capita fiscal capacity of province i for non-renewable resource base
C^i_{NRR} = Total actual revenues from the non-renewable resource revenue base which have not been invested in a SWF for province i.
I^i_{NRR} = Income earned on SWF in province i (i.e., return on the fund balance from the previous year).
WR^i_{NRR} = Withdrawals from funds to finance public spending for province i

[24] Please refer to Appendix A to view the existing Equalization formula.

Withdrawals WR^i_{NRR} are defined in terms of the province's total net wealth, not just the SWF, in order to prevent manipulation of the savings rule, as discussed above. In particular,

$$WR^i_{NRR} = -min\left[\Delta SWF^i + \Delta Other^i, 0\right]$$

Where $\Delta Other^i$ accounts for accumulation and repayment of debt in other funds. This definition measures the net effect of savings and borrowing across all provincial funds. It also treats the repayment of provincial debt as equivalent to savings of resource revenue for the purpose of Equalization.

At the same time, this definition of WR^i_{NRR} implies a very rigid view of government borrowing, which does not coordinate well with the consensus macroeconomic view of counter-cyclical fiscal policy. In particular, during a recession, a negative value of $\Delta Other^i$ corresponding with government borrowing is treated here as a withdrawal of resource wealth, ceteris paribus, and therefore results in an increase in the measured fiscal capacity of the province and a reduction in the equalization entitlement. The reverse is true during a boom, when the province is paying down debt (positive value of $\Delta Other^i$). It follows that the definition of WR^i_{NRR} above introduces a pro-cyclical component of Equalization that is not desirable.

In order to remove the pro-cyclical feature of the resource saving rule under Equalization, it is necessary to specify a budgetary management policy which allows provinces to discharge their stabilization role without experiencing offsetting effects on their Equalization entitlements. This policy can take the form of a zero debt accumulation rule over a multi-year cycle. Under such a rule, debt accumulated in a given year would not be recorded in $\Delta Other^i$ provided the province had not increased its overall real debt level (per capita) compared with x years ago (length of cycle). The

value of x could be negotiated, but for example a value of eight years might seem a reasonable period length for stabilization policy[25].

With these definitions, the provinces i's corresponding non-renewable resource Equalization entitlement is:

$$E^i_{NRR} = (b_{NRR} - FC^i_{NRR})P^i$$

Where,

b_{NRR} = Per-capita standard (or the average per-capita) of non-renewable resource revenues at the national level

In this model, province i's per-capita renewable resource fiscal capacity will be calculated in the following manner[26]:

$$FC^i_{RR} = \frac{Q^i_{RR} \times MK^i_{RR}}{P^i}$$

Where,

FC^i_{RR} = Per-capita fiscal capacity of province i for renewable resource base
Q^i_{RR} = Quantity of renewable resource revenues produced.
MK^i_{RR} = Estimated market price for renewable resources.

And province i's corresponding equalization entitlement will be:

$$E^i_{RR} = (b_{RR} - FC^i_{RR})P^i$$

Where,

b_{RR} = Per-capita standard (or the average per-capita) renewable resource revenues at the national level

[25] The simulation presented in this paper aims to examine the impact of the proposed treatment on resource revenues, compared to the status quo. Hence, this study will assume that the provinces are respecting this policy rule and $\Delta Other^i = 0$.

[26] In this iteration of the paper, actual renewable resource revenues will be used to calculate the per capita fiscal capacity of each province for the renewable resource revenue base $FC^i_{RR} = \frac{AC^i_{RR}}{P^i}$

Province i's total equalization entitlement will then equate to:

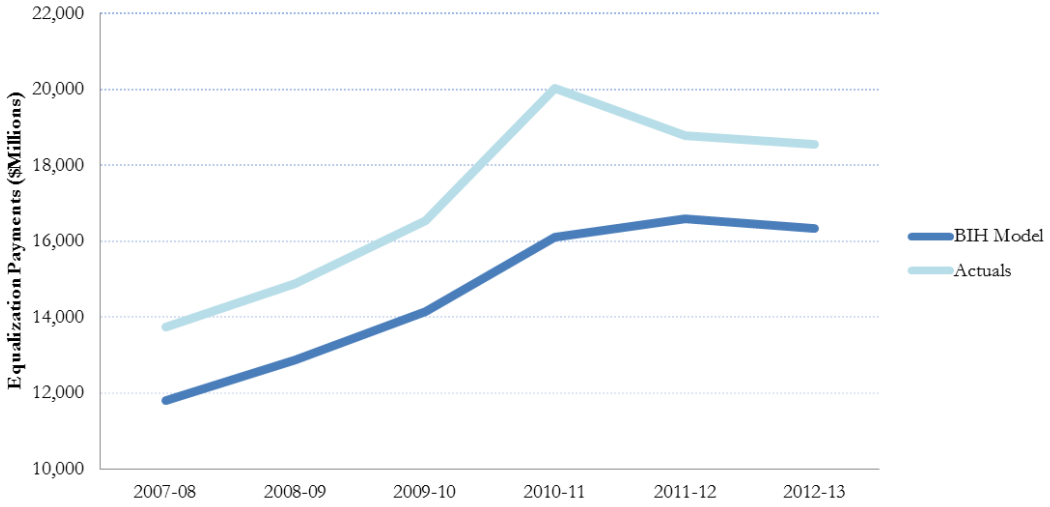
$$E^i_{Total} = \sum_{j=1}^{4} E^i_j + E^i_{RR} + E^i_{NRR}$$

$$E^i_{Total} = \left[\sum_{j=1}^{4}\left[NATR_j\left(b_j - b^i_j\right)\right] + \left(b_{RR} - FC^i_{RR}\right) + \left(b_{NRR} - FC^i_{NRR}\right)\right] P^i$$

Under this proposed system a province will receive an Equalization payment if $E^i_{Total} > 0$, and it will not receive any payment if $E^i_{Total} \leq 0$. Furthermore, these Equalization calculations will be based on a three-year weighted moving average of provincial fiscal capacity, lagged two years, akin to the current formula.[27]

Results

Figure 4: Actual Equalization Payments vs. BIH Equalization Payments



Note: Amounts correspond to pre-cap Equalization payments for all receiving provinces

[27] Equalization calculations correspond to the "pre-cap" entitlements of a province. For the sake of simplicity, the author will not impose a fiscal capacity cap nor a growth ceiling or floor to these calculations. Offshore Accord offsets will also be excluded from the current formula.

