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NEW ESTIMATES OF THE INDEX OF ECONOMIC WELL-  
BEING FOR CANADA AND THE PROVINCES, 1981-2008

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# **New Estimates of the Index of Economic Well-being for Canada and the Provinces, 1981-2008**

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## **Abstract**

This report presents new estimates of the Index of Economic Well-being (IEWB) and its four domains (consumption flows, stocks of wealth, economic equality and economic security) for Canada and the provinces for the 1981-2008 period. It finds that the IEWB advanced at a 1.20 per cent average annual growth rate over the period, below the 1.58 per cent growth for GDP per capita. Both the consumption and wealth domains experienced solid advances over the period, but these developments were offset by declines in the equality and economic security domains. The IEWB addresses most of the recommendations of the recently released Commission for the Measurement of Economic Performance and Social Progress (the Stiglitz report) on what aspects of economic reality an index of economic well-being should capture.

# New Estimates of the Index of Economic Well-being for Canada and the Provinces, 1981-2008

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# **New Estimates of the Index of Economic Well-being for Canada and the Provinces, 1981-2008**

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## **Executive Summary**

In 1998, the Centre for the Study of Living Standards (CSLS) released the first estimates of the Index of Economic Well-being for Canada (Osberg and Sharpe, 1998). The Index of Economic Well-being (IEWB) is a composite index based on a conceptual framework for measuring economic well-being developed by Osberg (1985). Over the past decade, the CSLS has extended the geographical coverage of the Index to the Canadian provinces and to major OECD countries and has made a number of changes to the methodology used to construct the Index.

This report has two main objectives. The first is to outline the methodology underlying the IEWB, with emphasis on the improvements that have been achieved since 1998. The second is to present updated estimates of the IEWB for Canada and the provinces over the 1981-2008 period. The report also discusses trends in the four domains of economic well-being that make up the Index – consumption, wealth, economic equality, and economic security – as well as an analysis of the sensitivity of our results to the subjective choice of weights assigned to those four domains.

## **The Index of Economic Well-being: Motivation and Conceptual Framework**

The conceptual framework underlying the Index of Economic Well-being is based on two main ideas. First, economic well-being has multiple dimensions and an index should reflect that fact by aggregating measures of the various domains of economic well-being. Second, an index of economic well-being should reflect the fact that individuals differ (and have a moral right to differ) in the relative weights they assign to the different domains of economic welfare. In order to be useful to all individuals irrespective of those value differences, an index of well-being should make value judgments as explicit and transparent as possible.

The most frequently cited indicator of economic well-being is per-capita GDP. GDP measurement is essential for many important public policy purposes such as macroeconomic demand management and public finance. However, GDP accounting omits consideration of many issues – leisure time, longevity of life, asset stock levels, income inequality, and so on – that are important to individuals' economic welfare. Economic well-being is multidimensional; per-capita GDP reflects only one aspect of it, namely a society's output per person.

In accordance with the conceptual framework developed by Osberg (1985), the IEWB is a composite index comprised of four domains of economic welfare:

- **Per-capita consumption**
- **Per-capita wealth**
- **Economic equality**
- **Economic security.**

These four domains reflect economic well-being in both the *present* and the *future*, and account for both *average* access to economic resources and the *distribution* of that access among members of society. In basing the IEWB on data that reflect each of these domains, we are constructing an index that captures the multiplicity of dimensions of economic well-being.

Of course there are many non-economic aspects of human welfare. In focusing on *economic* well-being, we do not mean to downgrade the importance of non-economic factors. Instead, we are motivated by the idea that a better measure of “access to resources needed for a decent standard of living” is needed if economic and social trends are to be combined into an index with larger ambitions.

Indices of economic and social well-being are constructed because societies have to make public policy choices and the members of a society are, from time to time, faced with questions of the form: Would public policy X make ‘society’ better off? Since some policies may favour one dimension of well-being over another, to answer this class of question citizens need a way of ‘adding it all up’ – a way of coming to a summative judgment about impacts across the different, conceptually dissimilar domains of economic welfare. One of the aims of index construction is therefore to facilitate public policy discussion by providing a transparent means of aggregating across different dimensions of well-being.

‘Adding up’ across the domains of well-being necessarily requires an explicit or implicit value judgment about the relative importance of the domains. Since individuals have morally legitimate differences in their values, there can be no single, objectively correct way of aggregating across the domains of well-being. We argue that most indices of economic well-being (such as per-capita GDP) make important value judgments, but they do so implicitly rather than explicitly.

The IEWB addresses this issue by making all value judgments as explicit and transparent as possible. Our hypothesis is that indices of social well-being can best help individuals to come to reasonable answers about social choices if information is presented in a way that highlights the objective trends in major domains of well-being, and thereby helps individuals to come to summative judgments, while also respecting differences in values. In constructing the IEWB, individuals can select weights for the four domains in accordance with their own values. The IEWB is therefore capable of facilitating summative judgments and of clarifying why such judgments may sometimes diverge. If disagreement about policy decisions occurs, it is useful to know whether such

disagreement comes from differing empirical assessment of objective data or differing values about their relative importance.

Thus, the IEWB has two major aims: to aggregate across different dimensions of economic well-being, and to allow for such aggregation even in the presence of morally legitimate value differences.

## Methodological Developments in the IEWB

In past papers, we have described the details of the construction of the IEWB (Osberg and Sharpe, 1998, 2002a, 2005). Interested readers may consult those references. In this section, we describe only the significant methodological improvements that the IEWB has undergone since its initial publication in 1998. The following is an outline of the three major changes:

- **A linear scaling technique was introduced.** The linear scaling technique is a method of standardizing the ranges of different variables so that they all take values between zero and one. This serves two purposes. First, it prevents the IEWB from being dominated by a few underlying variables that take on very large range of values. Second, it standardizes variables in such a way that an increase is always good for economic well-being and a decrease is always bad. We note that the values of a scaled variable are always sensitive to the range of values that the scale assumes. The linear scaling technique presumes that the observed range of any variable is a reasonable starting point for the feasible range that can be taken by the variable, and this makes it sensitive to that observed range.
- **The risk of unemployment component of the IEWB was reconceptualized.** In measuring the risk from unemployment, earlier versions of the IEWB used an ‘expected value of financial loss’ approach that implicitly gave equal weight to the unemployment rate and the Employment Insurance coverage rate (Osberg and Sharpe, 1998). Based on recent evidence on the disutility of being unemployed relative to the disutility of the income loss from unemployment, it was decided to weight the unemployment rate much more heavily than the financial protection from unemployment variable (80:20), which includes the benefits replacement rate as well as the EI coverage rate.
- **The weights assigned to the four domains were adjusted.** In the original estimates of the Index of Economic Well-being the following weights were chosen: consumption flows (0.4), stocks of wealth (0.1), equality (0.25), and economic security (0.25). These weights were motivated partly by the observed proportions of consumption and aggregate savings in affluent nations, but the authors were criticized for a bias against sustainability (because of the low weight for the stocks of wealth) and for a bias in favour of material goods because of the high weight given consumption. In all our papers we have stressed the subjectivity of value judgments and have provided access to Microsoft Excel

spreadsheets so that readers can assess for themselves the implications of differing value judgments. Nevertheless, the ‘base case’ estimates of subsequent versions of the Index give equal weights to the four domains. Although this embodies the value judgment that the domains are equally important, it gives the appearance of being even-handed and balanced. However, we provide estimates of the Index based on alternative weighting schemes to show the sensitivity of the results to the weights chosen.

## **Trends in the Index of Economic Well-being, 1981-2008**

This section reports our main empirical results. For Canada, key results are the following:

- The overall Index of Economic Well-being rose 0.167 points from 0.439 in 1981 to 0.605 in 2008 in Canada. This amounts to a 38.0 per cent total increase over the period, or a compound growth rate of 1.20 per cent per year.
- The growth rate of the IEWB was lower than that of GDP per capita, the most widely used metric of living standards. Indeed, real GDP per capita in Canada over the 1981-2008 period advanced 52.6 per cent (1.58 per cent per year), 14.6 percentage points greater than the per cent growth of the Index of Economic Well-being.
- The IEWB grew at 1.46 per cent per year over 1981-1989, but fell by 0.04 per cent per year over 1989-2000. The 1980s was thus a much better decade for progress in economic well-being than the 1990s. Since 2000, growth in the Index has averaged 2.67 per cent per year, even better than in the 1980s.
- Between 1981 and 2008, the index of the per-capita consumption domain increased 0.567 points (or 209.2 per cent) from 0.271 to 0.837. Of the four domains, consumption had by far the largest increase over the period.
- The index of the per-capita wealth domain also increased, by 0.274 points (or 93.8 per cent) from 0.293 to 0.567.
- The index of the economic equality domain fell by 0.076 points (or 13.9 per cent) from 0.545 to 0.469.
- The index of the economic security domain declined by 0.099 points (or 15.3 per cent) from 0.647 to 0.548. This decline in economic security was driven entirely by a decrease in security from the financial risk of illness, as measured by out-of-pocket healthcare expenditures. In Canada, the proportion of personal disposable income being spent on healthcare increased from 2.67 per cent in 1981 to 5.42 per cent in 2008.



- Overall, the increase in economic well-being in Canada over the 1981-2008 period has been driven by the dramatic increase in per-capita consumption and wealth, and hampered by the increases in economic inequality and insecurity.

In addition, we report results for the provinces. There is significant cross-province variation in the scores for the overall IEWB and the four domain indices. Key findings are:

- Alberta had the highest value of the overall IEWB in 2008 at 0.773 points, followed by Newfoundland at 0.691 points and Saskatchewan at 0.649 points.
- Quebec and New Brunswick had the lowest overall IEWB values at 0.541 and 0.572 points, respectively.
- These results – Alberta and Newfoundland ranking first in economic well-being and Quebec ranking near the bottom – are robust to the use of different weights for the four domains. Alberta has very high scores in the consumption, wealth, and economic security domains, while Quebec is below the Canadian average in all four domains.
- Newfoundland experienced by far the strongest growth in the IEWB over the 1981-2008 period; its IEWB score increased by 0.318 points (or 85.1 per cent), from 0.373 to 0.691. Alberta had the slowest growth; its score increased by 0.160 points, or 26.1 per cent. All provinces experienced positive IEWB growth over the period.
- Between 1981 and 2008, the indices of the consumption and wealth domains increased in all provinces. Newfoundland had the most significant growth in both domains. There, the index of the consumption domain increased by an astounding 0.644 points (or 772.4 per cent) from 0.083 to 0.727, while the index of the wealth domain increased by 0.565 points (or 327.7 per cent) from 0.172 to 0.737.
- The index of the economic equality domain decreased in six provinces, which indicates growing poverty and economic inequality. British Columbia had the largest decrease in its index of equality (0.146 points, or 30.6 per cent), and its 2008 score of 0.332 in the economic equality domain was by far the lowest among the provinces.
- The index of the economic security domain fell in almost all provinces, most significantly in Ontario where it declined by 25.1 per cent. Canadians in most provinces became less economically secure. Newfoundland and Prince Edward Island were the only two provinces to show growth in the security domain since 1981.
- As in the case of Canada as a whole, the decline in economic security in most provinces was driven by decreasing security from the financial risk of illness.

Almost all the provinces experienced positive growth in private health care spending as a share of disposable income between 1981 and 2008; the only exception was Newfoundland, and it is no coincidence that overall economic security increased over the period in that province.

## **Sensitivity of Results to Value Judgments**

The overall Index is the weighted sum of the four domains, and individuals may have different opinions about the relative weighting of those domains. An important objective of the Index of Economic Well-being is to make explicit the value judgments that underlie composite indicators of well-being by making the choice of weights as transparent as possible. By testing the sensitivity of our results against changes in the weights assigned to the four domains, we can see whether or not value judgments make a significant difference in the measurement of trends in economic welfare.

Sensitivity analysis shows that our key baseline results are robust to the use of different weights for the four domains. Under all four weighting alternatives we examine, economic well-being improved in Canada and in all provinces over the 1981-2008 period. It improved most quickly in Newfoundland. Alberta and Newfoundland had the highest levels of economic well-being in 2008, while Quebec ranked at the bottom among the provinces under three out of the four alternative weighting schemes (and third from the bottom under the fourth).

## **Projecting Economic Well-being to 2010**

The IMF has referred to the recent financial crisis and the global recession it engendered in 2008 and 2009 as the most severe international financial crisis of the post-war period, so one must expect that the downturn has affected the economic well-being of people across the world. Using recent consumption and unemployment projections from the Institute for Policy Analysis, we estimate the Index of Economic Well-being for 2009 and 2010 period for Canada.

Private consumption growth is expected to slow down in Canada as a result of the recession. Consumption expenditures are projected to decline by 0.3 per cent in 2009, and the projected growth of 1.5 per cent in 2010 is well below the growth rates of recent years. More importantly, the national unemployment rate is projected to average 8.5 per cent in 2009 and 8.7 per cent in 2010. This represents a sharp increase from 6.1 per cent in 2008.

The slowdown of per-capita consumption growth and the increase in the unemployment rate cause the IEWB to decline. The projected value of the overall Index for Canada in 2009 is 0.598, down 1.25 per cent from 0.605 in 2008. The 0.598 value will hold through 2010. The decline is driven mainly by a fall in economic security. Rising unemployment produces a decrease in the index of the security domain from 0.548 to 0.521 in 2009 – a one-year drop of 4.9 per cent – and then a further 0.43 per cent drop to 0.519 in 2010.

## **The IEWB and the Recommendations of the Sarkozy Commission**

This report is being released at a time in which concern about the measurement of economic well-being is growing in the policy community. In September, 2009, the Commission on the Measurement of Economic Performance and Social Progress delivered its final report (Stiglitz *et al.*, 2009). Initiated by French President Nicolas Sarkozy and written by Nobel Prize-winning economists Joseph Stiglitz and Amartya Sen and by Jean-Paul Fitoussi, the Commission has drawn the attention of the academic and public policy communities throughout the world toward the problem of the appropriate measurement of well-being and social progress. For the first time, the government of a major country has taken the explicit position that per-capita GDP growth is an inadequate measure of economic and social progress, and that policymaking should be oriented toward a broader conceptualization of public welfare.

The Commission made twelve recommendations in its final report. Although the Index of Economic Well-being precedes the Commission report by over a decade, it anticipates the Commission's recommendations in many respects. The Index addresses most of the Commission's recommendations with regard to what an index of economic well-being should capture, and its framework is potentially capable of incorporating additional concerns such as wealth inequality and risk of environmental catastrophe. Indeed, in its discussion of composite indices of well-being, the Commission report recognizes the Index of Economic Well-being as "more elaborated [than other composite indices] and relatively well-known" (Stiglitz *et al.*, 2009:237). The Index is a work in progress and there are further improvements to be made, but we consider the Commission's report to be an indication that the development of the Index is on the right track.

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# New Estimates of the Index of Economic Well-being for Canada and the Provinces, 1981-2008<sup>1</sup>

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In 1998, the Centre for the Study of Living Standards (CSLS) released the first empirical estimates for Canada of the Index of Economic Well-being (Osberg and Sharpe, 1998), a composite index based on a conceptual framework for measuring economic well-being developed by Osberg (1985). In the past decade, the CSLS has extended the geographical coverage of the Index to the Canadian provinces and to major OECD countries and has made a number of changes to the methodology used to construct the Index. The dual objectives of this report are to review these methodological changes and to present updated estimates of the Index for Canada and the provinces for the 1981-2008 period.

The report is divided into seven main parts. The first part provides a discussion of the motivation for the development of the Index of Economic Well-being (IEWB) and the potential contributions of the Index to the debate on the measurement of economic well-being. It also outlines the basic framework of the measure. The second part of the report discusses major methodological changes incorporated into the index, namely the switch to a scaling methodology, the reconceptualization of the risk from unemployment component of the economic security domain, and the move to equal weighting for the four domains. The third part, by far the longest, provides a detailed discussion of trends in the Index of Economic Well-being, and in the four domains and sub-components of the domains, in Canada and the provinces over the last quarter century. The fourth part tests the sensitivity of our results to alternative assumptions regarding the relative weights assigned to the four domains of the Index. The fifth part provides projections of the Index through to 2010 on the basis of unemployment rate and aggregate consumption forecasts. In the sixth part, we discuss the recommendations of the recent Stiglitz Report on the measurement of economic well-being and social progress, commissioned by French President Nicolas Sarkozy. We argue that the Index of Economic Well-being addresses nearly all of the report's recommendations. The seventh part discusses some lessons learned from the authors' experience in the construction of the Index of Economic Well-being. The eighth part concludes.<sup>2</sup>

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<sup>1</sup> The authors would like to thank the following people for assistance in updating the extensive database upon which the

<sup>2</sup> The tables referred to throughout this report are located at the end of this document. We also make frequent reference to appendix tables containing the underlying data; these are available at the CSLS web site at [http://www.csls.ca/iewb2009/IEWB\\_Canada\\_AppendixTables.pdf](http://www.csls.ca/iewb2009/IEWB_Canada_AppendixTables.pdf). The database is also available in Microsoft Excel format at [http://www.csls.ca/iewb2009/IEWB\\_Canada.xls](http://www.csls.ca/iewb2009/IEWB_Canada.xls).

## I. The Index of Economic Well-being: Motivation and Framework<sup>3</sup>

A frequent refrain in the social indicators literature is the (true) statement that there is more to “well-being” than economics, but it is also widely recognized that a key component of overall well-being is economic well-being or “access to economic resources.” Although there are good grounds for thinking that national income accounting measures may not necessarily be a good guide to popular perceptions of trends in economic well-being, GDP per capita is probably the single most often mentioned criterion of economic progress.

In focusing on the economic aspects of well-being in this report we do not intend to downgrade the importance of non-economic issues. Instead, we are motivated by the idea that a better measure of “access to resources needed for a decent standard of living” is needed if economic and social trends are to be combined into an index with larger ambitions.

With respect to the economic component of societal well-being, our particular emphasis is on sustainability and on the sensitivity of measures of aggregate “command over resources” to the omission or inclusion of measures of income distribution and economic security.

Although we argue that the IEWB is superior to GDP as a measure of command over resources, we do not intend to deny the importance of obtaining an accurate count of the total money value of goods and services produced for sale in the market in a given country in a given year (i.e. GDP). Clearly, GDP measurement is essential for many important public policy purposes (e.g. macroeconomic demand management, public finance). However, GDP accounting does omit consideration of many issues (for example, leisure time, longevity of life, asset stock levels) which are important to individuals’ command over resources. Although the compilers of the national accounts may protest that their attempt to measure the aggregate money value of marketed economic output was never intended as a full measure of economic well-being, it has often been used as such. The question the critics of GDP have to answer is whether alternative measures of command over resources are possible, plausible, and make some difference.

In developing an Index of Economic Well-Being for Canada based on four dimensions of economic well-being – consumption, accumulation, economic equality, and economic security – this report attempts to construct better measures of effective consumption and societal accumulation. However, an important point of difference with other indices is that we argue that “society’s well-being” is not a single, objective number (like the average altitude of a country).

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<sup>3</sup> This section draws on Osberg and Sharpe (2005).



It is more accurate, in our view, to think of each individual in society as making a subjective evaluation of objective data in coming to a personal conclusion about society's well-being. Well-being has multiple dimensions and individuals differ (and have the moral right to differ) in their subjective valuation of the relative importance of each dimension of well-being. But because all adults are occasionally called upon, in a democracy, to exercise choices (e.g. in voting) on issues that affect the collectivity (and some individuals, such as civil servants, make such decisions on a daily basis), citizens have reason to ask questions of the form: "Would public policy X make 'society' better off?" Presumably, self-interest plays some role in all our choices, but unless self-interest is the sole criterion, an index of society's well-being is useful in helping individuals answer such questions.

Although conceptually there may be no way to measure some of the different dimensions of well-being in directly comparable units, as a practical matter citizens are frequently called upon to choose between policies that favour one or the other. Hence, individuals often have to come to a summative decision – i.e. have a way of "adding it all

#### **Exhibit 1: Conceptual Framework for the Index of Economic Well-being**

<b>Concept</b>	<b>Present</b>	<b>Future</b>
<b>"Typical Citizen" or "Representative Agent"</b>	Average flow of current income	Aggregate accumulation of productive stocks
<b>Heterogeneity of Experiences of All Citizens</b>	Distribution of potential consumption -- income inequality and poverty	Insecurity of future incomes

up" – across domains that are conceptually dissimilar. From this perspective, the purpose of index construction should be to assist individuals – e.g. as voters in elections and as bureaucrats in policy making – in thinking systematically about public policy, without necessarily presuming that all individuals have the same values.

Our hypothesis is that indices of social well-being can best help individuals to come to reasonable answers about social choices if information is presented in a way that highlights the objective trends in major dimensions of well-being and thereby helps individuals to come to summative judgments – but also respects differences in values. Although it may not be possible to define an *objective* index of societal well-being, individuals still have the problem (indeed, the moral responsibility) of coming to a *subjective* evaluation of social states, and they need organized, objective data if they are to do it in a reasonable way.

The logic of our identification of four components of well-being is that it recognizes both trends in average outcomes and in the diversity of outcomes, both now and in the future, as Exhibit 1 illustrates.

When an average flow like GDP per capita (or an alternative, such as the average personal income) is used as a summative index of well-being, the analyst is implicitly stopping in the first quadrant of Exhibit 1. He or she is assuming that the experience of a representative agent can summarize the well-being of society and that the measured income flow optimally weights consumption and savings, so that one need not explicitly distinguish between present consumption flows and the accumulation of asset stocks which will enable future consumption flows.

However, if society is composed of diverse individuals living in an uncertain world who typically “live in the present, anticipating the future,” each individual’s estimate of societal economic well-being will depend on the proportion of national income saved for the future. GDP is a measure of the aggregate market income of a society. It does not reveal the savings rate, and there is little reason to believe that the national savings rate is automatically optimal. Indeed, if citizens have differing rates of time preference, any given savings rate will only be “optimal” from some persons’ points of view. Hence, a better estimate of the well-being of society should allow analysts to distinguish between current consumption and the accumulation of productive assets (which determines the sustainability of current levels of consumption), and thereby enable citizens to apply their differing values.

As well, individuals are justifiably concerned about the degree to which they and others will share in prosperity – there is a long tradition in economics that “social welfare” depends on both average incomes and the degree of inequality and poverty in the distribution of incomes. If the future is uncertain, and complete insurance is unobtainable (either privately or through the welfare state), individuals will also care about the degree to which the economic future is secure for themselves and others.

These four domains therefore have a logical rationale, and four is a manageable number of headings. If the objective of index construction is to assist public policy discussion, one must recognize that when too many categories have to be considered simultaneously, discussion can easily be overwhelmed by complexity. We therefore do not adopt the strategy of simply presenting a large battery of indicators. However, because reasonable people may disagree in the relative weight they would assign to each dimension (e.g. some will argue that inequality in income distribution is highly important while others will argue the opposite), we argue that it is preferable to be explicit and open about the relative weights assigned to components of well-being, rather than leaving them implicit and hidden. (An additional reason to distinguish the underlying components of economic well-being is that for policy purposes it is not particularly useful to know only that well-being has gone “up” or “down”, without also knowing which aspect of well-being has improved or deteriorated.) We specify *explicit* weights to the components of well being and test the sensitivity of aggregate trends to changes in those weights, in order to enable others to assess whether, based on their personal values about what is important in economic well-being, they would agree with an overall assessment of trends in the economy.

This report’s basic hypothesis – that a society’s economic well-being depends

on total consumption and accumulation, and on the individual inequality and insecurity that surround the distribution of macroeconomic aggregates – is consistent with a variety of theoretical perspectives. We do not present here a specific, formal model. In a series of papers (Osberg and Sharpe, 1998, 2002a, and 2005) we have described the details of the calculation of the four components or dimensions of economic well-being:

- [1] effective per capita consumption flows – which include consumption of marketed goods and services, government services, and adjustment of effective per-capita consumption flows for household production, changing household economies of scale, leisure, regrettable expenditures, and life expectancy;
- [2] net societal accumulation of stocks of productive resources – which consists of net accumulation of physical capital, the value of natural resources stocks, net international investment position, accumulation of human capital, and R&D stocks, as well as an adjustment for costs associated with environmental degradation;
- [3] economic equality – the intensity of poverty (incidence and depth) and the inequality of income;
- [4] economic security from job loss and unemployment, illness, family breakup, and poverty in old age.

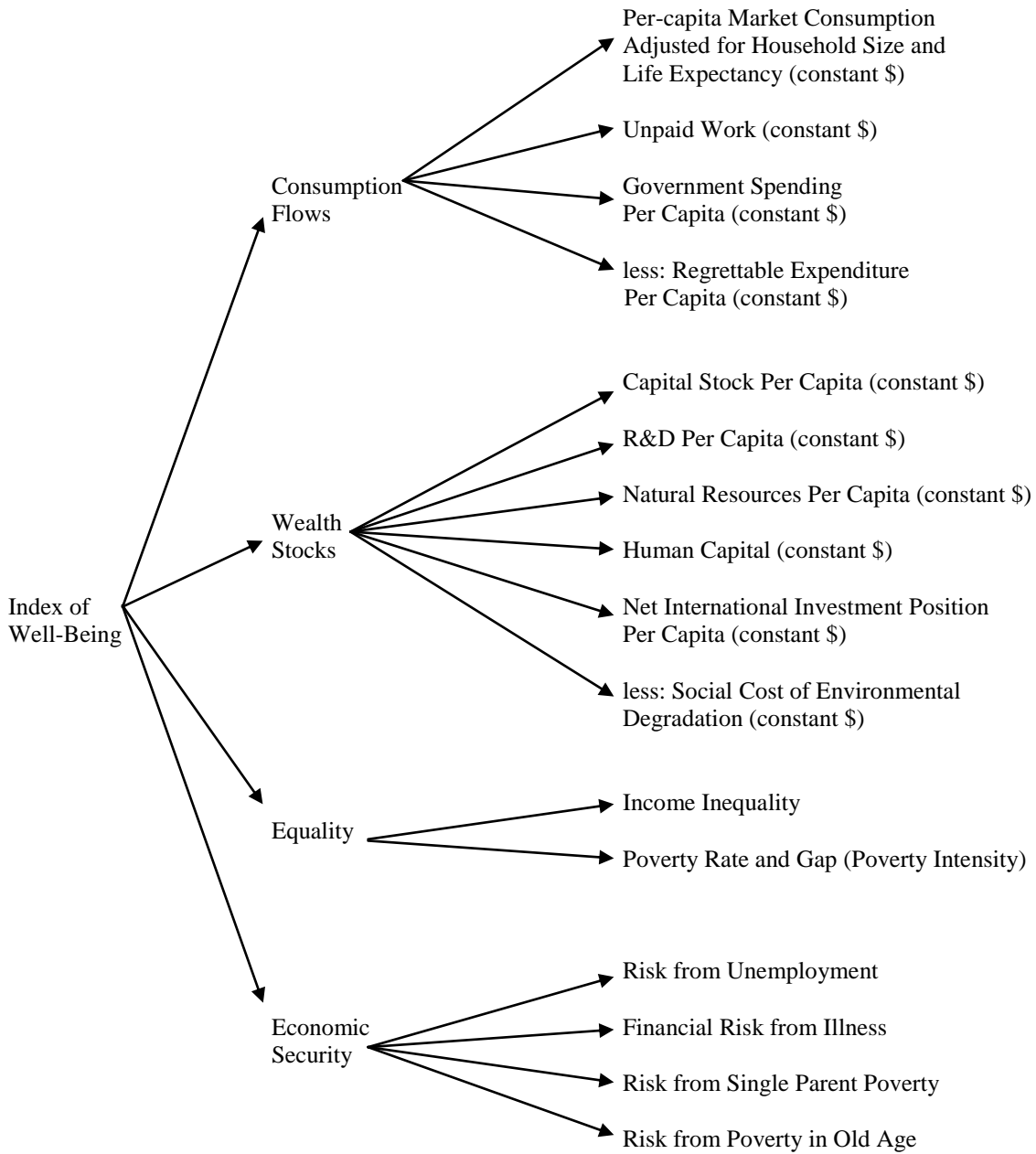
Each domain of economic well-being is itself an aggregation of many underlying variables, on which the existing data can be of uncertain quality. By contrast, the System of National Accounts has had many years of development effort by international agencies (particularly the UN and the IMF), and has produced an accounting system for GDP that is rigorously standardized across countries. However, using GDP per capita as a measure of “command over resources” would implicitly:

- (1) assume that the aggregate share of income devoted to accumulation (including the public capital stock, human capital, research and development and the value of unpriced environmental assets) is automatically optimal, and
- (2) set the weight of income distribution and economic insecurity to zero, by ignoring entirely their influence.

Neither assumption seems justifiable, and neither is innocuous.

Due to data limitations, estimates of the Index of Economic Well-being computed for different geographical regions may differ in the number of variables that can be included in the calculations. Exhibit 2 illustrates the components that are used in our estimates of the Index of Economic Well-being for Canada and the provinces, based on the four domains outlined above.

## Exhibit 2: The CSLS Index of Economic Well-being: Weighting Tree for Canada and the Provinces



## II. Methodological Developments in the Index of Economic Well-being

The Index of Economic Well-being is a work in progress and has been subject to a number of changes in methodology during its decade of existence. This part of the report reviews the major methodological developments that have affected the Index.

### A. Introduction of Linear Scaling

An essential question that underlies discussions of index methodology is: Should a single variable be scaled, and if so, what is the meaning or interpretation of a scaled variable (Sharpe and Salzman, 2003)? The key reason why it may be necessary to scale variables is that raw data have significantly different proportional ranges. In a standard index number approach, a raw variable is normalized to 100 in a base year and changes over time represent per cent changes in the underlying variable. The problem with this is that trends in the overall composite index will be dominated by variables with large proportional ranges because their per cent changes are larger.

As a hypothetical example, suppose the unemployment rate ranges over time between one and ten per cent, while per-capita consumption ranges between \$25,000 and \$45,000. The unemployment rate has a proportional range of 900 per cent ( $900 = 100 \cdot (10-1)/1$ ), while per-capita consumption has a proportional range of 80 per cent ( $80 = 100 \cdot (45,000-25,000)/25,000$ ). In a composite index, the unemployment rate would dominate per-capita consumption because the unemployment rate would experience much larger per cent changes over time. Meaningful changes in per-capita consumption would have a much smaller impact on the overall index, simply because they are proportionally smaller.

Thus, an unscaled aggregation of sub-indexes has an implicit weighting scheme. When the variables are aggregated without scaling, higher implicit weights are assigned to the variables that have large proportional ranges because their percentage increases are larger.<sup>4</sup> Linear scaling addresses this problem by standardizing the range of every variable. All the scaled variables have an identical absolute range (the  $[0,1]$  interval), and thus the same proportional range.

An additional motivation for the standardization of variables is the fact that increases in some variables, such as consumption flows, correspond to increases in overall well-being, whereas increases in other variables, such as unemployment, correspond to decreases in overall well-being. We call this the directionality issue. We want to standardize variables so that an increase in the standardized score corresponds to

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<sup>4</sup> Another way of seeing this problem is to note that a variable with a low base compared to the range of values can skew the composite index and cause small absolute changes in this variable to overwhelmingly affect the composite. For example, if the unemployment rate ranges from 0.5 per cent to 5.5 per cent, a change from 0.5 per cent to 5.5 per cent will be a ten-fold increase. However, for a different range, say between 10 per cent and 15 per cent, the same absolute change, of 5 percentage points, will only represent a 1.5-fold increase.

increase in overall well-being. The procedure of linear scaling, which produces a scaled variable as the standardized variable, provides a methodologically consistent way to standardize variables so that their increases correspond to increases in well-being. The procedures used to handle the directionality originally used in the Index of Economic Well-being had shortcomings.<sup>5</sup>

Linear Scaling Technique (LST) is a procedure used to standardize the range of a variable. To do this, an estimate is made for the high and low values which represent the possible range of a variable for all time periods and for all countries, and denoted Min and Max, respectively. The actual range of values may also be used. The data are then scaled according to these values. If an increase in a variable corresponds to an increase in overall welfare, the variable, VALUE, is scaled according to the formula

$$(1) \frac{\text{Value}-\text{Min}}{\text{Max}-\text{Min}}$$

In this case, we see that increases in the VALUE correspond to increases in scaled VALUE. Notice that if the Min is equal to zero, the formula above reduces to VALUE/Max.

If, in contrast, an increase in VALUE corresponds to decrease in overall welfare, the VALUE is scaled according to the complementary formula,

$$(2) \frac{\text{Max}-\text{Value}}{\text{Max}-\text{Min}}$$

In this case, we see that increases in the VALUE correspond to decreases in the scaled VALUE. In both cases, the range of values is 0-1, and 0 corresponds to the lowest level of welfare, and 1 corresponds to the highest. Note that this formula reduces to (Max-Value)/Max when Min is set to 0. This technique is used to scale all variables in many indices, including the Human Development Index.

Overall the linear scaling procedure has worked fairly well in the Index of Economic Well-being, particularly in resolving the directionality problem. However, there are certain weaknesses to this approach. First, the choice of the set of values used in the scaling procedure affects the results. For example, we have produced IEWB estimates for Canada alone and for Canada and the provinces together. The results for Canada when the scaling procedure is run with only the values for Canada differ significantly

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<sup>5</sup> The first procedure used was to take the reciprocal of the index values of the series. Thus a doubling, and then a tripling of the unemployment rate, from 4 to 8 to 12 per cent (or in index form from 1.0 to 2.0 to 3.0), results in a series of 1, 0.5, and .33. The weakness of this procedure is that it is not a linear transformation, which can skew the results. The second procedure used was to apply a linear transformation to the series by multiplying the series by -1 and then adding 2. The index values of the unemployment rate (1, 2, 3) would be transformed into 1, 0, and -1. Disadvantages of this procedure include a lack of transparency, the introduction of negative numbers into the time series, which confuses readers, and the perverse effects that a time series which includes a value of zero 0 can have when multiplicative operations are made (multiplication by zero gives zero).

from the results for Canada when the scaling procedure uses values for Canada *and* the provinces. The range of the values is much greater when the provinces are included. By definition, some provincial values must always be smaller than the average values for Canada and some must always be greater. Thus, the range of the *scaled* values for Canada is much smaller when the provinces are included because the denominator in equations (1) and (2) is larger.

Second, it is not always clear that the same range (0 to 1) for all variables is in fact desirable. For example, the Human Development Index (HDI) of the UNDP is another well-known index that uses the linear scaling technique. The HDI contains, as one of its three components, an index of the length of life. Because the index is linear, the implicit assumption is that a marginal additional year of life always has the same value, whether life expectancy is increasing from 38 to 39 or from 88 to 89.<sup>6</sup> It is not obvious that this is appropriate.

Third, the linear scaling method presents problems when new values outside the existing range of values are added. If there is an upward trend in a time series, each new scaling procedure will produce new scaled values for the series, and make obsolete the old series. An adjustment to the minimum and maximum values can in the short run resolve this problem when the range of actual values is used for scaling. For example, in the calculations used in this report, we subtracted 10 per cent of the value from the minimum value and added 10 per cent to the maximum value to create the range used in the scaling procedure. However, when new values exceed these adjusted minimums and maximums, rescaling will be needed.

Fourth, the linear scaling approach implies that per cent changes in the scaled values, unlike absolute percentage-point changes, are not easily comparable across variables because the range of values used for per cent calculations varies among variables and it forms the base that determines the percentage change. A lack of comparisons based on per cent changes of variables, and only based on percentage-point changes, would impoverish the analysis of trends in variables. In this report we have included reference to per cent changes in scaled values, although further research on the appropriateness of this is required.

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<sup>6</sup> Income inequality indices provide a subtler example of the problems of linearity. An index like the Gini coefficient can only range over a subset of values on the real line. Although the conceptual maximum for the Gini is 1.0 (where one individual has all the income), this is not a practical possibility because people without income do not survive. The 'practical maximum' for the Gini corresponds to a state of affairs in which everybody except a small elite (in the limit, one person) gets only a subsistence income, and the elite gets all the rest; it depends on the ratio of average income to subsistence income. A given change in the Gini index (e.g. by 0.02) might reflect the sort of change (from 0.26 to 0.28) we have seen in Denmark recently, or it could reflect a change (e.g. from 0.85 to 0.87) in which the last few non-elite to have above-subsistence incomes are driven down to bare subsistence. These changes differ significantly in social implications, but the linearity assumption rules out differing marginal values for the same index change and also rules out a dependence on the average level of income.

## B. Conceptualization of the Risk to Unemployment

Undoubtedly the most controversial aspect of the Index of Economic Well-being has been the risk of unemployment component of the economic security domain. In the first version of the Index (Osberg and Sharpe, 1998), it was the large downward trend in this component that was driving the overall economic security domain and hence the overall Index. The risk of unemployment component was in turn being driven by the fall in the Employment Insurance (EI) coverage rate (the ratio of EI beneficiaries to unemployed). The modeling of the risk of unemployment was done from an “expected value of financial loss” perspective. This motivated a probabilistic approach where the probability of obtaining a job (proxied first by the employment rate and currently by the unemployment rate) was multiplied by the probability of receiving EI benefits if unemployed and by the fraction of wages replaced by those benefits. This methodology led to large changes in the overall risk to unemployment variable as a result of the large fall in the EI coverage rate.

In the recent work updating Index of Economic Well-being estimates for the provinces, the methodology described above has been changed to reflect recent work on self-reported happiness that assesses the disutility implied by unemployment *per se* compared to the disutility from the financial loss arising from unemployment (Di Tella, MacCulloch, and Oswald, 2003). The probability of finding a job if laid off is more important than the probability of obtaining unemployment benefits if unemployed in the determination of the overall risk arising from unemployment. Consequently, our revised estimates weight the unemployment rate much more heavily than the financial protection from unemployment variable (80:20). It was also decided to make the unemployment rate and the financial protection rate additive, not multiplicative. This change had the effect of dampening the evolution of the risk of unemployment component over time.

## C. Weighting of four domains

Probably the most controversial issue in the construction of composite indexes is the weighting scheme. Results can indeed be very sensitive to the choice of weights. In the original estimates of the Index of Economic Well-being the following weights were chosen: consumption flows (0.4), stocks of wealth (0.1), equality (0.25), and economic security (0.25). Although the weights reflected observed aggregate proportions for consumption and savings, the authors were criticized for a bias against sustainability because of the low weight for the stocks of wealth. In subsequent versions of the Index, the baseline estimates give equal weights to the four domains. Although this reflects the value judgment that the domains are equally important, it appears even-handed and balanced. We do however provide estimates of the Index based on alternative weighting schemes to show the sensitivity of the results to the weights chosen.



