



Comprehensive Wealth

COMPREHENSIVE WEALTH IN CANADA -
MEASURING WHAT MATTERS IN THE LONG RUN

EXECUTIVE SUMMARY

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WHY WE SHOULD MEASURE COMPREHENSIVE WEALTH

Canadians are constantly bombarded with data, from apps measuring our footsteps to indicators of public health, nutrition, crime and sports stats. The challenge today is not a lack of data. It is whether we have the right kind of information to foster knowledge about our families, communities and nation.

Perhaps the most pervasive and influential measurement is gross domestic product, or GDP.

GDP, which measures national income, emerged from the need to better understand economic challenges following the Great Depression and to help track critical supply chains during the Second World War. Ever since, it has played a key role in tracking economic performance within and between countries.

Just as GDP evolved during a period of change when new measures were called for, there are calls today to complement GDP with other measures. The great challenges of today—from climate change to global trade tensions, income inequality and the remarkable growth of information technologies—are far removed from the concerns of GDP’s founding architects.

Accordingly, Canadians need new ways to measure how the nation is progressing. They need measures that focus not only on short-term income growth but also on longer-term development prospects. The chief economist of the World Economic Forum recently summed up the need well when she posed the question, “[Are we] living at the expense of tomorrow” by “building up debts that we will simply leave to future generations?” (Blanke, 2016).¹ The answers to such long-term questions lie not in measures of income but in measures of wealth—and more particularly, *comprehensive wealth* (Text Box ES1).

Text Box ES1. What is comprehensive wealth and why does it matter?

Every country has strengths to build upon in creating well-being for its citizens. Some countries have sophisticated machinery and infrastructure that allow them to create high-value products and ship them to the four corners of the world. Others have holdings of stocks and bonds that generate large financial returns. Still others have an environment that provides valuable natural resources and opportunities to enjoy unspoiled nature. Every country has citizens with knowledge and skills that can be used to run businesses and institutions and norms that create the trust needed for people to engage in society and the economy.

Each of these strengths can be thought of as a type of capital, or a set of assets. Machinery and infrastructure are examples of **produced capital**, so called because they have to be produced by people. Holdings of stocks, bonds and other financial assets represent **financial capital**. The land, resources and ecosystems that make up the environment can be thought of as **natural capital**. Knowledgeable and skilled citizens represent a stock of human capital. Finally, societal norms and the trust and cooperation they engender make up **social capital**.

Together, these forms of capital represent what has come to be known as comprehensive wealth. Different countries have different levels and mixes of comprehensive wealth. Some have a lot of natural capital but less produced capital, or vice versa. Likewise, the amounts of financial, human and social capital will vary from place to place. In total, some countries have substantial comprehensive wealth portfolios and others have smaller ones. But all countries have at least some assets in each of the five categories of the portfolio.

The per capita value of the comprehensive wealth portfolio is an important indicator because wealth is the foundation for much of national well-being. Nearly all the goods and services people enjoy—pretty much everything produced in the market plus many goods and services produced outside of it—are produced

¹See the main report for the list of works referenced in this study.

using the assets in the comprehensive wealth portfolio. The enjoyment—or consumption—of these goods and services contributes in many ways to well-being. Things like nourishment, shelter and mobility are obvious factors. Well-being is enhanced by the fruits of the comprehensive wealth portfolio in less familiar ways too, such as the enjoyment of a beautiful sunset and the freedom to walk city streets safely at night.

Tracking the evolution of comprehensive wealth over time is key to understanding whether growth in assets is keeping pace with growth in income or whether wealth is declining due to inadequate investment. This matters very much, especially in the long run. Only when comprehensive wealth growth keeps pace with income growth will the latter be sustainable in the long run. If comprehensive wealth declines over time due to inadequate investment, income growth may eventually come to a halt, putting well-being at risk (Hamilton & Clemens, 1999; Dasgupta & Mäler, 2000; Dasgupta, 2014).

To the extent wealth is measured—which is hardly at all in most countries—reporting focuses only on produced and financial capital. Comprehensive wealth goes well beyond this to include natural, human and social capital. Though less well known than produced and financial capital, these other forms of capital are just as essential to the nation’s well-being as machinery, buildings and bonds.

Tracking the value of the nation’s comprehensive wealth “portfolio” is important because of the link between wealth and long-term development prospects: that is, its capacity to create and sustain well-being for its citizens.

The assets that make up the comprehensive wealth portfolio are the basis for producing nearly all goods and services that people consume—obvious things like food, electricity and health care, but also clean air, healthy forests and safe communities. The consumption of these goods and services is a large part of what creates individual well-being. That is why comprehensive wealth is so important. [Text Box ES1](#) expands on these points.