Based on the BIH approach, if provinces invest 100 percent of their non-renewable resources in a Sovereign Wealth Fund and extract all income that has been generated – i.e., 4.5 percent per annum – for current spending from the fund, ceteris paribus, the federal government will realize an overall savings of $14.6 billion for an average annual savings of $2.4 billion over the six-year period (please refer to Appendix E for detailed results by province). Figure 4 illustrates the effect of the model on the evolution of Equalization payments over the six-year period studied.

The most notable change from actual figures represented in the current program and the model's estimates is the significant decrease in the Equalization entitlements of Quebec and Ontario, currently the two largest recipients of Equalization transfers. Quebec would experience an 87-percent decrease in its overall Equalization payments while Ontario would see its entitlement reduced by 30 percent.

Under the proposed equalization model, the geographical distribution of payments between the receiving provinces undergoes moderate changes during the period of analysis. The existing Equalization model grants Quebec and Ontario 53 and 12 percent, respectively, of overall actual payments. However, under the proposed model, these provinces will only receive 47 and 9 percent of payments, respectively. On the other hand, most of the remaining "have-not" provinces – New Brunswick, Manitoba, Saskatchewan, Nova Scotia, and Newfoundland and Labrador – see modest increases in their shares of overall Equalization entitlements. Prince Edward Island's percentage of overall payments remains the same.

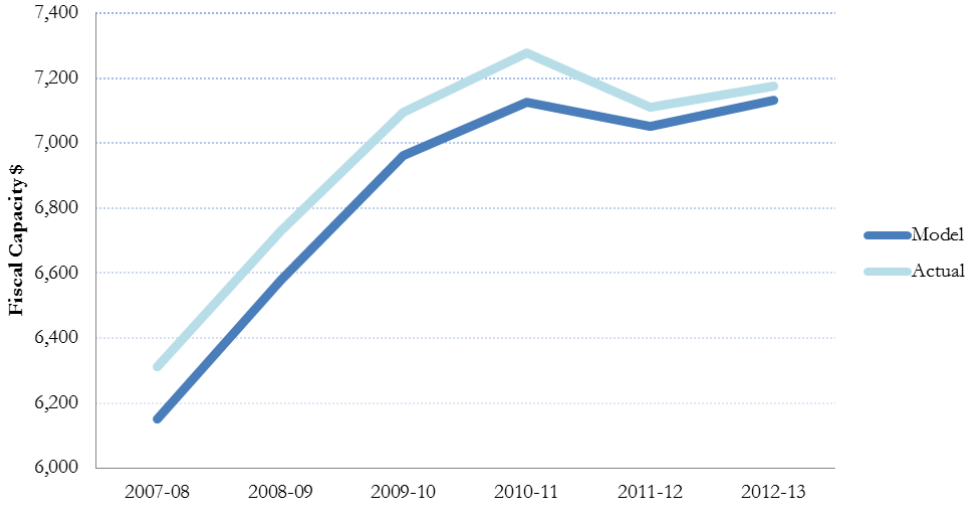
More generally, a small but noticeable increase in Equalization payments to resource-rich provinces can be observed, since non-renewable resource revenues that are assumed not to be financing current spending are fully excluded from calculations of fiscal capacity. Simultaneously, resource-poor provinces see a decrease in payments as the national average fiscal capacity is reduced.

Year to year, the model's predicted Equalization payments are also less volatile compared to the actual payments over the same period: this can be attributed to the fact that the most volatile revenue base – actual non-renewable resource revenues – has been fully excluded from the calculations.

By contrast, an alternate model which assumes that provinces invest only 30 percent[28] of their non-renewable resource revenues in SWFs does not result in a similar findings, instead predicting *significantly higher* Equalization transfers to "have-not" provinces compared to the status quo (see Appendix E). In other words, if provinces invest only 30 percent of non-renewable natural resource revenues, the proposed reform results in substantially increased federal costs rather than the desired savings. This is because any inclusion of resource revenues in excess of 50 percent – the current inclusion rate for natural resource revenues – will substantially increase resource-rich provinces' fiscal capacities, boosting Equalization entitlements for "have-not" provinces, which are based on the national average. Specifically, under this alternate model, the federal government will need to pay on average an additional $2.7 billion each year in Equalization payments. The evolution of Equalization payments will also be highly volatile following a pattern of resource revenues. These results indicate that a reform such as the one presented in this study, will only result in reduced spending on Equalization if all the provinces saved more than 50 percent of their non-renewable resource revenues in a SWF. A more detailed discussion of the implications of savings rates other than 100 percent can be found in the Discussion section.

[28] This amount was chosen because the AHSF – when it was actively saving – only invested 30 percent of all provincial natural resource revenues into the fund. As a benchmark amount, the author has chosen this percentage as a lower bound.

Figure 5: Per Capita Actual Fiscal Capacities vs. Per Capita BIH Fiscal Capacities