### III. Trends in the Index of Economic Well-being for Canada and the Provinces, 1981-2008

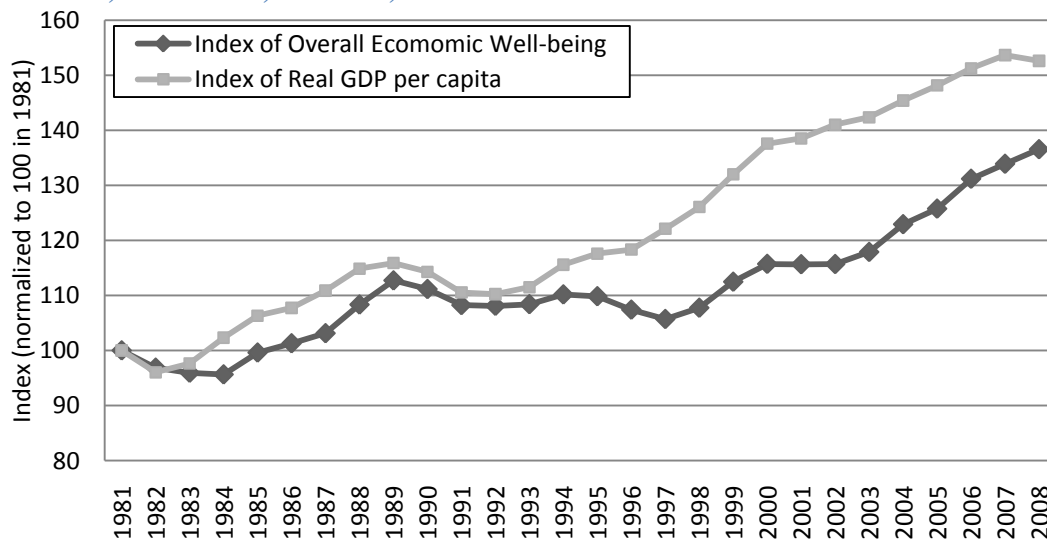
#### A. Overall Trends in the Index of Economic Well-being

##### i. Trends in Canada

The scaled value of the overall Index of Economic Well-being rose 0.167 points from 0.439 in 1981 to 0.605 in 2008 in Canada (Table 1).<sup>7</sup> This amounts to a 38.0 per cent total increase over the period, or an average annual rate of change of 1.20 per cent. This rate of growth is less than that of GDP per capita, the most widely used metric of living standards and sometimes seen as a proxy for economic well-being. Indeed, real GDP per capita in Canada over the 1981-2008 period advanced 52.6 per cent (1.58 per cent per year), 0.38 percentage points per year faster than the rate of increase of the Index of Economic Well-being (Tables 1 and 2 and Chart 1).

The rate of advance of the Index of Economic Well-being for Canada was not steady over the 1981-2008 period. The Index fell in the early years of the 1980s, advanced strongly during the 1984-1989 period, then fell from 1990 to 1993 and again in 1996. It picked up strongly in the 1997-2001 period. Progress stalled in 2002, but has since seen strong gains between 2003 and 2008.

**Chart 1: Trends in the Overall Index of Economic Well-being and GDP per Capita, Canada, 1981-2008, Indexed, 1981=100**



Source: Tables 1 and 2

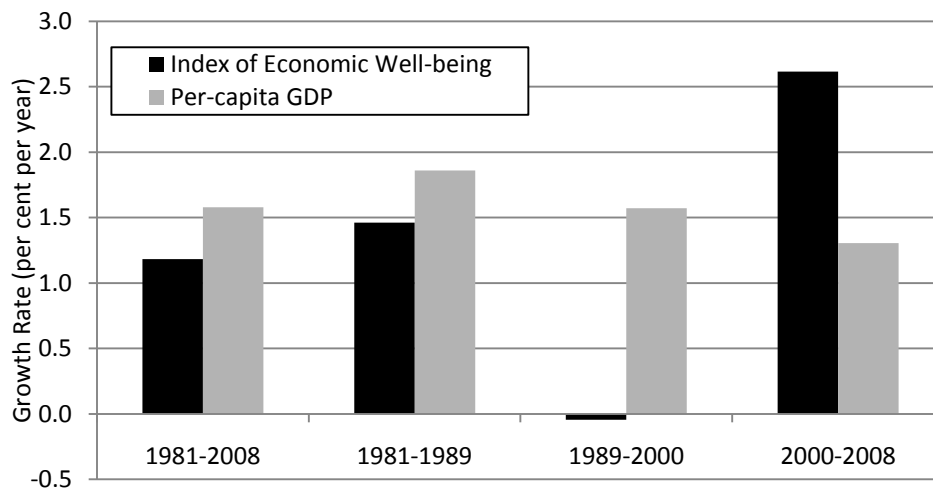
<sup>7</sup> All tables are located at the end of this document. Appendix tables can be accessed at [http://www.csls.ca/iewb2009/IEWB\\_Canada\\_AppendixTables.pdf](http://www.csls.ca/iewb2009/IEWB_Canada_AppendixTables.pdf).

The years 1981, 1989 and 2000 were well-defined business cycle peaks in Canada. The year 2008 may also be considered a business cycle peak, since GDP increased 0.5 per cent in that year and has fallen significantly in 2009.<sup>8</sup> From a peak to peak perspective, which controls for cyclical fluctuations, the Index of Economic Well-being grew at 1.46 per cent per year over 1981-1989, but fell by 0.04 per cent per year over 1989-2000. The 1980s was thus a much better decade for progress in economic well-being than the 1990s. Since 2000, growth in the Index has averaged 2.67 per cent per year, even better than in the 1980s.

The pattern of advance and decline in the Index of Economic Well-being for Canada corresponds roughly to that of GDP per capita (Chart 1), with economic expansions characterized by growth in both the Index of Economic Well-being and in GDP per capita, and with recessions and periods of economic stagnation characterized by declines in both variables. This relationship of course reflects the fact that some components of the Index of Economic Well-being, such as consumption, are included in GDP and that other components are correlated with or driven by GDP trends.

However, there are periods (such as the early 1990s) during which the Index and per-capita GDP diverge. The rate of advance of GDP per capita was remarkably similar in the three sub-periods of the overall 1981-2008 period: 1.86 per cent per year in 1981-1989, 1.57 per cent in 1989-2000 (although growth in the first half of the 1990s was much weaker than the second half), and 1.30 per cent over 2000-2008 (Table 2 and Chart 2). In the first of the three cyclically-neutral sub-periods, GDP per capita advanced at an

**Chart 2: Growth of the Index of Economic Well-being and Per-capita GDP, Canada, 1981-2008**



Source: Tables 1 and 2.

<sup>8</sup> Note, however, that Canada's GDP per capita declined by 0.7 per cent in 2008, as population growth exceeded GDP growth.

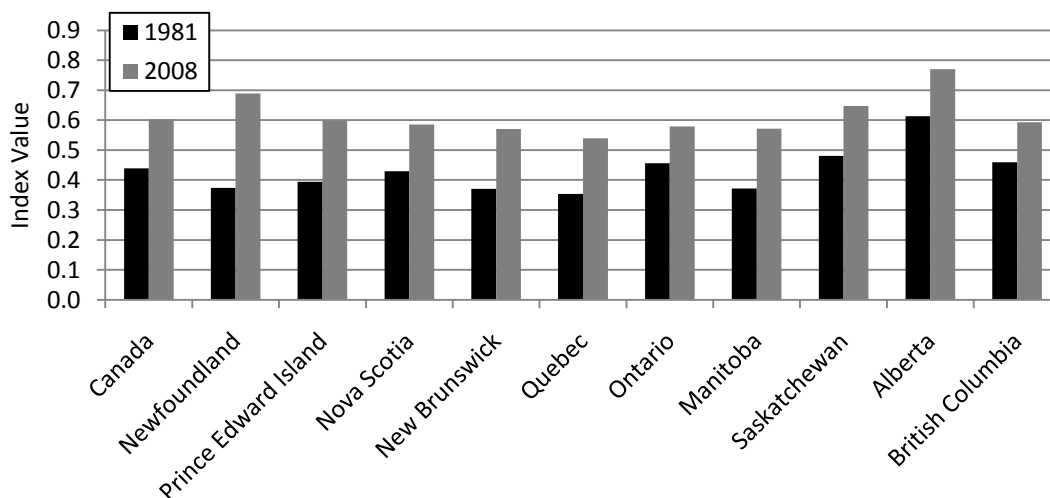
annual rate within 0.5 percentage points of the Index of Well-being. But in the 1990s (1989-2000), when the Index of Economic Well-being was declining by 0.04 per cent per year, GDP per capita grew only slightly more slowly than it had in the 1980s. Since 2000, on the other hand, the Index of Economic Well-being has progressed 1.3 percentage points faster per year than GDP per capita. Thus, rapid GDP per capita growth does not necessarily translate into rapid growth in economic well-being, and vice versa. The reasons for this will be explored later in the report.

## ii. Trends in the provinces

Among the provinces, Alberta had the highest value of the overall index in 2008 at 0.773 points, followed by Newfoundland at 0.691 points and Saskatchewan at 0.649 points (Table 1 and Chart 3). Quebec and New Brunswick had the lowest values at 0.541 and 0.572 points, respectively. In terms of progress, all the provinces experienced considerable growth in the overall Index of Economic Well-being over the 1981-2008 period. Newfoundland showed by far the strongest gain with 85.1 per cent growth, while the slowest growth came from Alberta with 26.1 per cent.

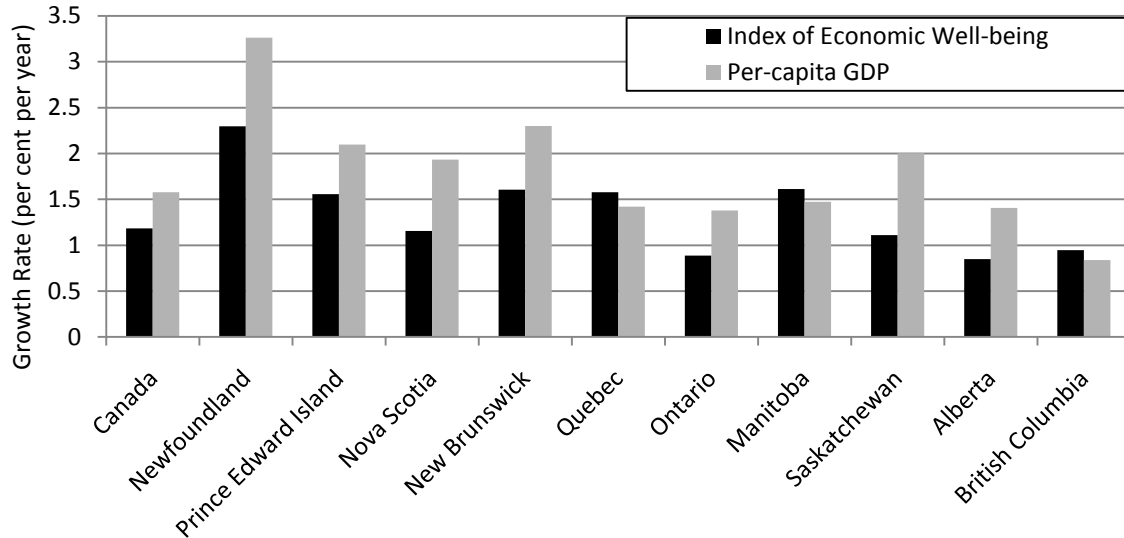
Alberta also had the highest level of real GDP per capita in 2008, followed by Ontario and Saskatchewan, while the Maritime Provinces had the lowest levels. In contrast to the national trend, three provinces experienced better growth in the Index of Economic Well-being than in real GDP per capita over the 1981-2008 period: Quebec, Manitoba and British Columbia (Chart 4). Exhibit 3 shows the rankings of Canada and the provinces according to the levels and growth rates of the Index of Economic Well-being and per-capita GDP. It is clear that the dimensions of economic welfare to which GDP implicitly assigns zero weight have an important impact on social rankings. Both in terms of 2008 levels and in terms of growth rates over the 1981-2008 period, the rankings given by the IEWB are somewhat different from those based on per-capita GDP.

**Chart 3: Overall Index of Economic Well-being, Canada and the Provinces, 1981 and 2008**



Source: Table 1

**Chart 4: Growth of the Index of Economic Well-being and Per-capita GDP, Canada and the Provinces, 1981-2008**



Source: Tables 1 and 2.

**Exhibit 3: Ranking by Index of Economic Well-being and Per-capita GDP, Canada and the Provinces**

Rank	Level, 2008		Growth Rate, 1981-2008	
	Index of Economic Well-being	GDP Per Capita	Index of Economic Well-being	GDP Per Capita
1	Alberta	Alberta	Newfoundland	Newfoundland
2	Newfoundland	Ontario	Manitoba	New Brunswick
3	Saskatchewan	Saskatchewan	New Brunswick	Prince Edward Island
4	Canada	Canada	Quebec	Saskatchewan
5	Prince Edward Island	Newfoundland	Prince Edward Island	Nova Scotia
6	British Columbia	British Columbia	Canada	Canada
7	Nova Scotia	Manitoba	Nova Scotia	Manitoba
8	Ontario	Quebec	Saskatchewan	Quebec
9	Manitoba	New Brunswick	British Columbia	Alberta
10	New Brunswick	Nova Scotia	Ontario	Ontario
11	Quebec	Prince Edward Island	Alberta	British Columbia

## B. Overall Trends in the Four Domains of the Index of Economic Well-being

The Index of Economic Well-being is comprised of four domains, or dimensions, of economic well-being: consumption flows, stocks of wealth, economic equality, and economic security. This section examines overall trends in these four domains in Canada over the 1981-2008 period. The next four sections look at each domain in depth, analyzing developments in the components and subcomponents of the domains at the national and provincial levels.

Chart 5 and Tables 3 to 6 present estimates of the four domains of the Index of Economic Well-being over the 1981-2008 period. One observes significant divergence in trends in the domains. The consumption and wealth domains enjoyed very large increases while the economic equality and security domains experienced more cyclical trends and declined over the period.

### i. Measurement of trends in the scaled domain indices

There are two ways to measure progress in the domains: the absolute change in the scale value of the domain, and the percentage change in the index of the scaled values. This latter method is influenced by the absolute level of the scaled value in the base year. For example, assume Domain A has scaled values of 0.2 and 0.6 in the base and end years while Domain B has values of 0.5 and 0.9. Progress measured in percentage points is the same for the two domains – 0.4 percentage points. But the index of the scaled values shows that Domain A increased 200 per cent while Domain B advanced only 80 per cent.

The scaled values are sensitive to the universe of values that are used for the scaling procedure. For Canada there are 28 data points for a time series for the 1981-2008 period, but for Canada and the provinces there are 308 data points (11\*28). For Canada scaled separately values run from 0 to 1. Equally, for Canada and the provinces scaled together the values run from 0 to 1. But for any given variable, some provinces will be above the Canadian average and some will be below. This means that the range of values must be wider when the provinces are included, and the range of *scaled* values for Canada will be much smaller when the provincial values are included than when Canada is considered alone. This also means that the percentage rate of increase in the index of the scaled values will be considerably greater for Canada if scaled separately.

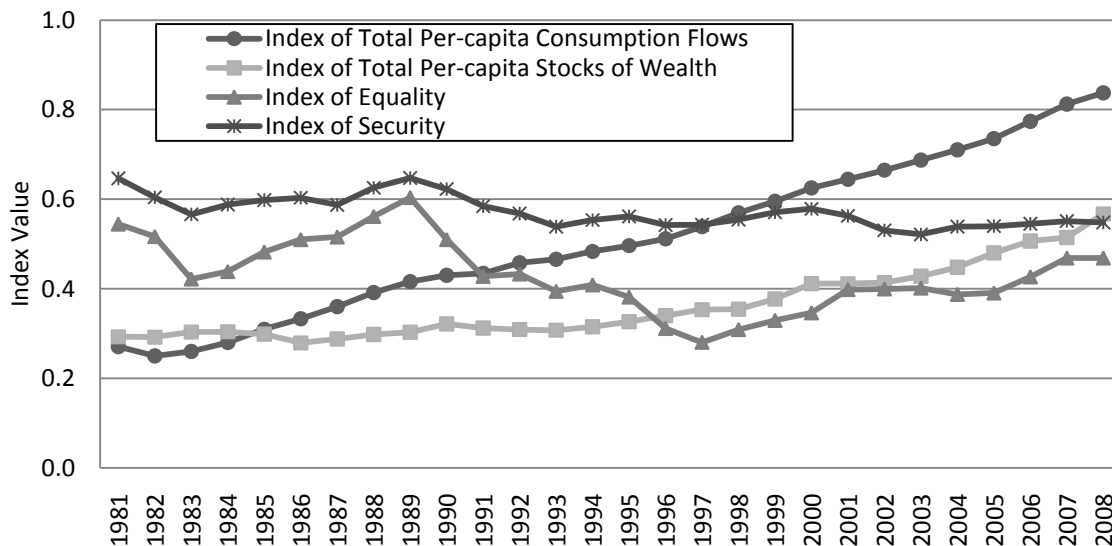
It should also be noted that for domains where components are aggregated in prices (consumption and wealth), index values will have different percentage rates of change depending on whether these rates are based on the scaled or unscaled values. For example, over the 1981-2008 period, total consumption flows in Canada increased 1.92 per cent per year (from \$26,544 to \$44,404) in real dollar terms, and 4.27 per cent per year (from 0.271 to 0.837) in scaled index terms.

## ii. Trends in Canada

In Canada, the consumption domain's index score of 0.837 was the highest among the four domains in 2008. The wealth domain had the next highest score, at 0.567, followed by the economic security domain at 0.548 and the equality domain at 0.469 (Chart 5 and Chart 6).<sup>9</sup>

Chart 6 illustrates that the increase in the overall Index of Economic Well-being over the 1981-2008 period was driven entirely by increases in the index scores for the consumption and wealth domains, while declines in economic equality and security dampened growth in overall well-being. Over the period, the index of the consumption domain increased 0.567 points (or 4.27 per cent per year) from its 1981 value of 0.271, while the index of the wealth domain grew 0.274 points (or 2.48 per cent per year) from 0.293 in 1981 (Tables 3 and 4). In contrast, the index of the economic equality domain fell 0.076 points (or 0.55 per cent per year) from its 1981 value of 0.545, and the index of the economic security domain declined 0.099 points (or 0.61 per cent per year) from 0.647 in 1981 (Tables 5 and 6).

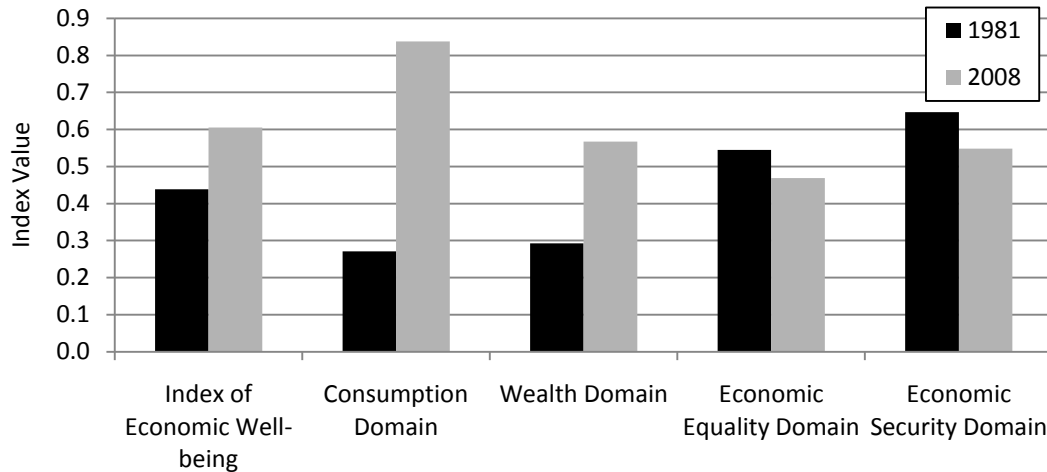
**Chart 5: Trends in the Four Domains of the Index of Economic Well-being, Canada, 1981-2008**



Source: Tables 3-6.

<sup>9</sup> Because of the linear scaling procedure, a scaled index of a variable for Canada is a function of the variation in that variable across provinces. As described in Section II above, the observed range of provincial values determines the 'feasible range' that we use in the linear scaling procedure. This explains why Canada's scaled value for the wealth domain is smaller than its scaled value for the consumption domain even though, in dollar terms, per-capita wealth is much greater than per-capita consumption. The wealth domain takes a much wider range of values across provinces, and the Canadian average value is further from the maximum provincial value in wealth than in consumption.

**Chart 6: The Index of Economic Well-being and its Domains, Canada, 1981 and 2008**



Source: Tables 1 and 3-6.

However, there were significant differences across the three cyclically-neutral sub-periods in terms of progress (or regress) in the four domains. The consumption domain experienced the most consistently strong growth, although the index grew much faster over the 1981-1989 period (5.51 per cent per year) than over the 1989-2000 period (3.77 per cent per year) or the 2000-2008 period (3.72 per cent per year) (Table 3). In contrast, the index of the wealth domain grew by only 0.44 per cent per year over 1981-1989, before accelerating to annual growth of 2.82 per cent over the 1989-2000 period and 4.09 per cent over 2000-2008 (Table 4).

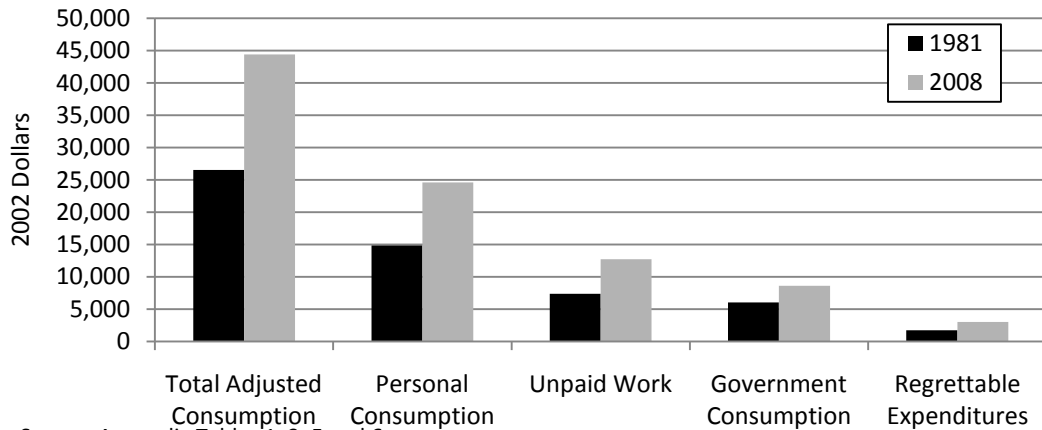
Canada's performance in economic equality was volatile. The domain's index increased by 1.30 per cent per year over 1981-1989, then plummeted by 4.93 per cent per year over the 1989-2000 period before reversing again and growing by 3.86 per cent per year over 2000-2008 (Table 5).

It was the economic security domain in which Canada's performance was the most consistently weak. After growing by a negligible 0.02 per cent per year over the 1981-1989 period, the index of the economic security domain declined 1.02 per cent per year over the 1989-2000 period and 0.68 per cent per year over the 2000-2008 period (Table 7).

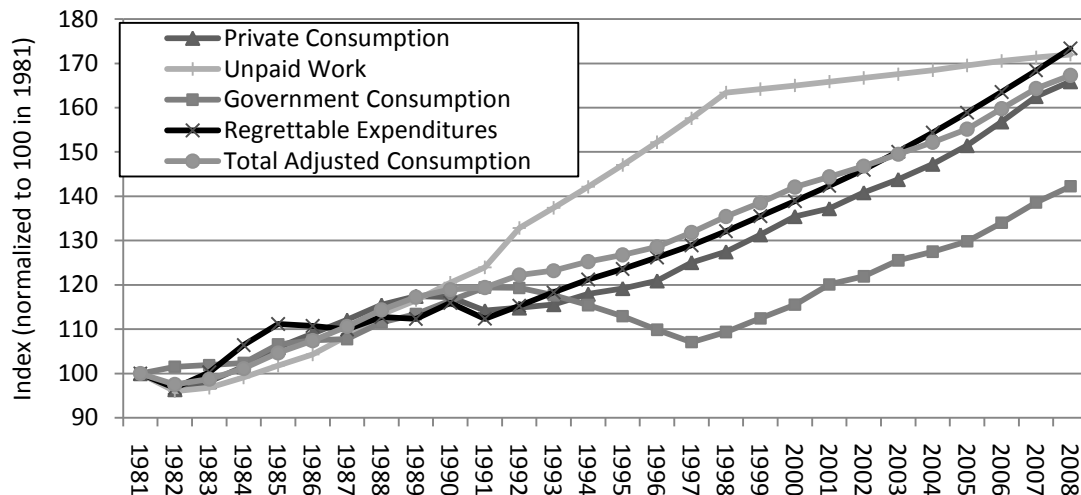
### **C. Trends in the Components of the Consumption Flows Domain**

As noted earlier in the report, the consumption domain consists in three main components: private or personal consumption expenditures; government expenditures on goods and services consumed either directly or indirectly by households; and the value of

**Chart 7: Components of the Consumption Domain, Canada, 2002 Dollars, 1981 and 2008**



**Chart 8: Trends in Total Adjusted Consumption per Capita and its Components, Canada, 1981-2008, (1981=100)**



unpaid work, including both unpaid household work and volunteer work outside the household.

Three adjustments are in turn made to these components.<sup>10</sup> First, since economies of scale exist in private household consumption, private consumer expenditure is adjusted for changes in family size. Second, regrettable expenditures – expenditures that do not contribute to economic well-being, defined here as commuting costs, costs of crime, costs

<sup>10</sup> In the estimates of the Index of Economic Well-being for OECD countries a fourth adjustment is made to consumption flows to account for the large international differences in growth rates and levels of annual hours worked (Osberg and Sharpe, 2009). As both the trend in hours worked in Canada and level differences among provinces are not particularly large, this adjustment has not been introduced in this report, but may be in the future.



of divorce, and household pollution abatement expenditures – are subtracted from overall consumption flows. Third, an adjustment for the positive impact of increased life expectancy on well-being is made by adjusting total consumption flows by the per cent increase in life expectancy.

Appendix Tables 1 to 6 show the estimates of the components of total consumption flows in Canada, expressed in per capita terms in 2002 constant dollars, as well as the adjustments for the 1981-2008 period.

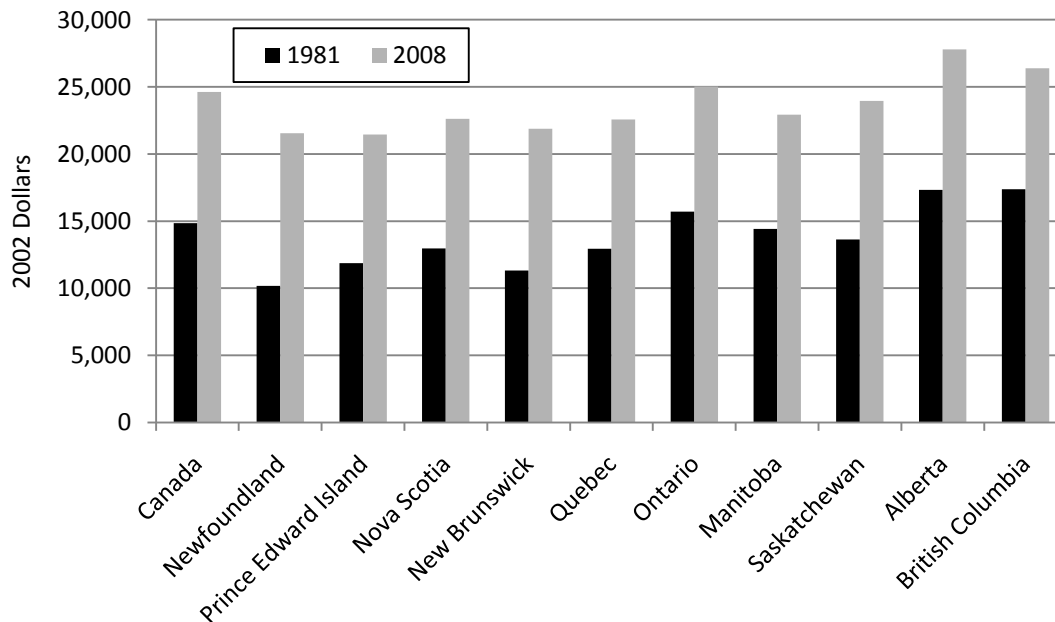
Chart 7 illustrates the levels of the dollar-denominated consumption components for Canada in 1981 and 2008, while Chart 8 plots their trends over the 1981-2008 period.

## i. Private Consumption

### a. Trends in Canada

In 2008, personal consumption per capita was \$24,634 (2002 dollars), accounting for over one half of total consumption flows (Appendix Table 1 and Chart 7). Personal consumption in 2008 was up 65.9 per cent from its 1981 level of \$14,849, an average annual rate of increase of 1.89 per cent. Except for the recessions of the early 1980s and early 1990s, private consumption progressed steadily throughout the period (Chart 8). However, growth was somewhat slower in the 1990s (1.30 per cent per year) than in the 1980s (2.03 per cent) and the 2000-2008 period (2.57 per cent).

**Chart 9: Private Consumption per Capita, Canada and the Provinces, 2002 Dollars, 1981 and 2008**



Source: Appendix Table 1

## b. Trends in the provinces

At \$27,791 (in 2002 dollars), Alberta had the highest personal consumption per capita of all the provinces in 2008, followed by British Columbia at \$26,391 and Ontario at \$25,040 (Chart 9). Prince Edward Island had the lowest level of personal consumption per capita at \$21,442. In terms of growth, all the provinces showed considerable progress. Newfoundland showed by far the strongest gains in personal consumption per capita since 1981 with a 111.8 per cent overall improvement (2.82 per cent annually) followed by New Brunswick with a gain of 93.1 per cent over the same period (2.47 per cent annually). British Columbia exhibited the least progress with a 51.9 per cent increase in per capita personal consumption between 1981 and 2008. Over the 1981-2008 period, most of the provinces showed a pattern similar to the national one; growth was consistently positive throughout the period, although it slowed somewhat in the 1990s. The exceptions are Saskatchewan and Alberta; in those provinces, personal consumption growth grew faster in the 1990s than the 1980s, and faster still between 2000 and 2008.

### ii. Average Family Size

It is important to adjust the dollar value of per-capita consumption to reflect the fact that there are economies of scale in household consumption. When people live together in groups, they can achieve greater effective consumption than they could if they lived alone as individuals; for instance, they can cooperate in household production (e.g. one person can cook for everyone) and share fixed costs (e.g. they can share one refrigerator rather than each person having to buy one). To account for this issue, we use the Luxembourg Income Study equivalence scale, which is the square root of family size.<sup>11</sup>

### a. Trends in Canada

In 2008, the average family size in Canada was 2.37 persons (Appendix Table 2).<sup>12</sup> This was down 12.7 per cent (or 0.50 per cent per year) from its 1981 level of 2.72 persons, due to both a decline in the number of children per family and an increase in the proportion of unattached individuals within total households. Average family size declined during all three sub-periods of the 1981-2008 period; the decline was fastest during the 1981-1989 period (0.75 per cent per year).

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<sup>11</sup> The definition of 'family' encompasses two groups: 'economic families,' which are groups of two or more persons related by blood, marriage, common-law, or adoption and living in the same dwelling; and 'unattached individuals,' which are persons either living alone or sharing a dwelling with persons to whom they are unrelated by blood, marriage, common-law, or adoption. Note that multiple families may live within a single household. Strictly speaking, our adjustment should be made on the basis of households rather than families. Two unattached individuals who live as roommates enjoy many of the benefits of economies of scale in household consumption (e.g. they don't have to buy two refrigerators), but since they are recorded as two separate families, our income adjustment does not capture the benefits of their cooperation. This is a minor issue, however.

<sup>12</sup> Data on the total number of families in Canada and the provinces, which is used to compute average family size, is available only to 2007. The value for 2008 is extrapolated using the compound annual growth rate for the 2001-2007 period. Throughout this report, the unavailability of data sometimes necessitates the construction of such estimates. Such cases will be identified either in the text or in a footnote.

## b. Trends in the provinces

Among the provinces, Saskatchewan had the largest average family size in 2008, at 2.56 persons, followed by Manitoba at 2.51. The smallest family size was in Quebec, at 2.19 persons. Over the 1981-2008 period, there was a shift in terms of where the largest average family sizes were observed. In 1981, family sizes in the Atlantic Provinces were all well above the national average; this was particularly true in Newfoundland, where the average family contained 3.55 persons. Over the period, each of the provinces from Quebec eastward experienced dramatic declines of at least 20.0 per cent in average family size, while the provinces from Ontario westward experienced declines between 5.6 and 8.5 per cent. The largest decline was in Newfoundland, where average family size fell 33.1 per cent from 3.55 to 2.38 over the period.

## iii. Government Expenditures on Goods and Services

### a. Trends in Canada

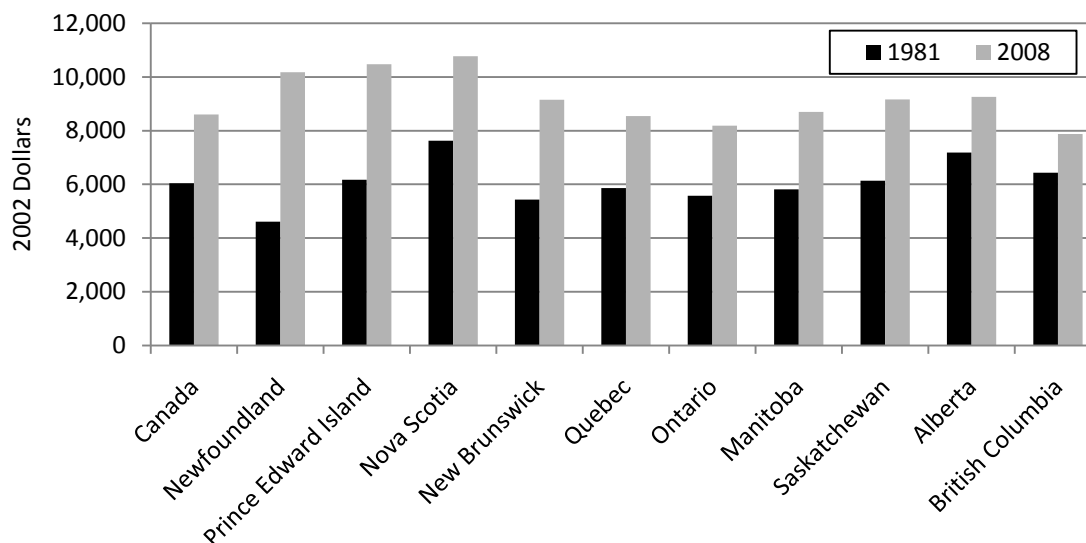
In 2008, government expenditures per capita on goods and services were \$8,601 in 2002 dollars (Appendix Table 3). Government expenditures include spending by all levels of government on current goods and services and on fixed capital and inventories, minus capital consumption allowances. Government expenditures in 2008 were up 42.3 per cent from \$6,046 in 1981, an average annual rate of increase of 1.31 per cent. Except for the years from 1992 to 1997 inclusive, government expenditure increased every year, although the pace of increase varied (Chart 8). Growth in per-capita real government expenditures was extremely weak in the 1990s (0.17 per cent per year), but fairly strong in the 1980s (1.58 per cent per year) and robust since 2000 (2.64 per cent per year).

### b. Trends in the provinces

At the provincial level, the Atlantic Provinces tended to have the largest levels of per-capita government expenditures in 2008, with Nova Scotia having the largest at \$10,774, followed by Prince Edward Island at \$10,476 and Newfoundland at \$10,171 (Chart 10). British Columbia had the lowest per-capita level at \$7,877.

The large 2008 levels in the Atlantic Provinces reflect the fact that those provinces had the largest growth in per-capita government spending over the 1981-2008 period. In particular, Newfoundland – which had the lowest per-capita government expenditures of any province in 1981, at \$4,605 – saw a 120.9 per cent increase over the period, while Prince Edward Island and New Brunswick also saw large gains of 69.6 per cent and 68.2 per cent, respectively. Meanwhile, per-capita government spending growth in British Columbia over the same period was the lowest of all the provinces at 22.5 per cent. Similar to the national pattern, all provinces experienced the lowest growth rates (in some cases, negative rates) during the 1990s.

**Chart 10: Per-capita Government Expenditures on Goods and Services, Canada and the Provinces, 2002 Dollars, 1981 and 2008**



Source: Appendix Table 3

#### iv. Unpaid Work

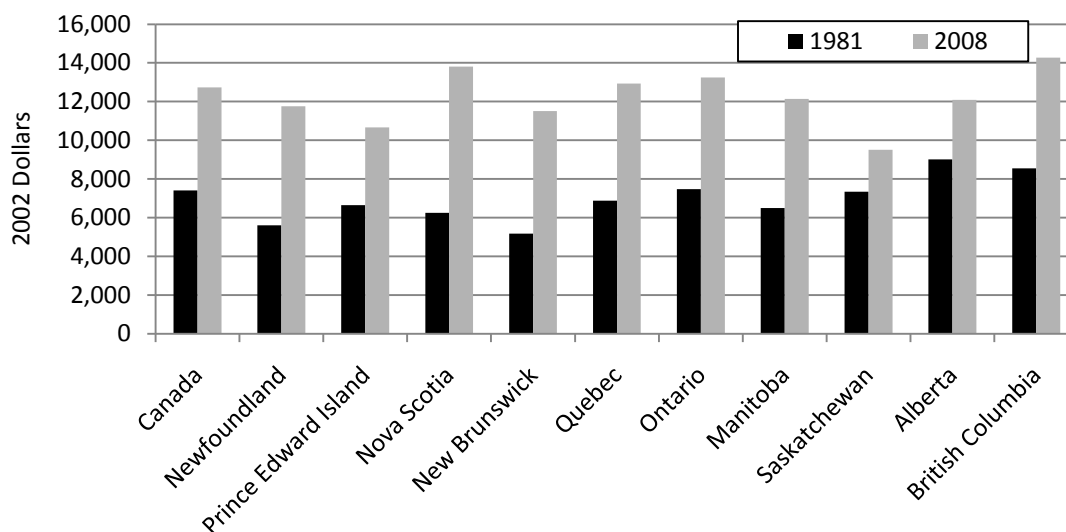
Statistics Canada (1995) classifies unpaid work into five major categories: domestic work (meal preparation, cleaning, clothing care, repairs and maintenance, and other domestic work); help and care (child care and adult care); management and shopping; transportation and travel; and other unpaid work. The first four categories are called household work. The last category is non-household work, or volunteer work. We draw estimates of hours of unpaid work performed by persons aged 15 and over for 1981, 1986, and 1992 from Statistics Canada (1995). Estimates for 1998 and 2005 are taken, respectively, from Statistics Canada's General Social Survey and Statistics Canada (2006b). Values for other years are estimated based on the average annual growth rates implied by the Statistics Canada data. Estimates of the value of unpaid work, based on a generalist replacement wage, are drawn from Statistics Canada (1995) for 1981, 1986 and 1992; values after 1992 are extrapolated using the growth rate of real wages over the 1992-2008 period.

##### a. Trends in Canada

The value of unpaid work in the Canadian economy in 2008 was \$12,738 per capita in 2002 dollars, up 72.0 per cent (or 2.03 per cent per year) from \$7,406 in 1981 (Appendix Table 5). Unpaid work accounted for the second largest share of total consumption flows at nearly one third (Chart 7).