Development requires sustaining consumption opportunities over time. More consumption today at the expense of less consumption tomorrow is not development at all. Understanding whether the nation is truly developing, therefore, requires understanding how comprehensive wealth, and not just how quickly GDP, is evolving. Yet no country, including Canada ([Text Box ES2](#)), currently measures comprehensive wealth.

Several international bodies have called on countries to go beyond GDP and begin measuring comprehensive wealth to gain greater insight into development and its sustainability. After all, they point out, GDP was never intended as a measure of well-being. The United Nations (UNECE, 2009) and the Commission on the Measurement of Economic Performance and Social Progress chaired by Nobel Prize-winning economist Joseph Stiglitz (Stiglitz et al., 2009), have both called for measures of comprehensive wealth. In a similar vein, the head of the International Monetary Fund remarked at the 2016 World Economic Forum that “there are lots of things that we don’t measure well. We have to [...] assess, and probably change, the way we look at the economy.”²

Though no national government yet does so, a number of other organizations have started to estimate comprehensive wealth. The World Bank published its first figures in the 1990s (Hamilton & Clemens, 1999) and it recently added a related indicator to its global development indicators. The United Nations also works in the area, releasing comprehensive wealth reports with estimates for most countries in 2012 and 2014 (UNU-IHDP & UNEP, 2012, 2014). The present study—one of the first to measure comprehensive wealth using detailed data for a single country³—builds upon this and other work.

² See <https://www.weforum.org/agenda/2016/01/gdp>.

³ The first study to focus on comprehensive wealth for a single country, which also happens to have been carried out for Canada, was conducted by the Ottawa-based Centre for the Study of Living Standards (Osberg & Sharpe, 2011).

Text Box ES2. What is known about wealth in Canada?

To the extent wealth is studied at all in most countries, measures are usually limited to produced and financial capital—just two of the five components of the comprehensive wealth portfolio. Canada stands out as something of an exception here. Thanks to the efforts of Statistics Canada, Canada regularly measures produced and financial capital (the only country to do so on a quarterly basis, it is worth adding). Natural capital is also much better measured in Canada than in most other countries. Official statistics on fossil fuels, minerals, timber and land go back several decades. Though human capital is not measured on a regular basis, Statistics Canada has published high-quality research studies on the topic (Gu & Wong, 2010, 2012). It has also published ground-breaking studies of social capital (Turcotte, 2015a).

Still, despite what might be the most complete wealth data anywhere, significant gaps remain that prevent a full understanding of comprehensive wealth in Canada. Given this, one of the conclusions of this study is that the federal government should fund Statistics Canada to begin measuring comprehensive wealth on a regular basis. Text Box 8 presents a research agenda to that end. Priority should be given to measuring human and social capital, especially in monetary terms, as these are currently addressed only through research studies. After this, filling the gaps in the official measures of natural capital—commercial fisheries, water and all ecosystems—is next most important.

Comprehensive wealth is suggested as a complement for GDP, not a replacement for it. Both are necessary to assess the nation's development. But Canadians need to begin thinking more about the country's long-term trajectory. GDP says plenty about income in the latest quarter but is silent on the prospects for the future. In contrast, comprehensive wealth focuses on the long term, answering essential questions about the sustainability of development and well-being. The President of the C.D. Howe Institute put it well when he remarked recently that "GDP is so twentieth century." Measuring wealth, he went on, is "the Next Big Thing" (Robson, 2015).

Prime Minister Trudeau, for his part, has underpinned the need for a longer-term view by noting that Canada's greatest asset is not its resources but its resourcefulness—that investing in education to help people learn, think and adapt is essential to improving their lives, and that confident countries invest in their future.⁴ He might well have added that confident countries measure how effective their investments are actually increasing wealth.

⁴ See <http://pm.gc.ca/eng/news/2016/01/20/canadian-opportunity-address-right-honourable-justin-trudeau-prime-minister-canada>.

SUMMARY OF FINDINGS

Based on a suite of indicators compiled using the best data and methods available today, this study⁵ reviewed Canada's comprehensive wealth performance over the 33-year period from 1980 to 2013. This timeframe extends well beyond business and political cycles, ensuring that the results reveal trends free from the ebb and flow of markets and policies. Here is what was found.