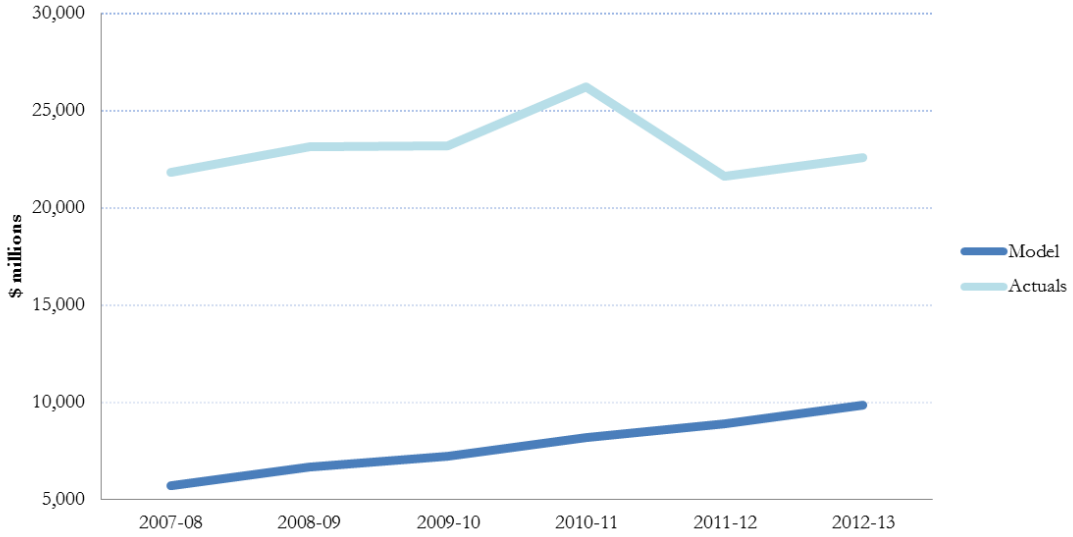
Note: Average per-capita fiscal capacity of all ten provinces

As shown in Figure 5, the BIH model with 100 percent saving of non-renewable resource revenues forecasts a lower per-capita total fiscal capacity, during the 6 year period of study, compared to the current Equalization program. However, the model appears to indicate a convergence between the actual and predicted per capita fiscal capacities of provinces. In fact, over the six-year period the difference between the two estimates appears to shrink to a relatively minor amount of $43 per person, as the interest borne on the accumulated wealth in the SWF increases to the point where it replaces the status quo's non-renewable resource revenue. Accordingly, we can expect the model to predict growing fiscal capacities as accumulated wealth in the SWF continues to increase over time.

On average, the model finds that resource rich provinces such as Alberta, Newfoundland and Labrador, and Saskatchewan have lower total fiscal capacities, as expected (Appendix E contains detailed per-capita total fiscal capacities by province). This can also be credited to the model's treatment of provincial governments' wealth as solely consisting of current financial assets. And only income from the fund is made available for government spending and therefore equalized.

Given these results, the question remains whether the BIH model reduces long-term fiscal disparities between provinces? Comparing the resource-adjusted fiscal capacity of all provinces for fiscal year 2012–13, we observe that when they divert 100 percent of their non-renewable resource revenues to SWFs, the resource-rich provinces still uniformly achieve the highest total fiscal capacities. In this model, Alberta, Saskatchewan, and British Columbia still achieve the highest standings in terms of total fiscal capacity, and they are followed by Ontario, Newfoundland and Labrador, Quebec, and Manitoba, respectively. However, the gap in fiscal capacity between the first- and last-ranked provinces is slightly diminished under this model.

Figure 6: Total Resource Fiscal capacity

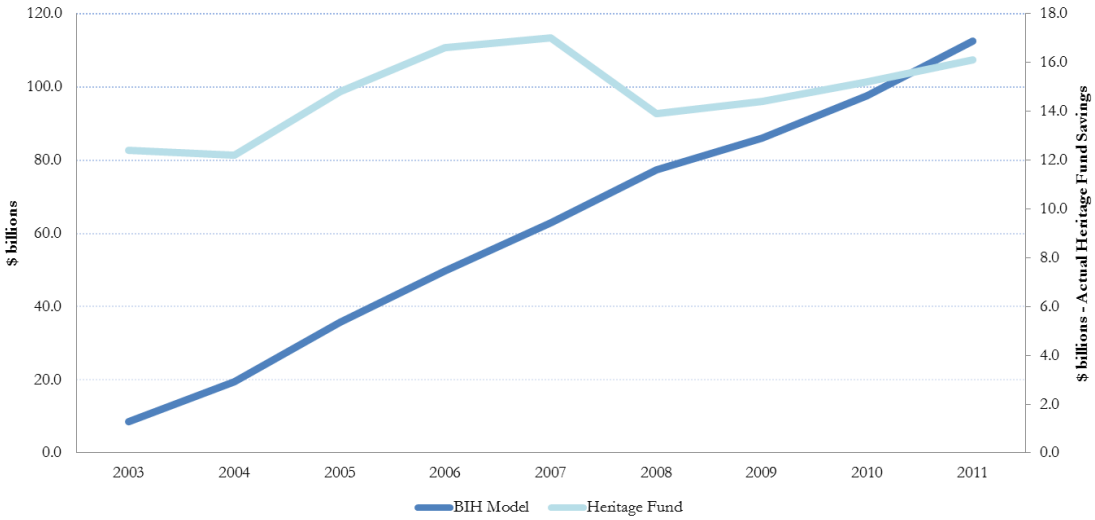


Note: Includes both renewable resource revenues and withdrawals from the SWF to finance public spending – assuming 100 percent savings of non-renewable resource revenues – ($ millions)

In addition, the estimated overall natural resource fiscal capacity is significantly lower compared to the current Equalization program, since all non-renewable resources are invested in SWFs rather than being spent currently on providing services. There is a large decline in total resource fiscal capacity – from around $22–$26 billion to around $5–$10 billion during the six years

of the study. And yet, as illustrated in Figure 6, the estimated resource fiscal capacities of provinces are relatively stable under BIH compared to the actual situation – please refer to Appendix E for detailed results. As expected, the model predicts less volatility in the revenue base given that SWFs help smooth the flow of income affected by the volatile nature of resource prices and provide a sustained source of income through the financial returns generated in the fund. If SWF income is withdrawn at a constant rate like that of Norway's "oil fund" – 4.5 percent annually in the case of this model – federal and provincial governments will be able to better plan and predict Equalization transfers.

Figure 7: Alberta Heritage Fund Growth



Note: AHSF savings information compiled from the AHSF Annual reports.