Changes in the per-capita value of unpaid work reflect trends in three factors: the actual hours of unpaid work of the working age population, the rate of increase in the generalist replacement wage that is used to value unpaid work, and the rate of growth of

**Chart 11: Per-capita Value of Unpaid Work, Canada and the Provinces, 2002 Dollars, 1981 and 2008**



Source: Appendix Table 5

the working age population compared to the total population. The per-capita number of hours of unpaid work in Canada was 1,211 in 2008, only 6.5 per cent higher than the 1981 level of 1,137 hours. Most of the increase in the per-capita value of unpaid work over the period reflected changes in the replacement wage rate for unpaid work, which increased 51.6 per cent from \$8.59 per hour in 1981 to \$13.01 per hour in 2008 (in 2002 dollars). Growth of the working age population (from 75.8 per cent to 80.8 per cent of the total population) also contributed to the increase in the value of unpaid work. Finally, since wages are deflated with the CPI and the value of unpaid work is deflated with the GDP deflator, the faster growth of the CPI relative to the GDP deflator (0.22 per cent per year) also led to growth in the measured value of unpaid work.

#### b. Trends in the provinces

Among the provinces, British Columbia had the largest value of unpaid work in 2008 at \$14,279 per capita (Chart 11). Nova Scotia was second, with unpaid work valued at \$13,813 per capita. The lowest value was Saskatchewan's \$9,513. The value of unpaid work increased in every province over the 1981-2008 period. The greatest growth over the period was 122.4 per cent (or 3.00 per cent per year) in New Brunswick.

#### v. Regrettable Expenditures

Most expenditures can be assumed to increase well-being because they are spent on the acquisition of things that people desire. Some expenditures, however, are spent to prevent or ameliorate undesirable outcomes. Since people would be better off if such expenditures were not necessary, they represent a reduction in well-being rather than an increase. These are called 'regrettable expenditures.' In this report, regrettable expenditures comprise four components: the costs of commuting, including transportation

and time use; the costs of crime, including security measures, repair of damaged property, and medical and legal expenses; the costs of household pollution abatement, including devices to improve air and water quality in the home; and the costs of automobile accidents, including medical and legal expenses and repair costs. The sum of these costs is subtracted from total consumption flows to account for the fact that they do not contribute to well-being, and indeed may detract from it.

#### a. Trends in Canada

In 2008, regrettable expenditures per capita were \$3,046 in 2002 dollars (Appendix Table 6). This total includes the costs of automobile accidents, commuting, crime, and household pollution abatement.<sup>13</sup> Regrettable expenditures rose 73.4 per cent in Canada over the 1981-2008 period, an average annual rate of advance of 2.06 per cent. As estimates since 1994 are based on extrapolations, growth rate trends during this period may be misleading.

#### b. Trends in the provinces

Among the provinces, the values of regrettable expenditures per capita were all within \$500 of the national average in 2008. The largest value was \$3,436 in Alberta; the smallest was \$2,651 in Prince Edward Island. The most significant growth over the 1981-2008 period was 121.4 per cent (or 2.99 per cent per year) in Newfoundland.

### vi. Life Expectancy

#### a. Trends in Canada

The final adjustment to consumption flows is for life expectancy, which has risen from 75.6 years in 1981 to an estimated 81.3 years in 2008, an increase of 7.5 per cent (Chart 12).<sup>14</sup> Life expectancy advanced at 0.27 per cent per year over the 1981-2008 period, and annual growth was steady across the sub-periods (0.28 per cent in 1981-89, 0.24 per cent in 1989-2000, and 0.29 per cent in 2000-2008). Total consumption flows in

2008 are therefore augmented by 7.5 per cent to reflect the additional consumption arising from increased longevity.

#### b. Trends in the provinces

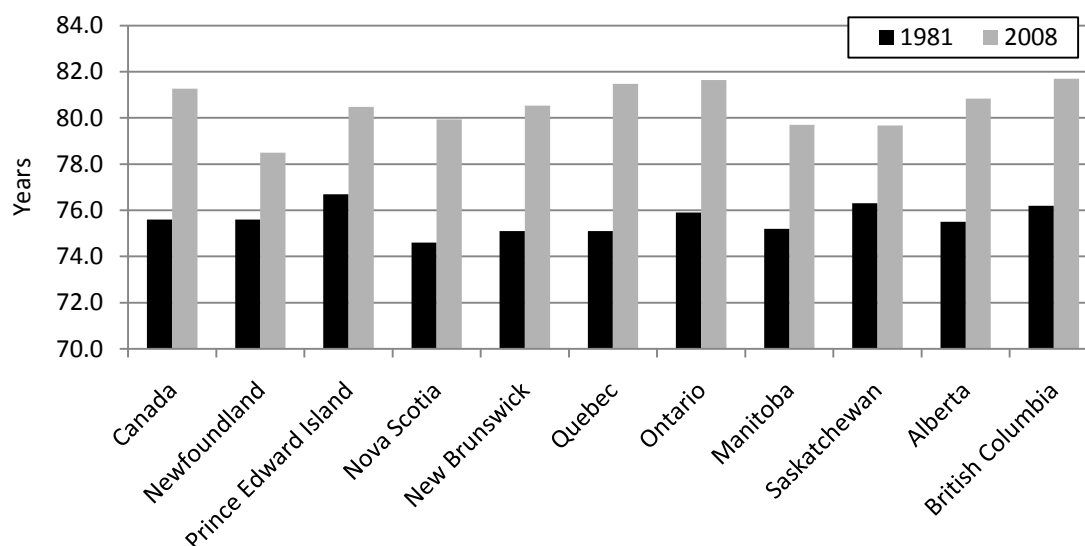
Newfoundland had a life expectancy of 78.5 years in 2008, the lowest of the Canadian provinces, while British Columbia had the highest at 81.7 years (Chart 12). Newfoundland's growth in life expectancy was also the lowest over the 1981-2008 period, at 3.8 per cent (or 0.14 per cent per year), although the growth rate picked up over

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<sup>13</sup> Estimates of regrettable expenditures for the 1981-94 period are from Messinger (1997). Post-1994 estimates are extrapolations based on the growth rate of the 1989-1994 period.

<sup>14</sup> Life expectancy estimates are currently available to only 2006. The 2007 and 2008 estimates are extrapolated using the average growth rate for the 2000-2006 period.

**Chart 12: Life Expectancy at Birth, Canada and the Provinces, Years, 1981 and 2008**



Source: Appendix Table 5

the sub-periods. The largest growth over the 1981-2008 period was 8.5 per cent (or 0.30 per cent per year) in Quebec; Quebec's 1981 life expectancy of 75.1 years was second-lowest in Canada, but the province's 2008 value of 81.5 years was among the highest.

## vii. Total Adjusted Consumption Flows

### a. Trends in Canada

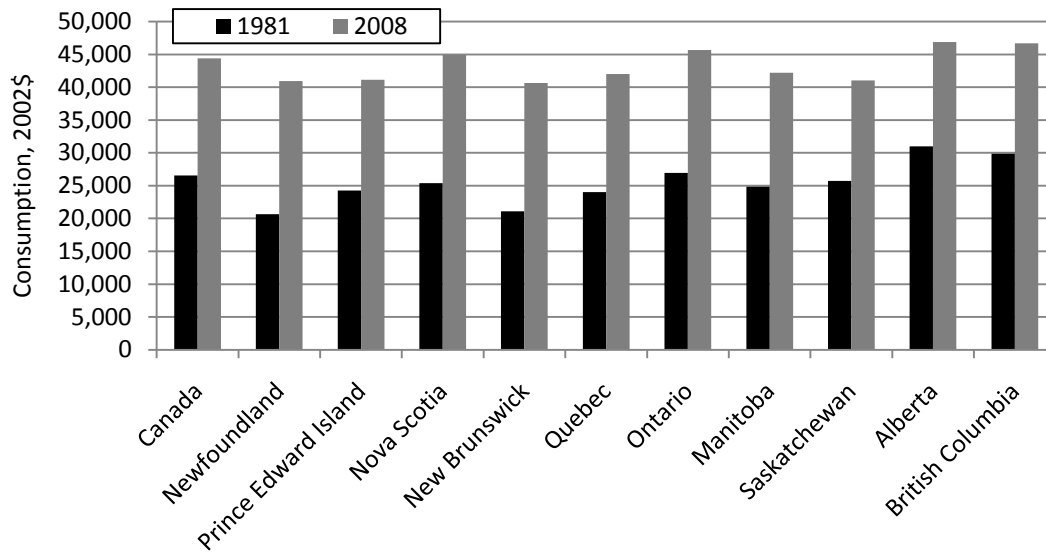
Total per-capita consumption is computed by summing family size-adjusted private consumption, government expenditures on goods and services, and unpaid work, subtracting regrettable expenditures, and then adjusting the total for the increase in life expectancy. It is this adjusted total consumption flows series that is scaled to generate the index of the consumption domain of the overall Index of Economic Well-being (Chart 14).

In 2008, total consumption flows on a per-capita basis amounted to \$44,404 (2002 dollars), up 67.3 per cent or, 1.92 per cent per year, from \$26,544 in 1981 (Table 3a and Chart 13). Per-capita consumption experienced strong positive growth in all three sub-periods; it grew 2.01 per cent per year over 1981-1989, 1.76 per cent per year over 1989-2000, and 2.06 per cent per year over 2000-2008.

### b. Trends in the provinces

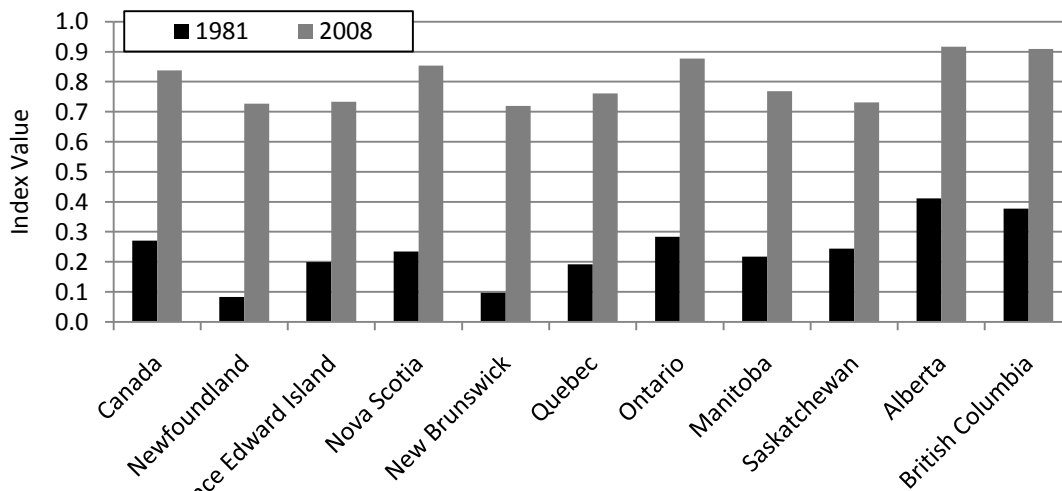
Among the provinces, Alberta had the highest per-capita total consumption flows in 2008 with \$46,905, followed by British Columbia with \$46,678 and Ontario with \$45,654 (Chart 13). New Brunswick and Newfoundland had the lowest flows with

**Chart 13: Total Adjusted Consumption per Capita, Canada and the Provinces, 1981 and 2008, \$2002**



Source: Table 3a

**Chart 14: Index of the Consumption Domain in Canada and the Provinces, 1981 and 2008**



Source: Table 3

\$40,670 and \$40,925, respectively. Newfoundland enjoyed the highest growth in total consumption per capita over the 1981-2008 period at 98.3 per cent followed by New Brunswick at 93.0 per cent. These numbers suggest that the regional economic disparities, in terms of total consumption, are becoming less significant over time. Indeed, all four of the Atlantic Provinces experienced growth in total consumption above the Canadian average over the period.

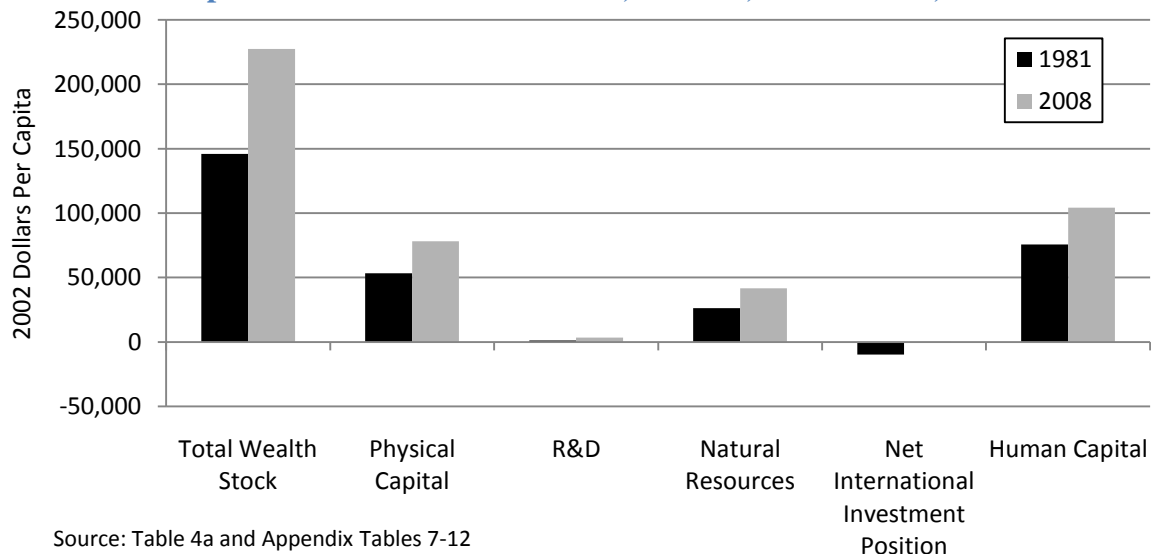


The linear scaling procedure is applied to the total adjusted consumption flows data to compute the scores for the index of the consumption domain. The scaling procedure does not affect the rankings of provinces. The index of the consumption domain was 0.837 in Canada in 2008, up 0.567 (or 209.2 per cent) from 0.271 in 1981. Among the provinces, the index was greatest in Alberta, at 0.917 (Chart 14). British Columbia was second, at 0.909, followed by Ontario at 0.877. New Brunswick had the lowest score at 0.719. The index of consumption increased significantly in all provinces over the 1981-2008 period. The most remarkable increase was in Newfoundland, where the index increased by 0.644 points from 0.083 in 1981 to 0.727 in 2008. Alberta had the slowest growth in consumption domain, but its consumption score was highest among the provinces in both 1981 and 2008.

#### D. Trends in the Components of the Stocks of Wealth Domain

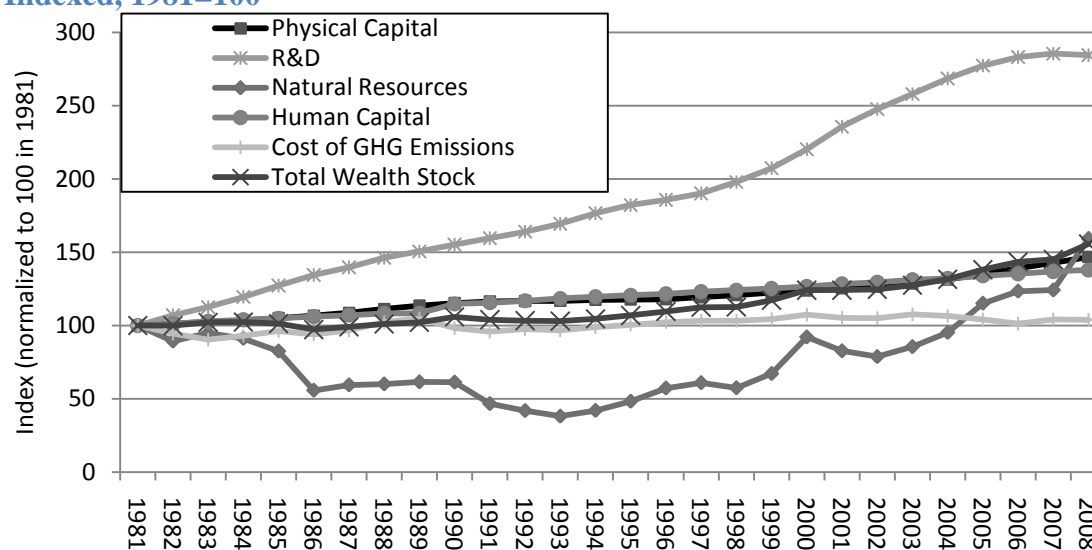
As noted earlier in the report, a society's stocks of wealth – both manmade and naturally occurring – determine how sustainable its current level of consumption really is. The wealth domain, which could equally well be called the sustainability domain, consists of five main components: the physical capital stock, the R&D stock, the stock of natural resources, the stock of human capital, and the net international investment position. One adjustment is made to the sum of these five components: to account for the social costs of environmental degradation, we subtract the estimated annual cost of greenhouse gas emissions. Chart 15 shows the levels of each component in 1981 and 2008, while Chart 16 illustrates their growth over the 1981-2008 period. The stock of human capital accounts for the largest share of total wealth in Canada, followed by physical capital and then natural resources. The social cost of greenhouse gas emissions is not included in the charts; it is very small relative to total wealth, which partly reflects the fact that it is a flow concept being used to adjust the total wealth stock on a year-to-year basis.

**Chart 15: Components of the Wealth Domain, Canada, 2002 Dollars, 1981 and 2008**



Source: Table 4a and Appendix Tables 7-12

**Chart 16: Trends in Per-capita Wealth and its Components, Canada, 1981-2008, Indexed, 1981=100**



Source: Table 4a and Appendix Tables 7-11.

## i. Physical Capital

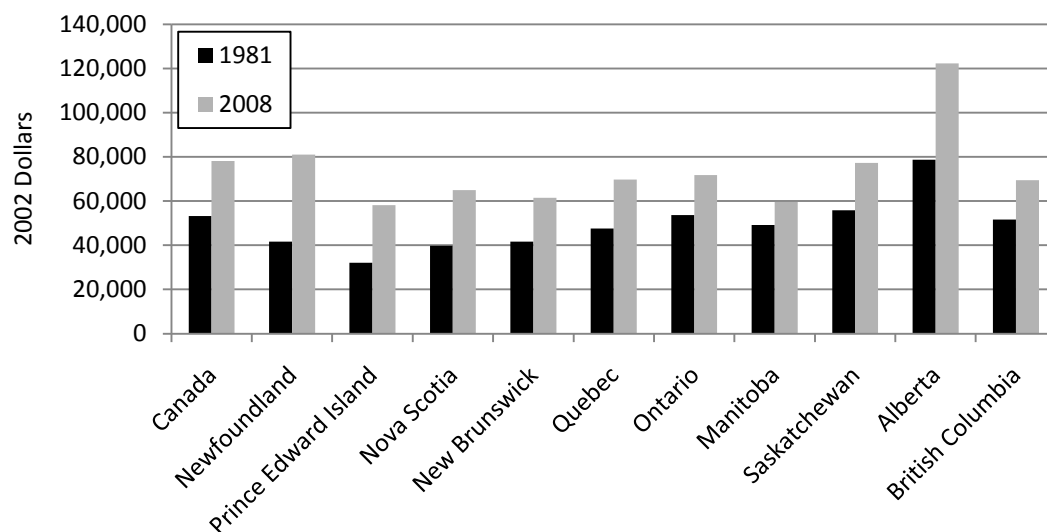
### a. Trends in Canada

In 2008, the per-capita stock of physical capital in Canada, defined as the residential and non-residential net capital stock based on geometric depreciation, was \$78,181 in 2002 dollars (Appendix Table 7 and Chart 15). Physical capital accounted for about one third of the total wealth stocks, the second highest of all the components (Chart 15). Over the 1981-2008 period, the capital stock in Canada increased 46.8 per cent, a 1.43 per cent average annual rate of growth. The growth rate of the capital stock was positive throughout the period (Chart 16), even during recessions. The 1990s, however, saw slightly slower per-capita capital stock growth (0.81 per cent per year) than the 1980s (1.59 per cent per year) and the 2000-2008 period (2.13 per cent per year).

### b. Trends in the provinces

Alberta had the by far the largest per-capita stock of physical capital of all the provinces with \$122,231 in 2002 dollars (Chart 17). Newfoundland was a distant second with \$81,075, while Prince Edward Island had the lowest level in 2008 with \$58,124. Newfoundland also enjoyed the strongest growth rate in per-capita capital stock over the 1981-2008 period at 94.9 per cent, or 2.50 per cent per year. Manitoba had the lowest overall growth over the period at 21.1 per cent, or 0.71 per cent per year. Similar to the national pattern, growth of the capital stock was positive in all three sub-periods. However, there were differences across the sub-periods in terms of the rate of growth. Some provinces have had their strongest growth since 2000 (for example, Prince Edward Island and British Columbia), while others had their strongest growth in the 1990s (for example, Newfoundland) or in the 1980s (for example, Quebec).

**Chart 17: Per-capita Net Capital Stock, Canada and the Provinces, 2002 Dollars, 1981 and 2008**



Source: Appendix Table 7

## ii. R&D Capital

### a. Trends in Canada

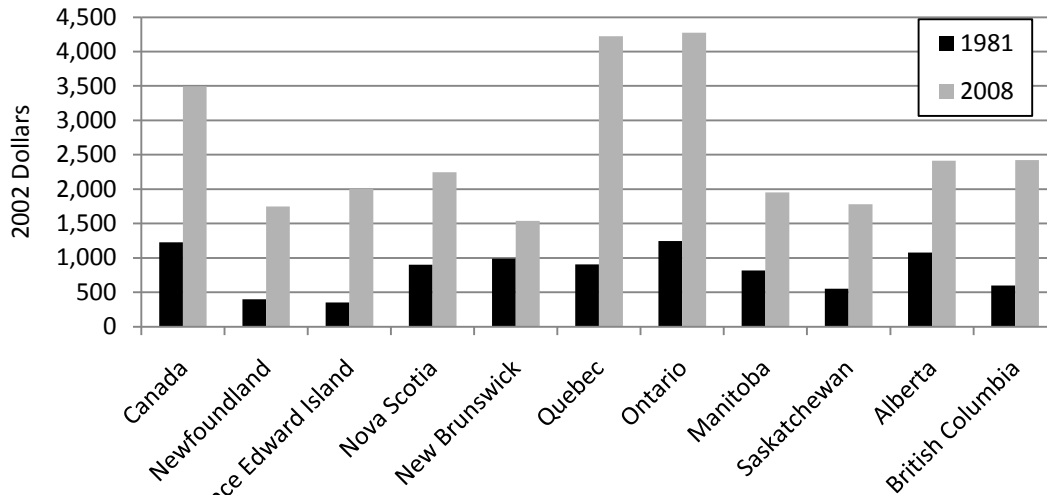
In 2008, the per-capita stock of R&D in Canada was \$3,492 (2002 dollars), accounting for less than 2 per cent of the total stocks of wealth (Appendix Table 8 and Chart 15).<sup>15</sup> This low share reflects both the relatively low share of GDP devoted to R&D (around 2 per cent) and the high depreciation rate of 20 per cent assumed for R&D stocks. From 1981 to 2008 R&D stocks increased 184.4 per cent or 3.95 per cent per year, much faster than the rate of advance of the other components of wealth (Chart 16). Growth in R&D stocks was positive through the period, although somewhat faster in the 1980s (5.25 per cent per year) than in the 1990s (3.52 per cent per year) and over 2000-2008 (3.25 per cent per year).

### b. Trends in the provinces

The provincial levels of per-capita stock of R&D were quite varied in 2008 (Chart 18). Ontario and Quebec had the highest levels at \$4,276 and \$4,223 (in 2002 dollars), respectively, whereas New Brunswick and Newfoundland had the lowest levels at \$1,540 and \$1,748. Prince Edward Island had the highest growth in the per-capita stock of R&D

<sup>15</sup> We compute the stock of R&D using official data on gross annual R&D expenditures (from Statistics Canada CANSIM Table 358-0001) and the GDP deflator. We assume a depreciation rate of 20 per cent per year. Thus, in a given year, the accumulated stock of R&D is that year's gross R&D expenditures plus 80 per cent of the previous year's accumulated stock. The question of how to measure R&D has challenged researchers for some time. Under the SNA 1993 accounting system (the current international standard for national accounting), R&D expenditures are counted as intermediate inputs for businesses or as current consumption for government and non-profit organizations. The new SNA 2008 recommends the capitalization of R&D, so that annual R&D expenditures represent a form of investment in an R&D capital stock. Our approach is consistent with that recommendation.

**Chart 18: R&D Stock Per Capita, Canada and the Provinces, 2002 Dollars, 1981 and 2008**



Source: Appendix Table 8

at 467.1 per cent over the 1981-2008 period, 100 percentage points above the second highest (Quebec with 367.4 per cent).

### iii. Natural Resources

#### a. Trends in Canada

Data on natural resource stocks are drawn from Statistics Canada's national environmental accounts. In 2008, the total value of natural resources was \$1,683 billion in current dollars, reflecting both the physical quantities and the prices of the resources. Timber stocks accounted for roughly 14 per cent of that total and subsoil resource stocks made up the rest.<sup>16</sup> Estimates for land, largely reflecting urban and agricultural land values, are available, but are not included in the definition of natural resources used in the Index of Economic Well-being. Estimates of the value of fish stocks and water have not yet been developed by Statistics Canada.

The per-capita value of natural resources in Canada in 2008 was estimated by Statistics Canada at \$41,712 (2002 dollars), up 59.3 per cent (or 1.74 per cent per year) from \$26,184 in 1981 (Appendix Table 9 and Chart 15). Natural resources accounted for 18.6 per cent of total wealth stocks.<sup>17</sup> The value of natural resources declined 5.91 per

<sup>16</sup> Statistics Canada provides estimates of the value of timber and subsoil resources (oil and minerals); official estimates for other important resources, such as water and fish stocks, are unavailable. Statistics Canada's data are available only to 2007. For timber, the 2008 value is extrapolated using the compound annual growth rate from the 2002-2007 period. For subsoil resources, the 2008 value is assumed to be equal to the 2007 value; it would be inappropriate to use past trends to project the 2008 values in these cases because the time series fluctuate significantly with resource prices from year to year.

<sup>17</sup> For a detailed discussion of the methodologies used by Statistics Canada to estimate the value of natural resources, see Statistics Canada (2006a).

cent annually between 1981 and 1989, the only one of the stocks of wealth that experienced this trend. Short-term swings in the value of natural resources largely reflect commodity price movements as changes in the physical stock of natural resources through exhaustion and discoveries are slow. For example, the almost 50 per cent fall in the value of natural resources in 1986 reflected the collapse in oil prices that year, while a similar increase between 2002 and 2005 was due to rising commodity prices.

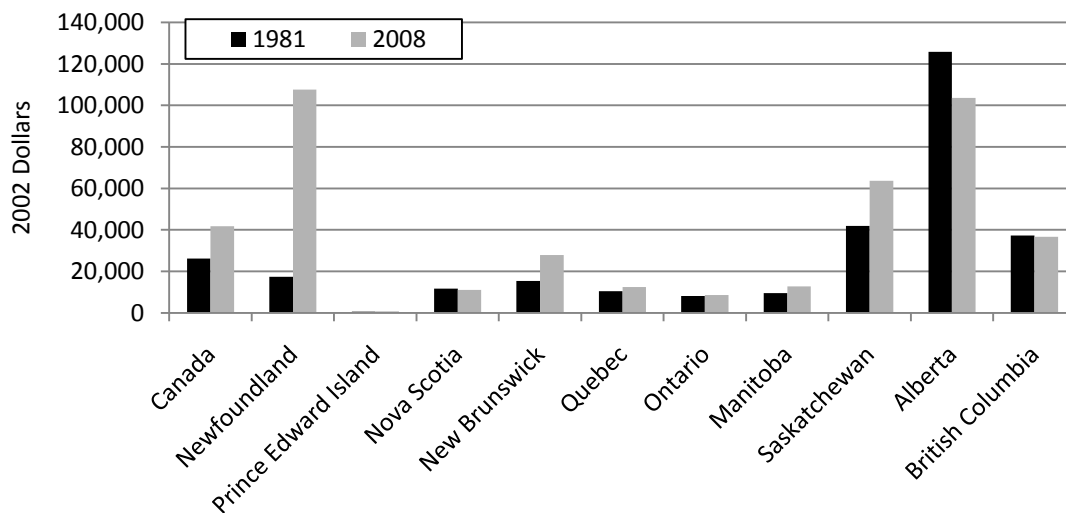
### b. Trends in the provinces

Not surprisingly, the value of natural resources per capita varied tremendously across the provinces in 2008. Newfoundland and Alberta were the distant outliers, with values of \$107,646 and \$103,566 per capita, respectively – both well above the third highest value of \$63,644 in Saskatchewan (Chart 19). At the other extreme, the value in Prince Edward Island was a meager \$700 per capita. Moreover, the value of natural resources was the most volatile component of total wealth for many of the provinces. While the value of Newfoundland’s stock grew 516.5 per cent over the 1981-2008 period, the value actually fell 3.38 per cent per year from 1980-1989, before growing remarkably in the following periods. In Alberta, the value of natural resources per capita actually declined 17.7 per cent over the whole period, with the 10.4 per cent annual decline during the 1981-1989 period accounting for the whole decrease.

### c. A note on natural resource valuation

The valuation of natural resources is very uncertain and an important caveat needs to be made. In official estimates for 2007 (the most recent year for which official data are available), Statistics Canada placed a value of \$342.1 billion (\$10,389 per capita) on

**Chart 19: Per-Capita Stock of Natural Resources, Canada and the Provinces, 2002 Dollars, 1981 and 2008**



Source: Appendix Table 9

established crude bitumen reserves, better known as oil sands reserves. This is based on the estimate that the oil sands contain 22.0 billion barrels of oil.<sup>18</sup> However, most observers think this reserve estimate is much too low given the advances that have been made in the technologies used to exploit the oil sands. For example, the Canadian Association of Petroleum Producers (CAPP) estimates the oil sands' potential at 175 billion barrels, placing Canada second only to Saudi Arabia in terms of oil reserves.<sup>19</sup>

If this estimate is accurate, the figures of Canada's natural resource wealth presented in this report are wildly underestimated. Under the assumption of oil at \$70 Canadian per barrel, and an estimated cost of extraction of \$19 per barrel, Sharpe *et al.* (2008) estimate that the net present value of the oil sands is \$1.48 trillion under the 175 billion barrel reserve assumption. Given Canada's population of 33 million in 2008, this translates into natural resource wealth for Canadians of \$44,500 per capita from the oil sands alone. That is greater than Statistics Canada's official estimates of *total* natural resource wealth per capita. From this perspective, the estimates of well-being presented in this report, based on official estimates of natural resource wealth, greatly underestimate the stocks of wealth and the future well-being of Canadians.<sup>20</sup> If the price of oil stays at current levels, then from a purely economic perspective (not taking into account the full social costs of environmental degradation), the wealth of the oil sands will likely contribute massively to the well-being of future generations of Canadians.

#### iv. Net International Position

##### a. Trends in Canada

Statistics Canada publishes data on Canada's annual end-of-year net international investment position in current dollars. In 2008, Canada had a net asset position of \$6.72 billion; this was the first occurrence of a positive net asset position in Statistics Canada's time series for Canada, which dates back to 1926. We transform the current-dollar estimates to 2002 dollars using the GDP deflator, also from Statistics Canada.

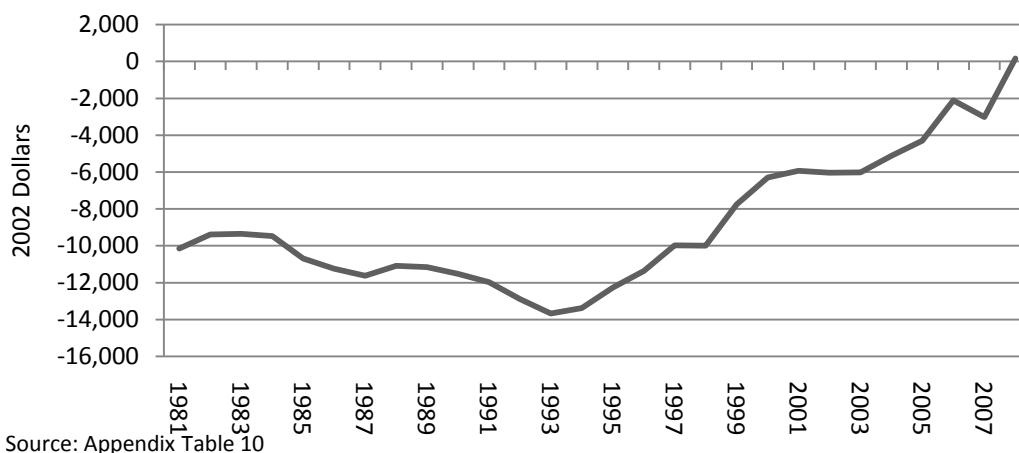
In 2002 dollars, Canada's net international investment position in 2008 was \$5.55 billion dollars, equivalent to \$167 per capita (Chart 20). Canada's international indebtedness rose in the 1980s and early 1990s, peaking at \$13,022 per capita in 1994, up from \$9,819 in 1981. Since then it has been on a strong downward trend, reflecting Canada's large current account surpluses.

<sup>18</sup> See Statistics Canada's Natural Resource Stock Accounts, CANSIM Tables 153-0005 and 153-0012.

<sup>19</sup> According to the CAPP website: "Canada's oil sands deposits contain as much as 175 billion barrels of economically viable oil, or enough oil to meet the country's current energy needs for 500 years. With current technology, Canada's oil sands are second only to Saudi Arabia in global oil reserves. As technology improves, so too does the potential to produce more oil from the oil sands." [http://www.capp.ca/default.asp?V\\_DOC\\_ID=1162](http://www.capp.ca/default.asp?V_DOC_ID=1162).

<sup>20</sup> A key point made by Sharpe *et al.* (2008) is that the net present value of a natural resource is heavily dependent upon the assumed time path of exploitation. The Sharpe *et al.* estimate of the value of the Alberta oil sands was based on projected short-term rates of exploitation that may no longer be valid, since the global recession and the collapse of oil prices after the summer of 2008 led to the postponement of many oil sands development projects. Pushing resource exploitation further into the future reduces the net present value of the resource because future resource revenues are subject to intertemporal discounting. Nevertheless, it remains likely that the official Statistics Canada estimates of the value of the oil sands understate the true value of the resource because they do not value the full quantity of exploitable oil.

**Chart 20: Per-capita Net International Investment Position, Canada, 2002 Dollars, 1981-2008**



### b. Trends in the provinces

No data are available on the provincial distribution of foreign assets and liabilities. Therefore, provincial figures for net international investment position are constructed by weighting the national figure by provincial shares of national GDP, on the assumption that such assets and liabilities directly related to the amount of economic activity in a province. Since the provincial values are constructed in this way, they are of little interest in and of themselves. In 2008, they ranged from \$125 per capita in Prince Edward Island to \$200 per capita in Alberta.

## v. Human Capital

### a. Trends in Canada

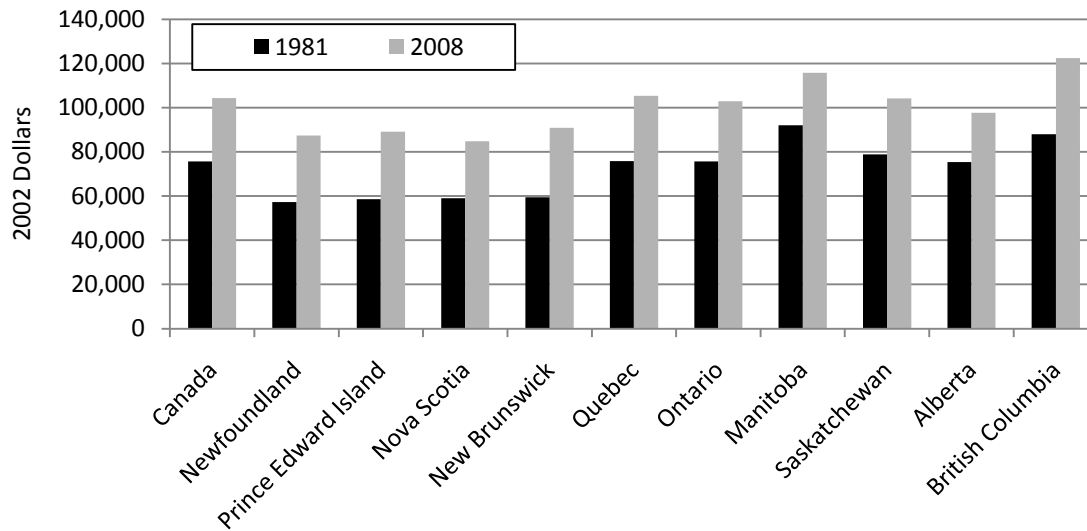
Human capital in the Index of Economic Well-being is defined on a cost basis as the accumulated private and public expenditures on education at all levels. In 2008, the per-capita value of human capital in Canada was \$104,262 (2002 dollars).<sup>21</sup> Representing 49 per cent of wealth stocks, human capital is the most important component of wealth stocks – even more important than physical capital (Chart 15). Per-capita human capital rose 37.8 per cent over the 1981-2008 period, an average annual rate of increase of 1.20 per cent. The annual rate of growth was somewhat faster in the 1990s (1.44 per cent) than in the 1980s (1.00 per cent) and the 2000-2008 period (1.06 per cent).

### b. Trends in the provinces

Once again, there were considerable differences across provinces in the per-capita value of human capital in 2008. British Columbia had the highest value at \$122,377 per

<sup>21</sup> The value of human capital is based on estimates of the cost of education in 2002/2003 drawn from Statistics Canada (2007).

**Chart 21: Per-capita Human Capital Stock, Canada and the Provinces, 2002 Dollars, 1981 and 2008**



Source: Appendix Table 11

capita, followed by Manitoba at \$115,807 and Quebec at \$105,300 (Chart 21). Nova Scotia and Newfoundland had the lowest values at \$84,724 and \$87,431 per capita, respectively. All provinces experienced growth in the values of human capital per capita in excess of 25 per cent over the 1981-2008, with New Brunswick, Newfoundland and Prince Edward Island all enjoying rates above 50 per cent. Most provinces exhibited a pattern similar to the national one in terms of growth rates in the cyclically-neutral sub-periods, with the fastest growth occurring in the 1990s.