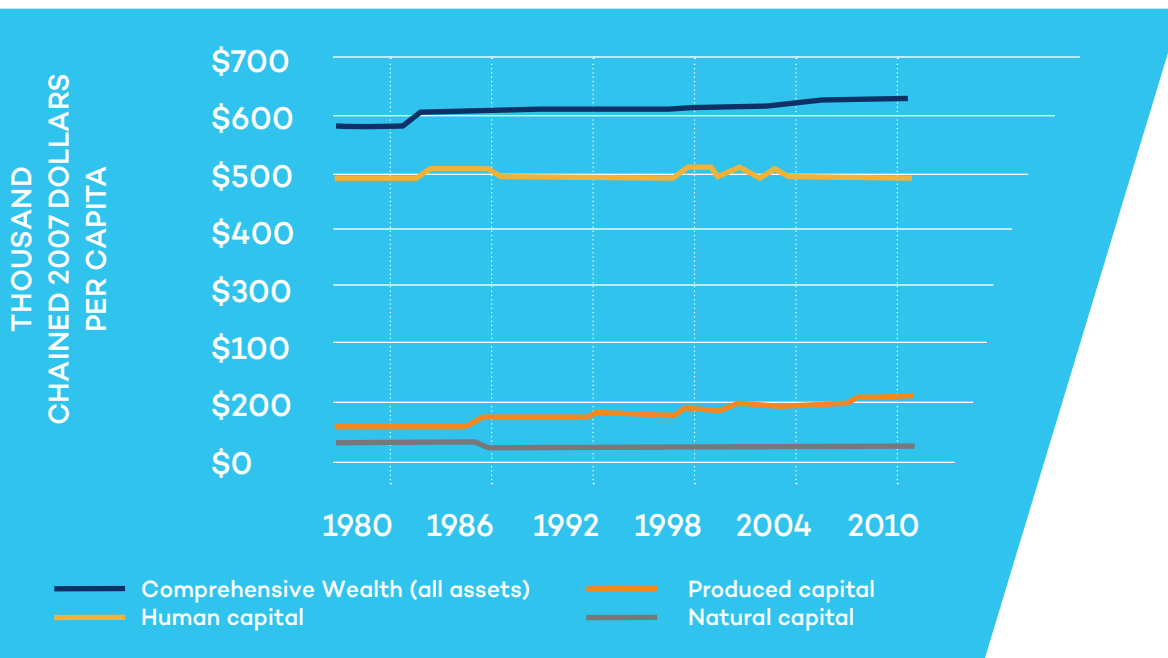
Overall, **comprehensive wealth** in Canada grew in real per capita terms⁶ by 7 per cent from 1980 to 2013 (Figure ES1 and Table ES1). In other words, the basis for Canada's capacity to generate the goods and services needed to sustain consumption was only slightly larger on average in 2013 than in 1980. On an annualized basis, growth in comprehensive wealth was a lacklustre 0.19 per cent per year. This finding is largely consistent with the handful of other studies of comprehensive wealth that have been undertaken for Canada (Text Box ES5) provides a comparison of these studies with the results here.

At the same time, Canadians consumed far more goods and services in 2013 than in 1980. Average individual consumption grew by 54 per cent over the period, or 1.36 per cent per year.

The gap between these two trends—relatively slow growth in comprehensive wealth and much faster growth in consumption—raises several concerns about long-term sustainability.

First, consumption growth was bolstered by the drawdown of **natural capital**. Due to a combination of physical depletion and changing market conditions, the value of Canada's minerals, fossil fuels, timber and agricultural land per person declined by a startling 25 per cent between 1980 and 2013 (Figure ES2). More recent data signal an even greater decline due to the steep drop in global oil prices. On top of this, the series of climate and ecosystem indicators compiled for the study point to declines in other forms of natural capital.

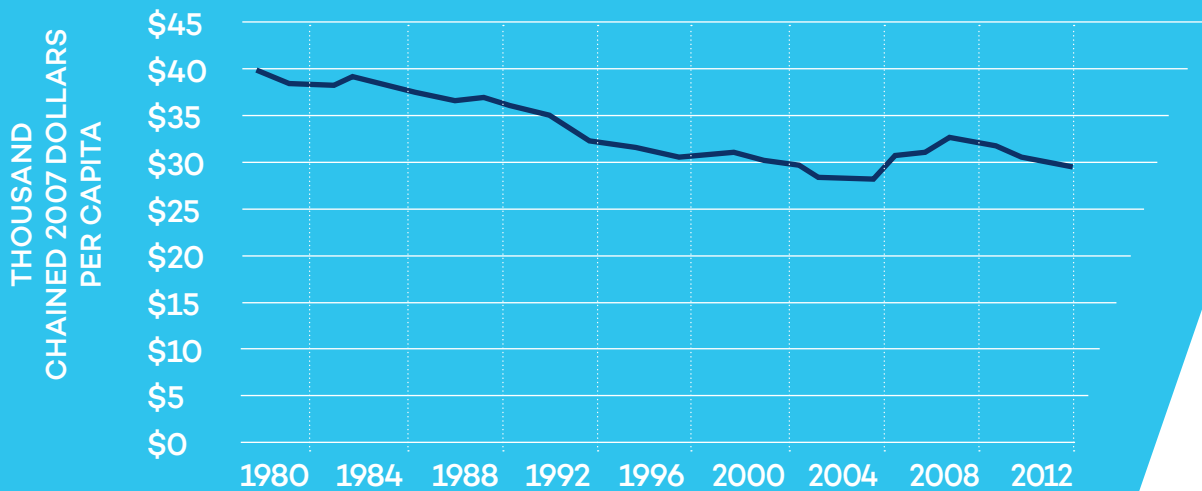
Figure ES1. **Comprehensive wealth per person, Canada - 1980–2013**



⁵ See Text Box ES3 for a brief overview of the concepts, data and methods used in the study.