Using an estimate based on an annual expected rate of return of 4.5 percent above the Canadian inflation rate and withdrawals constrained to only income generated by the SWF at a constant rate of 4.5 percent, the model shows that Canada can generate a total of $179.7 billion in accumulated sovereign wealth by all provinces over the six-year period examined here. For example, the BIH model predicts that the AHSF will accumulate $112.6 billion by the end of the six-year

period compared to the $16.1 billion it has accumulated since its inception (see Figure 7)[29]. By treating the resource revenues as wealth, the fund will allow Alberta to derive a continuous income stream similar to that of Norway. Even if the province were only to save 30 percent of non-renewable resource revenues in the fund, this approach would generate an additional $17.7 billion of accumulated wealth for Albertans within the six years of the study (See Appendix E).

Discussion

In a nutshell, under the proposed model, "full" Equalization would equalize resource revenues completely, where a dollar of resource revenue would be understood to equate to a dollar of income tax or consumption tax revenue used to finance current public services (the model attempts to derive a resource-adjusted fiscal capacity representing the sum of potential revenues based on the *national average rates* for the four tax bases and the *actual revenues* received from the sale, licensing, etc. of natural resources). In exchange for this concession by resource-rich provinces, their non-renewable resource revenues would only be subject to Equalization when they began to provide Net Fiscal Benefits to provincial residents. It is not surprising that some provinces, especially the Atlantic Provinces[30], are major proponents of this type of reform, as these provinces are the largest beneficiaries of the BIH approach. Given their recent increases in resource development, these provinces have chosen to account for a relatively large amount of wealth as current revenue, thereby "balancing" their budgets and in some years even achieving budget surpluses. If the Equalization program can promote saving strategies, these provinces can benefit substantially, since their resource

[29] At least $12 billion of this $16.1 billion amount in the AHSF has been accumulated before the five-year period in question.

[30] The Atlantic Institute for Market Studies (AIMS) have authored many studies that specifically explore this type of proposal and have specifically recommended adopting an approach similar to the BIH model to cope with the growing challenges of natural resources. For example, see Boessenkool, Kenneth (2001); Crowley, and O'Keefe (2006).

wealth will be accumulated for the future rather than spent as current revenue. Alberta therefore does not have to be the only province that benefits from resource wealth.

However, it is also important to note that Quebec and Ontario emerges as the only two provinces to "not benefit" from the proposed reform, as it would lead to a substantial decrease in their Equalization entitlements. However, in reducing the overall value of Equalization payments, the proposed reform would, at least partially, benefit residents of these provinces, who collectively contribute a majority of federal taxes. Federal funds can be freed up to either be available for more services or infrastructure investment, federal deficit/debt reduction, or to reduce the federal tax rate extracted from the economies of these provinces. In the longer-term, one can only presume (and hope) that all governments will adjust to either tax more efficiently or spend more efficiently under such a system.

The current Equalization system has no impact on provincial borrowing decisions, since entitlements are not reduced when provinces temporarily simulate higher revenues by borrowing. In reality, during economic downturns, it will be tempting for provinces to spend current and accumulated non-renewable resource revenues on stimulus policies. This is why, in addition to saving in a SWF, provinces should also be subject to an incentivizing mechanism or enforceable rule, such as the one described above, to promote cyclical stabilization. A zero debt accumulation policy (as measured over a given multi-year cycle) could potentially obtain compliance from the provinces in terms of balancing their operating budgets – on average – even while saving their resource revenues in SWFs. In the long run, SWFs can help to mitigate the negative effects of recessions by providing a stable income source to provinces and thereby lessening the need for austerity.

This study is subject to some limitations. To begin with, it assumes that all resource revenues are evaluated at market prices. However, this is not representative of the current situation, especially for hydroelectric revenues. Due to a lack of data availability, the author was unable to calculate "real" renewable resource revenues at market prices – before some of the rents are dissipated in the form of subsidies. In the next iteration of this study, the author plans to incorporate hydroelectric revenues assessed at market prices to assess the impact of these revenues on fiscal capacity.

An important consideration is that the Equalization calculations were conducted for a period of only six fiscal years from 2007–08 to 2012–13. It would be interesting to know how Equalization payments will evolve in the years after 2012–13, since it appears that the difference between the per capita fiscal capacity estimates of provinces in the BIH model and the actual levels are set to shrink – as depicted in Figure 6. Moreover, though the analysis presented in this study shows that the cost of the Equalization program would be reduced in the first six years by a total of $14.6 billion (assuming that provinces save 100 percent of non-renewable resource revenues), there is a possibility that the proposed reform might not provide a permanent or significant reduction in the total cost of the program to the federal government in the long-run. In fact, there is a potential for the total cost of the program to eventually rise if receiving provinces stagnate economically while average total fiscal capacities of provinces increase as a result of growth in SWFs. Furthermore, this increase could occur relatively quickly if provinces chose to save the full amount of revenues generated from non-renewable resources. Further study regarding the economic impacts on neighbouring provinces of such a shift in resource revenue expenditure is therefore warranted. If it is found that the cost of the program under the current "cap" would eventually rise, it may also be worth considering changing the cap in the interests of reaping the benefits such an increase in the average fiscal capacity would entail. In any case, the short time period of six fiscal years is not adequate to

accurately estimate the true impact of the BIH approach, which is designed for long-term financial planning. Supplementary analysis should run a forecast with a longer horizon to better understand the implications of this model. This study also does not account for the transfers that have actually been made into the Alberta Heritage Savings Fund by the province of Alberta, which, while relatively inconsequential with respect to the six-year period in question, could nevertheless impact the Equalization estimates of the model.

Regardless of the timeline under study, some of the assumptions in this paper bear additional discussion in the context of a proposed reform. First of all, this study assumes that the proposed reform is implemented instantaneously. In the short-run, assuming that the reform presented in this paper is successful at inducing provinces to save 100 percent of their non-renewable resource revenues in SWFs, the proposed reform would necessitate a considerable amount of adjustment by provinces to their taxation and/or spending policies. As a result, it might be preferable to phase in such a reform over a longer period – perhaps over 3, 5, or even 10 years – in order to reflect these changes in provincial policy. Phasing in such a reform may prompt provinces to vary the saving rate of revenues, significantly impacting the Equalization entitlements of have-not provinces. The study conducted at this juncture is a partial equilibrium analysis, and therefore cannot fully account for such effects: a general equilibrium analysis would be better suited to take into consideration all likely effects on the Equalization model, such as changes in tax and spending policies and a phased-in reform.