## vi. Social Costs of Environmental Degradation

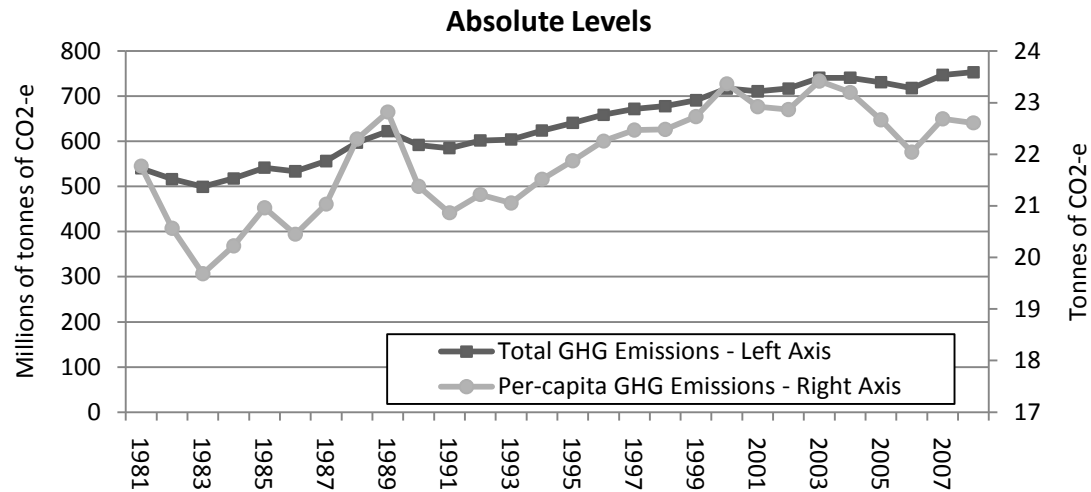
A negative factor affecting the sustainability of stocks of wealth is the degradation of the environment. Placing a value on the environment or the “services provided by ecosystems” is a massive and controversial task and well beyond the scope of the Index of Economic Well-being. But to highlight the importance of the environment for economic well-being, and to show that environmental issues can be accommodated in our framework for quantifying economic well-being, the Index does include estimates of the social costs of greenhouse gases, which contribute to global warming. In each year, we adjust the total wealth stock estimates by subtracting the social costs of greenhouse gas emissions in that year.

The estimates are derived by multiplying greenhouse gas emissions (measured in megatonnes of CO<sub>2</sub>-equivalent emissions, or MtCO<sub>2</sub>-e) by the social cost of such emissions.<sup>22</sup> In a recent review of 211 published estimates of the social cost of carbon, Tol (2007) finds that the average estimate from peer-reviewed studies is \$23/tCO<sub>2</sub>-e in

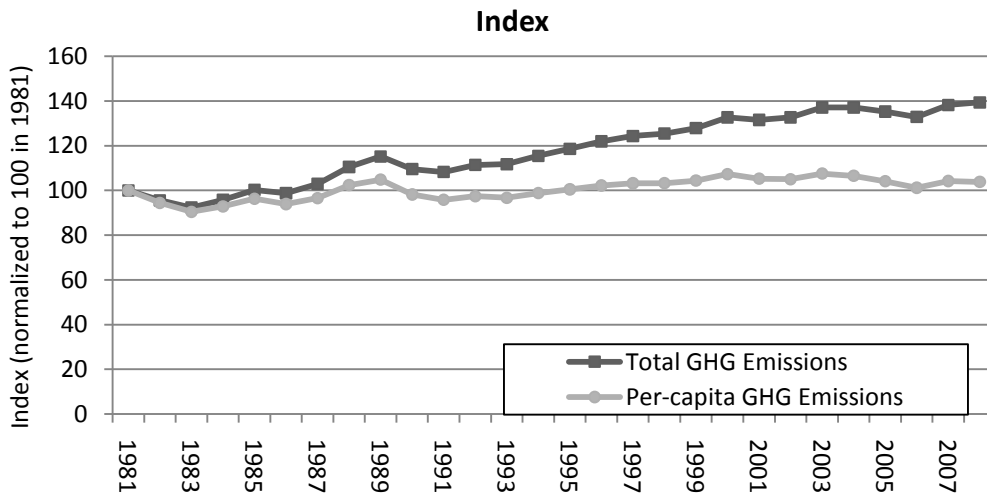
<sup>22</sup> See Sharpe *et al.* (2008) for a brief discussion of the methodological challenges surrounding the estimation of the marginal social costs of GHG emissions.



**Chart 22: Trends in Total and Per-capita Greenhouse Gas Emissions, Canada, Tonnes of CO<sub>2</sub>-equivalent, 1981-2008**



Source: Appendix Table 12



Source: Appendix Table 12

1998 Canadian dollars.<sup>23</sup> To simplify the calculations, it is assumed that all the costs of greenhouse gas emissions are borne in the jurisdiction in which the emissions are produced. In reality, the effects of greenhouse gases cross borders and are global in nature, but the distribution of the costs throughout the world is not known.<sup>24</sup>

<sup>23</sup> This corresponds to a social cost of carbon of \$71 US dollars per tonne of carbon (\$71/tC), the value given in Table 1 of Tol (2007). We convert it to Canadian dollars per tonne of CO<sub>2</sub>-equivalent emissions using the molecular mass conversion factor between carbon and CO<sub>2</sub> (3.664 tonnes of CO<sub>2</sub> contain one tonne of C) and the 1998 OECD Canada-US PPP for GDP (1.187293 CAD/USD). Tol does not specify the base year for the estimates in his meta-analysis; we use 1998 because it is the midpoint of the time period covered by his study. In our database, we estimate the total social costs of CO<sub>2</sub> emissions for Canada and the provinces in 1998 dollars per tonne, then convert the totals to 2002 dollars per tonne using province-specific GDP deflators from Statistics Canada.

<sup>24</sup> In the companion report on the Index of Economic Well-being in OECD countries (Osberg and Sharpe, 2009), we estimate the total costs of CO<sub>2</sub> emissions for the world based on global CO<sub>2</sub> emissions and then distribute these costs in proportion to a country's share of world GDP.

### a. Trends in Canada

In 2008, emissions of greenhouse gases in Canada (primarily CO<sub>2</sub>) were 753 Mt CO<sub>2</sub>-e, up 39.4 per cent from 540 Mt CO<sub>2</sub>-e in 1981 (Environment Canada, 2009).<sup>25</sup> Despite the Kyoto protocol, greenhouse emissions in Canada have been on a roughly continuous upward trend throughout the period, although they did shrink in the mid-2000s. Based on the marginal social cost estimate from Tol (2007), the social costs of greenhouse gases totaled \$564 (2002 dollars) per capita in 2008, up 3.9 per cent from \$543 in 1981. The per-capita burden of greenhouse gas costs increased by 0.59 per cent per year between 1981 and 1989 and by 0.21 per cent per year in the 1990s, but it fell by 0.41 per cent per year over the 2000-2008 period as Canada's population grew faster than its greenhouse gas emissions. Chart 22 illustrates the divergence of the trends in aggregate and per-capita GHG emissions over the 1981-2008 period.

Given that the total value of stocks of wealth in Canada was \$227,250 per capita in 2008, the social costs of greenhouse gases, according to the admittedly simplistic calculations in this report, have only a marginal impact on total wealth. Everything else being held constant, Canadians' per-capita wealth would have been only 0.25 per cent higher in 2008 if per-capita greenhouse gas costs had been zero.

This figure neglects the impact that a presumed higher future social cost of GHG emissions would have on the present value of oil and gas reserves and is, of course, dependent on our assumption regarding the marginal social cost per tonne of CO<sub>2</sub> emitted. We have used the average of estimates from a number of studies, which themselves have a wide range of values. In future editions of the IEWB, we plan to embed programming to allow analysts to specify the shadow value they assign to CO<sub>2</sub> emissions.

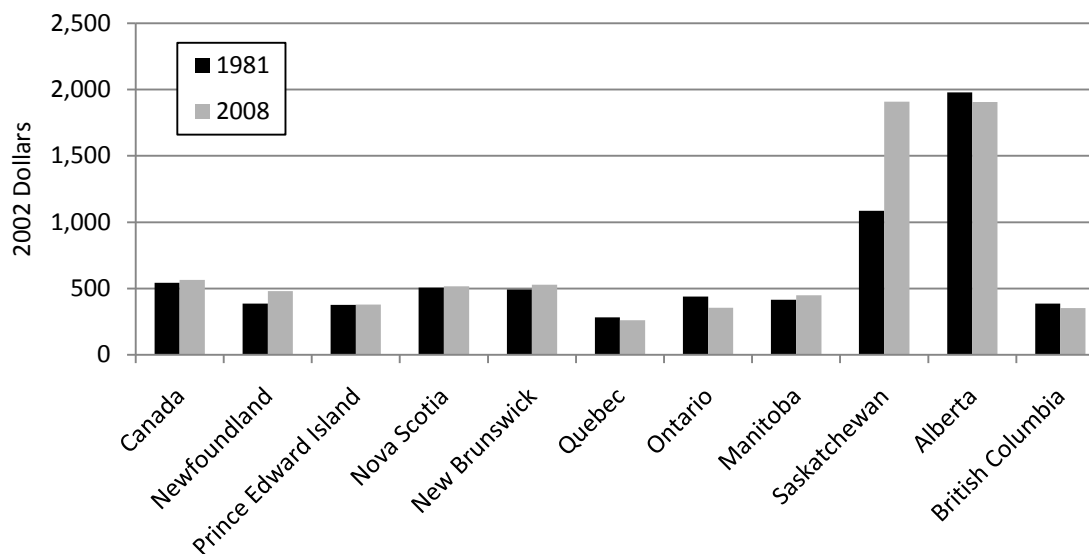
### b. Trends in the provinces

Saskatchewan and Alberta had per-capita greenhouse gas social costs much higher than all the other provinces in 2008, at \$1,910 and \$1,907 per capita, respectively (Chart 23). For Alberta, these costs were actually down 3.6 per cent from 1981 levels; although greenhouse gas emissions increased by 50.9 per cent over the period, the population grew 56.5 per cent. In Saskatchewan, however, per-capita GHG costs were 76.1 per cent higher in 2008 than in 1981, with most of the increase occurring over the 1989-2000 period. In every province except for Newfoundland and Saskatchewan, the per-capita social costs of greenhouse gas emissions declined over the 2000-2008 period.

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<sup>25</sup> Aggregate GHG emissions estimates are available only to 2007. The 2008 value is extrapolated based on the compound annual growth rate from the 2002-2007 period.

**Chart 23: Per-capita Social Costs of Greenhouse Gas Emissions, Canada and the Provinces, 2002 Dollars, 1981 and 2008**



Source: Appendix Table 12

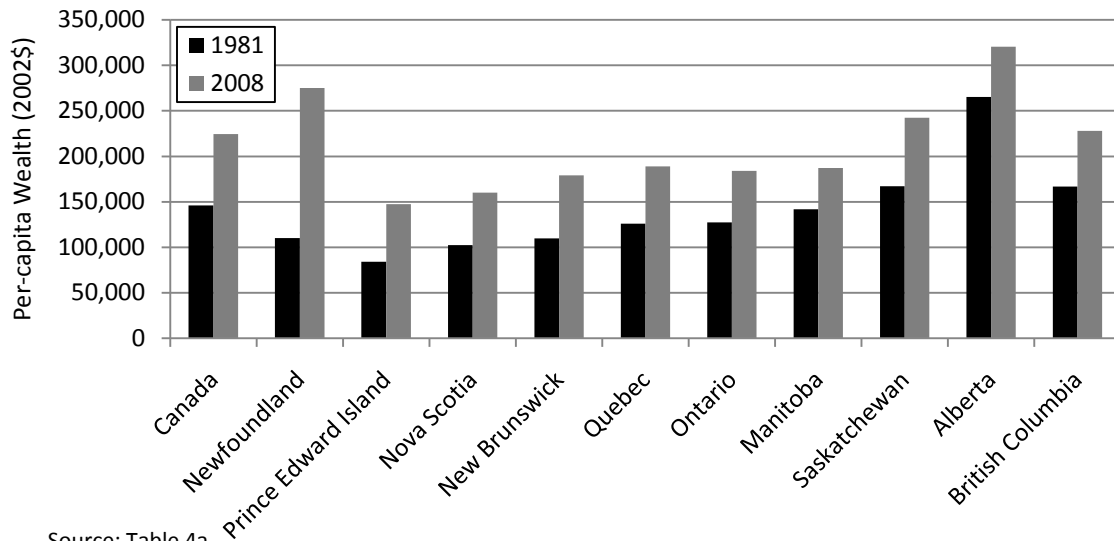
## vii. Total Wealth Stocks

### a. Trends in Canada

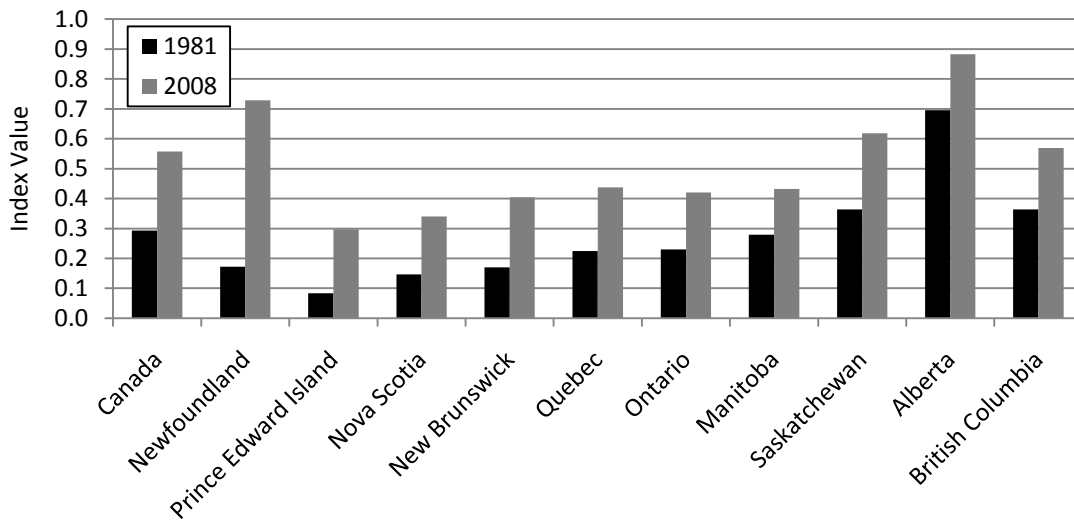
As the different components of wealth stocks are expressed in prices, total wealth stocks are the sum of the five components and the greenhouse gas adjustment. In 2008, they totaled \$227,250 per capita (2002 dollars) in Canada, up 55.7 per cent from 1981 (Table 4a). The rate of growth of wealth stocks was much faster in the 1990s (1.79 per cent per year) and since 2000 (2.88 per cent per year) than in the 1980s (0.26 per cent per year). This improvement reflected several developments: the falling value of natural resources in the 1980s and the rising value since 1990; and the rising international indebtedness in the 1980s and early 1990s and the falling indebtedness since 1994.

### b. Trends in the provinces

At \$324,209, Alberta had the largest total per-capita wealth stock by a substantial margin in 2008 (Chart 24). The province also had the most volatile total wealth, shrinking at 3.27 per cent per year in the 1980s, then growing in the next two periods at 2.82 per cent per year in the 1990s and 2.02 per cent per year since 2000. Fluctuations in the value of natural resources were responsible for these swings. Behind Alberta in 2008 were Newfoundland (with \$277,551 total wealth per capita), Saskatchewan (with \$244,992) and British Columbia (with \$230,739). At the other end, Prince Edward Island had the lowest total wealth per capita at \$149,666, followed by Nova Scotia with \$162,614. Newfoundland experienced far and away the fastest growth; its total per-capita wealth in 2008 was 151.7 per cent higher than its 1981 stock, which implies a growth rate of 3.48 per cent per year. Alberta experienced the lowest growth since 1981 at 22.2 per cent.

**Chart 24: Total Per-capita Wealth in Canada and the Provinces, 1981 and 2008**

Source: Table 4a

**Chart 25: Index of the Wealth Domain in Canada and the Provinces, 1981 and 2008**

Source: Table 4

The index of the wealth domain is acquired by applying the linear scaling procedure to the total per-capita wealth data. The index was 0.557 in Canada in 2008, up 0.274 points (or 93.8 per cent) from 0.293 in 1981.

As in the case of the consumption domain, the scaling procedure does not affect the rankings of the provinces. Alberta had the highest score in the wealth domain in 2008, at 0.894 (Chart 25). It was followed by Newfoundland at 0.737 and Saskatchewan at 0.627. Prince Edward Island's score of 0.305 was lowest among the provinces. The wealth domain index increased in all ten provinces over the 1981-2008 period. Newfoundland's increase of 0.565 points was the largest among the provinces. As in the

case of the consumption domain, Alberta had the lowest per cent growth in the wealth domain over the period, but had the highest wealth score in both 1981 and 2008.

## E. Trends in the Economic Equality Domain

The third domain of the Index of Economic Well-being is economic equality. At current levels, a fall in equality, or rise in inequality, is considered to decrease economic well-being and vice versa. The equality domain consists in two component concepts: income inequality and poverty. We measure income inequality using the Gini coefficient, constructed by Statistics Canada for the total population of family units based on total after-tax family income.<sup>26</sup> To measure poverty, we use poverty intensity, which is the product of the poverty rate and the poverty gap. The poverty rate and gap are based on Statistics Canada's low-income cut-offs (LICOs), which measure the income level below which a family is expected to spend at least twenty percentage points more of its income on necessities (food, shelter and clothing) than an average family, controlling for community size and family size (Statistics Canada, 2006c).<sup>27</sup> The poverty rate is the percentage of Canadians who live below the LICO, and the average poverty gap is the average difference between the LICO and the incomes of those whose incomes fall below it.

High poverty intensity is considered more detrimental to economic well-being than an unequal income distribution. Consequently, poverty intensity is given a weight of three quarters, and income distribution a weight of one quarter, in the determination of the overall index for the equality domain.

### i. Income Inequality

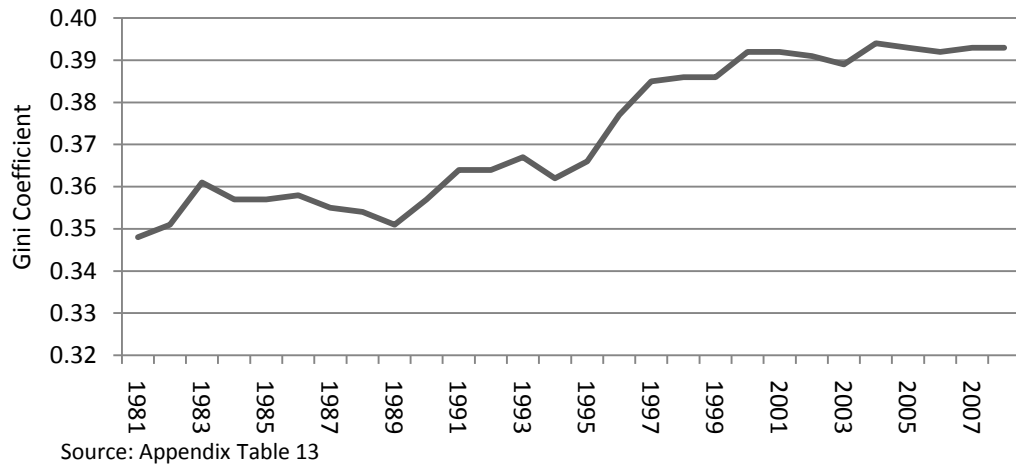
#### a. Trends in Canada

In 2008, the Gini coefficient for all families in Canada based on after-tax income was estimated to be 0.393, up 12.9 per cent from 0.348 in 1981 (Appendix Table 13 and Chart 26).<sup>28</sup> Nearly all of the increase in inequality occurred in the 1990s; the compound

<sup>26</sup> See Footnote 11 above for the definition of a 'family.'

<sup>27</sup> In our work on international estimates of the Index of Economic Well-being (Osberg and Sharpe, 2009), and in past work on the Index for Canada and the provinces, we have measured poverty using the low income measure (LIM) approach, whereby the poverty line is defined as a fixed proportion (e.g. 50 per cent) of the median income. We must use this approach in international comparisons because comparable data similar to the LICOs are not available for countries other than Canada. For our work on Canada and the provinces, we opted to switch to the LICO approach for several reasons. First, the LICOs are the most common poverty measures used in the literature on Canada. Second, Statistics Canada produces official estimates of the poverty rate and gap based on location- and family size-specific LICOs; this level of precision would be difficult to achieve using the LIM approach, and in any case, we think it is better to use Statistics Canada's official data whenever possible in the interest of transparency. Note that poverty rates based on the LICOs should experience a greater decline over the 1981-2008 period than rates based on the LIM. This is because the LICO is an 'absolute' measure of poverty while the LIM is a 'relative' measure; the poverty line rises with median income under the LIM approach, while the LICO does not. Indeed, while the LICO-based poverty rate for all persons fell by 2.4 percentage points in Canada between 1981 and 2007 (from 11.6 per cent to 9.2 per cent), the LIM-based rate increased by 0.6 percentage points (from 12.4 per cent to 13.0 per cent) over the same period (Osberg and Sharpe, 2009).

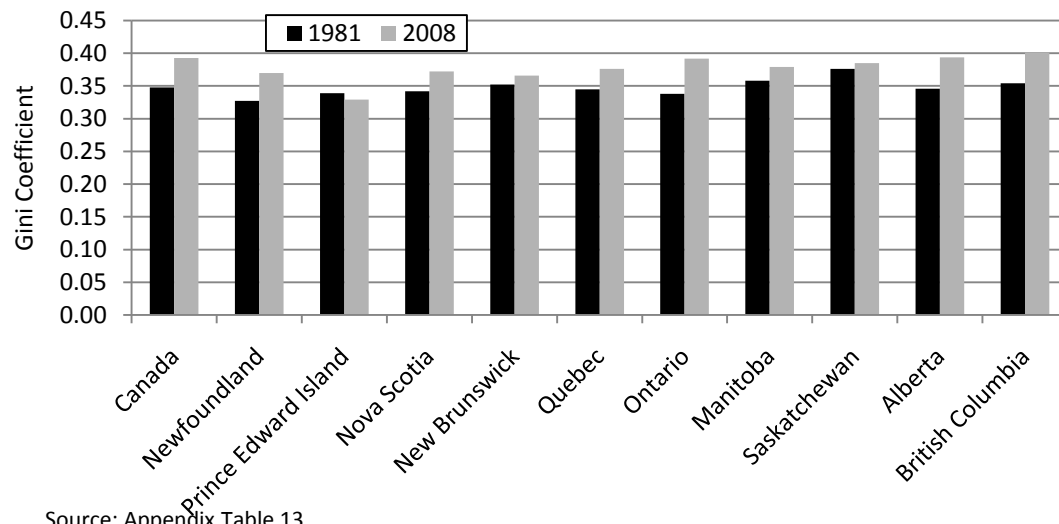
<sup>28</sup> Statistics Canada estimates of the Gini coefficient are available to 2007. The 2008 value is assumed to be equal to the 2007 value.

**Chart 26: Gini Coefficient for All Family Units, Canada, 1981-2008**

annual growth rate of the Gini coefficient over the 1989-2000 period was 1.01 per cent, compared to rates of 0.11 per cent over the 1981-1989 period and 0.03 per cent over the 2000-2008 period.

#### b. Trends in the provinces

Among the provinces, the highest Gini coefficient in 2008 was 0.401 for British Columbia, followed by Alberta's 0.394 and Ontario's 0.392 (Chart 27). Prince Edward Island had the lowest coefficient at 0.329. Over the 1981-2008 period, Ontario experienced the largest change, in percentage terms, at 16.0 per cent, followed by Alberta at 13.9 per cent. Prince Edward Island was the only province where the Gini coefficient actually dropped over the period (by 2.9 per cent). As was the case for Canada as a

**Chart 27: Gini Coefficient for Families Based on After-tax Income, Canada and the Provinces, 1981 and 2008**

whole, the 1990s were responsible for most of the increase in Gini coefficients across the board, while the 2000s saw a relative stabilization and, in the case of Prince Edward Island and Ontario, a drop.

## ii. Poverty

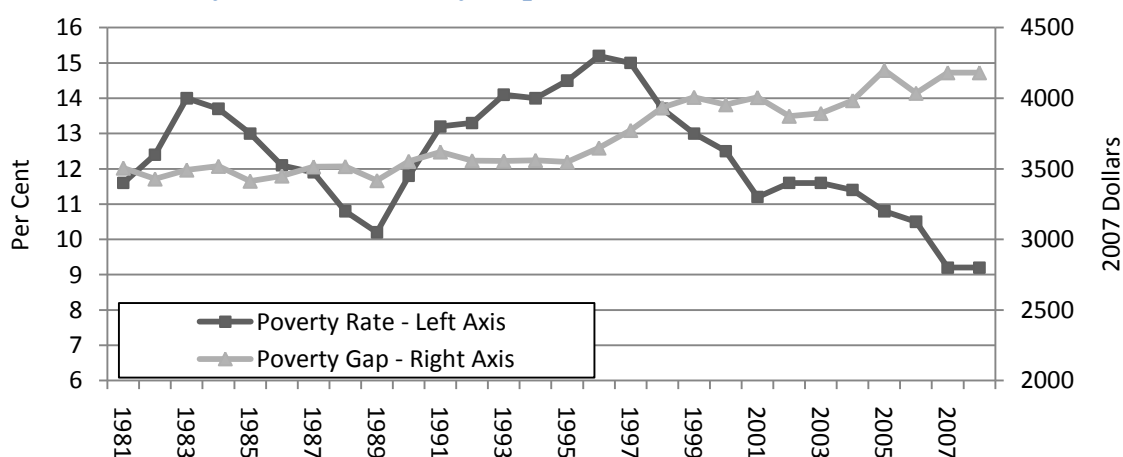
### a. Trends in Canada

In contrast to the upward trend in income inequality over the 1981-2008 period, the poverty rate has risen and fallen as a lag of the unemployment rate in Canada (Appendix Table 14 and Chart 28). The poverty rate for all persons, based on the LICOs, was estimated at 9.2 per cent in 2008, down from the 11.6 per cent figure in 1981.<sup>29</sup> It peaked at 13.7 per cent in 1984, hit a low point of 10.2 per cent in 1989, rebounded to a high point of 15.2 per cent in 1996 and then remained above 11 per cent until 2004, after which it fell to 10.8 per cent in 2005 and to 9.2 per cent in 2008.

In 2008, the per-person poverty gap in Canada was \$4,182 (in 2007 dollars), 19.3 per cent higher than its 1981 value of \$3,506 (Appendix Table 15 and Chart 28). The poverty gap was stable over the 1980s, but it began rising in the early 1990s to peak at \$4,199 in 2005. It has effectively maintained that level since 2005.

Poverty intensity is the product of the poverty rate and poverty gap. The magnitude of poverty intensity in a particular place at a point in time has no meaning; the measure is useful only for comparisons across time or across jurisdictions. Poverty intensity was down 5.4 per cent in 2008 from its 1981 level in Canada (Appendix Table 16). Not surprisingly, it exhibited the same pattern as the poverty rate, falling in the late 1980s, rising until 1997, and then falling from the late 1990s to 2008.

**Chart 28: Poverty Rate and Poverty Gap for All Persons, Canada, 1981-2008**



Source: Appendix Tables 14 and 15

<sup>29</sup> Statistics Canada estimates of the poverty rate and poverty gap are available to 2007; the 2008 values are assumed to be the same as the 2007 values.

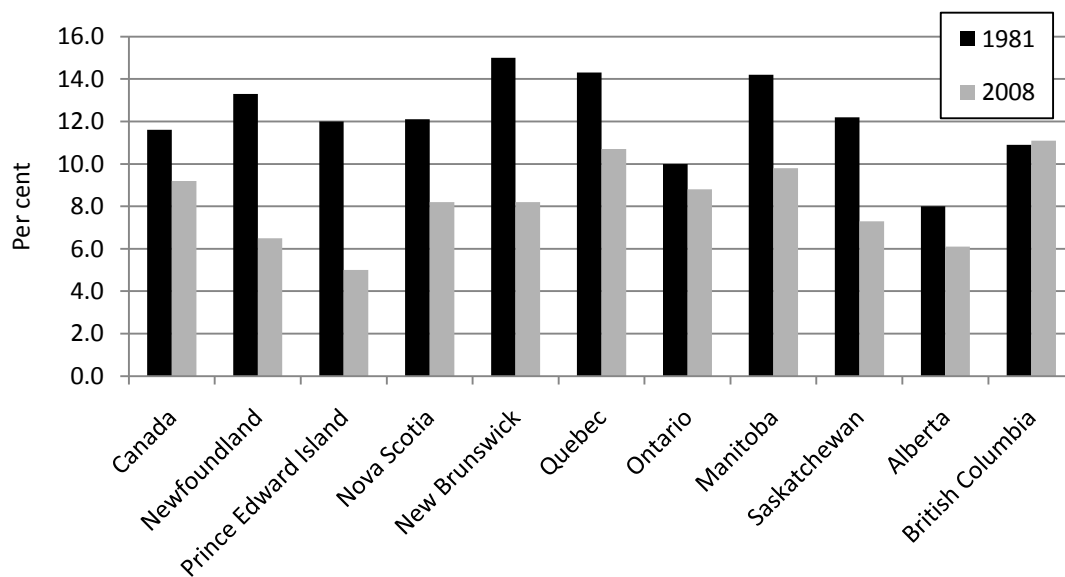
## b. Trends in the provinces

The highest poverty rates among the provinces in 2008 occurred in British Columbia, with 11.1 per cent, and Quebec, with 10.7 per cent (Chart 29). The lowest rate in 2008 was in Prince Edward Island, with an impressive 5.0 per cent, and Alberta followed with 6.1 per cent. The poverty rate fell in all the provinces over the 1981-2008 period, except for in British Columbia where it rose slightly from 10.9 per cent to 11.1 per cent. While the provincial trends throughout the 1981-2008 period generally followed the national one, there was considerable variety across provinces in terms of total changes over the whole period. Poverty rates in Prince Edward Island and Newfoundland dropped 7.0 and 6.8 percentage points between 1981 and 2008, while those of Ontario and Alberta fell less than 2 percentage points.

New Brunswick had the lowest poverty gap among the provinces in 2008 at \$3,150; Alberta had the highest at \$4,630 (Chart 30). Over the 1981-2008 period, the poverty gap increased in every province. There was some variability over the sub-periods – the gap declined in five provinces during the 1980s – but since 1989, the gap has grown steadily across Canada except in New Brunswick, where it fell 1.02 per cent per year over the 2000-2008 period.

Over the 1981-2008 period, the greatest drops in poverty intensity were in Manitoba and New Brunswick, at 28.2 per cent and 25.4 per cent, respectively. Poverty intensity failed to decline over the period in three provinces: Nova Scotia, Ontario, and British Columbia.

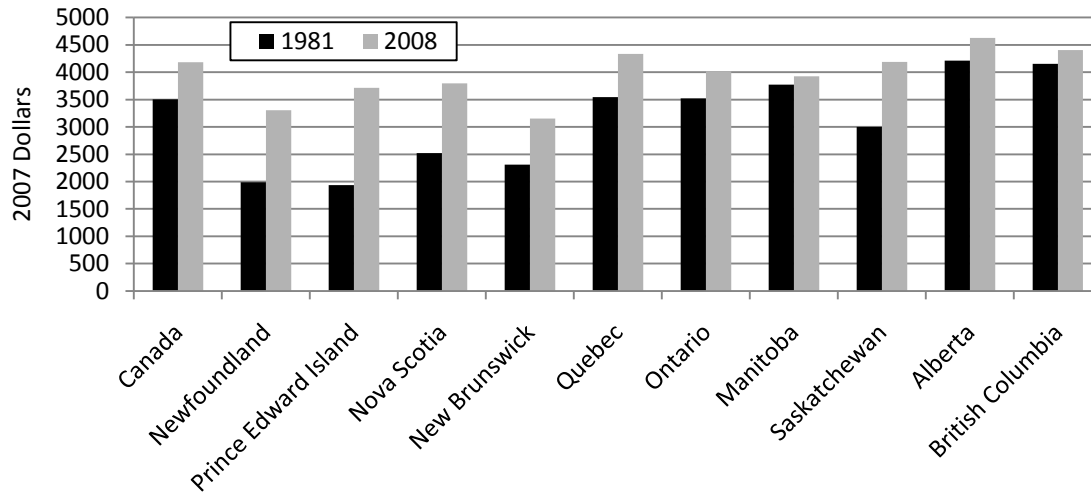
**Chart 29: Poverty Rate Based on LICOs, Canada and the Provinces, Per Cent, 1981 and 2008**



Source: Appendix Table 14



**Chart 30: Average Poverty Gap Based on LICOs, Canada and the Provinces, 2007 Dollars, 1981 and 2008**



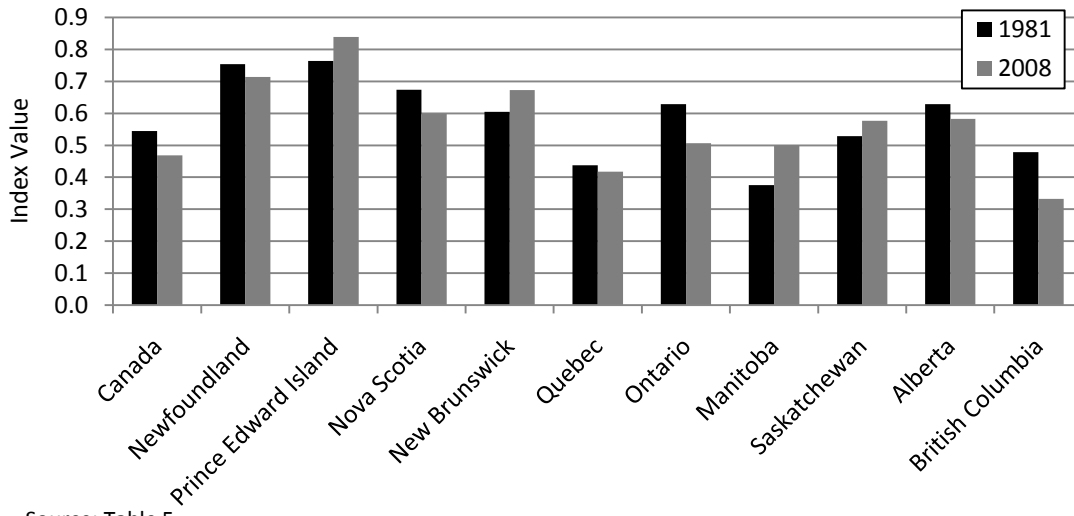
Source: Appendix Table 15

### iii. Overall Economic Equality Domain

The index of the economic equality domain is the weighted sum of the scaled Gini coefficient and the scaled poverty intensity, with poverty intensity receiving three quarters of the weight. In Canada, the index was 0.469 in 2008, down 0.076 points (or 13.9 per cent) from 0.545 in 1981. Prince Edward Island had the highest score in the equality domain in 2008 at 0.839, followed by Newfoundland at 0.714 (Chart 31). British Columbia had the lowest score by a considerable margin with 0.332; the next lowest score was Quebec's 0.417.

Four of the ten provinces (Prince Edward Island, New Brunswick, Manitoba, and Saskatchewan) saw considerable improvement in the equality index over the 1981-2008 period; in Manitoba, the index increased by 33.3 per cent from 0.375 to 0.500 (Chart 31). On the other hand, the index dropped over the period in the rest of Canada. The largest decline was in British Columbia, where the index of equality fell by 30.6 per cent over the period.

**Chart 31: Index of the Equality Domain in Canada and the Provinces, 1981 and 2008**



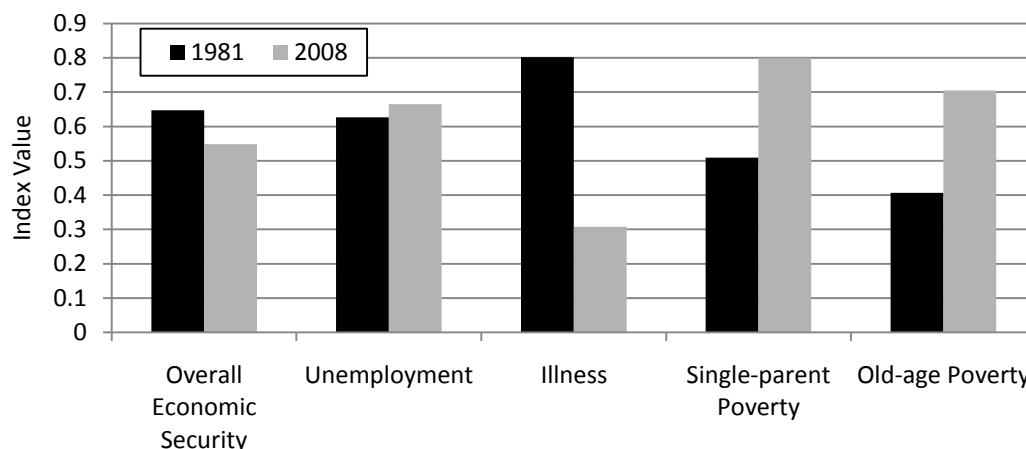
Source: Table 5

## F. Trends in the Economic Security Domain

The economic security domain is the most complex domain of the Index of Economic Well-being and the methodologies used in its construction have evolved since the Index was first released in 1998.<sup>30</sup> The domain consists in four components called risks to economic well-being facing the population, namely the risk imposed by unemployment, the financial risk from illness, the risk from single parent poverty, and the risk of poverty in old age. Three of these components are in turn composed of more than one variable. Chart 32 illustrates Canada's scores in the sub-indices for each of the four economic security components in 1981 and 2008, as well as the overall index of economic security. Canadians became more secure over the period in terms of the risk from unemployment, single-parent poverty, and old-age poverty, but these gains were more than offset by the fall in security from the financial risk of illness.

<sup>30</sup> For a discussion of the role of economic security in an index of economic well-being and an assessment of the CSLS approach to the measurement of economic security, see Heslop (2009).

**Chart 32: The Economic Security Domain and its Components, Canada, 1981 and 2008**



Source: Table 6 and Appendix Tables 20, 22, 26, and 29

## i. Risk from Unemployment

Risk imposed by unemployment is determined by three variables: the unemployment rate, the proportion of the unemployed receiving EI benefits, and the proportion of earnings that are replaced by EI benefits.

### a. Trends in Canada

The unemployment rate was 6.1 per cent in Canada in 2008, slightly higher than the lowest rate (6.0 per cent in 2007) attained during the 1981-2008 period (Appendix Table 17 and Chart 33). The unemployment rate rose in the early 1980s, peaking at 12.0 per cent in 1983 because of recession, then fell during the recovery and the economic expansion during the rest of the decade. This pattern repeated itself in the 1990s, with the unemployment rate rising to 11.4 per cent in 1993 and then slowly unwinding to 6.8 per cent in 2000. Unlike the early 1980s and 1990s, the early 2000s did not experience a major economic downturn, so the unemployment rate has been relatively stable since 2000, peaking at 7.7 per cent in 2002 before falling until 2007. It is now rising again due to the current recession.