⁶ All wealth values in this study are expressed in real (chained 2007 dollar) terms per capita to account for the effects of growth in prices and population over time. For ease of reading, the modifiers "real" and "per capita" are not always used when values are reported. When they are not, the reader should take for granted that the figures are in real per capita terms unless otherwise indicated.

Figure ES2. **Natural capital per person, Canada - 1980–2013**



Human capital—the largest component of comprehensive wealth (80 per cent)—did not grow at all between 1980 and 2013 even though more Canadians graduated with diplomas. This means that, even with improved credentials, the average Canadian worker had the same lifetime earning potential in 2013 as in 1980.

Produced capital was the bright spot in the comprehensive wealth portfolio, growing by 73 per cent per person over the period, or 1.68 per cent per year. A closer look, however, reveals that this growth was highly concentrated. Some 70 per cent of the growth in total produced capital was due to expansion in just two areas: housing and the oil and gas extraction industry. This raises concerns about the concentration of the economy in areas known for volatility and that face uncertainty in today’s world, especially in the case of oil and gas extraction.

Social capital, which can only be measured in qualitative terms at the moment, showed signs of stability but not growth based on the series of non-monetary indicators compiled for the study.

Text Box ES3. **Concepts, data and methods used in the study**

Though still new to many people, the concept of comprehensive wealth dates back to the 1990s, and thinking about the individual elements of it dates back much further than that, most famously to Adam Smith and his 18th century work on the wealth of nations. More recently, the late University of British Columbia economist Anthony Scott (1956) had already characterized the environment in natural capital terms by the 1950s. Work on measuring human capital began seriously in the 1960s (Schultz, 1960, 1961). Social capital, though somewhat newer, has been an area of active research since the 1980s (Coleman, 1988; Putnam, 1995).

To measure comprehensive wealth for Canada, this study used the best data available from Statistics Canada and, in a few cases, other sources. Global Forest Watch Canada was the main source of data used to compile the ecosystem indicators. In addition, data from the OECD were used for several indicators of human and social capital.

The methods used in the study are well established and would be familiar to anyone accustomed to working with national economic, environmental or social statistics.

Table ES1. Trends in comprehensive wealth and its components, Canada – 1980-2013

Indicator	Per capita level (chained 2007 dollars)		Growth (1980–2013)	
	1980	2013	Total	Annualized rate
Comprehensive Wealth Index	\$592,000	\$631,000	7%	0.19%
Produced Capital Index	\$58,100	\$100,700	73%	1.68%
Market Natural Capital Index	\$39,800	\$29,200	-25%	-0.93%
Non-Market Natural Capital Index			Unknown, but available non-monetary indicators suggest a decline	
Human Capital Index	\$500,000	\$500,000	0%	0%
Social Capital Index	n/a	n/a	Unknown, but available non-monetary indicators suggest stability	
Consumption*	\$24,300	\$37,500	54%	1.36%

* Consumption is shown for sake of comparison only; it is not a component of comprehensive wealth.

Taken as a whole, the trends in Table ES1 above paint a worrisome picture. Though Canada’s development is not unsustainable—comprehensive wealth would have to be declining in real per capita terms for that to be the case—neither can it be said to rest on a robust base. Growth in comprehensive wealth has been slow, especially in comparison to growth in consumption, and its individual components show various signs of weakness. From the significant decline in natural capital to flat human capital, to highly concentrated growth in produced capital, real strength in Canada’s comprehensive wealth portfolio is hard to find.⁷ Text Box ES4 expands on these concerns with additional data.

⁷This is consistent with the recent conclusion of the federal government’s Economic Advisory Council that per capita GDP growth could fall from its historic level of about 1.9 per cent annually to 0.8 per cent in the coming decades if policy changes to address the challenges associated with demographic shifts (such as ageing of the workforce) are not implemented (Advisory Council on Economic Growth, 2016a).

Though Canada has not been managing its comprehensive wealth portfolio as well as it could, the country is fortunate to remain very wealthy. In fact, thanks to its vast reserves of natural capital, the United Nations has ranked Canada first among G7 nations in terms of the level of comprehensive wealth per capita (UNU-IHDP & UNEP, 2014). This clearly puts the country in a position of strength vis à vis its peers. At the same time—and consistent with the findings of this study—the UN ranked Canada last among G7 members in terms of growth in comprehensive wealth. In other words, other countries are doing better than Canada at managing the growth of their comprehensive wealth portfolios. And they’re catching up as a result. In 1990, the average per capita comprehensive wealth in other G7 countries was 72 per cent of Canada’s; by 2010, this share had climbed to 83 per cent (Table ES2).