More importantly, as previously mentioned, the reform proposal presented in this study will be successful if and only if the assumption of 100 percent non-renewable resource savings is realized. As the modeled provincial savings rate declines from 100 percent, the benefit to the federal government in terms of reduced total Equalization entitlements continuously decreases, and at some

point before a 50 percent savings rate is reached, the benefit dips below zero and becomes instead an increased liability. As this study does not delve deeply into Canadian federal constitutional law, it is beyond its scope to discuss what, if any, power the federal government has to obtain compliance from provinces to get them to save their full resource revenues in SWFs. That being said, in order to achieve any savings through the proposed reform, the federal government must somehow either obtain voluntary compliance or else compel the provinces to save the majority – if not all – of their non-renewable resource revenues. Accordingly, subsequent research should explore the effects on the payment model of various inclusion rates between 50 percent and 100 percent of natural resource revenues, since it is possible that some amount in this range would ensure that the cost of the program to the federal government did not increase. This could also be explored in the context of a phased-in approach as discussed above, in order to progressively pursue hypothesized benefits while ensuring that the cost of the Equalization program to the federal government does not increase following the proposed reform.

Alternatively, the author suggests the possibility that if the Canadian Equalization system was a self-financing system, it would give more of an incentive for resource-rich provinces to save their revenues in SWFs. The reason for this is that "have" provinces under such a system directly forfeit part of their fiscal capacity to "have-not" provinces, an eventuality that resource-rich provinces could avoid or mitigate by diverting some non-renewable resource revenues to SWFs and thereby keeping them from counting towards their fiscal capacity. However, the establishment of such a system may face opposition from some provinces that would be required to support the constitutional amendment required to bring it about. Consequently, the best that can be hoped for at this time is to provide a good enough incentive for the provinces to save.

Furthermore, this BIH model assumes that all provinces will establish a SWF and obtain the same interest rate on their investments, under the assumption of an interest rate of 4.5 percent above Canada's inflation rate. Given provincial autonomy in this regard, however, it is unlikely that all provincial SWFs would achieve the same level of returns. Nonetheless, the proposed approach leaves decisions on the prospective set-up of specific SWFs to the provinces in question. However, if provinces were to create these types of funds, the author would recommend that they observe the Santiago Principles[31], which are set in place as a framework to govern SWFs. Provinces, however, do have a good Canadian example of a non-commodity based Sovereign Wealth Fund from which to draw inspiration: the Canada Pension Plan (CPP). The CPP requires two thirds of Canada's population and provinces to agree to make any changes to the plan, which is a higher standard than is required to change the Constitution. As a result, there has been no attempt by the federal government to "raid" the fund for current spending (Drohan, 2012, p.20). There is no shortage of advice on how a SWF can be designed. Although numerous funds exist, the biggest obstacle to implementing this type fund – and/or this proposal – is the lack of political will. Any policy decision concerning Equalization will ultimately come down to a decision on the trade-off between equity and efficiency.

Conclusion

It is worth stressing that there is no "correct" Equalization formula. The one provided in the proposed reform above is simply in the author's opinion, the soundest approach to managing the negative effects of non-renewable natural resource revenues. Proponents of the Equalization

[31] The Santiago Principles are a set of 24 distinct voluntary directives that provide rules for the operations and investment decisions of Sovereign Wealth Funds. With the guidance of the International Monetary Fund (IMF) and the International Forum of Sovereign Wealth Funds (formerly the International Working Group of Sovereign Wealth Funds), these principles were established in 2008 with 25 countries signing on. The Principles' main objective is to provide guidance and guarantee that investment decisions are based on "economic and financial risk return-related considerations" (Behrendt 2010, p.4).

program have often called it "the glue that holds Confederation together." However, it is evident that the current system of Equalization is not efficaciously structured to negate distortions and imbalances caused by unequal natural resource endowments. In fact, fiscal disparities in Canada are increasingly propelled by differences in commodity distribution. The production of revenues by extracting renewable resources today – such as by the forestry industry – implies that sometime in the future, if an adequate sustainable program such as reforestation is in place, we can keep reaping the rewards of this resource. However, in order to achieve the same results with non-renewable resources, the revenues generated from this base must be invested in some form of fund that can produce a continuous flow of income.

Of course, while including the accumulation and repayment of debt in other funds in the Equalization calculations may strongly incentivize federal and provincial governments to streamline their spending and tax policies and build SWFs for future benefit, the lure of "province-building" and tax competition may still exist. Furthermore, it may be quite difficult to implement such a proposal given the very high current deficits and debt-to-GDP ratios of the provinces. The reform proposed at this juncture, albeit a partial solution, if implemented can address some of the key concerns of inefficiency and equity in the Canadian federation both by making a fairer accounting of provinces' true fiscal capacities and by nudging them toward securing their futures though SWFs. Nevertheless, Canadian provinces cannot blindly adopt any one country's SWF model. Norway, for instance, is a unitary state that is able to establish one national SWF to serve its purposes and can thus take decisive action to mitigate petrodollar (or petrokronor) type effects. With each of Canada's provinces running very different economies, the provinces will have to establish a SWF model that best suits a federal state.