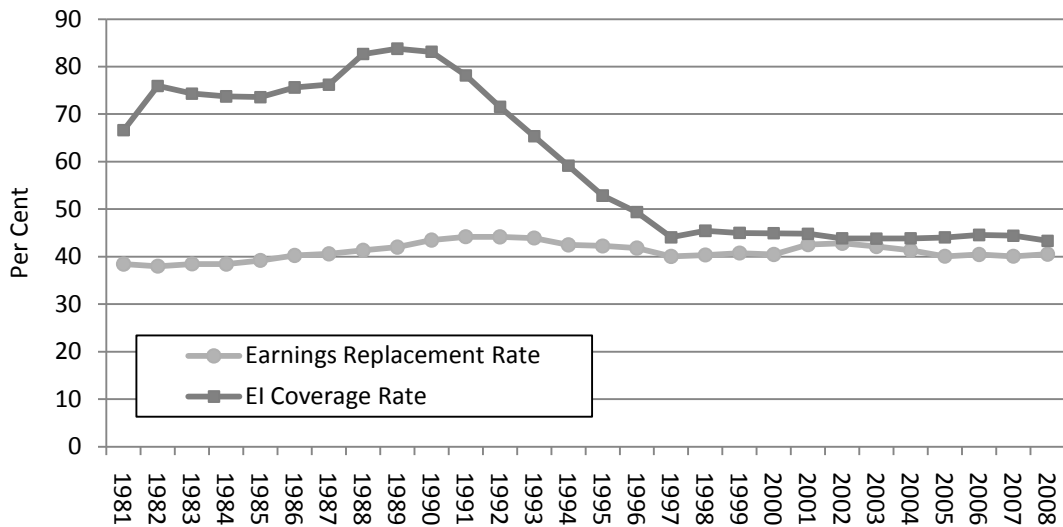
In 2008, the proportion of the unemployed receiving EI benefits in Canada was 43.3 per cent,<sup>31</sup> down from 66.6 per cent in 1981 and 83.8 per cent in 1989 (Appendix Table 18 and Chart 33). It appears that the EI system became more generous in terms of coverage in the 1980s, but that this generosity fell significantly from 1989 to 1997, and has since stabilized.

<sup>31</sup> Strictly speaking the 43.3 per cent is the ratio of the number of persons receiving EI benefits to the number of unemployed. It is unlikely that all EI beneficiaries are classified as unemployed by the Labour Force Survey, especially in a region where there are few job prospects. And of course new labour market entrants may be unemployed but not eligible for EI benefits.

**Chart 33: Trends in the Unemployment Rate and the EI Replacement and Coverage rates, Canada, Per Cent, 1981-2008**



Source: Appendix Table 17



Source: Appendix Tables 18 and 19

On average, EI benefits replaced 40.5 per cent of average weekly earnings in 2008 (Chart 33). This was 5.5 per cent above the 1981 replacement rate of 38.4 per cent. EI benefits peaked at 44.2 per cent in 1991 and 1992.

The aggregation procedure for the variables that make up the risk of unemployment component of the economic security domain is complicated. First, the EI coverage rate and the EI benefits rate are multiplied to obtain an index for the financial protection from unemployment. This index fell 31.4 per cent between 1981 and 2008 for Canada. Second, both the unemployment rate and the financial protection index are scaled. Third, the scaled values of the two indexes are weighted to produce the overall index of security from the risk imposed by unemployment. Since low unemployment

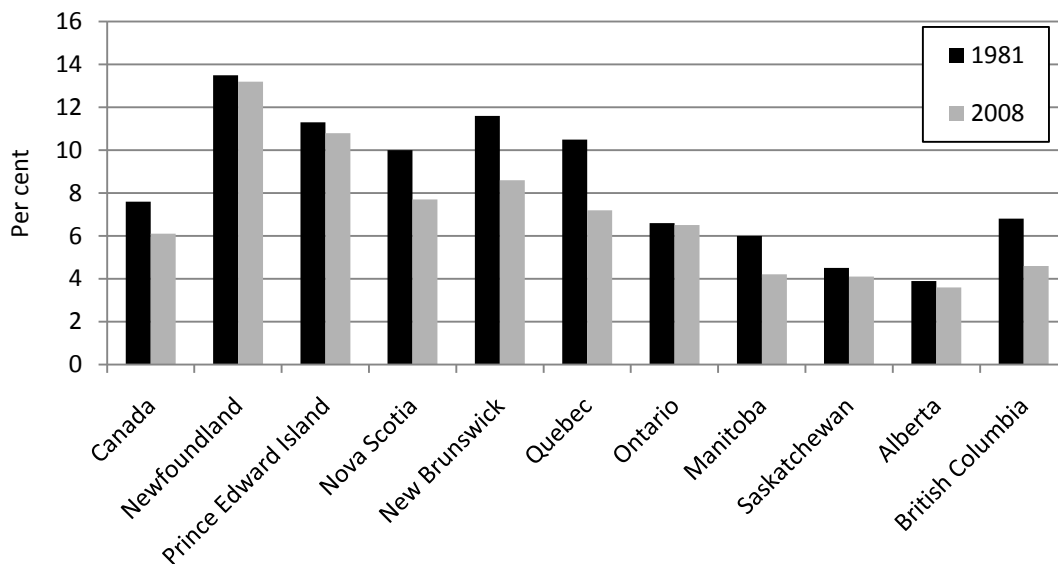
provides employment security by the relative ease of obtaining employment, the unemployment rate is considered considerably more important than the EI system as a source of economic security for the working population. Consequently, it is given a weight of four-fifths in the aggregation of the overall index to reflect the disutility of unemployment *per se* (Di Tella, MacCulloch, and Oswald, 2003). A weight of one-fifth is given to the financial protection variable. This methodology represents a significant change from the earlier methodologies where the unemployment rate and EI system were weighted equally.

The greater weight given to the unemployment rate (relative to the EI variables) produces the result that the scaled value of economic security for risk of unemployment in Canada, at 0.665, is 0.038 points (or 6.1 per cent) greater in 2008 than in 1981 despite the fact that financial protection fell over 30 per cent and the unemployment rate only decreased 19.7 per cent (Chart 37).

### b. Trends in the provinces

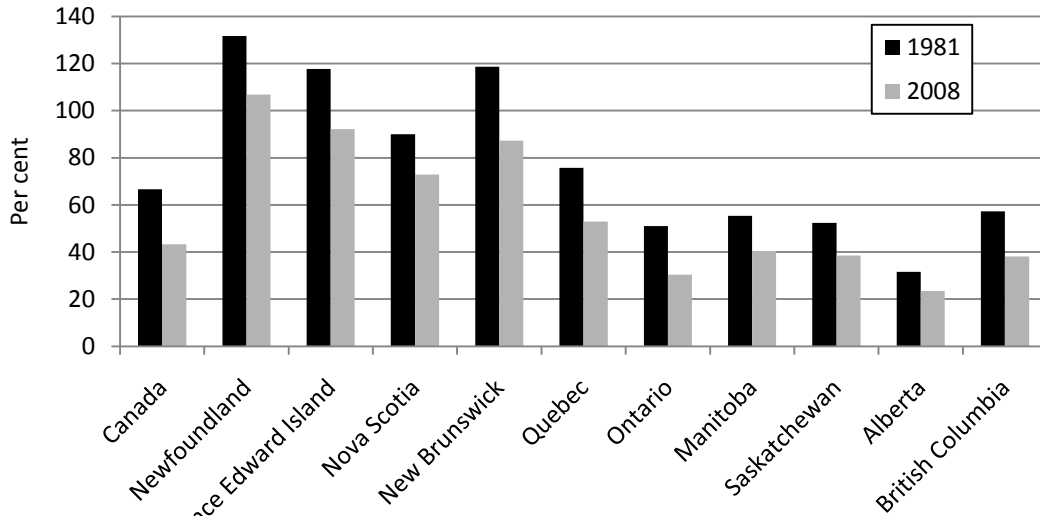
The Atlantic provinces had higher unemployment rates than the rest of Canada in 2008, led by Newfoundland with 13.2 per cent and Prince Edward Island with 10.8 per cent (Chart 34). The lowest rates were in Alberta and Saskatchewan with 3.6 and 4.1 per cent, respectively. Over the 1981-2008 period, the provinces generally followed a pattern similar to the national one, with unemployment peaking in the early 1980s and mid-1990s. The highest rate over the entire period was 20.1 per cent found in Newfoundland in 1993, while the lowest rate was 3.4 per cent found in Alberta in 2006.

**Chart 34: Unemployment Rate in Canada and the Provinces, 1981 and 2008, per cent**



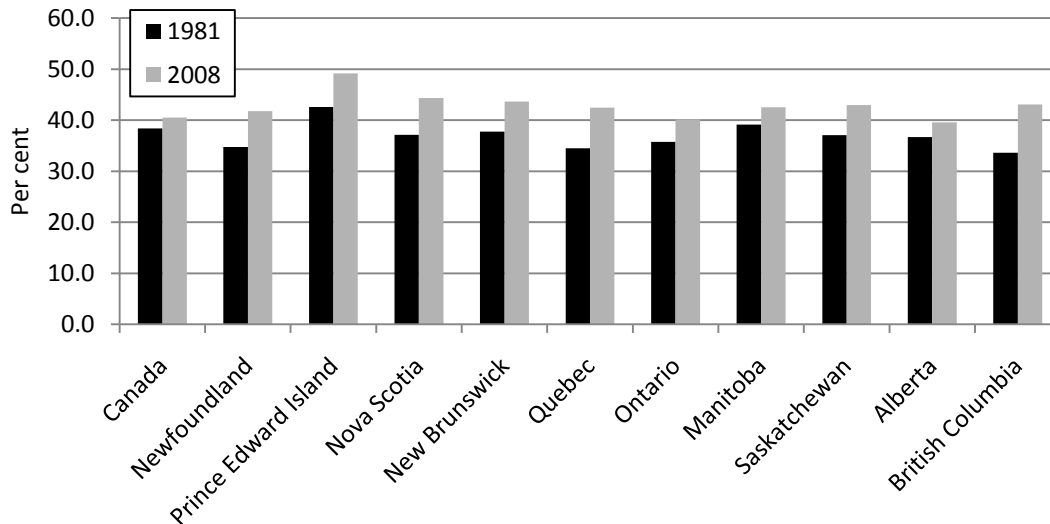
Source: Appendix Table 17

**Chart 35: Employment Insurance Coverage Ratio, Canada and the Provinces, Per Cent, 1981 and 2008**



Source: Appendix Table 18

**Chart 36: Average Proportion of Earnings Replaced by EI Benefits, Canada and the Provinces, Per Cent, 1981 and 2008**



Source: Appendix Table 19

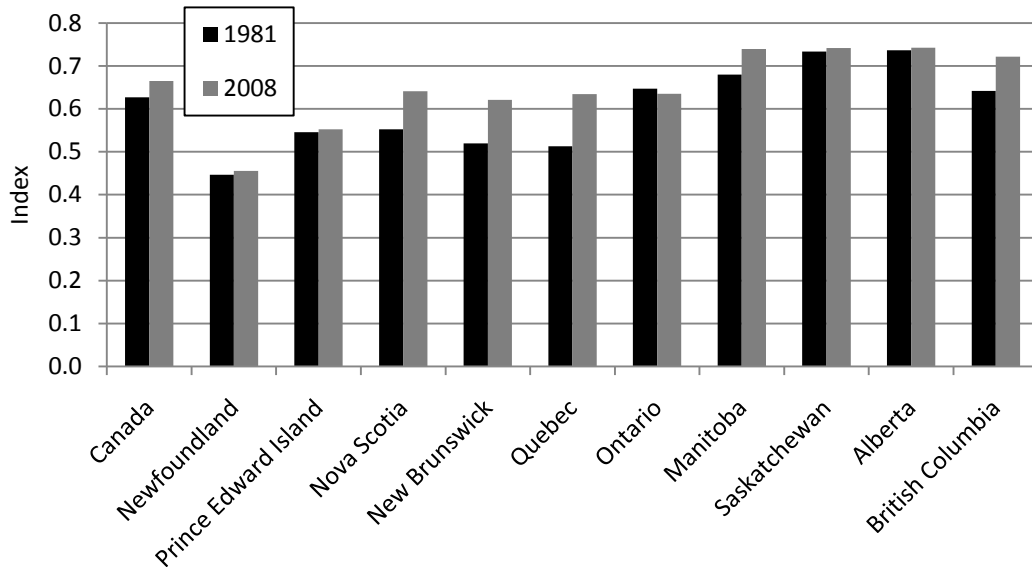
The highest provincial EI coverage ratio in 2008 was 106.8 per cent in Newfoundland. This reflects the fact that EI recipients may outnumber those technically classified as unemployed (Footnote 31). The lowest coverage rate in 2008 was in Alberta, at 23.5 per cent. The large cross-province differences in the EI coverage ratios are a result of the structure of the EI system; the eligibility criteria for EI benefits, and the duration of those benefits, differ across regions of Canada depending on local labour market conditions. The EI system is more generous in regions of high unemployment, such as the Atlantic provinces, than in regions of low unemployment, such as Alberta.

The EI coverage ratio declined in every province over the 1981-2008 period. The largest decline was 1.90 per cent per year in Ontario, while the smallest was 0.77 per cent per year in both Newfoundland and Nova Scotia.

There was much less variation across provinces in the EI replacement rate. The rate was highest in Prince Edward Island in 2008, at 49.2 per cent; Alberta's rate of 39.6 per cent was lowest among the provinces (Chart 36). The largest increase in the replacement rate over the period was the 28.0 per cent increase in British Columbia.

The scaled values of the index of security from unemployment were higher in 2008 than in 1981 for all provinces with the exception of Ontario, where the value fell 1.9 per cent over the period (Chart 37). There was a tie for the highest scaled value in 2008 between Alberta and Saskatchewan, at 0.742, with Manitoba close behind at 0.739. The lowest value was found in Newfoundland at 0.455, followed by Prince Edward Island at 0.552. Over the entire period, Quebec saw the most progress with 23.6 per cent growth in the index.

**Chart 37: Overall Index of Security from the Risk Imposed by Unemployment, Canada and the Provinces, 1981 and 2008**



Source: Appendix Table 20

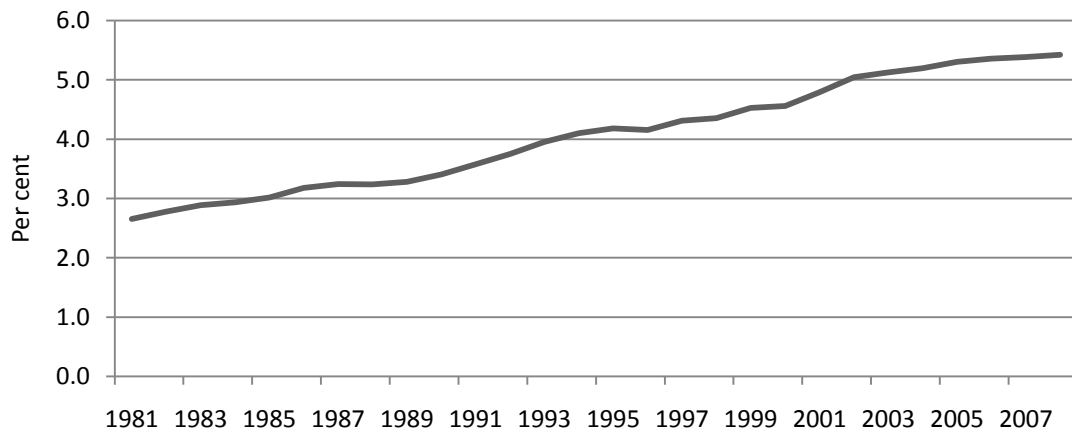
## ii. Financial Risk from Illness

The second component of the economic security domain is the financial risk imposed by illness. In Canada, health care deemed medically necessary is provided free of charge to all citizens through public medicare programs. In this sense the financial risk imposed by illness is much less than in countries without such universal coverage like the United States. But there is still significant private expenditure on health care in Canada and these expenditures have been rising rapidly. Included are spending for dental care, drugs taken outside hospitals, unlisted medical services such as acupuncture, and delisted medical services.<sup>32</sup> Also included are medically unnecessary procedures purchased by Canadians, such as plastic surgery.

### a. Trends in Canada

Private non-reimbursed expenditure on health care in Canada rose from \$6.3 billion current dollars in 1981 to \$51.6 billion in 2008. This represented more than a doubling of private health spending as a share of disposable income, from 2.65 per cent to 5.42 per cent (Appendix Table 21 and Chart 38).<sup>33</sup> This development can be considered a deterioration of the economic security of Canadians. Increased private health expenditure imposed by poor health thus represents a growing financial burden for low income Canadians. The growth rate of private health expenditures as a share of disposable income was fairly stable over the 1981-2008 period. The share grew 2.67 per cent per year over the 1981-1989 period, 3.05 per cent per year over the 1989-2000 period, and 2.19 per cent per year over the 2000-2008 period.

**Chart 38: Private Medical Expenditures as a Proportion of Personal Disposable Income, Canada, Per Cent, 1981-2008**



Source: Appendix Table 21

<sup>32</sup> Physiotherapy and vision care are examples of medical services that have been recently delisted in Ontario.

<sup>33</sup> Data on private health care expenditures are available to 2007. The 2008 values are extrapolated using the compound annual growth rate from the 2002-2007 period.



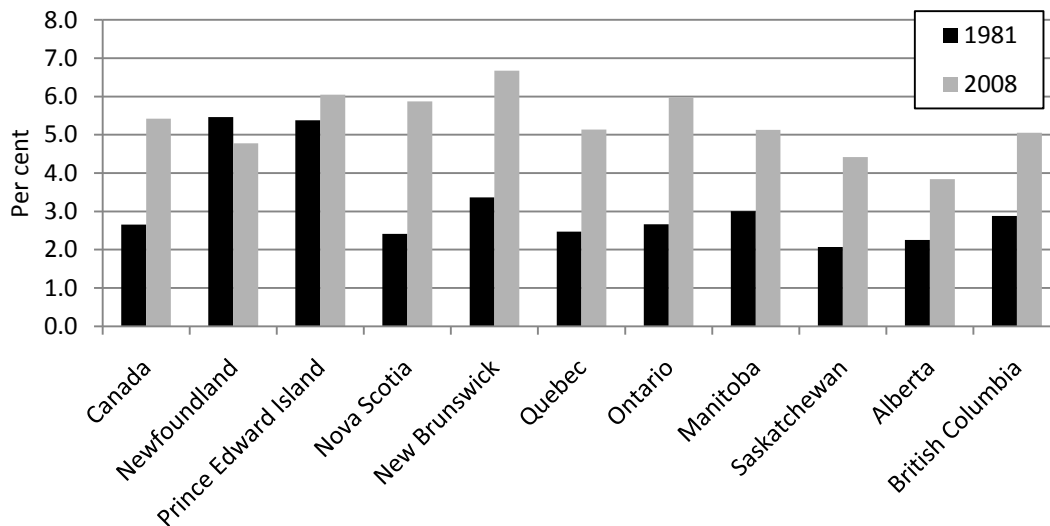
The scaled value of the ‘risk imposed by illness’ component of the economic security domain for Canada fell 0.494 points from 0.802 in 1981 to 0.307 in 2008 (Appendix Table 22). In terms of the index of the scaled values, this represented a 61.7 per cent decrease. As will be discussed later in the report, this development accounted for the entire decline in overall economic security domain.

### b. Trends in the provinces

New Brunswick had the highest proportion of private health care spending to personal disposable income in 2008 with 6.68 per cent, followed by Prince Edward Island and Ontario (at 6.05 and 5.97 per cent). The lowest proportion was Alberta’s 3.84 per cent. Since 1981, all provinces experienced positive growth in private health care spending as a share of disposable income with the exception of Newfoundland, which actually saw a decline of 12.6 per cent. Nova Scotia had the largest increase, at 143.7 per cent over the period, while several other provinces had growth in the 70 to 80 per cent range (Chart 39).

On the scaled value of the risk imposed by illness component of the economic security domain, Alberta had the highest level of security with 0.589 in 2008, followed by Saskatchewan with 0.487. New Brunswick and Prince Edward Island had the lowest scores with 0.083 and 0.195, respectively. In Newfoundland, measured security from the financial risk of illness increased by only 40.8 per cent over the 1981-2008 period. All the other provinces saw declines over the period, the worst of which occurred in New Brunswick and Ontario with 87.6 and 73.8 per cent, respectively.

**Chart 39: Private Expenditure on Healthcare as a Proportion of Personal Disposable Income, Canada and the Provinces, 1981 and 2008, per cent**



Source: Appendix Table 21

### iii. Risk from Single-Parent Poverty

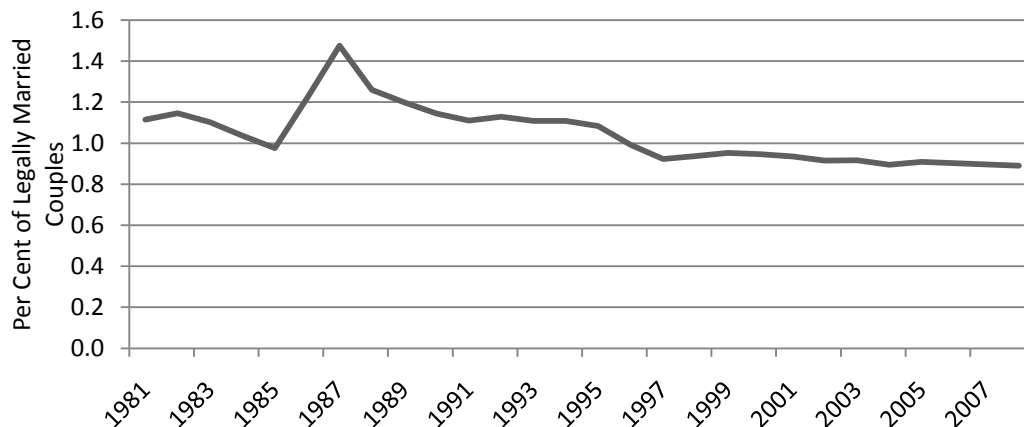
The third component of the economic security domain is the risk of single parent poverty. This component consists of three variables: the divorce rate (as divorce throws many people, especially women, into poverty), the poverty rate for lone parent families, and the poverty gap for these families. As in the equality domain, poverty is defined in terms of the Statistics Canada LICOs. The poverty rate is the proportion of lone-parent families whose total after-tax incomes fall below the LICO, and the poverty gap is the average difference between the LICO and the incomes of those families.

#### a. Trends in Canada

The divorce rate for married couples, defined as the number of divorces divided by the number of married couples, was 0.89 per cent in Canada in 2008, the lowest rate in a quarter century (Appendix Table 23 and Chart 40).<sup>34</sup> The divorce rate rose from 1.12 per cent in 1981 to a peak of 1.47 per cent in 1987 and has since been on a downward trend reflecting possibly the aging of the population (the incidence of divorce declines after a certain number of years of marriage).

It is well known that the poverty rate is particularly high for lone parent families. In 2008, this rate was 21.3 per cent in Canada (Appendix Table 24 and Chart 41).<sup>35</sup> It fell considerably in the mid-1980s, increased in the early 1990s, peaked in 1996 and continued to fall thereafter. In 2008, it was 46.1 per cent below its 1981 level of 39.5 per cent.

**Chart 40: Divorce Rate, Canada, Per Cent of Legally Married Couples per Year, 1981-2008**

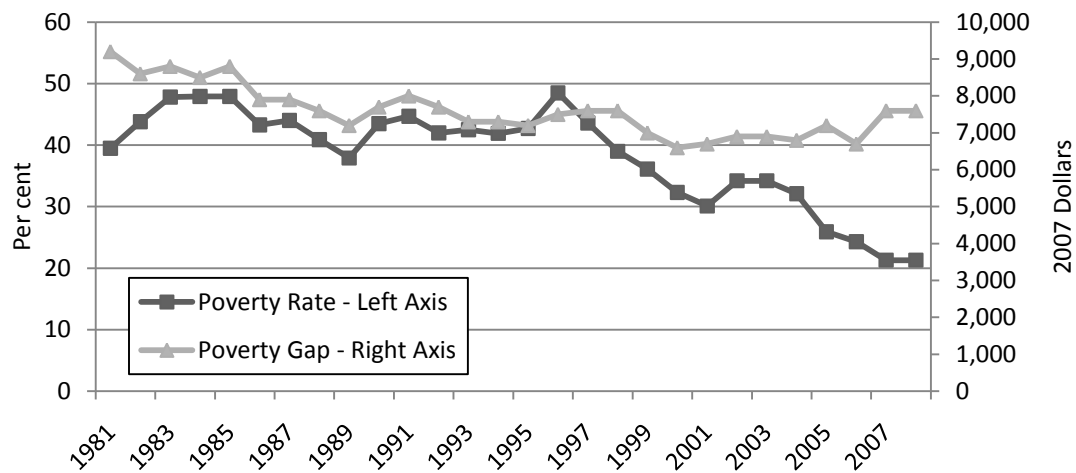


Source: Appendix Table 23

<sup>34</sup> The most recent year for which divorce data are available is 2005; values for subsequent years are extrapolated using the compound annual growth rate from the 2000-2005 period.

<sup>35</sup> Data on the single-parent poverty rate and poverty gap are available to 2007; the 2008 values are assumed to be equal to the 2007 values.

**Chart 41: Poverty Rate and Poverty Gap for Single-parent Families, Canada, 1981-2008**



Source: Appendix Tables 24 and 25

Like the poverty rate, the average single-parent poverty gap fell from 1981 to 2008 in Canada (Appendix Table 25 and Chart 41). The gap was \$7,600 (in 2007 dollars) in 2008, 17.4 per cent below its 1981 value of \$9,200. Most of the decline occurred during the 1980s, when the average gap fell 3.02 per cent per year. The decline slowed to 0.79 per cent per year over the 1989-2000 period, and between 2000 and 2008, the gap increased 1.78 per cent per year.

The overall ‘risk of single-parent poverty’ component is calculated in a multiplicative manner as the product of the divorce rate, the poverty rate for single parents and poverty gap for single parents. This indicator for Canada fell 64.5 per cent over the 1981-2008 period. The index is then scaled. Canada’s score in security from single-parent poverty was 0.800 in 2008, up 57.2 per cent from 0.509 in 1981 (Chart 45).

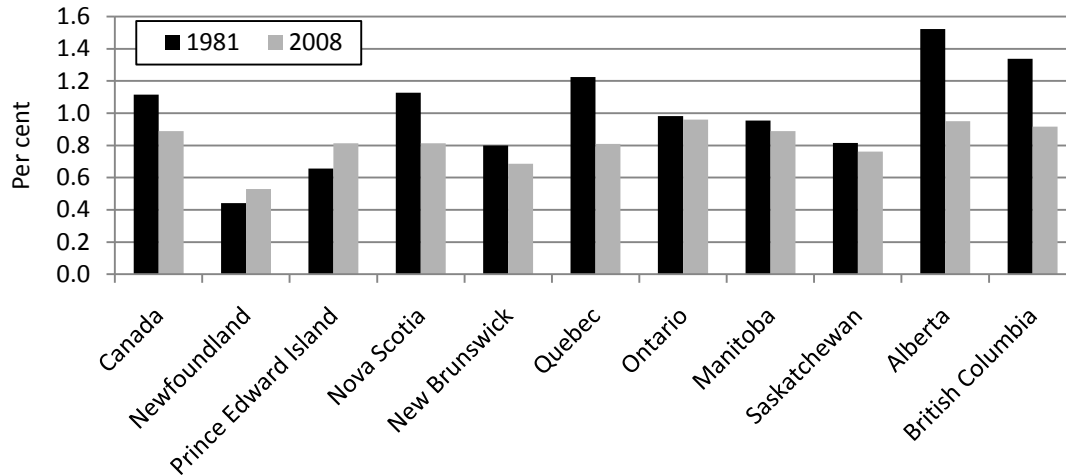
#### b. Trends in the provinces

Among the provinces, the highest divorce rate in 2008 was in Ontario, at 0.96 per cent, followed by Alberta at 0.95 per cent (Chart 42). The lowest rate was 0.53 per cent in Newfoundland. The divorce rate decreased over the 1981-2008 period in every province except for Newfoundland and Prince Edward Island; in those provinces, the rate increased by 19.7 and 23.8 per cent, respectively.

In 2008, the poverty rate for single-parent families ranged from a low of 15.2 per cent in Prince Edward Island to a high of 28.6 per cent in New Brunswick (Chart 43). Every province experienced a considerable drop in the poverty rate in 2008 compared to the 1981 level. The biggest drop occurred in Nova Scotia at 70.9 per cent, while the most modest one was in Alberta at 22.7 per cent.

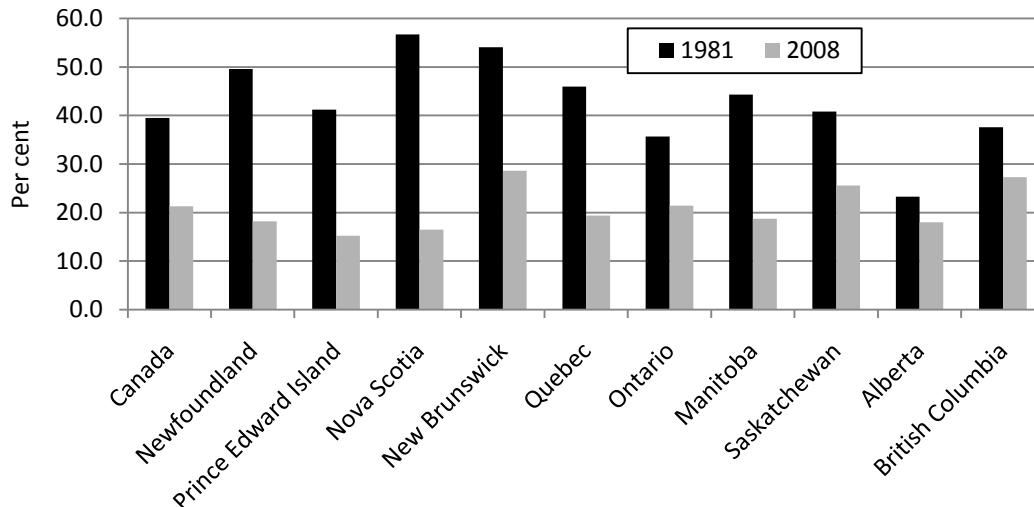
British Columbia had the largest average poverty gap for single-parent families among the provinces in 2008 with \$9,500, followed by Alberta and Manitoba each with \$7,900 (Chart 44). Newfoundland and New Brunswick had the lowest poverty gaps with \$4,100 and \$4,600, respectively. Over the 1981-2008 period, Newfoundland enjoyed the most significant drop in per cent terms at 53.4 per cent, while Saskatchewan and British Columbia were the only two provinces where the gap actually increased over the period (by 4.8 and 2.2 per cent, respectively).

**Chart 42: Divorce Rate, Canada and the Provinces, Per Cent, 1981 and 2008**



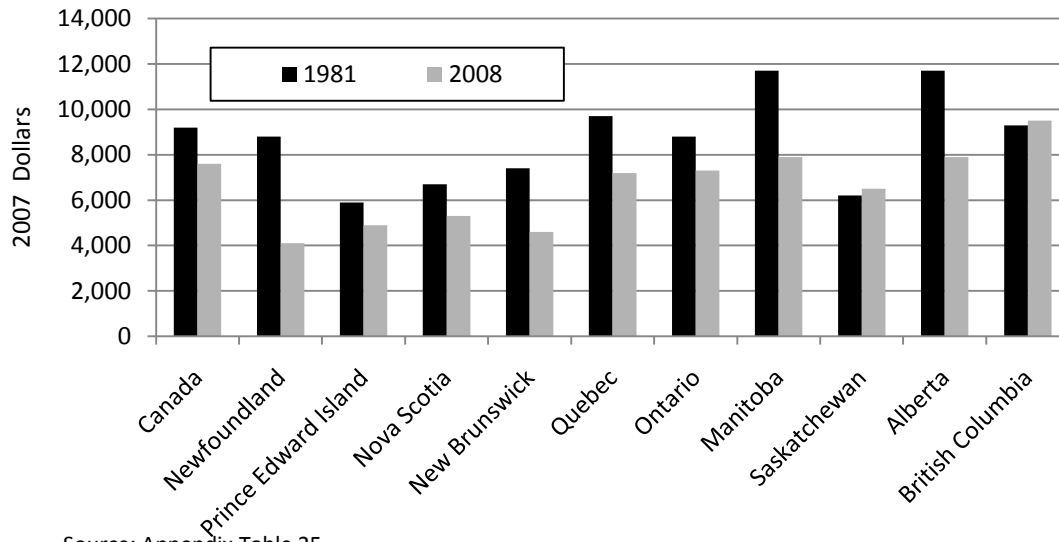
Source: Appendix Table 23

**Chart 43: Poverty Rate among Single-Parent Families, Canada and the Provinces, Per Cent, 1981 and 2008**



Source: Appendix Table 24

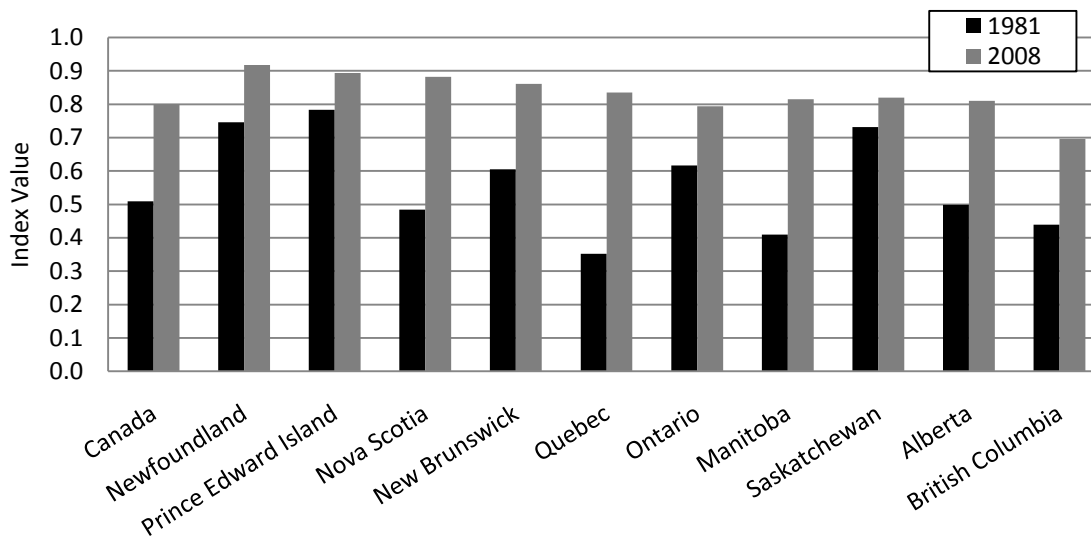
**Chart 44: Average Poverty Gap among Single-Parent Families, Canada and the Provinces, 2007 Dollars, 1981 and 2008**



Source: Appendix Table 25

Perhaps surprisingly, Newfoundland had the highest score on the index of security from single-parent poverty in 2008, at 0.917 (Chart 45). Prince Edward Island was next, with a score of 0.893. British Columbia's score of 0.696 was lowest among the provinces. All the provinces experienced improvement in the index of security from the risk of single-parent poverty. The strongest improvement came from Quebec, with a 137.4 per cent gain, followed by Manitoba with a 98.8 per cent improvement. The smallest improvements came in Saskatchewan and Prince Edward Island with 12.1 and 14.1 per cent, respectively.

**Chart 45: Overall Index of Security from Risk Imposed by Single Parent Poverty, Canada and the Provinces, 1981 and 2008**



Source: Appendix Table 26

#### iv. Risk of Poverty in Old Age

The fourth component of the economic security domain is the risk of poverty in old age. This component is proxied by the poverty rate and poverty gap of families headed by persons 65 and over. Once again, these concepts are defined in terms of the Statistics Canada LICOs.

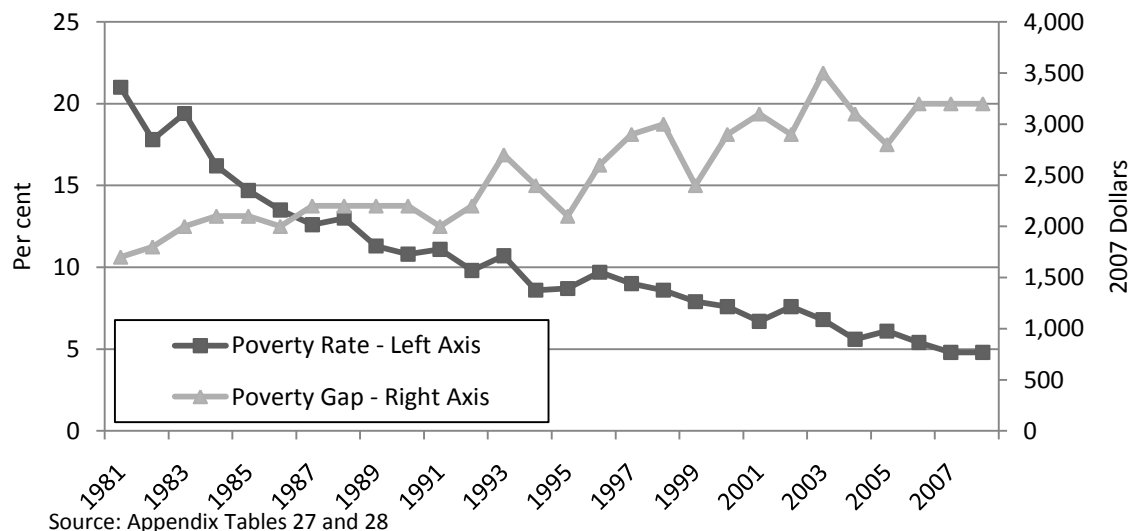
##### a. Trends in Canada

The poverty rate among elderly families in Canada was 4.8 per cent in 2008, down 77.1 per cent from 21.0 per cent in 1981 (Appendix Table 27 and Chart 46).<sup>36</sup> The poverty rate declined in all three cyclically-neutral sub-periods; it fell 7.45 per cent per year over the 1981-1989 period, 3.54 per cent per year over 1989-2000, and 5.58 per cent per year over 2000-2008.

While elderly poverty rates have fallen across Canada, the elderly poverty gap has not. In Canada as a whole, the gap was \$3,200 (in 2007 dollars) in 2008, 88.2 per cent above the 1981 gap of \$1,700 (Appendix Table 28 and Chart 46). The gap increased in all three sub-periods, although the annual rate of increase declined over time from 3.28 per cent in the 1981-1989 period to 1.24 per cent in the 2000-2008 period.

The overall ‘risk of poverty in old age’ component is the scaled value of the elderly poverty intensity (the product of the poverty rate and the poverty gap). In Canada, elderly poverty intensity declined by 3.08 per cent per year over the 1981-2008 period. In scaled form, security from old-age poverty stood at 0.705 in 2008, up 73.2 per cent from its 1981 value of 0.407 (Appendix Table 29 and Chart 49).

**Chart 46: Poverty Rate and Poverty Gap for Elderly Families, Canada, 1981-2008**



<sup>36</sup> Data on the poverty rate and poverty gap among elderly families are available only to 2007; the 2008 values are assumed to be equal to the 2007 values.