Table ES2. **United Nations’ estimates of comprehensive wealth for G7 countries**

Country	Real comprehensive wealth <i>per capita</i> *			Annual growth (1990–2010)	
	1990	2010	Rank (2010)	Rate	Rank (2010)
Canada	475,846	502,972	1	0.28%	7
France	342,866	425,022	5	1.08%	2
Germany	325,513	435,655	3	1.47%	1
Italy	276,943	324,712	7	0.8%	5
Japan	361,234	432,236	4	0.9%	3
United Kingdom	345,487	409,074	6	0.85%	4
United States	411,673	463,375	2	0.59%	6

* All values expressed in thousand constant 2005 U.S. dollars.

Source: UNU-IHDP & UNEP, 2014.

Text Box ES4. Concerns regarding sustainability – further details

The fact that per capita consumption grew more quickly than per capita comprehensive wealth over the study period is a concern because consumption growth that is faster than growth in comprehensive wealth is sustainable in certain instances. One is when productivity gains are large enough to account for the gap.⁸ However, Canadian productivity growth from 1980 to 2013 was too small (0.11 per cent annually) to explain the observed divergence.⁹

In the absence of adequate productivity growth, the gap between growth in consumption and comprehensive wealth points to insufficient investment in the comprehensive wealth portfolio. In other words, Canadians appear to have invested too little overall or not invested in the right places for comprehensive wealth to grow at the rate needed to match the growth in consumption. This may have been because too much income was used to support current consumption and not enough set aside for investment or because the investments that were made did not create new wealth fast enough, or both.

The trend in natural capital is of particular concern, as natural resources have long been one of the engines of Canada's consumption growth. As noted above, the per capita value of Canada's natural capital fell by 25 per cent between 1980 and 2013—a decline of a quarter in little more than a generation. More up-to-date data from Statistics Canada show that its value fell even further after 2013 due to the drop in global oil prices: by the end of 2015, the total nominal value of Canada's natural capital was 75 per cent lower than at the beginning of 2014.¹⁰ Unless oil prices recover, this loss in wealth may not be recovered.

Also of concern is the flat trend in human capital—the largest component by far of comprehensive wealth. This trend persisted even though a greater percentage of Canadians graduated with advanced academic qualifications in 2013 than in 1980.¹¹ The reasons for the lack of growth in Canadian human capital are complex and further research is needed to understand them. Evidence shows that other developed countries have succeeded in increasing human capital, so the problem is certainly not universal.¹² Part of the explanation lies in the aging of the Canadian workforce, since older workers have fewer years of work left and, by definition, lower levels of human capital. There is more to it though. It may be that increased levels of education are needed just to maintain a given level of human capital today. Or it may be that Canada has not been investing in areas of education that are translating into increased human capital. Unfortunately, available evidence on the investment in education in Canada is conflicting, so a clear answer is not possible.

Though produced capital was a relative bright spot in Canada's comprehensive wealth portfolio, growing at 1.68 per cent annually over the study period, here too there are reasons for concern. Canada's produced capital is tightly coupled with its declining natural capital base and has become more so over time. In 1980, the oil and gas extraction industry owned about 9 per cent of the stock of produced capital in the business sector. From 1980 to 2013, investment by this industry accounted for 38 per cent of all growth in business-sector produced capital.¹³ As a result, by 2013, the share of produced assets owned by this industry had more than tripled to 28 per cent.

The other engine of produced capital growth over the period was housing. Other things being equal, a growing housing stock is positive for well-being and sustainability. However, the degree to which it—along with oil and gas extraction infrastructure—accounted for growth in produced capital over the study period is worrisome from an economic diversification perspective.

⁸ Productivity measures the efficiency with which assets are used to create outputs. If productivity grows, more output can be created from the same asset base, other things being equal.

⁹ Statistics Canada, *Multi-factor Productivity*, CANSIM Table 383-0021.

¹⁰ Statistics Canada, *National Balance Sheet Accounts*, CANSIM Table 378-0121.

¹¹ Statistics Canada, *Census of Population and National Household Survey*.

¹² The United Kingdom, Australia and New Zealand all had growing rates of human capital during periods overlapping with the study period here, though the time series available for those countries are all much shorter. The United States, like Canada, did not show growth in human capital based on available data (Christian, 2011; Office for National Statistics, 2011; Wei, 2008; Le et al., 2006).

¹³ This figure should not be confused with the figure of 70 per cent mentioned above, which referred to the share of housing *plus* the oil and gas industry in the growth of total produced capital. The figure of 38 per cent here refers to just the oil and gas industry and to just produced capital owned by the business sector (houses being owned by the household sector).