Additionally, the impact of this type of policy is best appreciated over the long term, since short term gains in terms of fiscal capacity are relatively small, though the federal savings on Equalization payments, even in the short term ($14.6 billion) are significant.. Given that federal and provincial politicians in Canada tend to face an electoral timeframe of roughly four years, a reform such as the one presented above may not prove particularly inspiring to them. However, the stakes remain high for both levels of government as each faces its own fiscal pressures, a fact made amply evident during the 2009 recession. It is especially vital that research into reforms addressing both federal and provincial concerns regarding fiscal disparities be undertaken soon, given the unsustainability of the current program. Nonetheless, as former Bank of Canada governor David Dodge concluded,

> *"No matter how the Equalization formula is modified, it is unlikely to be able to satisfy the constitutional demand of comparable services at comparable tax levels. And in all likelihood, the best that these transfers will be able to support is a minimum acceptable level of provincial services at a not unreasonably higher level of provincial taxation" (Ivison, 2012).*

Appendix A: Calculation of Equalization Payments

B_j^i = Size of tax base j in province i

$B_j = \sum_{i=1}^{10} B_j^i$ = Total tax base j for all provinces

t_j^i = Tax rate levied by province i on tax base j

$R_j^i = t_j^i B_j^i$ = Tax revenue collected from tax base j in province i

$R_j = \sum_{i=1}^{10} R_j^i$ = Total Revenue collected from tax base j by all provinces

National average tax rate for base j

$$NATR_j = \frac{R_j}{B_j}$$

Revenue Yield: A province's ability to raise revenue for a particular tax base j

$$Revenue\ Yield_j^i = NATR_j\ x\ B_j^i = \frac{R_j}{B_j}\ x\ B_j^i$$

Province i's overall fiscal capacity

$$Total\ Fiscal\ Capacity^i = \sum_{j=1}^{4} Revenu\ Yield_j^i = \sum_{j=1}^{4} \left(\frac{R_j}{B_j}\ x\ B_j^i\right)$$

$P^i = Population\ in\ province\ i$

$$P = \sum_{i=1}^{10} P^i = Population\ of\ Canada$$

Per-capita Fiscal Capacity

$$Per\ Capita\ Fiscal\ Capacity_j^i = \frac{NATR_j\ x\ B_j^i}{P^i} = \left(\frac{R_j}{B_j}\ x\ B_j^i\right)\frac{1}{P^i}$$

$$Per\ capita\ fiscal\ fapacity^i = \frac{\sum_{j=1}^{4} Revenu\ Yield_j^i}{P^i} = \frac{\sum_{j=1}^{4}\left(\frac{R_j}{B_j}\ x\ B_j^i\right)}{P^i}$$

The total pre-cap Equalization entitlement for province i category j

$$E_j^i = NATR_j(b_j - b_j^i)P^i$$

$b_j^i = \frac{B_j^i}{P^i} = per\ capita\ size\ of\ the\ tax\ base\ j$

$b_j = \frac{B_j}{P} = The\ average\ tax\ base\ per\ capita\ for\ category\ j$

$r_j^i = \frac{R_j^i}{P^i} = t_j^i b_j^i = per\ capita\ Tax\ revenue\ collected\ from\ tax\ base\ j\ in\ province\ i$

$r_j = \frac{R_j}{P} = The\ average\ tax\ revenue\ collected\ per\ person, among\ all\ provinces\ in\ base\ j$

The total pre-cap Equalization entitlement for province i category of natural resources

$E_{resource}^i = 0.5t_{resource}(b_{resource} - b_{resource}^i)P^i$

Imposing the Fiscal Capacity Cap

The current Equalization formula partially excludes resource revenues, which makes it probable that a resource-rich receiving province will end up with a post-Equalization fiscal capacity that is significantly greater than a resource-poor receiving province's or even that of a non-receiving province's fiscal capacity. When the excluded resources revenues are re-included in the total fiscal capacity measure of a province, it is also conceivable that an Equalization payment may raise a province's total fiscal capacity above that of a resource-poor receiving province or of a non-receiving province.

In order to avert this type of situation, the current program includes two fiscal capacity caps, which have being implemented to ensure equity among provinces.

1) If more than half of the Canadian population resides in Equalization-receiving provinces, the fiscal capacity cap will be equal to the average total fiscal capacity of the receiving provinces, while including 100 percent of natural resource revenues.
2) If not, the fiscal capacity cap will be equal to the total fiscal capacity of the lowest non-receiving province, while including 100 percent of natural resource revenues.

Imposing the Growth Ceiling

The total Equalization payments have been established according to a growth track which is commensurate with the overall economic growth of Canada. The formula is set to ensure that the program grows at the three-year average rate of growth in nominal gross domestic product for the calendar year that ends during the fiscal year and the two previous calendar years. This amount constitutes a ceiling where total Equalization payments after the application of the fiscal capacity cap exceed this amount and otherwise will constitute a floor.

Applying the Ceiling

If the total of fiscal Equalization payments determined after the application of the fiscal capacity cap exceeds the growth track, provincial payments are reduced on an equal per-capita basis to ensure that the total payout respects the growth track. If the per-capita reduction is greater than a province's per-capita fiscal Equalization payment, the reduction for that province is limited to its fiscal Equalization payment.

Applying the Floor

If the total of fiscal Equalization payments after the application of the fiscal capacity cap is less than the growth track, provincial payments are increased on an equal per-capita basis to ensure that the total payout respects the growth track. Any province not receiving a fiscal Equalization payment may also receive an adjustment payment, but only to the extent that its total per-capita fiscal capacity would otherwise fall below that of other receiving provinces.

Note: Formula as per Department of Finance

Appendix B: Natural Resource Revenue Sources

Renewable Resources

1. Forestry Revenues / Sale or Lease of Crown Lands
2. Forestry Revenues / Sale or Lease of Private Lands
3. Water Power Rental Revenues
4. Hydroelectric Government Business Enterprise Revenues

Non-Renewable Resources

1. Conventional New Oil Revenues
2. Conventional Old Oil Revenues
3. Heavy Oil Revenues
4. Oil Export Charges
5. Mined Oil Revenues
6. Light and Medium Third-tier Oil Revenues
7. Heavy Third-tier Oil Revenues
8. Natural Gas Revenues (Domestic and Exports)
9. Sales of Crown Leases
10. Other Oil and Gas Revenues
11. Mining Revenues
12. Shared Revenues: Offshore Activities / Newfoundland and Labrador
13. Shared Revenues: Offshore Activities / Nova Scotia

Source: Department of Finance

Appendix C: Constitution of Canada: Sections Related to Equalization Payments

Section 36 reads:

" (1) Without altering the legislative authority of Parliament or of the provincial legislatures, or the rights of any of them with respect to the exercise of their legislative authority Parliament and the legislatures, together with the government of Canada and the provincial governments, are committed to

(a) Promoting equal opportunities for the well-being of Canadians;
(b) Furthering economic development to reduce disparity in opportunities; and
(c) Providing essential public services of reasonable quality to all Canadians.