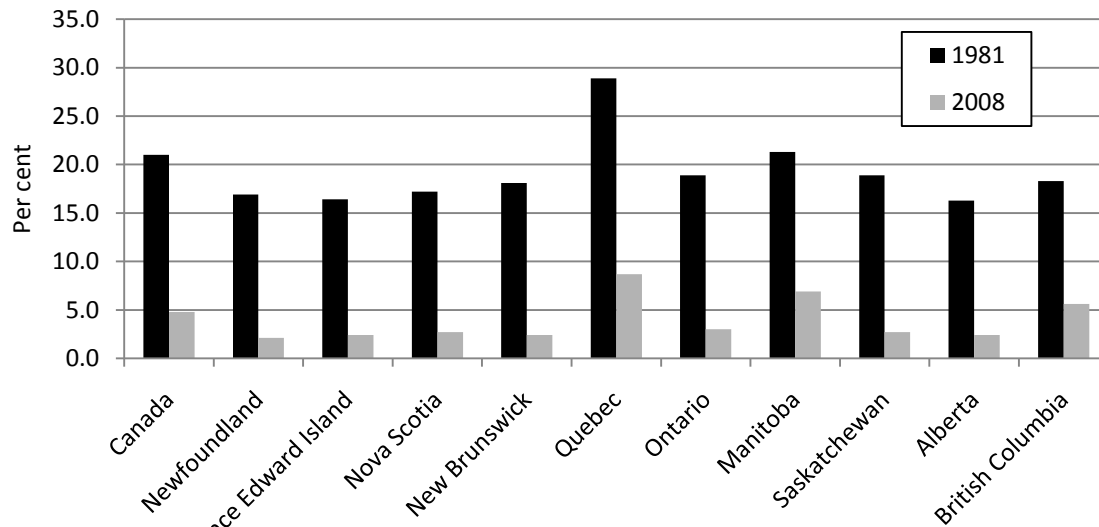
## b. Trends in the provinces

Among the provinces, the highest elderly poverty rate in 2008 was Quebec's 8.7 per cent, followed by Manitoba's 6.9 per cent (Chart 47). The lowest rate was 2.1 per cent in Newfoundland. Over the 1981-2008 period, the elderly poverty rate fell significantly across the board. While Manitoba had the smallest drop at 67.6 per cent, most of the provinces had changes in excess of 80 per cent. Newfoundland enjoyed the largest drop, from 16.9 per cent in 1981 to 2.1 per cent in 2008, an 87.6 per cent change.

Alberta had the highest elderly poverty gap in 2008 at \$4,300 (Chart 48). The lowest was Newfoundland's \$800. Every province saw an increase in the elderly poverty gap over the 1981-2008 period except for Newfoundland, where it declined 33.3 per cent from \$1,200 to \$800. The largest increase was in Saskatchewan, where the gap grew 133.3 per cent from \$1,200 in 1981 to \$2,800 in 2008.

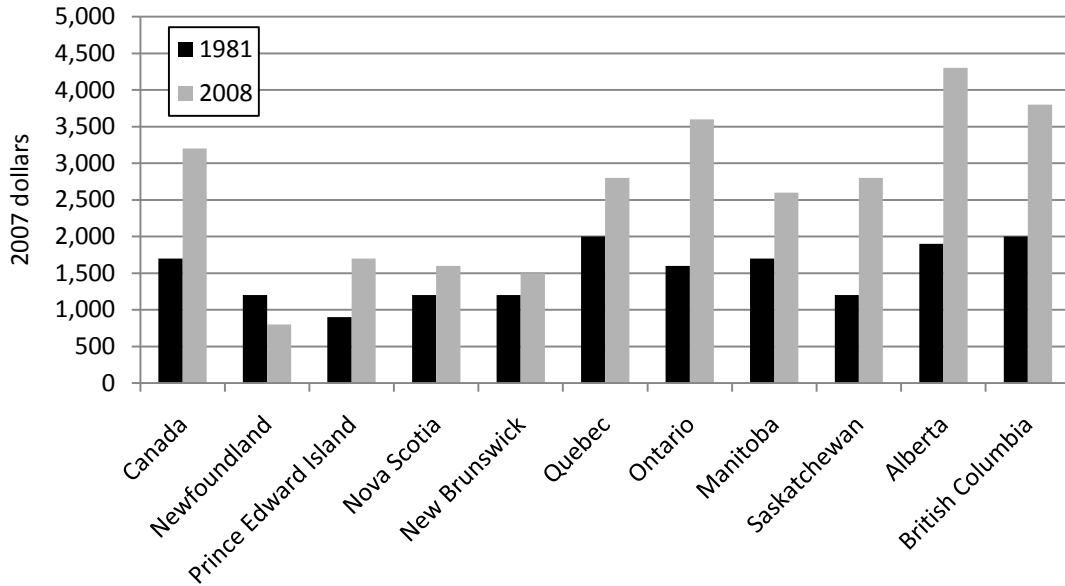
In 2008, Newfoundland had the highest index score for security from the risk of poverty in old age at 0.905, followed by New Brunswick at 0.877 (Chart 49). Quebec had the lowest value at 0.573. Security from old-age poverty increased in every province over the 1981-2008 period, led by Quebec's incredible 587.5 per cent increase. The next largest increase in security over the period was 67.0 per cent in Manitoba.

**Chart 47: Poverty Rate for Elderly Families, Canada and the Provinces, 1981 and 2008, per cent**



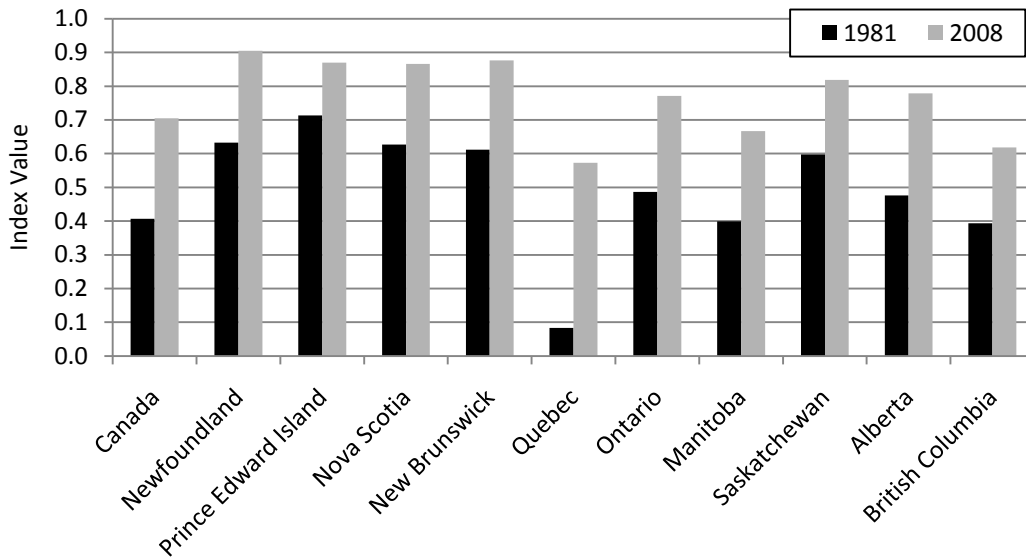
Source: Appendix Table 27

**Chart 48: Average Poverty Gap for Elderly Families, Canada and the Provinces, 2007 Dollars, 1981 and 2008**



Source: Appendix Table 28

**Chart 49: Overall Index of Security from Risk Imposed by Poverty in Old Age, Canada and the Provinces, 1981 and 2008**



Appendix Table 29



## **v. Weighting of the Components in the Index of Economic Security Domain**

The scaled values of the four components of the economic security domain are aggregated to obtain an overall scaled index for the domain. The weights used for this aggregation procedure are constructed from the relative sizes of the populations subject to each risk.

In terms of the risk of unemployment, it is assumed that the entire population aged 15 to 64 years is subject to this risk. In 2008, this was equivalent to 69.5 per cent of the total population in Canada (Appendix Table 30). In terms of the financial risk associated with illness, it is assumed that 100 per cent of the population is at risk. In terms of the risk of single parent poverty, it is assumed that all married people and their children who are under 18 are at risk. In 2008, this group represented 37.4 per cent of the Canadian population. In terms of the risk to poverty in old age, it is assumed that the population 45 and over is most at risk. This group represented 41.4 per cent of the Canadian population in 2008. The component-specific weights are generated by summing the four proportions of the population subject to the four risks and then standardizing to unity by dividing each proportion by that sum.

Because of demographic shifts, the proportion of the population affected by the different risks, and hence the weights, vary over time. With the aging of the Canadian population, the proportion of the population in the 15-64 age group has increased from 68.1 per cent in 1981 to 69.5 per cent in 2008, the proportion of the population aged 45 and over rose from 28.5 per cent to 41.4 per cent, and the proportion of married people with children under 18 (and their children) fell from 53.0 per cent to 37.4 per cent.

The contribution of each component is the product of its scaled value and weight. For example, in Canada in 2008 the contribution of the risk of unemployment was 0.186 ( $0.665 * 0.28$ ); from the financial risk from illness, 0.123 ( $0.307 * 0.40$ ); from the risk of single parent poverty, 0.120 ( $0.800 * 0.15$ ); and from the risk of poverty in old age, 0.120 ( $0.705 * 0.17$ ). Aggregating the contributions gives 0.548, which is the value of the overall economic security domain for Canada in 2008 (Table 6).

## **vi. Trends in the Economic Security Domain**

### **a. Trends in Canada**

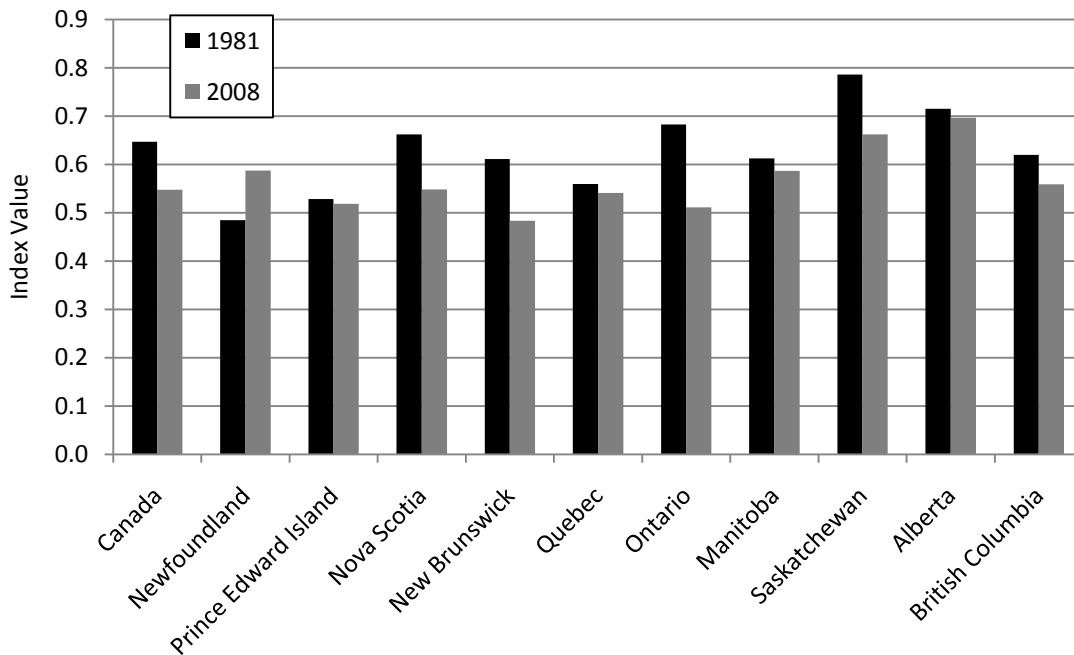
The overall index of economic security for Canada fell 0.099 points (or 15.3 per cent) from 0.647 in 1981 to 0.548 in 2008. The scaled values of three of the components of economic security increased between 1981 and 2008 – the financial risk from unemployment by 0.038 points, the risk from single parent poverty by 0.291 points, and the risk of poverty in old age by 0.298 points. This means that the entire decline in overall economic security in Canada over the 1981-2008 was driven by the decrease in security from the financial risk from illness, which fell by 0.494 points (or 61.7 per cent). The large weight assigned to this risk also contributed to its preponderant role in determining the evolution of the overall economic security domain.

As was noted earlier in the report, the fall in the security domain greatly dampened the overall upward trend in the Index of Economic Well-being arising from the increase in the consumption flows and stocks of wealth domains. This means that the more than doubling of the share of personal disposable income going to health care had, according to the Index of Economic Well-being, a major negative effect on economic well-being in Canada in the 1981-2008 period.

### b. Trends in the provinces

Alberta and Saskatchewan were the provinces with the highest scores in the economic security domain in 2008; their scores were 0.697 and 0.663, respectively (Table 6 and Chart 50). Between 1981 and 2008, measured economic security declined in every province except Newfoundland, where it increased 21.3 per cent. The largest decline was 21.5 per cent in Ontario. Newfoundland's increased economic security reflects the fact that it was the only province in which security from the financial risk of illness increased over the 1981-2008 period (Chart 39). The declines in economic security in every other province were all driven by rising out-of-pocket expenditures on health care.

**Chart 50: Index of the Security Domain in Canada and the Provinces, 1981 and 2008**



Source: Table 6

## IV. Sensitivity Analysis

In this section, we explore the sensitivity of our results to the choice of the weights that are assigned to the four domains of well-being. In the literature, most composite indices assign equal weight to each component. The best known example is probably the Human Development Index, which assigns equal weight to sub-indices of education, health and access to resources (i.e. the log of GDP per capita). The main baseline results we report continue in this tradition, but there is no objective sense in which this weighting scheme is preferable to all others. The choice of weights is a value judgment, and the IEWB is designed to make that judgment as transparent as possible. There are defensible alternative weighting schemes, and we would like to know the robustness of our qualitative findings to changes in the weights.<sup>37</sup>

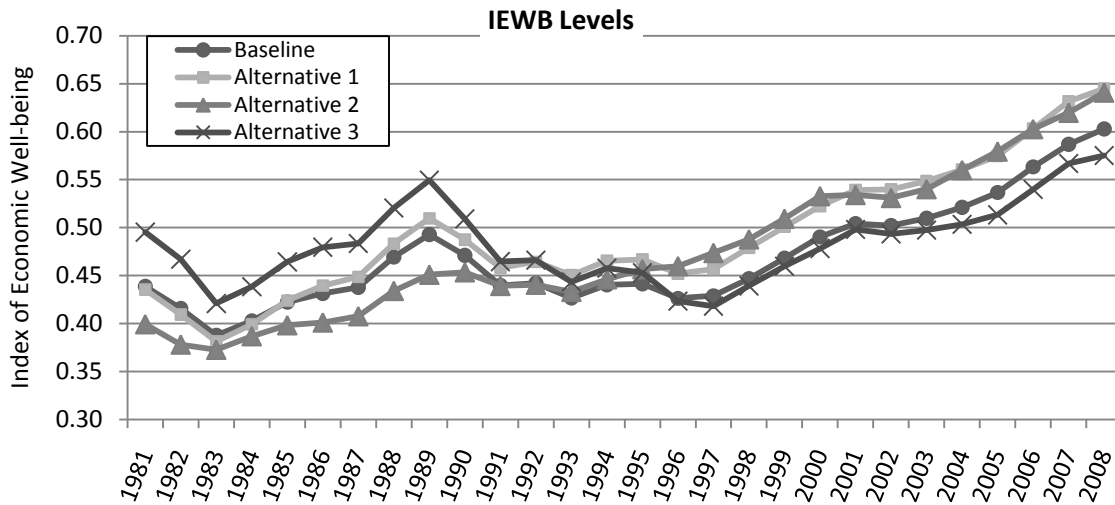
We compute the Index of Economic Well-being under three alternative weighting schemes. They are outlined in Exhibit 4. The baseline results are those reported earlier in this report, with each domain given equal weight. Alternative 1 keeps the weights for equality and security unchanged, but shifts weight from wealth stocks to consumption flows. This is reasonable if it is believed that people value current consumption more than accumulated stocks of wealth. Note that these were the weights that we used in the original estimates of the Index (Osberg and Sharpe, 1998). Although these weights do not exactly reflect the proportion of national income that Canadians collectively choose to invest rather than consume in a typical year, the implied 4:1 ratio of the value of consumption relative to savings is far closer than the 1:1 ratio in the baseline IEWB. Alternative 2 assigns zero weight to distributional concerns; the weight placed on both inequality and poverty is set to zero.<sup>38</sup> Alternative 3 was recently used by the French business magazine *L'Expansion* (Dedieu, 2009). It assigns high weights to economic equality and security and lower weights to consumption and wealth.

### Exhibit 4: Weighting Schemes for Sensitivity Analysis

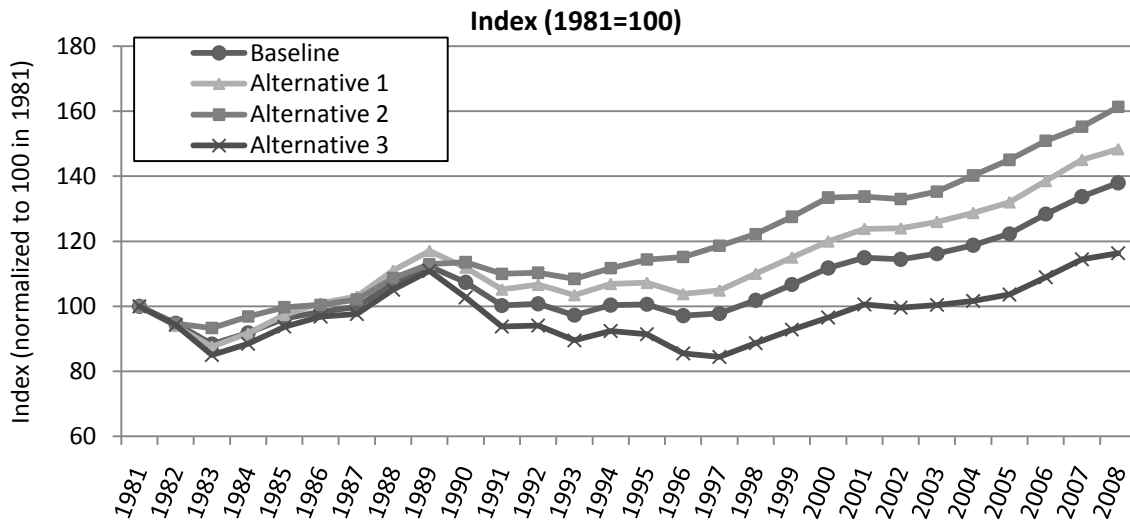
	Weights			
	Consumption	Wealth	Equality	Security
Baseline	0.25	0.25	0.25	0.25
Alternative 1	0.40	0.10	0.25	0.25
Alternative 2	0.33	0.33	0.00	0.33
Alternative 3	0.20	0.10	0.40	0.30

<sup>37</sup> Again, we invite readers to download the data tables in Microsoft Excel format at the CSLs web site (<http://www.csls.ca/iwb.asp>) and build versions of the Index of Economic Well-being with their own preferred weights.

<sup>38</sup> If it is thought to be 'left-wing' to emphasize distributional issues, then putting zero weight on such issues might be thought to be an extreme 'right-wing' perspective.

**Chart 51: Index of Economic Well-being under Baseline and Alternative Weights**

Source: Table 1 and Appendix Tables 31-33



Source: Table 1 and Appendix Tables 31-33

## A. Alternative 1: Consumption Weighted More Heavily than Wealth

### i. Trends in Canada

Under Alternative 1, the scaled value of the overall Index of Economic Well-being for Canada was 0.646 in 2008, up from 0.435 in 1981 (Chart 51 and Table 7). Recall that the baseline estimates for 1981 and 2008 were 0.439 and 0.605, respectively. Shifting weight from wealth to consumption raised the level of the Index in 2008 by 0.041 points (or 6.3 per cent), and increased the absolute growth of the Index over the 1981-2008 period from 0.167 points to 0.210 points. These changes reflect the fact that the consumption domain index experienced strong growth over the period and was substantially greater in value than the other domain indices in 2008 (Chart 5). Since consumption grew faster than wealth over the period (0.567 points versus 0.274 points),

and since the scaled values of consumption for Canada exceed the scaled values of wealth (0.837 versus 0.567 in 2008),<sup>39</sup> it is unsurprising that shifting weight from the wealth domain to the current consumption domain increases both the value and the growth rate of the overall Index. The more one discounts wealth (i.e. future consumption) compared to present consumption (or, the greater is the evaluator's subjective rate of time preference), the more positively one will evaluate economic well-being over this period.

## ii. Trends in the provinces

The change in weighting (that is, giving greater weight to consumption at the expense of wealth) has no effect on the ranking of provinces with the highest and lowest Index values in 2008. As before, Alberta and Newfoundland had the highest 2008 overall Index values, at 0.776 and 0.690, respectively (Table 7). These values are almost identical to the values of 0.773 and 0.681 that were computed for Alberta and Newfoundland under the baseline weighting scheme. Quebec and New Brunswick remain the two provinces with the lowest Index values in 2008; their overall Index values were 0.588 and 0.618. In these cases, the change in weights does make a non-negligible impact on the magnitudes of the Index; the baseline estimates were 0.541 and 0.572 for Quebec and New Brunswick, respectively. This reflects the fact that Alberta and Newfoundland have similar scaled values for consumption and wealth, whereas consumption is significantly larger than wealth (in scaled terms) in Quebec and New Brunswick.

The ranking of the remaining provinces by IEWB level does change somewhat under the alternative weights (Exhibit 5). The most noteworthy change is that Nova Scotia's 2008 Index value increases from 0.588 to 0.663 when the weight on consumption is increased; this raises Nova Scotia's ranking from sixth to fourth among all provinces in terms of overall well-being. Nova Scotia's scaled consumption value is slightly above the Canadian average, while its scaled wealth value is far below average. Shifting weight from wealth to consumption is therefore particularly beneficial to this province's measured well-being.

Over the 1981-2008 period, every province experienced faster growth in measured well-being under Alternative 1 than under the baseline weighting scheme. This reflects the strong growth of consumption relative to wealth in every part of Canada. However, the differences in the growth of the baseline Index and the Alternative 1 Index are not large in magnitude. As noted above, the growth of the Index for Canada as a whole over the 1981-2008 period was 0.167 points under the baseline weights and 0.210 points under Alternative 1 – a difference of just 0.044 points in growth. At the provincial level, the largest difference in growth over the period was 0.062 points in Nova Scotia. In

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<sup>39</sup> Note that the actual dollar value of per-capita wealth is larger than the dollar value of per-capita consumption flows. The reverse is true of the *scaled* values because of the linear scaling technique; the range of values for wealth is larger than the range of values for consumption because there is greater cross-provincial variation in wealth than in consumption per capita. This results in lower scaled wealth values than scaled consumption values for Canada.

**Exhibit 5: Ranking of Provinces According to Economic Well-being under Baseline and Alternative Weights**

<b><u>Level, 2008</u></b>				
	Baseline	Alternative 1	Alternative 2	Alternative 3
Highest well-being	Alberta	Alberta	Alberta	Alberta
	Newfoundland	Newfoundland	Newfoundland	Newfoundland
	Saskatchewan	Saskatchewan	British Columbia	Prince Edward Island
	Canada	Nova Scotia	Saskatchewan	Saskatchewan
	Prince Edward Island	Prince Edward Island	Canada	Nova Scotia
	British Columbia	Ontario	Ontario	New Brunswick
	Nova Scotia	Canada	Manitoba	Canada
	Ontario	British Columbia	Nova Scotia	Ontario
	Manitoba	Manitoba	Quebec	Manitoba
	New Brunswick	New Brunswick	New Brunswick	British Columbia
Lowest well-being	Quebec	Quebec	Prince Edward Island	Quebec

<b><u>Growth Rate, 1981-2008</u></b>				
	Baseline	Alternative 1	Alternative 2	Alternative 3
Fastest IEWB growth	Newfoundland	Newfoundland	Newfoundland	Newfoundland
	Manitoba	Manitoba	Prince Edward Island	Manitoba
	New Brunswick	New Brunswick	New Brunswick	Prince Edward Island
	Quebec	Quebec	Quebec	Quebec
	Prince Edward Island	Prince Edward Island	Nova Scotia	New Brunswick
	Canada	Nova Scotia	Manitoba	Saskatchewan
	Nova Scotia	Canada	Canada	Canada
	Saskatchewan	Saskatchewan	Ontario	Alberta
	British Columbia	Ontario	British Columbia	Nova Scotia
	Ontario	British Columbia	Saskatchewan	British Columbia
Slowest IEWB growth	Alberta	Alberta	Alberta	Ontario

Source: Table 7

terms of cross-provincial comparisons, however, Alternative 1 changes almost nothing from the baseline results; the ranking of the provinces according to IEWB growth over the 1981-2008 period is nearly identical under both weighting schemes, with Newfoundland experiencing the fastest growth and Alberta the slowest (Exhibit 5). Note that under both weighting schemes, the provinces with the lowest Index levels in 2008 (Quebec, New Brunswick, and Manitoba) were among the fastest-growing over the 1981-2008 period.

### iii. Summary

Overall, the results are mostly robust to the change from the baseline weights to the Alternative 1 weights. Aside from the improvement in the measured well-being of Nova Scotians, the cross-provincial patterns are essentially the same under the two weighting schemes. A final noteworthy effect of the change is that the annual growth rate of the Index of Economic Well-being for Canada under the Alternative 1 weights is 1.47 per cent per year over 1981-2008, which is much closer to the annual growth rate of per-capita GDP (unscaled) over the period. The consumption domain is the main driver of the Index and consumption is itself a large component of GDP, so it is no surprise that placing greater weight on the consumption domain brings the Index more in line with per-capita GDP. This reinforces the idea that per-capita GDP growth can be a proximate indicator of growth in well-being *if* one places significant value on per-capita consumption relative to other dimensions of well-being. Or, put another way: the more one values things *other than* consumption, the less appropriate is per-capita GDP as an indicator of economic well-being.

## B. Alternative 2: No Weight Given to Economic Equality

### i. Trends in Canada

Under Alternative 2 it is assumed that inequality and poverty do not matter to average economic well-being; no weight at all is given to this domain and a weight of 0.33 is given to each of the remaining three domains. In 2008, this version of the overall Index took a value of 0.644 for Canada as a whole, up 0.245 points from 0.399 in 1981 (Chart 51 and Table 7). By comparison, the baseline Index increased by 0.167 points from 0.439 in 1981 to 0.605 in 2008. As before, the alternative weights lead to a greater measured improvement in well-being over the 1981-2008 period because the fast-growing consumption and wealth domains are more heavily weighted under Alternative 2 than under the baseline weights. However, Alternative 2 also places a greater weight on the economic security domain than the baseline weights do. Since the scaled index of economic security declined from 0.647 to 0.548 over the period, increasing that domain's weight from 0.25 to 0.33 amplifies its negative influence on measured well-being and partly offsets the positive impact of the higher consumption and wealth weights on the growth of the Index.

## ii. Trends in the provinces

Alberta and Newfoundland remain the two provinces with the highest measured well-being under Alternative 2; their index values are 0.828 and 0.677, respectively. Note that the magnitude of Alberta's lead over Newfoundland has increased relative to the baseline Index (see Table 7). This reflects Alberta's particularly high score in the economic security domain, a result driven by its low unemployment risk.

At the bottom end, some baseline results are more sensitive to the change of weights. Prince Edward Island has the lowest measured well-being for 2008 under Alternative 2, at 0.514; under the baseline weights, Prince Edward Island ranked fourth out of the ten provinces. This result is due to the fact that Prince Edward Island's score in the economic equality domain (0.839 in 2008) is the highest in Canada, whereas the province is average or below-average in every other domain. In particular, Prince Edward Island's score in the wealth domain (0.305 in 2008) is the lowest in the country. Shifting all the weight from the economic equality domain to the other three domains therefore dramatically lowers Prince Edward Island's measured well-being.

That being said, New Brunswick and Quebec remain near the bottom of the list in terms of measured well-being; their respective overall Index scores under Alternative 2 are 0.533 and 0.577, the second- and third-lowest among the provinces.

In every province, measured economic well-being grew faster under Alternative 2 as under the baseline weights over the 1981-2008 period. Newfoundland experienced the largest absolute change over the period under both weighting schemes – 0.318 points under the baseline and 0.433 points under Alternative 2. The largest difference in overall growth between the two weighting schemes is 0.115 points in Newfoundland.

## iii. Summary

Overall, Alternative 2 changes the results (relative to the baseline weights) more than did Alternative 1, in ways that some might find a bit surprising. The exclusion of economic equality from the Index substantially increases Alberta's measured well-being relative to the other provinces, and substantially decreases that of Prince Edward Island. Most importantly, the compound annual growth rate of the overall Index for Canada over the 1981-2008 period was 1.79 per cent per year – higher than the growth rate of per-capita GDP over the same period (1.58 per cent per year). This reverses the baseline results, in which the growth rate of per-capita GDP exceeded that of the Index of Economic Well-being. The reversal is driven by the fact that placing less weight on one dimension of well-being implicitly requires placing more weight on other dimensions of well-being. Alternative 2 places greater weight on the fast-growing consumption and wealth domains at the expense of the economic equality domain, which had negative (but near-zero) annual growth over the period. To a reader who does not consider income distribution and poverty to be important, these results suggest that the economic well-being of Canadians is improving even faster than per-capita GDP growth would imply.



## C. Alternative 3: High Weights Given to Economic Equality and Security

### i. Trends in Canada

As shown in Exhibit 4, Alternative 3 gives greater weights to economic equality (0.4) and security (0.3) than to consumption (0.2) and wealth (0.1). Under these weights, the value of the overall Index in 2008 was 0.576, up 0.081 points from 0.495 in 1981 (Chart 51 and Table 7). By comparison, the baseline Index increased by 0.167 points from 0.439 in 1981 to 0.605 in 2008.

It comes as no surprise that the 2008 Index value under Alternative 3 is substantially lower than the 2008 baseline value. The scaled index of economic equality declined from 0.545 to 0.469 between 1981 and 2008, and the index of the economic security domain declined from 0.647 to 0.548 over the same period. In contrast, the indices of the consumption and wealth domains both grew over the period, and in 2008 the index of the consumption domain had the largest value of any of the four domain indices at 0.837. Shifting weight away from consumption and wealth and toward equality and security therefore dampens the growth of the overall IEWB and leads to lower measured well-being.

For Canada as a whole, the compound annual growth rate of the overall Index under Alternative 3 was 0.56 per cent per year over the 1981-2008 period, well below the growth rates computed under the other weighting schemes and below the growth rates of per-capita GDP (1.58 per cent per year) and the baseline Index (1.20 per cent per year).

### ii. Trends in the provinces

Alberta and Newfoundland are once again the top two provinces in terms of measured well-being, with IEWB values of 0.715 and 0.681 under Alternative 3. Both provinces' scores in the equality and security sub-indices are above the Canadian average, so deemphasizing the consumption and wealth components (where Alberta also has very high scores) does not affect their ranking relative to the other provinces. That being said, both provinces' overall Index values are lower in magnitude under Alternative 3 than under the baseline and the other Alternatives.

Quebec has the lowest IEWB score for 2008 under Alternative 3, at 0.526. The next lowest is British Columbia, at 0.540. British Columbia is the province with the lowest score in the economic equality index by a substantial margin. Its score of 0.332 is 20.3 per cent below that of Quebec (0.417), the next lowest. However, British Columbia does slightly better than Quebec in terms of economic security (0.559 versus 0.541) and substantially better in the other two domains. Quebec ranks in the bottom three provinces in overall well-being under all four weighting schemes, and at the *very* bottom under three of them. Quebec rates below the Canadian average in all four domains of economic well-being.

In every province, the growth rate of the IEWB over the 1981-2008 period was lower under Alternative 3 than under the baseline. This result is driven by the shift in weight away from fast-growing consumption and wealth and toward the equality and security domains, which have experienced negative growth in most parts of the country.

#### **D. Overall Summary of Sensitivity Analysis**

Value judgments regarding the importance of the different domains of economic well-being can matter, but in the alternative scenarios presented here, they have no significant effect on the rankings of provinces according to the Index of Economic Well-being. The baseline IEWB results are largely robust to the alternative weighting schemes we have examined. Under all four weighting alternatives, measured well-being is improving in all provinces. It is improving most quickly in Newfoundland. Alberta has the highest level of economic well-being for 2008, while Quebec ranks at the bottom among the provinces under three out of the four alternative weighting schemes (and third from the bottom under the fourth). As Chart 51 illustrates, the pattern of the Index over time is essentially the same under all the weighting schemes.

Some quantitative results are sensitive to the change of weights. In particular, the comparison between the IEWB and per-capita GDP is affected by the choice of weights. The growth gap between per-capita GDP and the IEWB over the 1981-2008 period is smaller when the consumption domain receives a larger weight. The fact that different weighting schemes affect trends in the overall index reflects the fact that the IEWB is designed so as to make it possible for different people to compute a composite index of overall well-being in accordance with their personal values. Individuals have the right to differ in their preferences over the dimensions of well-being, and it is natural that such differences should affect their assessment of measured well-being. Because the Index of Economic Well-Being accommodates such differences in a transparent way it enables observers to assess for themselves how much differing values matter for the perception of trends in economic well-being.

## V. Projecting Economic Well-being in 2009 and 2010

The IMF has referred to the recent financial crisis and the global recession it engendered in 2008 and 2009 as the most severe international financial crisis of the post-war period, so one must expect the economic well-being of Canadians to be affected. The aim of this section is to provide rough projections of economic well-being in Canada, as measured by the IEWB, for 2009 and 2010. We do not attempt to project the future values of all the variables that comprise the Index of Economic Well-being. Rather, we focus on two key variables likely to be affected by the recession and to drive changes in well-being: consumption and unemployment.

Projections of consumption and unemployment are drawn from the economic outlook produced by the Institute for Policy Analysis at the University of Toronto (Dungan and Murphy, 2009). Personal consumption expenditures declined by 0.3 per cent during the first quarter of 2009 after having grown by 4.6 per cent in 2007 and 3.0 per cent in 2008. Although they rebounded by 0.4 per cent in the second quarter, personal consumption expenditures are projected to decline by 0.3 per cent over 2009 as a whole.<sup>40</sup> Consumption is expected to return to positive growth in 2010, although the projected growth rate of 1.5 per cent will still be low relative to consumption growth in recent years. In terms of levels, these projections imply that per-capita consumption will be \$24,518 (in 2002 dollars) in 2009 and \$24,685 in 2010. By comparison, the 2008 value was \$24,634.

The national unemployment rate jumped to 7.6 per cent in the first quarter of 2009 and then to 8.4 per cent in the second quarter – a sharp increase from 6.0 per cent in 2007 and 6.1 per cent in 2008. Although an April 2009 OECD projection of Canada's unemployment forecast a rise to over 10 per cent in 2010, the Institute for Policy Analysis projections we use here predict an average unemployment rate of 8.5 per cent in 2009 and 8.7 per cent in 2010.

In addition to the projections of aggregate consumption and unemployment from the Institute for Policy Analysis, we use Statistics Canada's Canadian population projections in our computation of per-capita consumption (Statistics Canada, 2005). *All other variables are assumed to maintain their 2008 values throughout 2009 and 2010.*<sup>41</sup> We are not arguing that this assumption is “realistic” – we know already that increases in government spending in the coming years will partially offset the decline in personal consumption expenditures, while rising unemployment will lead to a more poverty. Recently-announced adjustments to the Employment Insurance system may increase the proportion of the unemployed eligible for EI benefits, but R&D spending and physical capital investment are likely to fall. All of these changes are important, but at this stage

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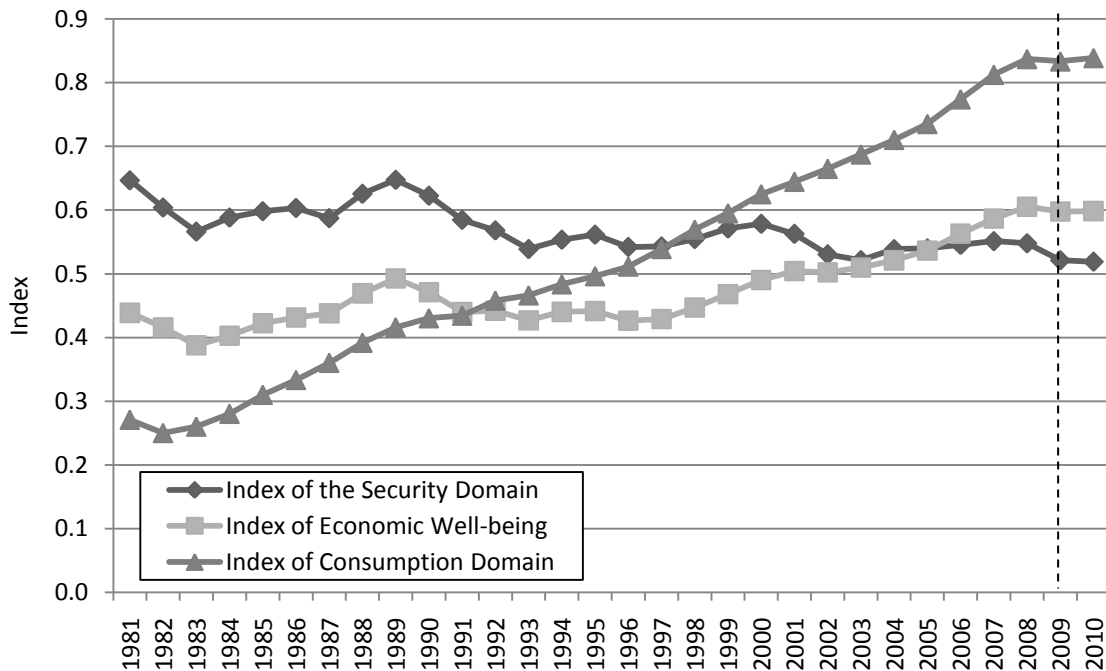
<sup>40</sup> It is interesting to note that the fall in consumption expenditure in 2009 is expected to be significantly less than that of real GDP, which is forecast to decline 2.7 per cent. This is because the investment and exports components of GDP are much more volatile than the consumption component. Equally, the rebound in consumption projected for 2010 is expected to be less than that in GDP: 1.5 per cent versus 2.9 per cent.

<sup>41</sup> We also assume that the maximum and minimum values used in the scaling procedure do not change.

### Exhibit 6: Projecting Economic Well-being in Canada, 2009 and 2010

	Personal Consumption Per Capita	Unemployment Rate	Index of the Consumption Domain	Index of the Wealth Domain	Index of the Equality Domain	Index of the Security Domain	Overall Index of Economic Well-being
2007	24,138	6.0	0.813	0.515	0.469	0.551	0.587
2008	24,634	6.1	0.837	0.567	0.469	0.548	0.605
2009	24,518	8.5	0.834	0.567	0.469	0.521	0.598
2010	24,685	8.7	0.839	0.567	0.469	0.519	0.598

Chart 52: Index of Economic Well-being and Selected Domains, Canada, 1981-2010



of our work we are unable to model them explicitly. We therefore focus on the two variables with the largest net effect on economic well-being: personal consumption and the unemployment rate, both of which receive significant weight in the Index of Economic Well-being.

Exhibit 6 illustrates the projected values of consumption and unemployment, as well as the resulting projections of the four domain indices and the overall Index of Economic Well-being for Canada. Values for 2007 and 2008 are included for comparison. Even in this very simple analysis, the impact of the recession on economic well-being is visible. In combination, the cessation of per-capita consumption growth and the increase in the unemployment rate cause the IEWB to decline. The projected value of the overall Index for 2009 is 0.598, down 1.25 per cent from 0.605 in 2008. The 0.598 value will hold through 2010.