Text Box ES5. Comparison with other studies

Comprehensive wealth has been measured for Canada in two earlier studies—the Index of Economic Well-Being compiled by the Ottawa-based Centre for the Study of Living Standards (CSLS) (Osberg & Sharpe, 2011) and a global report covering 140 countries prepared by the United Nations (UNE-IHDP & UNEP, 2014).¹⁴ The table below summarizes the results of these studies and compares them with the results here. Taking account of differences in data and methods, the results of all three studies are broadly consistent.

Like this study, the study by the CSLS made use of Canadian data. It also considered essentially the same time period. The major difference between the studies is in the approach to measuring human capital. The CSLS used its own estimate of human capital based on the cost of educational investments. The estimate used here (which is taken from a Statistics Canada research study and is, arguably, better suited to the analysis of sustainability) is based on the value of lifetime earnings. This difference in approach explains nearly all of the divergence in the results of the two studies. If the CSLS's estimate of human capital is replaced with Statistics Canada's estimate, the two studies come to essentially identical conclusions.

Comparing results with the UN's global report is less straightforward because the UN measures comprehensive wealth in U.S. dollars and uses methods adapted to the production of estimates for 140 countries with widely varying data availability and quality. The UN's time series (1990–2010) is also shorter than the one here. These differences notwithstanding, the UN's findings are broadly consistent with those here. Like this study, the UN finds that Canadian comprehensive wealth grew relatively slowly in recent decades. Both studies conclude that produced capital grew strongly and natural capital declined substantially. The main difference is, again, in human capital, which UNEP estimates to have grown 0.63 per cent annually from 1990 to 2010 (based on a lifetime income approach similar to this study). The corresponding figure here is 0.0 per cent. An important reason for this discrepancy is the UN's use of a very high discount rate (8.5 per cent) to deflate future earnings. Such a high discount rate is appropriate for many of the countries in the UN's study, but not for Canada; Statistics Canada used a value of 5.1 per cent in its study. The remaining differences are likely explained by the fact that the UN used data from global databases to estimate human capital, while this study used an estimate directly from Statistics Canada.

Indicator	Centre for the Study of Living Standards		UNEP Global Report		This Study	
	Per capita level in 2013 (constant 2007 dollars)	Annual growth (1981–2013)	Per capita level in 2010 (constant 2005 U.S. dollars)	Annual growth (1990–2010)	Per capita level in 2013 (chained 2007 dollars)	Annual growth (1980–2013)
Comprehensive Wealth Index	\$267,000	1.21%	\$503,000	0.28%	\$613,000	0.19%
Produced Capital Index	\$101,000	1.55%	\$108,000	2.3%	\$100,700	1.68%
Market Natural Capital Index	\$19,100	-0.88%	\$128,000	-1.46%	\$29,200	-0.93%
Human Capital Index	\$154,000	1.16%	\$268,000	0.63%	\$500,000	0.0%

¹⁴ The World Bank has also produced studies that have measured comprehensive wealth for Canada. No comparison is made with them here because they do not include direct estimates of human capital and, therefore, are less easily compared with the results here.

Text Box ES6. Trends in ecosystem, climate and green growth indicators

A number of non-monetary indicators related to ecosystems and the climate system were included in this study to complete the portrait of natural capital. Their trends are summarized in the table below. Overall, they point to declines in non-market natural capital on top of the decline in the value of market natural capital.

Theme	Indicator	Trend	
Ecosystems	Forests	<ul style="list-style-type: none"> Slight decline in forest area between 2000 and 2011. About 40% of forests were considered “developed” in 2011.¹⁵ 	↓
	Wetlands	<ul style="list-style-type: none"> Wetland area declined in most parts of the country (other than the Maritimes and the North) between 2000 and 2011. With most of the country’s remaining wetlands found in northern regions, only about one fifth were considered developed. 	↓
	Surface Water	<ul style="list-style-type: none"> No assessment of change over time possible. Nationally, 20% of surface water areas were considered developed, rising to 40% in NFLD, NB, NS, PEI, AB and BC. 	???
	Grasslands	<ul style="list-style-type: none"> Slight decline in grasslands from 2000 to 2011. Unlike wetlands, remaining grasslands are significantly developed (95%). 	↓
Climate	Precipitation	<ul style="list-style-type: none"> Precipitation generally increased in Canada between 1948 and 2014, consistent with climate change predictions. 	↓
	Temperature	<ul style="list-style-type: none"> Temperature showed a trend similar to that of precipitation, with an overall increase nationally from 1948–2014, consistent with climate change predictions. 	↓
	Snow Cover	<ul style="list-style-type: none"> In spite of increased precipitation, annual average snow cover declined across the country from 1972–2011, consistent with climate change predictions. 	↓
	Glacier Mass	<ul style="list-style-type: none"> The mass of selected glaciers in the Western Cordillera and High Arctic declined from 1960 to 2007, consistent with climate change predictions. 	↓
	Water Yield	<ul style="list-style-type: none"> The annual renewal of Canada’s freshwater resources declined in the southern part of the country from 1971 to 2004, consistent with climate change predictions. 	↓
	Sea Ice Extent	<ul style="list-style-type: none"> The extent of sea ice declined from 1968 to 2010, consistent with climate change predictions. 	↓

In addition to the natural capital indicators, the study also included a **case study on green growth** using data compiled by the OECD.¹⁶ The case study provided some evidence that pressure on Canada’s natural capital is being brought under control but also that more could be done.