(2) Parliament and the government of Canada are committed to the principle of making Equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation"

Section 92 (A) reads:

(1) In each province, the legislature may exclusively make laws in relation to
(a) Exploration for non-renewable natural resource in the province;
(b) Development, conservation and management of non-renewable natural resources and forestry resources in the province, including laws in relation to the rate of primary production therefrom; and
(c) Development, conservation and management of sites and facilities in the province for the generation and production of electrical energy.

(2) In each province, the legislature may make laws in relation to the export from the province to another part of Canada of the primary production from non-renewable natural resources and forestry resources in the province and the production from facilities in the province for the generation of electrical energy, but such laws may not authorize or provide for discrimination in prices or in supplies exported to another part of Canada.

(3) Nothing in subsection (2) derogates from the authority of Parliament to enact laws in relation to the matters referred to in that subsection and, where such a law of Parliament and a law of a province conflict, the law of Parliament prevails to the extent of the conflict.

(4) In each province, the legislature may make laws in relation to the raising of money by any mode or system of taxation in respect of
(a) Non-renewable natural resources and forestry resources in the province and the primary production therefrom, and
(b) Sites and facilities in the province for the generation of electrical energy and the production therefrom, whether or not such production is exported in whole or in part from the province, but such laws may not authorize or provide for taxation that differentiates between production exported to another part of Canada and production not exported from the province.

(5) The expression "primary production" has the meaning assigned by the Sixth Schedule.

(6) Nothing in subsections (1) to (5) derogates from any powers or rights that a legislature or government of a province had immediately before the coming into force of this section.

Appendix D: List of Abbreviations

Abbreviation	Name
NL	Newfoundland and Labrador
PE	Prince Edward Island
NS	Nova Scotia
NB	New Brunswick
QC	Quebec
ON	Ontario
MB	Manitoba
SK	Saskatchewan
AB	Alberta
BC	British Columbia
AHSF	Alberta Heritage Savings Fund
BIH	Bird-In-Hand
NFB	Net Fiscal Benefit
PIH	Permanent Income Hypothesis
PRIM	Permanent Resource Income Model
RTS	Representative Tax System
SWF	Sovereign Wealth Fund

Appendix E: Results

Equalization Payments Investing 100 Percent of Non-Renewable Resource Revenues

Modeled Equalization payments

	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	Model
2007-08	918	271	1,377	1,334	5,152	0	1,597	1,150	0	0	11,799
2008-09	946	301	1,507	1,478	5,789	0	1,863	980	0	0	12,864
2009-10	881	328	1,682	1,607	7,062	0	1,829	747	0	0	14,136
2010-11	754	336	1,729	1,639	8,140	1,492	1,866	146	0	0	16,103
2011-12	613	338	1,609	1,536	7,768	3,023	1,703	0	0	0	16,591
2012-13	339	343	1,605	1,514	7,131	3,742	1,666	0	0	0	16,338

Note: Amounts correspond to pre-cap Equalization payments for all receiving
($Millions)

Actual Equalization Payments

	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	Actuals
2007-08	822	294	1,465	1,477	7,160	0	1,826	677	0	0	13,720
2008-09	803	322	1,553	1,584	8,028	0	2,063	520	0	0	14,874
2009-10	293	347	1,645	1,727	9,346	980	2,042	163	0	0	16,542
2010-11	0	356	1,675	1,733	10,758	3,434	2,067	0	0	0	20,023
2011-12	0	346	1,552	1,577	9,641	3,831	1,818	0	0	0	18,765
2012-13	0	349	1,575	1,559	8,923	4,376	1,775	0	0	0	18,556

Note: Amounts correspond to pre-cap Equalization payments for all receiving
($Millions)

Estimated Difference

	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	ALL
2007-08	96	-23	-88	-143	-2,008	0	-229	473	0	0	-1,921
2008-09	143	-21	-45	-106	-2,239	0	-201	460	0	0	-2,010
2009-10	588	-19	37	-119	-2,284	-980	-213	584	0	0	-2,406
2010-11	754	-21	54	-95	-2,618	-1,941	-201	146	0	0	-3,920
2011-12	613	-8	57	-41	-1,873	-808	-115	0	0	0	-2,174
2012-13	339	-6	30	-45	-1,792	-634	-109	0	0	0	-2,218

Note: Amounts correspond to pre-cap Equalization payments for all receiving
($Millions)

Equalization Payments Investing 30 Percent of Non-Renewable Resource Revenues

Modeled Equalization payments

	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	Model
2007-08	788	320	1,609	1,584	7,786	0	1,974	367	0	0	14,428
2008-09	767	349	1,695	1,688	8,445	1,484	2,218	100	0	0	16,747
2009-10	192	378	1,789	1,804	9,792	3,661	2,191	0	0	0	19,807
2010-11	0	387	1,774	1,858	10,961	6,145	2,248	0	0	0	23,373
2011-12	0	378	1,673	1,708	9,902	6,627	2,009	0	0	0	22,297
2012-13	0	380	1,693	1,690	9,104	7,112	1,952	0	0	0	21,930

Note: Amounts correspond to pre-cap Equalization payments for all receiving *($Millions)*

Actual Equalization Payments

	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	Actuals
2007-08	822	294	1,465	1,477	7,160	0	1,826	677	0	0	13,720
2008-09	803	322	1,553	1,584	8,028	0	2,063	520	0	0	14,874
2009-10	293	347	1,645	1,727	9,346	980	2,042	163	0	0	16,542
2010-11	0	356	1,675	1,733	10,758	3,434	2,067	0	0	0	20,023
2011-12	0	346	1,552	1,577	9,641	3,831	1,818	0	0	0	18,765
2012-13	0	349	1,575	1,559	8,923	4,376	1,775	0	0	0	18,556