The decline is driven mainly by a fall in economic security. Rising unemployment produces a decrease in the index of the security domain from 0.548 to 0.521 in 2009 – a one-year drop of 4.9 per cent – and then a further 0.43 per cent drop to 0.519 in 2010. By comparison, the index of the consumption domain is expected to fall by 0.4 per cent in 2009 (from 0.837 to 0.834), then rebound to 0.839 in 2010.

As argued by Osberg (2009), the extreme volatility of financial markets since 2008 has implied a corresponding increase in the uncertainty of expectations of retirement income among Canadians dependent on personal savings or defined contribution pension plans (and the survival probabilities of some defined benefit pension plans have also become uncertain). Over and above the impacts of real trends in average consumption and aggregate unemployment on “insecurity,” these financial market trends can be expected to add to the subjective insecurity felt by many Canadians. However, we are not yet able to incorporate these trends into the IEWB.

Chart 52 illustrates the long-run trends in the overall Index and the indices of the consumption and security domains with the 2009 and 2010 projections included. In 2009, there is a clear kink in the lines representing the consumption domain and the overall Index. Both are expected to stop growing after several years of steady growth. The security index has a particularly bad (though not unprecedented) year in 2009.

## VI. The Index of Economic Well-being and the Recommendations of the Sarkozy Commission

In September, 2009, the Commission on the Measurement of Economic Performance and Social Progress (hereafter the Commission) delivered its final report (Stiglitz *et al.*, 2009). Initiated by French President Nicolas Sarkozy and chaired by Nobel Prize-winning economists Joseph Stiglitz and Amartya Sen and by Jean-Paul Fitoussi, the Commission has drawn the attention of the academic and public policy communities around the world toward the problem of the appropriate measurement of well-being and social progress. For the first time, the government of a major country has taken the explicit position that per-capita GDP growth is an inadequate measure of economic and social progress, and that policymaking should be oriented toward a broader conceptualization of public welfare. As President Sarkozy noted in his speech upon the release of the Commission report, the statistics we collect both reflect our shared values and influence our actions:

Statistics reflect our aspirations and the value we assign to things. They cannot be uncoupled from our view of the world, of the economy, of society, of the idea of a person and his relationships with others. To think of statistics as being objective, exterior to ourselves, incontestable and indisputable, is no doubt comfortable and reassuring, but it is dangerous. It is dangerous because from that perspective, we do not ask questions about the finality of what we do, about what we are really measuring, or about the lessons we must learn.<sup>42</sup> (Sarkozy, 2009)

The same points were reinforced by Professor Stiglitz in his remarks at the same event:

In an increasingly performance-oriented society, metrics matter. What we measure affects what we do. If we have the wrong metrics, we will strive for the wrong things. In the quest to increase GDP, we may end up with a society in which citizens are worse off. (Stiglitz, 2009)

The principles expressed by President Sarkozy and Professor Stiglitz are remarkably similar to those underlying the Index of Economic Well-being. As we noted in the first section of this report, the Index is designed to account for both the variety of outcomes that people value and the variety of philosophical frameworks through which people interpret the world. The Index reflects multiple dimensions of economic well-being; per-capita GDP reflects only one, namely the average amount of output per person a society produces. Further, the Index explicitly acknowledges that individuals differ (and have a moral right to differ) in their values by making the underlying values judgments (for instance, the choice of the weights for the four domains) as transparent as

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<sup>42</sup> This passage was translated by the CSLS. The original French is: “La statistique, la comptabilité reflètent nos aspirations, la valeur que nous accordons aux choses. Elles sont indissociables d’une vision du monde, de l’économie, de la société, d’une idée de l’homme, de son rapport aux autres. Les prendre comme des données objectives, extérieures à nous-mêmes, incontestables et indiscutables, c’est sans doute rassurant, confortable, mais c’est dangereux. C’est dangereux parce que l’on en vient à ne plus se poser de questions ni sur la finalité de ce que l’on fait, ni sur ce que l’on mesure réellement, ni sur les leçons qu’il faut en tirer.”

possible. Per-capita GDP involves such value judgments – it assigns zero weight to asset accumulation, economic equality, economic security, and all conceivable dimensions of well-being other than per-person output – but it does so implicitly rather than explicitly. By making value judgments explicit, the Index of Economic Well-being invites us to ask questions about what we are measuring, what we think it is important to measure, and how we approach measurement methodologically-speaking.

If people disagree about policy evaluation, it is important for the democratic debate to know *why*. When strong value judgments are implicitly built into an index, it is unclear whether people disagree about the ranking of social choices implied by that index because they have different subjective values or because they have differing cognitive assessments of objective data. The Index of Economic Well-being attempts to disentangle value judgments from objective data by making value choices clear and explicit.

In its report, the Commission makes twelve specific recommendations regarding how statisticians and policymakers should approach the measurement of well-being. The Index of Economic Well-being incorporates, either in total or in part, ten of the twelve.

*Recommendation 1: When evaluating material well-being, look at income and consumption rather than production.*

We agree that individuals' command over resources is better described by data on their consumption rather than their production, and that human well-being is influenced by a broader conception of consumption than the purely monetary measure now captured as part of GDP. That is why one of the four domains of the Index of Economic Well-being is entirely based on adjusted per-capita consumption flows rather than per-capita GDP.

*Recommendation 2: Emphasize the household perspective.*

Two of the four key domains that comprise the Index of Economic Well-being are based on household-level data. The economic equality domain is based on household measures of both income distribution (Gini coefficient) and poverty (both the poverty rate and poverty gap). In the economic security domain, the Index incorporates household-level data on poverty among the elderly, as well as poverty for single-parent households. In that sense the Index takes seriously the household as the fundamental social unit whose perspective is most relevant for the measurement of well-being.

However, households live in societies, so an index of national economic performance should reflect both the potential resources available to the aggregate of all households and the actual realization of resources by individual households. The consumption and wealth domains are based entirely on aggregate data expressed in per-capita terms because those domains represent the aggregate consumption potential and wealth acquisition of society as a whole. They do not exclusively reflect the household perspective; for instance, the consumption domain includes government spending on public goods such as education, which affects the well-being of households. The Index

therefore strikes a balance between aggregation of societal outcomes and disaggregation to household outcomes.

*Recommendation 3: Consider income and consumption jointly with wealth.*

Current wealth represents the potential for future consumption, so a good measure of well-being should account for it. The Index of Economic Well-being devotes one of the four domains entirely to changes over time in wealth stocks, and it adopts a wider conception of wealth than is captured in the GDP perspective (including, for example, environmental degradation, natural resource wealth, human capital wealth and the present value of research and development). The ‘wealth’ component of the IEWB could equally well be labeled the ‘sustainability’ component, since it attempts to measure the aggregate stock of productive resources (man-made and naturally occurring) that is necessary for future consumption.

*Recommendation 4: Give more prominence to the distribution of income, consumption, and wealth.*

Economic equality comprises one of the four domains of the Index. The inclusion of the Gini coefficient directly quantifies economic inequality, while the poverty gap measures economic deprivation. Poverty is a distributional matter to the extent that deprivation is particularly objectionable where it exists in the context of an affluent society; when people are poor in a rich society even in a relative sense, it is an indicator of possible distributional injustice.

The economic equality domain addresses only inequality of income, but in principle this domain can be expanded by explicit consideration of other dimensions of inequality that are relevant for economic well-being, including wealth inequality, unequal access to credit, and so on. These areas may be explored in the future.

*Recommendation 5: Broaden income measures to non-market activities.*

The consumption domain of the Index of Economic Well-being incorporates estimates of the market value of non-market activities, including consumption flows that arise from unpaid work or household production and change over time in the value of leisure (more specifically, changes in the value of leisure relative to the United States in 1980). Although estimates of “regrettable necessities” – for instance, the cost of expenditures, like commuting or crime prevention, that do not add to utility – are often not available, the Index also includes such data when it is possible to do so.

*Recommendation 6: Quality of life depends on people’s objective conditions and capabilities. Steps should be taken to improve measures of people’s health, education, personal activities and environmental conditions. In particular, substantial effort should be devoted to developing and implementing robust, reliable measures of social connections, political voice, and insecurity that can be shown to predict life satisfaction.*



The Index of Economic Well-being addresses some of these concerns. Changes in health are reflected in the adjustment of consumption for changes in life expectancy. An entire domain is devoted to the measurement of economic risk, and that domain includes a component that addresses health-related financial risk. The condition of the natural environment is explicitly incorporated through the environmental degradation adjustment to the wealth stocks domain.

However, the Index of Economic Well-being is consciously limited to an *economic* focus, on the theory that one index should not try to do everything and that there are many dimensions of life – broad sociopolitical conditions, freedom of speech and religion, and so on – that probably should be part of a separate set of indices. It may be fruitful to explore such measures, to the extent that they influence well-being mainly through economic channels.

*Recommendation 7: Quality-of-life indicators in all dimensions covered should assess inequalities in a comprehensive way.*

In terms of economic determinants of well-being, this is similar to Recommendation 4. As noted above, the Index of Economic Well-being contains an entire domain devoted to economic equality.

*Recommendation 8: Surveys should be designed to address the links between various quality-of-life domains for each person, and this information should be used when designing policies in various fields.*

The IEWB methodology is based on the premise that the weights placed on the domains of well-being differ across individuals. We take this recommendation to be a call for more empirical research on the actual patterns of value weightings in different societies.<sup>43</sup>

*Recommendation 9: Statistical offices should provide the information needed to aggregate across quality-of-life dimensions, allowing the construction of different indexes.*

The Index of Economic Well-being is an example of an index that aggregates across dimensions of well-being. In another sense, however, the Index reflects the principle that multiple indices can be useful. The Index of Economic Well-being can be examined as four separate sub-indices, and the transparent nature of the weighting choices effectively allows for the construction of many aggregate indices depending on the values of the index-maker.

We agree that the primary responsibility of official statistical agencies is to provide the high-quality data necessary to construct aggregate indices of well-being. Such data should be made freely available for Index construction by outside researchers.

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<sup>43</sup> In Section 4.1 on sensitivity analysis, for example, we evaluated four alternative possible sets of weights. We would like to know how relatively popular each might be.

*Recommendation 10: Measures of both objective and subjective well-being provide key information about people's quality of life. Statistical offices should incorporate questions to capture people's life evaluations, hedonic experiences and priorities in their own survey.*

The relative weights assigned to components of the Index are explicitly subjective aspects of measurement. One way to generate baseline weights for the domains of the Index would be via surveys of public opinion on the relative importance of different aspects of well-being.

Public opinion polls do not relieve individual citizens of the moral responsibility of making personal judgments. Knowing what other citizens think is certainly interesting as an ingredient in predicting political trends, but each citizen in a democracy still has the responsibility of voting for the alternative that he or she personally thinks is best for society. We construct indices of well-being as ways of summarizing the information people need to fulfill such a responsibility.

With respect to the raw data underlying the Index, we think it important not to meld together different types of data. Although measurement of subjective attitudes is a hugely important area of research, it is crucial to distinguish clearly between subjective opinion polling and objective measurement of economic data. For this reason, the Index does not include any measures of subjective well-being such as self-assessed happiness. While such measures are undoubtedly important for measuring overall quality of life, it is not clear that they outperform 'hard data' as indicators of the *economic* aspects of well-being.

*Recommendation 11: Sustainability assessment requires a well-identified dashboard of indicators. The distinctive feature of the components of this dashboard should be that they are interpretable as variations of some underlying "stocks." A monetary index of sustainability has its place in such a dashboard but, under the current state of the art, it should remain essentially focused in economic aspects of sustainability.*

The "Wealth" component of the Index could equally well be labeled the "Sustainability" component, since it measures the net accumulation of productive stocks broadly conceived. Negative accumulation – depletion of wealth stocks over time – is clearly not sustainable. By summing over the values of different types of wealth stock, the Index assumes one type of wealth can be substituted for another.<sup>44</sup> As the Commission report notes, sustainability deals with whether and for how long given states of affairs may be maintained, while assessment of current well-being is an attempt to rank states of affairs at a point in time. Nevertheless, voters care about both present and future outcomes (although to differing degrees) and are from time to time faced with choices that require assessing trade-offs between current well-being and long-run sustainability. Such choices are facilitated by an index that can 'sum up' changes in well-being and changes in sustainability.

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<sup>44</sup> This is sometimes called the Hartwick rule for sustainability.

The Index of Economic Well-being aggregates in monetary terms over both man-made and natural forms of wealth, and accounts explicitly for environmental degradation in the form of greenhouse gas emissions. The wealth/sustainability component could easily be “opened up” so as to be more explicit about the values of the components, and to make it easier to incorporate differing judgments, for example, about the appropriate shadow price of CO<sub>2</sub> emissions. The Index is therefore fully capable of incorporating sustainability concerns, though data constraints prevent a full treatment of those concerns at this time.

*Recommendation 12: The environmental aspects of sustainability deserve a separate follow-up based on a well-chosen set of physical indicators. In particular there is a need for a clear indicator of our proximity to dangerous levels of environmental damage (such as associated with climate change or the depletion of fish stocks).*

In using the idea of “proximity to dangerous levels of environmental damage,” Recommendation 12 asks for both measurement of the current level of physical environmental indicators and a specification of “dangerous levels” of damage. It has an implicit ‘risk of environmental catastrophe’ perspective, and a full treatment of this issue would require some specificity as to what “dangerous levels” is meant to imply. The security component of the IEWB provides a natural way for such considerations to be incorporated into the measurement of well-being.

The IEWB currently includes the value of natural resource stocks, as well as the social costs of greenhouse gas emissions. These do not really measure the risk of catastrophe; they measure the dollar values of the levels of resources and emissions costs, without reference to *optimal* or *sustainable* levels. As noted above, risk/security, current consumption, and sustainability are conceptually distinct components of well-being.

The Index of Economic Well-being precedes the Commission report by over a decade, but it anticipates most of the Commission’s recommendations. The Index addresses most of the Commission’s recommendations with regard to what an index of economic well-being should capture, and its framework is potentially capable of incorporating additional concerns such as wealth inequality and risk of environmental catastrophe. Indeed, in its discussion of composite indices of well-being, the Commission report recognizes the Index of Economic Well-being as “more elaborated [than other composite indices] and relatively well-known” (Stiglitz *et al.*, 2009:237). The Index is a work in progress and there are further improvements to be made, but we consider the Commission’s report to be an indication that the development of the Index is on the right track.

## VII. Lessons Learned in the Development of the Index of Economic Well-being

The authors, through the Centre for the Study of Living Standards (CSLS), have been engaged in the development of the Index of Economic Well-being for more than a decade.<sup>45</sup> This section of the report discusses this experience. We first outline the history of the IEWB and briefly discuss its impact. We touch upon the methodological developments mentioned earlier in the report, and summarize the data limitations and conceptual challenges we have encountered. Finally, we highlight what we believe are three of the lessons learned from this experience.

### A. History of the IEWB

In 1997, the Centre for the Study of Living Standards (CSLS) received a contract valued at \$50,000 CAD from Human Resources Development Canada (HRDC) to construct the IEWB based on the conceptual framework for measuring economic well-being developed by Lars Osberg in 1985 (Osberg, 1985). The Index was first released in October 1998 at a CSLS conference “The State of Living Standards and Quality of Life in Canada”<sup>46</sup> and subsequently published by Human Resources Development Canada as an Applied Research Branch research report (Osberg and Sharpe, 1998).

A key IEWB finding was that the economic well-being of Canadians was falling despite the economic growth of the mid and late 1990s. This development was due to the decline in the economic security component of the index. In turn, economic security was falling in large part because of the increased financial risk from unemployment. This indicator is determined by the unemployment rate, the employment insurance (EI)

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<sup>45</sup> In addition to its work on the IEWB, the CSLS is currently involved in a number of other projects on well-being. These include:

- the Canadian Index of Wellbeing (CIW) project spearheaded by the Atkinson Charitable Foundation where the CSLS is responsible for the living standards domain (Sharpe and Arsenault, 2009);
- the Levy Institute Measure of Economic Well-being (LIMEW) project where the CSLS is developing estimates for Canada (Evans and Sharpe, 2010);
- the OECD Measuring the Progress of Societies project where CSLS Executive Director Andrew Sharpe is a member of the coordinating committee;
- the Vital Signs project coordinated by Community Foundation of Canada where the CSLS has responsibility for developing and maintaining a large database of community well-being indicators;
- a benchmarking project for the National Aboriginal Economic Development Board where the CSLS is developing indicators to track the economic development of Aboriginal Canadians in a number of areas;
- a research project on the determinants of subjective well-being in Canada in collaboration with the Institute for Competitiveness and Prosperity;
- a project to develop a new measure of well-being for Canada called the Good Life Time (GLT) Index, with Michael Wolfson from Statistics Canada; and
- the coordination of an International Working Group on Methodology for Composite Index Construction for the International Society for Quality of Life Studies (ISQOLS).

<sup>46</sup> Papers from the conference are posted at <http://www.csls.ca/events/october.asp>.

replacement rate and the EI coverage rate. It was this latter variable that was responsible for the increase because of major cuts to the EI program during the first half of the 1990s. Thus the fall in the IEWB in the 1990s was largely driven by public policy, in particular the cuts to the EI programs.

HRDC, the financier of the IEWB, was the department responsible for the EI program. It did not welcome the message that it was directly responsible for the fall in economic well-being in Canada. It was felt that too much weight was being given to this one variable. Perhaps not surprisingly, HRDC decided to provide no additional financial support to the CSLS for work on the IEWB.

The loss of financial support from HRDC was a major setback to the development of the IEWB. Other sources of funding were approached, but none were found. This meant that work by the CSLS on the IEWB had to be financed by cross-subsidization from CSLS funded projects. As the CSLS is a small economic research organization with no core funding, there were limited resources from cross-subsidization so the work on the IEWB has proceeded at a much slower pace than originally anticipated or planned. It should be noted that the option of changing the IEWB to make it more palatable to HRDC was never considered. It was felt that the independence of the project from funder influence was paramount, and from a long-run perspective more important than short-term financial support.

In the early 2000s the CSLS devoted significant energy to the IEWB. Papers were presented at national and international conferences,<sup>47</sup> presentations were made to many difference audiences, and the IEWB was published in a number of outlets, including two papers in the *Review of Income and Wealth* (Osberg and Sharpe, 2002a and 2005).<sup>48</sup> After 2004, the CSLS devoted less energy to the IEWB due to the lack of funding and the time demands from income-generating projects. The number of papers, presentations, and publications by the CSLS on the IEWB fell from that of the early 2000s. In 2009, the CSLS has redirected its energies toward the IEWB, with the release of revised and updated estimates for both Canada and the provinces and OECD countries.

## **B. Factors Limiting the Impact of the IEWB**

There is great interest in measures of economic well-being that go beyond GDP, even among orthodox economic organizations such as the OECD.<sup>49</sup> The IEWB has

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<sup>47</sup> For example, the IEWB was presented at the 1998, 2000 and 2002 General Conferences of the International Association for Research in Income and Wealth, the 2000, 2003, 2006, and 2009 annual meetings of the Canadian Economics Association, the 2000 annual meeting of the American Economic Association, and the 1998, 2000, 2003, and 2006 international conferences of the International Society for Quality of Life Studies.

<sup>48</sup> Other publications include Osberg and Sharpe, 2001, 2002a, 2002b, 2004a, 2004b, and 2006.

<sup>49</sup> A research paper from the OECD Economics Department (Boarini, Johansson and D'Ercole, 2006) concluded that while measures of GDP per capita and economic growth remain critical for any assessment of well-being, they need to be complemented with measures of other dimensions of well-being to obtain a comprehensive picture of well-being. The authors found that calculations to extend measures of economic resources to include leisure, sharing of income within households and distributional concerns suggest that

certainty received significant attention,<sup>50</sup> particularly outside Canada and especially in France.<sup>51</sup> Nevertheless, we believe that the Index could become even more well-known. In our view, three major factors have prevented the IEWB from becoming a household name like the Human Development Index (HDI).

The first and most important factor is the lack of resources that the CSLS has put into its communication strategy. This of course reflects the lack of funding for the IEWB as well as a lack of expertise in self-promotion.

A second factor has been the focus on academic outlets for the IEWB instead of more accessible publications, which has limited the public profile of the Index. This choice has reflected the desire to obtain academic credibility for the IEWB. It was also related to the objective of the CSLS for developing the IEWB, namely to assess actual trends in economic well-being of societies in a dispassionate, objective, balanced manner. As the CSLS is an economic research organization, the advancement of a particular advocacy objective through the promotion of a composite index is not part of its mandate.<sup>52</sup>

A third and final factor that has limited the use of IEWB is its complexity, both conceptually in terms of the specification of the components and empirically in terms of data requirements. For example, instead of using the poverty rate, the IEWB uses the concept of poverty intensity, which requires estimates of poverty from micro-data sets, a major undertaking. This complexity means that an investment of time and effort is required to fully understand the various components of the IEWB and the interrelationships between the variables. It also means that efforts (e.g. Perez-Mayo and Jurado, 2008) to replicate the IEBW beyond the set of 14 OECD countries for which it has been originally estimated generally run up against data constraints, at least for a complete replication.

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cross-country rankings based on these indicators and GDP are similar, although they have evolved differently over time. It also found that levels of most measures of specific social conditions are significantly correlated to GDP per capita, while changes over time are not. But it found that survey-based data on happiness and life satisfaction are weakly correlated with GDP per capita.

<sup>50</sup> For example, googling “Index of Economic Well-being” on July 12, 2009 revealed 21,600 specific hits.

<sup>51</sup> On the interest of the IEWB in France, see Gadrey and Jany-Catrice (2004), the symposium in *Travail et emploi* in January-February 2003 and the summary of the IEWB prepared for the French Senate (Osberg and Sharpe (2004). The French business magazine *L'Expansion* featured the IEWB in August 2009 (Dedieu, 2009).

<sup>52</sup> In contrast to the non-advocacy approach of the CSLS, the London-based New Economics Foundation has used its composite index, the Happy Planet Index (HPI) as an effective advocacy tool (NEF, 2006 and 2009). However, the HPI results may be suspect. The United States ranks 114th out of 143 on this index, while the Dominican Republic ranks 2nd, Jamaica 3rd, Guatemala 4th, Vietnam 5th, Columbia 6th, Cuba 7th, and El Salvador 8th. Given the migration flows from these countries to the United States, such a massive gap in well-being against the United States seems improbable. Of course, these results reflect the small ecological footprint of the Latin American countries (and the large footprint of the United States), which in turns reflect the low level of development and income. Poor countries have small footprints and hence to well on the index especially if their life satisfaction and life expectancy are average or above.

## C. Changes in Methodology

Like the national accounts, the IEWB is a dynamic construct subject to changes in methodology over time as new knowledge and understanding is incorporated. As noted earlier in this report, there have been four major methodological changes in the IEWB since 1998. To recapitulate:

- In 2003, we abandoned an index number approach in favour of the linear scaling approach.
- In 2006, we reconceptualized the risk of unemployment component of the economic security domain. The weights of the unemployment rate variable and the financial protection from unemployment variable were altered, so that the unemployment rate now receives a much higher weight than the financial protection from unemployment variable.
- We also recently adjusted the weights of the four economic security domain. These weights are proportionate to the population affected by the risk, and we made two small changes to the definitions of those populations. First, the risk from single parent poverty was extended to all persons in two-parent families (with children under 18), as an increasing proportion of single-parent families are headed by men. Second, the risk from old age poverty was extended to the population 65 and over, the group directly affected by this risk.
- The baseline weighting scheme for the four domains of the IEWB was changed, so that the four domains now receive equal weight.

There is no need to repeat the discussion of these methodological developments here. We simply note that the Index of Economic Well-being remains a work in progress, and we will continue to improve the methodology whenever possible.

## D. Data Limitations

The data requirements for the IEWB are huge, and data gaps have been a major obstacle to the construction of the IEWB, particularly at the international level. Indeed, there are in fact two IEWB data sets, one for Canada and the provinces and another for selected OECD countries. This reflects the availability of certain variables for Canada, such as time series estimates of the value of natural resources and unpaid work, for which comparable data are unavailable from international data sources such as the OECD.<sup>53</sup>

Nearly 30 countries are members of the OECD, but the CSLS has only produced estimates of the IEWB for 14 countries. The reason for this is that the micro-data sets

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<sup>53</sup> Such estimates may of course be available from certain national statistical agencies. However, taking data on a piecemeal basis from national statistical agencies will not result in consistent estimates across countries so such a strategy of data gathering has been avoided.

based on comparable definitions are required to calculate poverty rates, poverty gaps, and Gini coefficients. The only source of such micro-data sets is the Luxembourg Income Study (LIS). Unfortunately, the LIS maintains suitable datasets (that is, datasets spanning the period from the early 1980s to the late 2000s) for only fourteen countries, with one dataset for approximately every five year period. This means that time series estimates for the IEWB cannot be produced for countries for which LIS micro-data sets are not available.

In the conceptual development of the IEWB a number of variables were identified for inclusion for which official data proved unavailable, especially at the international level. For certain variables such as human capital, R&D stocks, the value of increased life expectancy, and the costs of environmental degradation, the CSLS was able to develop its own estimates. For other variables, it was not possible for the CSLS to do so. The international data gaps are highlighted below:

- a time series on the value of unpaid work, both household work and volunteer work;
- a time series on the value of regrettables, including the cost of commuting, and auto accidents; and
- a time series on the value of natural resources.

It is hoped that these data gaps can be filled in the future.

## **E. Conceptual Challenges**

In constructing the Index of Economic Well-being, we have confronted conceptual challenges that lie at the heart of economics. These challenges are largely related to the valuation of non-market economic activity and the modeling of risk. Some of these challenges are discussed below.

### **i. Modeling the financial risk from illness**

The financial risk from illness is currently modeled in the IEWB by the proportion of unreimbursed medical expenses in disposable income. But whether this variable adequately captures the financial risk from illness across countries, or over time in one country, is unclear. The real financial risk from illness manifests itself mainly from bankruptcy. In countries with universal health coverage, which include all developed OECD countries except the United States, it is very difficult for one to be forced into bankruptcy because of catastrophic medical costs (although lost income due to illness can precipitate bankruptcy). In the United States, on the other hand, many persons go bankrupt for medical reasons. For example, Himmelstein *et al.* (2009) report that nearly two thirds of the one million bankruptcies in the United States in 2007 were linked to illness; that three quarters of the families who filed for bankruptcy due to medical reasons



were insured; that medical bankruptcies have increased 50 per cent since 2000; and that overall risk of medical bankruptcy was 0.6 per cent in 2007, or 6 per cent over a decade.<sup>54</sup>

Consequently, a time series on medical bankruptcy may be a better indicator of the financial risk from illness than the proportion of unreimbursed medical expenses in disposable income. The CSLS is exploring the availability of such a series for OECD countries.

## **ii. Estimating the costs of environmental degradation**

The IEWB explicitly recognizes the importance of the environment for economic well-being by adjusting estimates of stocks of wealth by an annual estimate of costs of environmental degradation. This sub-component of the IEWB is admittedly underdeveloped. The only aspect of environment degradation currently included is the social cost of greenhouse gases, which are valued at \$21 per tonne of CO<sub>2</sub>-equivalent emissions (or \$76 per tonne of carbon) in 2000 US dollars. The CSLS has produced a research report that discusses the issue of the valuation of greenhouse gases (Sharpe, Arsenault, Murray and Qiao, 2008), but much work of both a conceptual and empirical nature remains to be done on this topic. We also hope to make it easier in future for analysts who believe in different shadow costs for carbon emissions to see the sensitivity of estimates of well-being to such assumptions.

The CSLS also plans to add estimates of additional types of environmental degradation (e.g. loss of wetlands) to the IEWB, but has not yet had the opportunity to explore the conceptual issues involved in the construction of such estimates. Other composite indexes, such as the Genuine Progress Indicator and the Happy Planet Index, do make estimates of different types of environment degradation, but these estimates often seem implausibly large. The expansion of the environmental degradation component of the wealth domain of the IEWB is a priority for future work.

## **iii. Valuation of natural resources**

The IEWB for Canada and the provinces includes, as part of the wealth component, official estimates of the value of natural resources produced by Statistics Canada. But there remain many conceptual issues associated with these estimates, including the discount rate, the definition of reserves, and the time path of the exploitation of the resource. Motivated by what we saw as the undervaluation of the Alberta oil sands in official estimates, due to too narrow a definition of reserves, the CSLS produced a detailed report on conceptual and empirical issues related to natural resource valuation in 2008 ((Sharpe, Arsenault, Murray and Qiao, 2008). Perhaps not surprisingly, a key finding was the interaction of the time path of exploitation of the reserves and the discount rate for the valuation of natural resources. Resources that are

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<sup>54</sup> Given the economic downturn and the upward trend in medical bankruptcies experienced over the 2001-2007 period due to health care inflation, which will likely continue, the proportion of US families experiencing medical bankruptcies may be considerably higher than 6 per cent over the next decade.

expected to be exploited well into the future have little present value under assumptions of high, or even a moderate, discount rates. In any case, much more work remains to be done in this area, particularly at the international level to produce consistent and comparable estimates of natural resources.

#### **iv. Happiness and weighting schemes**

It has been noted that the IEWB has already been influenced by recent research on happiness. Because surveys of subjective well-being have revealed the serious negative effect of unemployment on well-being, the unemployment rate was assigned a much greater weight, relative to the generosity of unemployment insurance protection (0.8 instead of 0.5), in the risk from unemployment sub-component of the economic security component of the IEWB.

It is possible that the weighting scheme for the four components of the IEWB (as well as the weighting scheme for the four risks in the economic security component and the income distribution and poverty sub-components of the equality component) could be developed as a function of their impact on happiness. For example, if happiness studies consistently show that increased consumption has minimal effect on economic well-being, there may be a strong case for reducing the weight of this component of the IEWB.

#### **v. Valuation of increased life expectancy**

The IEWB already values increased life expectancy by boosting consumption by the per cent rise in life expectancy. But this is a crude approximation and more sophisticated methodologies may yield a more accurate (and likely larger) estimates of the contribution of longer lives to economic well-being.<sup>55</sup> More work is needed on this issue.

#### **vi. Valuation of leisure**

The IEWB also includes an adjustment to consumption flows for reductions in hours worked. But the estimate is based only on changes in hours of work relative to a benchmark. It does not capture the overall value of leisure to well-being, which is very large.<sup>56</sup> Such a valuation exercise is difficult, but merits a place in the long-term development of the IEWB.

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<sup>55</sup> For example, Nordaus (2003) found that that the economic value of increases in longevity in the last 100 years is about as large as the value of measured growth in non-health goods and services. Over the 1900-1995 period, the value of improved health or health income grew at between 2.2 and 3.0 per cent per year in the United States, compared to only 2.1 per cent for consumption. Over the 1980-1990 period, the increase in expenditure on health care was one half the increase in the value of health income. Indeed, Nordhaus (2003:35) states that “The medical revolution over the last century appears to qualify, at least from an economic point of view, for Samuel Johnson’s accolade as ‘the greatest benefit to mankind.’”

<sup>56</sup> For example, Nordhaus and Tobin (1972:12) estimated that in the United States in 1965 the absolute value of leisure exceeded that of GDP!

## **vii. Middle class insecurity related to retirement**

One of the four risks of the economic security component is the risk of poverty in old age. This risk is currently captured by the poverty intensity rate for persons 65 and over. But the current economic crisis and stock market crash has greatly increased anxiety over the retirement plans of the middle class. Instead of focusing on only the risk of poverty in old age, consideration is being given to broaden the risk to a lower than expected living standards in old age (Osberg, 2009). Variables such as pension coverage (particularly from defined benefit plans), the likelihood of pension plan defaults, and the size of individual retirement funds could be included in a new formulation of the financial risks associated with old age.

## **F. Lessons Learned**

This section highlights three lessons that have been learned from the CSLS experience in developing the Index of Economic Well-being.

### **i. Composite Indicators Focus Debate**

The Index of Economic Well-being, like the well-known Human Development Index developed by the United Nations Development Program, is a composite indicator that produces a single number bottom line. There is a major division among social scientists about the merits of composite indicators. One side is critical because of the nature of composite index construction, particularly the weighting issues. The other side sees great value in composite indicators as a heuristic tool.

Our experience resonates with the second perspective. We readily admit that composite indicators involve assumptions about the relative importance of different aspects of welfare – but so does the real world of public policy choices. Although in most cases it would not be appropriate for official statistical agencies to produce composite indicators involving subjective valuations, such indicators can be extremely useful in focusing the attention of the research and policy communities, as well as the media and the general public, on a particular trend or variable that is driving the composite index. This attention can lead to actions, such as research aimed at understanding the trend identified, policy changes to rectify an unacceptable situation, or the allocation of resources to fill data gaps identified by the composite indicator. Examples of composite indicators that have successfully fostered public debate include the already mentioned Human Development Index and the *MacLean's* composite ranking of Canadian universities. The Canadian Council on Learning has developed a composite learning index whose explicit purpose is to foster debate about what constitutes lifetime learning in Canada.

### **ii. Sensitivity of Composite Indicators to Methodological Choices**

Many different methodologies can be used in the construction of a composite index and the results are very dependent on the choice of methodology. There is no one

methodology that is appropriate for all situations. Experts disagree about the best way to deal with many thorny index construction issues.

A situation where composite indexes are highly sensitive to methodological choices can be potentially abused. Unscrupulous composite index constructors can in principle choose the methodology that gives them the results they seek. Such a danger requires a high degree of transparency in index construction (straightforward methodologies are preferable *a priori* to complicated methodologies, everything else being equal). In addition, it is very important that composite index developers provide clear rationales for their choice of one methodology over competing methodologies.

### **iii. The Importance of Testing Results to Different Weighting Schemes**

As noted earlier in the report, weighting schemes for composite indexes are very controversial. The ideal way to approach weighting is to undertake a large survey of the population to obtain consistent preferences on all variables in the composite index. Such an undertaking is beyond the means of almost all composite index developers.

In our experience, the most effective and realistic way to deal with this issue is to give equal weight to the main components of the composite index and then to undertake sensitivity analysis to ascertain how sensitive the overall trends of the index are to a range of weights. In some cases, the path of a composite index is robust to any set of weights while in others the path varies significantly with the set of weights chosen.

We conducted sensitivity analyses based on three alternative weighting schemes in this report. In addition, we have posted the time series estimates of the four domains of the Index of Economic Well-being in a Microsoft Excel file on the CSLS website.<sup>57</sup> Visitors to the website can choose any set of weights for the four domains they wish and then see the path of the overall Index that their set of weights generates. We believe that such testing of the results to different weighting schemes is an essential element of the transparency of any composite index construction exercise.

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<sup>57</sup> The CSLS web site for the Index of Economic Well-being is located at <http://www.csls.ca/iwb.asp>.

## VIII. Conclusion

This report presents revised and updated estimates of the Index of Economic Well-being for Canada and the provinces for the 1981-2008 period based on what we believe are methodological improvements to the Index. The results show that since 1981, and more particularly since 1997, the economic well-being of Canadians has improved considerably. The overall Index of Economic Well-being rose 0.167 points from 0.439 in 1981 to 0.605 in 2008 in Canada. This amounts to a 38.0 per cent total increase over the period, or a compound growth rate of 1.20 per cent per year.

The increase in well-being was driven by robust growth in consumption and stocks of wealth. The index of the consumption domain increased 4.27 per cent per year over the 1981-2008 period, while the index of the wealth domain grew 2.48 per cent per year.

However, the growth of economic well-being was hindered by declines in economic equality and security. The index of the economic equality domain fell by 0.076 points (or 13.9 per cent) over the 1981-2008 period, driven by rising income inequality. The index of the economic security domain declined by 0.099 points (or 15.3 per cent) over the same period, entirely as a result of rising out-of-pocket healthcare expenditures. In Canada, the proportion of personal disposable income being spent on healthcare increased from 2.67 per cent in 1981 to 5.42 per cent in 2008.

Among the provinces, Alberta and Newfoundland had the highest levels of economic well-being in 2008. Quebec and New Brunswick had the lowest levels. Economic well-being increased in every province over the 1981-2008 period, driven by rising consumption and wealth. As in the case of Canada as a whole, however, growth in economic well-being was held back by declining economic security.

Sensitivity analysis shows that our key baseline results are robust to the use of different weights for the four domains. Under all four weighting alternatives we examine, economic well-being improved in Canada and in all provinces over the 1981-2008 period. It improved most quickly in Newfoundland. Alberta and Newfoundland always had the highest levels of economic well-being in 2008, while Quebec ranked at the bottom among the provinces under three out of the four alternative weighting schemes (and third from the bottom under the fourth).

We project that the ongoing economic downturn will cause the IEWB to decline 1.25 per cent in 2009 and remain unchanged in 2010 after a decade of robust growth. The decline is driven mainly by a fall in economic security, which is expected to drop 4.9 per cent in 2009 and then a further 0.43 per cent in 2010.

This report is being released at a time in which concern about the measurement of economic well-being is growing in the policy community. The Commission on the Measurement of Economic Performance and Social Progress, which delivered its final report in September 2009, has drawn the attention of the academic and public policy

communities throughout the world toward the problem of the appropriate measurement of well-being and social progress. The Commission made twelve recommendations in its final report, and although the Index of Economic Well-being precedes the Commission report by over a decade, it anticipates the Commission's recommendations in many respects. Indeed, in its discussion of composite indices of well-being, the Commission report recognizes the Index of Economic Well-being as "more elaborated [than other composite indices] and relatively well-known" (Stiglitz *et al.*, 2009:237).

The Index remains a work in progress. It will undoubtedly undergo further modifications as research on the conceptualization of economic-well-being, and ways to capture these concepts empirically, evolves. We consider the Commission's report to be an indication that the development of the Index is on the right track.