Indicators related to greenhouse gas productivity and water productivity both improved in recent years, though Canada ranked only 31st out of 34 OECD member states in terms of greenhouse gas productivity in 2013.

Canada figured among global leaders in the 1990s in terms of environmental innovation, though the country stood well below the OECD average in 2013.

In terms of environmental taxes, Canada ranked second last among OECD member states in 2013, though its performance in this regard is likely to improve as the federal and provincial governments move toward placing a price on carbon emissions.

¹⁵ Ecosystems are considered “developed” if they are found within 1 kilometre of a development feature such as a road, pipeline or town.

¹⁶ OECD, *Green Growth indicators database*.

Text Box ES7. Trends in social capital indicators

Though no monetary assessment of social capital was possible for this study, a number of non-monetary indicators were available from Statistics Canada. They are divided into indicators of civic engagement and indicators of trust and cooperative norms. In general, they are available for much shorter time periods than the monetary estimates of produced, natural and human capital compiled for this study.

Overall, only one of the indicators of civic engagement (*Diversity in Social Networks*) showed a strong and consistent upward trend over the period considered. None of the indicators of trust and cooperative norms showed a consistent upward trend over the period, with considerable inconsistencies in results across time and regions. On the basis of these indicators, social capital would appear to be stable, but not growing, during the periods studied.

Theme	Indicator	Trend
Civic Engagement	Participation in Group Activities	• Participation in group activities rose slightly from 2003 to 2008 but then remained steady until 2013. 
	Volunteering	• Volunteering rates rose slightly from 2004 to 2010 and then fell again in 2013. 
	Diversity in Social Networks	• The share of people having contact with friends from visibly different ethnic groups increased steadily between 2003 and 2013. 
	Control over public decisions	• The share of people feeling that they had some degree of control over public decisions increased substantially between 1993 and 2000 but then remained more or less stable until 2011. 
	Voter Turnout	• Voter turnout in federal elections trended generally downward from 1979 to 2007 but rose again in the last two federal elections though not to its 1979 level. 
Trust and Cooperative Norms	Generalized Trust	• Generalized trust showed essentially no change between 2003 and 2013. 
	Trust in Neighbours and Strangers	• Trust in neighbours was unchanged from 2003 to 2013, while trust in strangers increased slightly; both dipped significantly in 2008 before recovering again in 2013. 
	Trust that a Lost Wallet Will Be Returned	• Trust that a lost wallet will be returned was unchanged between 2003 and 2008. 
	Trust in Institutions	• Trust in institutions, measured as confidence in the federal government, varied considerably from 1993 to 2011, though there was a general trend toward greater confidence. 

WHAT DO THE FINDINGS MEAN FOR CANADA?

The need for Canada to measure and understand comprehensive wealth has never been greater. Its development model is based heavily on the exploitation of natural capital, and the country cannot sustain another 30 years of natural capital depletion. Short-term commodity price volatility and the longer-term global shift to a cleaner, knowledge-driven economy mean that future reliance on fossil fuels to underpin the country's growth is risky. The current debate about fossil fuel projects and pipelines needs, therefore, to include a vision of transformation toward a low-carbon economy. Given all this, it is surprising how little is understood of the role of natural capital within the overall economy. Comprehensive wealth measures promise to shed greater light on this role.

Inevitably, Canada will have to diversify its economy and focus on growing all components of the comprehensive wealth portfolio to ensure that its development remains sustainable. The range of possible actions to accomplish this is obviously broad and complex, touching upon aspects of tax, fiscal, industrial, trade, natural resource, climate, environmental, education and health policies to name but a few. Given this complexity, detailed policy suggestions are beyond the scope of this study. However, there are a few obvious areas in which actions will be necessary.

First, Canada must reverse the trend in its natural capital, both to ensure continued flows of resource commodities and to ensure the on-going provision of environmental benefits like clean air and water. Climate change represents a major threat to the latter, and more research is needed to understand its potential impacts on Canadians and their well-being.

Second, Canada must grow its human capital. Better education and training are key here, but so too are efforts to increase productivity. This is a particularly complex area, and one where more data of the sort provided by comprehensive wealth would be very welcome.