Note: Amounts correspond to pre-cap Equalization payments for all receiving *($Millions)*

Estimated Difference

	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	ALL
2007-08	-34	26	144	108	626	0	148	-310	0	0	708
2008-09	-37	28	142	104	416	1,484	155	-420	0	0	1,873
2009-10	-101	31	144	77	447	2,681	149	-163	0	0	3,266
2010-11	0	31	99	124	203	2,711	182	0	0	0	3,350
2011-12	0	31	120	132	261	2,796	191	0	0	0	3,532
2012-13	0	31	119	131	181	2,736	177	0	0	0	3,374

Note: Amounts correspond to pre-cap Equalization payments for all receiving *($Millions)*

Average Per-capita Fiscal Capacity by Province – Investing 100 Percent of Non-Renewable Resource Revenues

Newfoundland and Labrador

	Model	Actual	Difference
2007-08	4,370	4,719	-349
2008-09	4,734	5,164	-430
2009-10	5,230	6,521	-1,290
2010-11	5,639	7,469	-1,830
2011-12	5,842	7,632	-1,790
2012-13	6,465	8,444	-1,979

Prince Edward Island

	Model	Actual	Difference
2007-08	4,181	4,180	1
2008-09	4,399	4,398	1
2009-10	4,584	4,583	1
2010-11	4,705	4,705	0
2011-12	4,634	4,634	0
2012-13	4,711	4,711	1

Nova Scotia

	Model	Actual	Difference
2007-08	4,679	4,749	-69
2008-09	4,968	5,072	-103
2009-10	5,166	5,340	-174
2010-11	5,281	5,488	-208
2011-12	5,336	5,455	-118
2012-13	5,426	5,501	-75

New Brunswick

	Model	Actual	Difference
2007-08	4,375	4,348	27
2008-09	4,610	4,621	-10
2009-10	4,806	4,781	25
2010-11	4,930	4,954	-23
2011-12	4,998	5,001	-3
2012-13	5,114	5,097	17

Quebec

	Model	Actual	Difference
2007-08	5,467	5,365	103
2008-09	5,818	5,675	143
2009-10	6,036	5,872	164
2010-11	6,069	5,879	190
2011-12	6,052	5,869	183
2012-13	6,221	6,036	185

Ontario

	Model	Actual	Difference
2007-08	6,579	6,558	21
2008-09	6,807	6,815	-8
2009-10	7,025	7,018	7
2010-11	7,009	7,008	1
2011-12	6,819	6,815	5
2012-13	6,845	6,840	5

Manitoba

	Model	Actual	Difference
2007-08	4,785	4,752	33
2008-09	4,993	4,974	19
2009-10	5,418	5,374	44
2010-11	5,566	5,548	17
2011-12	5,642	5,605	37
2012-13	5,767	5,721	46

Saskatchewan

	Model	Actual	Difference
2007-08	4,991	5,631	-640
2008-09	5,589	6,205	-616
2009-10	6,210	6,932	-722
2010-11	6,980	8,319	-1,339
2011-12	7,428	8,267	-839
2012-13	7,720	8,466	-747

Alberta			
	Model	Actual	Difference
2007-08	7,927	9,583	-1,656
2008-09	9,133	10,673	-1,541
2009-10	10,143	11,438	-1,296
2010-11	11,023	12,091	-1,069
2011-12	10,972	11,424	-452
2012-13	10,939	11,351	-412

British Columbia			
	Model	Actual	Difference
2007-08	6,322	6,340	-18
2008-09	6,944	6,918	26
2009-10	7,521	7,478	42
2010-11	7,675	7,718	-44
2011-12	7,525	7,514	11
2012-13	7,523	7,453	70

Total Resource Fiscal Capacity by Province – Investing 100 Percent of Non-Renewable Resource Revenues *($ millions)*

Modeled Resource Fiscal Capacity

	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	Total
2007-08	74	1	10	57	1,399	1,158	120	132	646	2,107	5,702
2008-09	75	1	16	58	2,061	599	128	222	1,204	2,304	6,668
2009-10	89	0	27	55	2,367	211	133	345	1,798	2,168	7,193
2010-11	139	0	43	55	2,849	225	135	438	2,420	1,882	8,187
2011-12	237	0	66	50	2,914	208	140	578	3,043	1,661	8,897
2012-13	348	0	83	54	2,933	186	145	694	3,551	1,828	9,823

Note: Includes both renewable resource revenues and withdrawals from the SWF to finance public spending – assuming 100 percent savings of non-renewable resource revenues
($Millions)

Actual Resource Fiscal Capacity

	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	Actuals
2007-08	508	1	149	74	1,244	1,801	163	1,534	11,972	4,368	21,813
2008-09	591	1	226	131	1,953	1,394	212	1,663	12,577	4,385	23,134
2009-10	1,492	1	380	73	2,232	246	162	2,128	12,493	3,974	23,181
2010-11	2,135	1	476	145	2,776	417	228	3,565	12,371	4,140	26,254
2011-12	2,289	0	354	104	2,981	298	191	2,861	9,343	3,223	21,643
2012-13	2,712	0	308	83	2,960	238	178	2,928	10,125	3,030	22,563

Note: Includes both renewable resource revenues and withdrawals from the SWF to finance public spending – assuming 100 percent savings of non-renewable resource revenues
($Millions)

Wealth Accumulation of Alberta in a SWF With Extraction of 4.5 Percent of Funds at Year-End

	BIH Accumulated Wealth for Alberta - 100 percent investment rate	BIH Accumulated Wealth for Alberta - 30 percent investment rate	Heritage fund Balance for Alberta
2003-04	8.6	2.6	12.4
2004-05	19.6	5.9	12.2
2005-06	35.7	10.7	14.8
2006-07	49.8	14.9	16.6
2007-08	62.9	18.9	17.0
2008-09	77.4	23.2	13.9
2009-10	86.0	25.8	14.4
2010-11	97.6	29.3	15.2
2011-12	112.6	33.8	16.1

Note: Heritage Fund Savings information compiled from the AHSF Annual reports *($ billions)*

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