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Table 1: Overall Index of Economic Well-being, Canada and the Provinces, 1981-2008

	Canada	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1981	0.439	0.373	0.394	0.429	0.371	0.353	0.456	0.371	0.481	0.613	0.460
1982	0.416	0.365	0.411	0.413	0.356	0.343	0.427	0.373	0.488	0.585	0.408
1983	0.388	0.326	0.400	0.395	0.304	0.321	0.388	0.362	0.472	0.534	0.412
1984	0.403	0.370	0.415	0.414	0.354	0.336	0.419	0.401	0.471	0.501	0.389
1985	0.422	0.359	0.434	0.419	0.401	0.367	0.446	0.416	0.437	0.571	0.361
1986	0.431	0.399	0.472	0.430	0.423	0.371	0.463	0.423	0.433	0.528	0.410
1987	0.438	0.396	0.471	0.446	0.418	0.378	0.481	0.421	0.472	0.498	0.408
1988	0.469	0.467	0.503	0.481	0.469	0.405	0.502	0.442	0.493	0.518	0.483
1989	0.493	0.485	0.486	0.493	0.477	0.434	0.530	0.472	0.492	0.512	0.513
1990	0.471	0.453	0.513	0.504	0.473	0.402	0.505	0.455	0.471	0.528	0.474
1991	0.440	0.401	0.469	0.488	0.451	0.372	0.468	0.423	0.448	0.480	0.469
1992	0.442	0.403	0.495	0.478	0.441	0.389	0.484	0.408	0.439	0.433	0.452
1993	0.427	0.409	0.481	0.477	0.432	0.362	0.458	0.414	0.445	0.456	0.438
1994	0.440	0.420	0.473	0.450	0.426	0.370	0.475	0.410	0.468	0.484	0.461
1995	0.441	0.429	0.448	0.464	0.458	0.364	0.476	0.444	0.466	0.484	0.470
1996	0.426	0.431	0.452	0.447	0.460	0.365	0.444	0.434	0.486	0.484	0.434
1997	0.429	0.441	0.454	0.443	0.443	0.360	0.452	0.424	0.508	0.493	0.446
1998	0.447	0.450	0.468	0.441	0.478	0.383	0.479	0.463	0.504	0.493	0.444
1999	0.468	0.484	0.460	0.473	0.507	0.425	0.488	0.458	0.531	0.548	0.447
2000	0.490	0.514	0.479	0.499	0.506	0.427	0.508	0.473	0.529	0.608	0.487
2001	0.504	0.543	0.503	0.501	0.500	0.458	0.517	0.503	0.547	0.624	0.479
2002	0.502	0.530	0.518	0.503	0.505	0.469	0.509	0.474	0.556	0.627	0.472
2003	0.510	0.525	0.533	0.503	0.500	0.478	0.523	0.507	0.559	0.603	0.474
2004	0.521	0.549	0.541	0.503	0.523	0.507	0.517	0.509	0.548	0.631	0.501
2005	0.537	0.625	0.569	0.529	0.510	0.488	0.528	0.501	0.545	0.692	0.536
2006	0.563	0.660	0.559	0.545	0.538	0.524	0.548	0.524	0.572	0.748	0.553
2007	0.587	0.681	0.591	0.574	0.566	0.531	0.573	0.562	0.637	0.772	0.589
2008	0.605	0.691	0.599	0.588	0.572	0.541	0.582	0.574	0.649	0.773	0.595
Absolute Change in Points											
81-08	0.167	0.318	0.205	0.158	0.201	0.188	0.125	0.203	0.169	0.160	0.135
81-89	0.054	0.112	0.093	0.064	0.106	0.081	0.074	0.101	0.012	-0.101	0.054
89-00	-0.002	0.029	-0.007	0.006	0.029	-0.007	-0.021	0.001	0.037	0.096	-0.026
00-08	0.115	0.178	0.120	0.088	0.066	0.114	0.073	0.101	0.120	0.165	0.107
Per cent Change											
81-08	38.0	85.1	52.2	36.9	54.2	53.2	27.5	54.6	35.1	26.1	29.4
81-89	12.3	29.9	23.5	14.8	28.5	22.8	16.1	27.1	2.5	-16.4	11.7
89-00	-0.5	5.9	-1.4	1.3	6.1	-1.5	-4.0	0.3	7.5	18.7	-5.0
00-08	23.4	34.6	25.0	17.7	13.1	26.7	14.4	21.3	22.7	27.1	22.0
Compound Annual Growth Rate											
81-08	1.20	2.31	1.57	1.17	1.62	1.59	0.90	1.63	1.12	0.86	0.96
81-89	1.46	3.33	2.68	1.74	3.19	2.60	1.89	3.04	0.31	-2.22	1.39
89-00	-0.04	0.52	-0.13	0.12	0.54	-0.14	-0.37	0.03	0.66	1.57	-0.47
00-08	2.67	3.78	2.82	2.06	1.55	3.00	1.69	2.44	2.59	3.05	2.52

Source: CSLS Index of Economic Well-being database for Canada, Table 9

Table 2: Per-capita GDP, Canada and the Provinces, \$2002, 1981-2008

	Canada	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1981	26,074	16,289	17,101	18,683	17,143	23,689	28,547	23,793	23,961	35,797	29,895
1982	25,039	16,484	17,245	19,302	17,427	22,719	27,431	22,944	23,260	33,477	27,557
1983	25,460	16,839	18,656	19,567	18,452	23,064	28,284	22,807	23,593	32,792	27,444
1984	26,682	17,275	18,857	20,558	18,685	23,969	30,118	24,399	23,742	34,143	27,276
1985	27,722	17,545	18,623	21,359	19,198	24,634	30,924	25,711	24,124	36,740	28,932
1986	28,094	17,654	19,317	21,722	20,468	24,950	31,691	25,572	25,406	35,505	28,699
1987	28,912	18,286	19,569	22,307	21,458	25,731	32,578	25,777	25,422	36,085	30,023
1988	29,952	19,427	20,110	22,488	21,530	26,684	33,632	25,544	24,674	38,729	31,079
1989	30,217	20,209	20,519	22,836	21,568	26,527	33,858	26,204	25,483	38,637	31,275
1990	29,798	20,186	20,611	22,596	21,316	26,339	32,664	26,788	27,571	38,751	30,822
1991	28,826	20,219	20,567	22,301	21,161	25,380	30,980	25,811	28,036	38,257	30,100
1992	28,742	19,904	21,038	22,490	21,420	25,339	30,829	25,987	26,924	38,002	30,048
1993	29,072	20,056	21,076	22,612	22,022	25,672	30,770	25,977	28,607	40,205	30,519
1994	30,137	21,119	21,892	22,629	22,441	26,662	32,200	26,872	29,752	42,174	30,448
1995	30,662	21,880	23,136	22,973	23,156	27,023	32,940	26,803	29,949	42,985	30,341
1996	30,854	21,150	23,580	23,048	23,264	27,166	32,916	27,489	30,676	43,186	30,312
1997	31,841	21,751	23,621	24,005	23,538	27,941	33,941	28,463	31,898	45,249	30,687
1998	32,873	23,392	24,747	24,909	24,473	28,739	35,146	29,628	33,272	46,499	30,820
1999	34,415	24,967	25,699	26,215	25,991	30,397	37,345	29,990	33,448	46,268	31,598
2000	35,873	26,528	26,156	27,027	26,549	31,584	38,973	31,115	34,541	48,244	32,810
2001	36,119	27,270	25,855	27,925	26,992	31,890	38,955	31,252	34,464	48,214	32,721
2002	36,771	31,677	27,039	28,964	28,251	32,448	39,514	31,609	34,453	48,138	33,721
2003	37,119	33,600	27,540	29,281	29,033	32,648	39,565	31,829	36,061	48,801	34,300
2004	37,913	33,249	28,170	29,508	29,858	33,303	40,090	32,257	37,836	50,493	35,266
2005	38,628	34,095	28,636	29,932	30,383	33,600	40,771	32,930	39,214	51,592	36,443
2006	39,439	35,398	29,362	30,209	31,229	33,937	41,384	34,080	39,183	53,132	37,643
2007	40,066	38,889	30,051	30,773	31,768	34,589	41,909	34,916	39,848	53,405	38,177
2008	39,790	38,760	29,955	31,321	31,670	34,668	41,300	35,311	40,925	52,183	37,451
<b>Compound Annual Growth Rate</b>											
81-08	1.58	3.26	2.10	1.93	2.30	1.42	1.38	1.47	2.00	1.41	0.84
81-89	1.86	2.73	2.30	2.54	2.91	1.42	2.16	1.21	0.77	0.96	0.57
89-00	1.57	2.50	2.23	1.54	1.91	1.60	1.29	1.57	2.80	2.04	0.44
00-08	1.30	4.85	1.71	1.86	2.23	1.17	0.73	1.59	2.14	0.99	1.67
<b>Per cent Change</b>											
81-08	52.6	138.0	75.2	67.6	84.7	46.4	44.7	48.4	70.8	45.8	25.3
81-89	15.9	24.1	20.0	22.2	25.8	12.0	18.6	10.1	6.4	7.9	4.6
89-00	18.7	31.3	27.5	18.4	23.1	19.1	15.1	18.7	35.5	24.9	4.9
00-08	10.9	46.1	14.5	15.9	19.3	9.8	6.0	13.5	18.5	8.2	14.1

Source: Statistics Canada, CANSIM Tables 384-0013 and 051-0001.  
See the CSLS Index of Economic Well-being database for Canada, Table 1

Table 3: Index of the Consumption Domain, Canada and the Provinces, 1981-2008

	Canada	Newfoundland Island	Prince Edward Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	
1981	0.271	0.083	0.199	0.235	0.097	0.191	0.284	0.218	0.244	0.411	0.377
1982	0.250	0.088	0.183	0.221	0.113	0.172	0.265	0.235	0.222	0.384	0.322
1983	0.260	0.102	0.192	0.223	0.134	0.190	0.277	0.243	0.225	0.388	0.317
1984	0.280	0.133	0.227	0.267	0.164	0.219	0.298	0.294	0.232	0.386	0.313
1985	0.310	0.163	0.237	0.301	0.209	0.253	0.328	0.330	0.238	0.421	0.329
1986	0.333	0.198	0.244	0.329	0.247	0.282	0.353	0.362	0.264	0.424	0.337
1987	0.360	0.218	0.294	0.358	0.272	0.296	0.388	0.375	0.281	0.452	0.378
1988	0.392	0.257	0.342	0.389	0.293	0.325	0.422	0.383	0.287	0.480	0.415
1989	0.416	0.274	0.374	0.409	0.298	0.341	0.448	0.404	0.313	0.505	0.455
1990	0.430	0.272	0.399	0.422	0.312	0.351	0.464	0.418	0.327	0.514	0.477
1991	0.434	0.263	0.396	0.422	0.307	0.347	0.476	0.414	0.317	0.496	0.500
1992	0.458	0.274	0.448	0.457	0.319	0.370	0.507	0.430	0.327	0.506	0.527
1993	0.466	0.273	0.310	0.479	0.335	0.378	0.514	0.436	0.343	0.517	0.532
1994	0.484	0.283	0.325	0.478	0.343	0.398	0.538	0.452	0.354	0.527	0.552
1995	0.496	0.295	0.331	0.496	0.355	0.408	0.555	0.462	0.365	0.537	0.554
1996	0.511	0.305	0.357	0.492	0.368	0.432	0.566	0.475	0.385	0.551	0.577
1997	0.539	0.320	0.414	0.510	0.387	0.448	0.600	0.501	0.414	0.590	0.602
1998	0.569	0.377	0.427	0.537	0.422	0.477	0.635	0.515	0.437	0.623	0.633
1999	0.595	0.424	0.478	0.578	0.464	0.501	0.664	0.542	0.451	0.639	0.655
2000	0.625	0.452	0.491	0.599	0.480	0.533	0.690	0.557	0.468	0.678	0.687
2001	0.645	0.496	0.528	0.624	0.490	0.558	0.706	0.583	0.497	0.704	0.703
2002	0.665	0.533	0.551	0.660	0.514	0.579	0.727	0.604	0.515	0.718	0.722
2003	0.687	0.548	0.582	0.681	0.534	0.611	0.749	0.621	0.527	0.731	0.745
2004	0.710	0.565	0.585	0.699	0.568	0.631	0.773	0.640	0.546	0.753	0.771
2005	0.735	0.585	0.620	0.733	0.598	0.654	0.792	0.664	0.573	0.789	0.806
2006	0.774	0.636	0.659	0.778	0.643	0.687	0.826	0.696	0.615	0.841	0.849
2007	0.813	0.682	0.702	0.813	0.678	0.729	0.857	0.739	0.667	0.898	0.890
2008	0.837	0.727	0.733	0.854	0.719	0.761	0.877	0.768	0.731	0.917	0.909
Absolute Change in Points											
81-08	0.567	0.644	0.535	0.619	0.622	0.569	0.593	0.550	0.487	0.505	0.533
81-89	0.145	0.191	0.175	0.174	0.201	0.150	0.164	0.187	0.068	0.094	0.079
89-00	0.209	0.178	0.117	0.191	0.182	0.192	0.242	0.153	0.155	0.173	0.232
00-08	0.212	0.275	0.242	0.255	0.238	0.227	0.187	0.211	0.263	0.239	0.222
Per cent Change											
81-08	209.2	772.4	269.1	264.0	639.3	297.4	209.1	252.7	199.3	122.8	141.4
81-89	53.6	229.1	88.3	74.1	206.4	78.4	57.9	85.7	28.0	22.8	20.8
89-00	50.2	64.9	31.3	46.7	61.2	56.2	54.1	37.8	49.6	34.2	51.0
00-08	34.0	60.7	49.3	42.5	49.6	42.6	27.0	37.9	56.3	35.3	32.3
Compound Annual Growth Rate											
81-08	4.27	8.35	4.96	4.90	7.69	5.24	4.27	4.78	4.14	3.01	3.32
81-89	5.51	16.06	8.23	7.17	15.02	7.50	5.87	8.04	3.14	2.60	2.39
89-00	3.77	4.65	2.51	3.55	4.44	4.14	4.01	2.96	3.73	2.71	3.82
00-08	3.72	6.11	5.13	4.53	5.17	4.54	3.04	4.10	5.74	3.85	3.57

Source: CSLS Index of Economic Well-being database for Canada, Table 1

Table 3a: Total Per-capita Consumption Flows, Canada and the Provinces, \$2002, 1981-2008

	Canada	Newfoundland Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	
1981	26,544	20,635	24,273	25,406	21,073	24,043	26,952	24,873	25,710	30,979	29,882
1982	25,886	20,770	23,779	24,980	21,558	23,417	26,371	25,417	25,010	30,114	28,169
1983	26,202	21,219	24,057	25,052	22,225	24,009	26,732	25,676	25,116	30,228	27,995
1984	26,838	22,213	25,149	26,416	23,189	24,922	27,412	27,262	25,324	30,164	27,862
1985	27,777	23,133	25,485	27,493	24,589	25,978	28,346	28,406	25,504	31,292	28,373
1986	28,513	24,244	25,700	28,382	25,790	26,912	29,131	29,431	26,323	31,372	28,620
1987	29,364	24,873	27,268	29,280	26,579	27,330	30,225	29,816	26,863	32,247	29,909
1988	30,356	26,119	28,787	30,266	27,234	28,258	31,300	30,082	27,063	33,126	31,092
1989	31,123	26,654	29,803	30,886	27,401	28,774	32,128	30,753	27,869	33,931	32,357
1990	31,570	26,575	30,583	31,309	27,848	29,081	32,640	31,194	28,306	34,200	33,042
1991	31,698	26,293	30,504	31,325	27,700	28,932	33,016	31,070	28,001	33,642	33,761
1992	32,444	26,651	32,134	32,422	28,074	29,662	33,991	31,574	28,314	33,961	34,610
1993	32,703	26,613	27,776	33,093	28,572	29,909	34,215	31,756	28,813	34,313	34,791
1994	33,251	26,919	28,245	33,077	28,820	30,555	34,957	32,258	29,164	34,611	35,401
1995	33,653	27,304	28,449	33,646	29,200	30,868	35,513	32,579	29,506	34,922	35,482
1996	34,131	27,629	29,248	33,510	29,609	31,613	35,838	32,985	30,150	35,378	36,187
1997	34,998	28,107	31,074	34,094	30,216	32,141	36,938	33,795	31,059	36,601	36,988
1998	35,957	29,884	31,454	34,924	31,305	33,031	38,031	34,255	31,792	37,637	37,973
1999	36,768	31,380	33,078	36,236	32,631	33,789	38,946	35,080	32,219	38,161	38,669
2000	37,713	32,266	33,497	36,905	33,152	34,824	39,769	35,565	32,759	39,369	39,671
2001	38,327	33,638	34,665	37,664	33,446	35,600	40,265	36,397	33,685	40,198	40,163
2002	38,969	34,801	35,386	38,809	34,222	36,273	40,924	37,049	34,240	40,630	40,782
2003	39,681	35,277	36,347	39,480	34,829	37,259	41,633	37,576	34,625	41,043	41,479
2004	40,403	35,815	36,452	40,051	35,902	37,910	42,391	38,198	35,208	41,754	42,317
2005	41,190	36,455	37,563	41,106	36,869	38,612	42,972	38,930	36,082	42,895	43,406
2006	42,408	38,059	38,773	42,524	38,275	39,667	44,046	39,956	37,384	44,514	44,788
2007	43,623	39,509	40,130	43,640	39,383	40,978	45,028	41,304	39,049	46,302	46,066
2008	44,404	40,925	41,129	44,935	40,670	41,991	45,654	42,218	41,060	46,905	46,678
Compound Annual Growth Rate											
81-08	1.92	2.57	1.97	2.13	2.46	2.09	1.97	1.98	1.75	1.55	1.67
81-89	2.01	3.25	2.60	2.47	3.34	2.27	2.22	2.69	1.01	1.14	1.00
89-00	1.76	1.75	1.07	1.63	1.75	1.75	1.96	1.33	1.48	1.36	1.87
00-08	2.06	3.02	2.60	2.49	2.59	2.37	1.74	2.17	2.86	2.21	2.05
Per cent Change											
81-08	67.3	98.3	69.4	76.9	93.0	74.7	69.4	69.7	59.7	51.4	56.2
81-89	17.2	29.2	22.8	21.6	30.0	19.7	19.2	23.6	8.4	9.5	8.3
89-00	21.2	21.1	12.4	19.5	21.0	21.0	23.8	15.6	17.5	16.0	22.6
00-08	17.7	26.8	22.8	21.8	22.7	20.6	14.8	18.7	25.3	19.1	17.7

Source: CSLS Index of Economic Well-being database for Canada, Table 1

Table 4: Index of the Wealth Domain, Canada and the Provinces, 1981-2008

	Canada	Newfoundland Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	
1981	0.293	0.172	0.083	0.146	0.170	0.225	0.230	0.279	0.364	0.696	0.363
1982	0.292	0.166	0.088	0.149	0.161	0.225	0.230	0.272	0.346	0.700	0.347
1983	0.303	0.168	0.094	0.157	0.159	0.230	0.236	0.271	0.361	0.775	0.342
1984	0.304	0.175	0.097	0.168	0.159	0.235	0.241	0.278	0.379	0.747	0.338
1985	0.299	0.172	0.101	0.167	0.155	0.236	0.242	0.272	0.368	0.731	0.331
1986	0.279	0.173	0.105	0.168	0.159	0.241	0.245	0.273	0.330	0.571	0.331
1987	0.288	0.183	0.104	0.180	0.179	0.250	0.257	0.282	0.368	0.546	0.353
1988	0.298	0.205	0.114	0.193	0.208	0.266	0.274	0.296	0.386	0.479	0.381
1989	0.303	0.215	0.121	0.201	0.224	0.270	0.278	0.302	0.395	0.486	0.388
1990	0.321	0.218	0.140	0.221	0.244	0.286	0.291	0.317	0.397	0.526	0.409
1991	0.312	0.215	0.147	0.218	0.238	0.285	0.292	0.314	0.365	0.453	0.392
1992	0.309	0.217	0.154	0.210	0.229	0.285	0.290	0.312	0.367	0.451	0.373
1993	0.308	0.217	0.164	0.207	0.218	0.284	0.287	0.308	0.352	0.463	0.369
1994	0.315	0.235	0.167	0.209	0.225	0.290	0.293	0.313	0.384	0.471	0.379
1995	0.326	0.263	0.176	0.220	0.254	0.308	0.300	0.324	0.409	0.459	0.394
1996	0.340	0.275	0.183	0.226	0.272	0.320	0.307	0.329	0.413	0.509	0.412
1997	0.353	0.295	0.194	0.237	0.288	0.336	0.317	0.340	0.426	0.522	0.429
1998	0.355	0.314	0.198	0.244	0.298	0.342	0.319	0.343	0.409	0.483	0.439
1999	0.377	0.371	0.208	0.252	0.314	0.354	0.334	0.355	0.450	0.581	0.454
2000	0.411	0.467	0.218	0.291	0.325	0.364	0.347	0.368	0.511	0.732	0.484
2001	0.411	0.448	0.232	0.291	0.330	0.370	0.351	0.368	0.479	0.695	0.491
2002	0.414	0.462	0.240	0.287	0.337	0.376	0.355	0.371	0.477	0.697	0.489
2003	0.428	0.460	0.250	0.289	0.342	0.384	0.362	0.376	0.506	0.744	0.511
2004	0.448	0.522	0.261	0.299	0.361	0.399	0.375	0.388	0.540	0.777	0.527
2005	0.480	0.743	0.270	0.308	0.369	0.411	0.388	0.402	0.597	0.843	0.556
2006	0.507	0.736	0.286	0.326	0.388	0.426	0.407	0.421	0.625	0.914	0.560
2007	0.515	0.743	0.291	0.335	0.396	0.432	0.413	0.427	0.645	0.917	0.567
2008	0.567	0.737	0.305	0.349	0.412	0.447	0.432	0.441	0.627	0.894	0.579
Absolute Change in Points											
81-08	0.274	0.565	0.222	0.203	0.242	0.222	0.202	0.162	0.263	0.199	0.215
81-89	0.010	0.043	0.037	0.055	0.054	0.046	0.049	0.023	0.031	-0.209	0.025
89-00	0.108	0.252	0.097	0.090	0.101	0.094	0.069	0.066	0.116	0.246	0.096
00-08	0.156	0.270	0.087	0.058	0.087	0.083	0.085	0.073	0.116	0.162	0.095
Per cent Change											
81-08	93.8	327.7	266.3	138.8	142.1	98.7	88.2	58.1	72.4	28.6	59.3
81-89	3.6	24.7	44.8	37.5	31.7	20.3	21.2	8.3	8.5	-30.1	6.8
89-00	35.7	117.3	80.5	44.8	44.9	34.6	24.7	21.7	29.5	50.6	24.7
00-08	37.8	57.8	40.1	20.0	26.8	22.7	24.6	19.9	22.7	22.1	19.6
Compound Annual Growth Rate											
81-08	2.48	5.53	4.93	3.28	3.33	2.58	2.37	1.71	2.04	0.93	1.74
81-89	0.44	2.80	4.74	4.06	3.51	2.34	2.43	1.00	1.03	-4.37	0.82
89-00	2.82	7.31	5.52	3.42	3.43	2.74	2.02	1.80	2.38	3.79	2.03
00-08	4.09	5.87	4.30	2.30	3.02	2.59	2.79	2.30	2.59	2.53	2.27

Source: CSLS Index of Economic Well-being database for Canada, Table 2

Table 4a: Total Per-capita Wealth Stocks, Canada and the Provinces, \$2002, 1981-2008

	Canada	Newfoundland Island	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1981	145,947	110,280	83,926	102,525	109,696	125,832	127,254	141,838	166,996	265,339	166,919
1982	145,759	108,526	85,262	103,398	106,943	125,977	127,379	139,764	161,860	266,509	161,949
1983	149,135	109,105	87,156	105,775	106,266	127,326	129,068	139,655	166,327	288,934	160,425
1984	149,296	111,215	88,055	109,078	106,275	128,830	130,737	141,518	171,626	280,601	159,357
1985	147,771	110,077	89,085	108,774	105,283	129,065	131,006	139,712	168,155	275,702	157,287
1986	141,927	110,444	90,243	108,863	106,346	130,683	131,893	140,213	157,066	228,425	157,321
1987	144,530	113,405	90,098	112,500	112,247	133,293	135,385	142,766	168,325	220,927	163,862
1988	147,545	119,908	93,035	116,298	120,862	138,083	140,433	146,809	173,569	201,021	172,258
1989	149,044	122,891	94,995	118,757	125,709	139,348	141,651	148,694	176,174	203,350	174,200
1990	154,482	123,716	100,629	124,758	131,572	143,884	145,479	153,033	176,912	215,063	180,503
1991	151,751	122,907	102,823	123,920	129,733	143,533	145,638	152,305	167,316	193,453	175,270
1992	150,778	123,547	104,838	121,584	127,070	143,665	145,124	151,714	167,881	192,878	169,634
1993	150,363	123,472	107,896	120,590	123,965	143,319	144,266	150,446	163,651	196,271	168,420
1994	152,633	128,830	108,769	121,065	125,755	145,204	145,922	151,962	172,938	198,757	171,593
1995	155,954	137,097	111,256	124,310	134,554	150,429	148,117	155,251	180,484	195,270	175,957
1996	159,991	140,774	113,436	126,219	139,891	154,137	150,180	156,716	181,689	210,094	181,191
1997	163,963	146,631	116,829	129,364	144,536	158,894	153,175	159,985	185,364	213,818	186,271
1998	164,315	152,143	117,932	131,395	147,433	160,634	153,818	160,822	180,535	202,386	189,173
1999	171,001	169,050	120,987	133,961	152,242	164,225	158,073	164,281	192,673	231,231	193,660
2000	181,142	197,558	123,789	145,402	155,562	167,077	161,970	168,141	210,632	276,202	202,583
2001	181,111	192,091	127,927	145,581	157,028	169,007	163,136	168,308	201,149	265,096	204,749
2002	181,815	195,983	130,247	144,335	158,959	170,648	164,268	169,084	200,529	265,845	204,172
2003	186,128	195,665	133,235	144,732	160,471	172,956	166,424	170,757	209,262	279,785	210,577
2004	191,977	213,853	136,653	147,830	166,064	177,335	170,310	174,301	219,159	289,422	215,335
2005	201,526	279,405	139,347	150,607	168,692	181,045	174,340	178,395	236,190	309,095	223,996
2006	209,344	277,196	143,827	155,688	174,076	185,397	179,759	183,943	244,375	330,138	225,299
2007	211,709	279,275	145,376	158,361	176,611	187,332	181,740	185,790	250,366	330,825	227,151
2008	227,250	277,551	149,666	162,614	181,403	191,579	187,229	189,826	244,992	324,209	230,739
Compound Annual Growth Rate											
81-08	1.65	3.48	2.17	1.72	1.88	1.57	1.44	1.09	1.43	0.74	1.21
81-89	0.26	1.36	1.56	1.85	1.72	1.28	1.35	0.59	0.67	-3.27	0.54
89-00	1.79	4.41	2.44	1.86	1.96	1.66	1.23	1.12	1.64	2.82	1.38
00-08	2.88	4.34	2.40	1.41	1.94	1.73	1.83	1.53	1.91	2.02	1.64
Per cent Change											
81-08	55.7	151.7	78.3	58.6	65.4	52.3	47.1	33.8	46.7	22.2	38.2
81-89	2.1	11.4	13.2	15.8	14.6	10.7	11.3	4.8	5.5	-23.4	4.4
89-00	21.5	60.8	30.3	22.4	23.7	19.9	14.3	13.1	19.6	35.8	16.3
00-08	25.5	40.5	20.9	11.8	16.6	14.7	15.6	12.9	16.3	17.4	13.9

Source: CSLS Index of Economic Well-being database for Canada, Table 2



Table 5: Index of the Equality Domain, Canada and the Provinces, 1981-2008

	Canada	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1981	0.545	0.754	0.764	0.674	0.605	0.437	0.629	0.375	0.528	0.629	0.479
1982	0.517	0.730	0.803	0.626	0.582	0.430	0.578	0.382	0.595	0.614	0.425
1983	0.422	0.598	0.723	0.565	0.415	0.347	0.455	0.408	0.552	0.402	0.429
1984	0.439	0.664	0.714	0.613	0.556	0.320	0.528	0.403	0.545	0.320	0.391
1985	0.482	0.582	0.795	0.614	0.669	0.411	0.580	0.454	0.441	0.503	0.293
1986	0.510	0.645	0.878	0.651	0.705	0.398	0.610	0.484	0.466	0.496	0.435
1987	0.516	0.634	0.819	0.661	0.644	0.419	0.638	0.436	0.587	0.401	0.403
1988	0.562	0.787	0.875	0.699	0.757	0.447	0.652	0.463	0.593	0.498	0.565
1989	0.604	0.817	0.806	0.718	0.747	0.541	0.695	0.542	0.584	0.433	0.599
1990	0.510	0.708	0.883	0.744	0.722	0.409	0.615	0.456	0.475	0.458	0.385
1991	0.428	0.543	0.743	0.701	0.665	0.298	0.527	0.360	0.445	0.378	0.385
1992	0.433	0.568	0.818	0.659	0.647	0.371	0.555	0.291	0.423	0.233	0.337
1993	0.394	0.598	0.881	0.664	0.612	0.285	0.500	0.327	0.471	0.280	0.305
1994	0.409	0.621	0.860	0.549	0.586	0.274	0.511	0.328	0.512	0.375	0.321
1995	0.382	0.590	0.753	0.573	0.617	0.209	0.491	0.388	0.459	0.357	0.323
1996	0.311	0.574	0.747	0.518	0.594	0.218	0.370	0.372	0.493	0.297	0.184
1997	0.280	0.568	0.703	0.487	0.532	0.155	0.351	0.316	0.566	0.260	0.180
1998	0.309	0.548	0.739	0.445	0.599	0.202	0.411	0.403	0.491	0.260	0.155
1999	0.329	0.555	0.651	0.468	0.647	0.296	0.396	0.368	0.562	0.326	0.123
2000	0.346	0.573	0.657	0.530	0.612	0.261	0.429	0.401	0.486	0.384	0.174
2001	0.398	0.653	0.746	0.520	0.624	0.345	0.471	0.511	0.585	0.450	0.163
2002	0.400	0.574	0.759	0.550	0.614	0.391	0.446	0.384	0.608	0.459	0.187
2003	0.402	0.557	0.796	0.532	0.586	0.394	0.478	0.480	0.584	0.315	0.194
2004	0.388	0.574	0.797	0.476	0.612	0.440	0.411	0.447	0.475	0.364	0.215
2005	0.391	0.651	0.850	0.532	0.567	0.350	0.427	0.401	0.396	0.481	0.259
2006	0.427	0.680	0.773	0.532	0.606	0.433	0.455	0.398	0.419	0.552	0.237
2007	0.469	0.714	0.839	0.599	0.673	0.417	0.506	0.500	0.576	0.583	0.332
2008	0.469	0.714	0.839	0.599	0.673	0.417	0.506	0.500	0.576	0.583	0.332
Absolute Change in Points											
81-08	-0.076	-0.040	0.075	-0.075	0.069	-0.020	-0.123	0.125	0.048	-0.045	-0.146
81-89	0.059	0.063	0.042	0.044	0.142	0.104	0.066	0.167	0.056	-0.196	0.121
89-00	-0.258	-0.244	-0.149	-0.188	-0.135	-0.280	-0.266	-0.141	-0.098	-0.049	-0.425
00-08	0.123	0.141	0.182	0.069	0.062	0.156	0.077	0.099	0.090	0.199	0.159
Per cent Change											
81-08	-13.9	-5.3	9.8	-11.1	11.4	-4.6	-19.5	33.3	9.1	-7.2	-30.6
81-89	10.9	8.4	5.5	6.6	23.5	23.7	10.5	44.5	10.5	-31.2	25.2
89-00	-42.7	-29.9	-18.5	-26.2	-18.1	-51.8	-38.3	-26.1	-16.7	-11.3	-71.0
00-08	35.4	24.6	27.7	13.1	10.1	59.8	18.0	24.8	18.6	52.0	91.3
Compound Annual Growth Rate											
81-08	-0.55	-0.20	0.35	-0.43	0.40	-0.18	-0.80	1.07	0.32	-0.28	-1.34
81-89	1.30	1.01	0.67	0.80	2.68	2.70	1.26	4.71	1.26	-4.56	2.85
89-00	-4.93	-3.18	-1.84	-2.72	-1.80	-6.41	-4.29	-2.71	-1.65	-1.09	-10.65
00-08	3.86	2.79	3.10	1.55	1.21	6.03	2.09	2.81	2.15	5.37	8.44

Source: CSLS Index of Economic Well-being database for Canada, Table 3

Table 6: Index of the Economic Security Domain, Canada and the Provinces, 1981-2008

	Canada	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1981	0.647	0.484	0.529	0.663	0.611	0.560	0.683	0.613	0.786	0.715	0.620
1982	0.604	0.478	0.572	0.654	0.567	0.544	0.635	0.601	0.790	0.644	0.538
1983	0.566	0.437	0.592	0.634	0.509	0.517	0.583	0.524	0.749	0.572	0.562
1984	0.588	0.506	0.622	0.610	0.537	0.570	0.610	0.630	0.729	0.552	0.513
1985	0.598	0.518	0.603	0.593	0.572	0.567	0.635	0.607	0.703	0.629	0.490
1986	0.603	0.580	0.660	0.574	0.580	0.561	0.645	0.574	0.674	0.623	0.537
1987	0.587	0.548	0.666	0.586	0.578	0.546	0.641	0.593	0.653	0.596	0.498
1988	0.626	0.621	0.679	0.644	0.620	0.584	0.661	0.626	0.706	0.615	0.571
1989	0.648	0.635	0.644	0.644	0.637	0.583	0.698	0.638	0.678	0.624	0.611
1990	0.623	0.616	0.632	0.629	0.615	0.561	0.649	0.630	0.684	0.613	0.627
1991	0.585	0.584	0.589	0.610	0.592	0.558	0.576	0.604	0.666	0.591	0.600
1992	0.568	0.552	0.560	0.587	0.568	0.530	0.583	0.598	0.640	0.540	0.571
1993	0.539	0.548	0.567	0.559	0.562	0.502	0.533	0.584	0.614	0.566	0.547
1994	0.554	0.541	0.539	0.563	0.552	0.516	0.559	0.548	0.623	0.564	0.590
1995	0.562	0.568	0.532	0.568	0.608	0.532	0.557	0.599	0.632	0.585	0.608
1996	0.542	0.568	0.520	0.551	0.604	0.490	0.535	0.559	0.651	0.578	0.563
1997	0.543	0.582	0.506	0.536	0.565	0.499	0.539	0.541	0.625	0.599	0.574
1998	0.555	0.561	0.507	0.540	0.594	0.511	0.552	0.589	0.678	0.608	0.549
1999	0.571	0.585	0.503	0.595	0.602	0.548	0.558	0.568	0.660	0.644	0.557
2000	0.579	0.563	0.552	0.577	0.606	0.551	0.568	0.567	0.652	0.638	0.605
2001	0.563	0.577	0.507	0.569	0.557	0.560	0.542	0.551	0.626	0.649	0.558
2002	0.531	0.551	0.522	0.513	0.555	0.532	0.508	0.536	0.625	0.636	0.491
2003	0.521	0.533	0.506	0.511	0.540	0.522	0.504	0.549	0.620	0.620	0.447
2004	0.539	0.537	0.520	0.536	0.552	0.559	0.508	0.559	0.632	0.631	0.490
2005	0.540	0.521	0.535	0.545	0.504	0.536	0.504	0.539	0.613	0.653	0.525
2006	0.545	0.588	0.517	0.545	0.515	0.551	0.504	0.580	0.629	0.685	0.565
2007	0.551	0.585	0.531	0.547	0.515	0.547	0.516	0.583	0.658	0.692	0.567
2008	0.548	0.588	0.519	0.548	0.483	0.541	0.511	0.586	0.663	0.697	0.559
Absolute Change in Points											
81-08	-0.099	0.103	-0.010	-0.114	-0.128	-0.019	-0.171	-0.026	-0.123	-0.019	-0.061
81-89	0.001	0.150	0.116	-0.018	0.026	0.023	0.015	0.026	-0.107	-0.091	-0.009
89-00	-0.069	-0.072	-0.093	-0.067	-0.031	-0.032	-0.130	-0.071	-0.026	0.013	-0.006
00-08	-0.031	0.025	-0.033	-0.029	-0.123	-0.010	-0.056	0.019	0.011	0.059	-0.046
Per cent Change											
81-08	-15.3	21.3	-1.9	-17.2	-20.9	-3.4	-25.1	-4.3	-15.7	-2.6	-9.8
81-89	0.1	31.0	21.9	-2.8	4.3	4.1	2.2	4.2	-13.7	-12.7	-1.4
89-00	-10.7	-11.3	-14.4	-10.4	-4.9	-5.5	-18.7	-11.2	-3.9	2.2	-0.9
00-08	-5.3	4.4	-5.9	-5.0	-20.3	-1.8	-9.9	3.4	1.6	9.3	-7.7
Compound Annual Growth Rate											
81-08	-0.61	0.72	-0.07	-0.70	-0.87	-0.13	-1.07	-0.16	-0.63	-0.10	-0.38
81-89	0.02	3.44	2.51	-0.35	0.53	0.51	0.28	0.51	-1.82	-1.69	-0.18
89-00	-1.02	-1.08	-1.40	-0.99	-0.46	-0.51	-1.86	-1.07	-0.36	0.19	-0.09
00-08	-0.68	0.53	-0.76	-0.64	-2.79	-0.23	-1.30	0.42	0.20	1.12	-0.99

Source: CSLS Index of Economic Well-being database for Canada, Table 8

Table 7: Summary of the Effects of Alternative Weighting Schemes on the Index of Economic Well-being, Canada and the Provinces, 1981-2008

	<u>Baseline</u>				<u>Alternative 1</u>				<u>Alternative 2</u>				<u>Alternative 3</u>			
	1981	2008	Change in Points	Compound annual growth	1981	2008	Change in Points	Compound annual growth	1981	2008	Change in Points	Compound annual growth	1981	2008	Change in Points	Compound annual growth
Canada	0.439	0.605	0.167	1.20	0.435	0.646	0.210	1.47	0.399	0.644	0.245	1.79	0.495	0.576	0.081	0.56
Newfoundland	0.373	0.691	0.318	2.31	0.360	0.690	0.330	2.44	0.244	0.677	0.433	3.85	0.481	0.681	0.200	1.30
Prince Edward Island	0.394	0.599	0.205	1.57	0.411	0.663	0.252	1.79	0.268	0.514	0.246	2.45	0.512	0.668	0.156	0.99
Nova Scotia	0.429	0.588	0.158	1.17	0.443	0.663	0.221	1.51	0.344	0.578	0.234	1.94	0.530	0.610	0.080	0.52
New Brunswick	0.371	0.572	0.201	1.62	0.360	0.618	0.258	2.02	0.290	0.533	0.243	2.28	0.462	0.599	0.138	0.97
Quebec	0.353	0.541	0.188	1.59	0.348	0.588	0.240	1.96	0.322	0.577	0.255	2.18	0.404	0.526	0.122	0.98
Ontario	0.456	0.582	0.125	0.90	0.464	0.648	0.184	1.24	0.395	0.601	0.206	1.57	0.536	0.574	0.038	0.26
Manitoba	0.371	0.574	0.203	1.63	0.362	0.623	0.261	2.03	0.366	0.592	0.226	1.80	0.405	0.574	0.168	1.29
Saskatchewan	0.481	0.649	0.169	1.12	0.463	0.665	0.202	1.35	0.460	0.667	0.207	1.38	0.532	0.638	0.106	0.67
Alberta	0.613	0.773	0.160	0.86	0.570	0.776	0.206	1.15	0.601	0.828	0.226	1.19	0.618	0.715	0.097	0.54
British Columbia	0.460	0.595	0.135	0.96	0.462	0.644	0.183	1.24	0.449	0.676	0.227	1.53	0.489	0.540	0.051	0.37

Source: CSLS Index of Economic Well-being database for Canada, Tables 9, 10A, 10B, and 10C

Note: The four weighting schemes are as follows:

Baseline: 0.25 Consumption + 0.25 Wealth + 0.25 Equality + 0.25 Economic Security

Alternative 1: 0.40 Consumption + 0.10 Wealth + 0.25 Equality + 0.25 Economic Security

Alternative 2: 0.33 Consumption + 0.33 Wealth + 0.00 Equality + 0.33 Economic Security

Alternative 3: 0.20 Consumption + 0.10 Wealth + 0.40 Equality + 0.30 Economic Security