Third, the country needs to diversify its produced capital so that housing and oil and gas infrastructure are less dominant in the overall mix. Investments in housing, while obviously important to well-being in many ways, can hamper it in the long term if they crowd out investments elsewhere in the economy or if housing values are diminished because of market corrections. The value of oil and gas extraction assets is tightly coupled with the value of Canada's fossil fuel assets, which have fallen rapidly in recent years and, as noted, face serious obstacles in the long term. Diversification of produced capital is needed to hedge against these risks. The recent recommendation from the federal government's Economic Advisory Council for significant and broad investment in the country's infrastructure is welcome in this regard: as the Council noted, "governments at all levels have not invested enough to support long-term economic growth" (Advisory Council on Economic Growth, 2016b, p. 4).

Finally, Canada needs to begin systematically measuring comprehensive wealth to track its success in making these and other changes necessary to ensure continued growth in the nation's wealth. As noted, Statistics Canada already keeps one of the most detailed sets of wealth figures in the world, so Canada is well placed to play a leadership role in this emerging area. To this end, the federal government should fund Statistics Canada to begin regular reporting of comprehensive wealth measures following the same cycle as GDP (see [Text Box ES8](#) for further research recommendations).

Simply publishing new measures of comprehensive wealth is, of course, not enough. Decision makers must at the same time increase their focus on comprehensive wealth, using the new measures both to guide and evaluate their efforts in ensuring its growth. Public and private efforts have long been focused on ensuring growth in GDP, and the country has enjoyed much success in this regard. The question of whether the comprehensive wealth portfolio—which is, after all, the basis for GDP—is sustainable has received less attention. The time has come to change that.

Text Box ES8. Research agenda

Though among the best in the world, Statistics Canada's measures of wealth remain incomplete and, in some instances, are based on research studies rather than official statistics.

The federal government should fund Statistics Canada to regularly publish comprehensive wealth measures. These should include timely and complete estimates of produced, natural, human and social capital in monetary and non-monetary terms to be published alongside quarterly GDP. All of these measures should be compiled for Canada as a whole and for each province/territory, by sector of the economy and by income level (to reflect the distribution of wealth).

Two components of the comprehensive wealth portfolio stand out as needing particular attention: human capital and social capital. Human capital accounts for about 80 per cent of comprehensive wealth in Canada. Given this large share, the fact that per capita human capital did not grow between 1980 and 2013 is a special concern. Canada is a wealthy, technologically advanced country competing in a global market where other countries are succeeding in increasing human capital. Sustaining development in the face of static human capital is a challenge. Better data than those currently available are needed to address this challenge.

Research is needed to understand the reasons for Canada's human capital performance. To facilitate this, the federal government should, as a priority, fund Statistics Canada to elevate its research program on human capital to a fully-fledged set of official statistics.

Social capital is the least well understood and measured component of the comprehensive wealth portfolio. The fact that no monetary valuation of social capital is possible means the measures of comprehensive wealth presented in this study are not truly comprehensive.

Research is needed to better understand social capital and its relation to other forms of capital. In particular, research into means of valuing social capital to permit its inclusion in monetary measures of comprehensive wealth is needed.

Next to human and social capital, research on natural capital is the most urgently needed. As noted earlier, the values of important natural assets—commercial fisheries, water and all ecosystems—aren't currently measured by Statistics Canada. In measuring the value of these assets, the potential impact of climate change should be taken into consideration. Fish stocks, forests, agricultural land, lakes and rivers, wetlands, permafrost, glaciers and other natural assets are all at risk of disturbance from a changing climate. This has implications for water, food and timber supplies, tourism and recreation, flood protection, transportation, cultural and spiritual well-being, not to mention the well-being of non-human species. The impacts are not necessarily limited to natural capital either; produced capital, in particular, is tightly coupled with natural capital in Canada. Degradation of natural capital due to climate change may therefore lead to "knock-on" losses in other asset categories.

Research is needed to fill the gaps in Statistics Canada's measures of natural capital. In this, the possible impacts of climate change on Canada's natural capital should be considered. The research should also consider how changes to natural capital stocks as a result of climate change might impact the value of other capital stocks; for example, how the loss of timber stocks due to more severe pest infestations or forest fires might impact the value of produced, human and social capital.

Beyond the need to regularly measure comprehensive wealth and its components, there is a need to review the way in which productivity is measured in Canada. Statistics Canada's broadest measure of productivity considers only the efficiency with which human capital and produced capital are employed in creating output. The exclusion of natural capital from this measure may mean that productivity growth is underestimated.

Statistics Canada should study the inclusion of natural capital as an explicit input in the calculation of multi-factor productivity. Most of the data required to do so already exist. The major gaps requiring filling in the short term are the value of commercial fish stocks and water resources (e.g., hydroelectric and irrigation reservoirs). The value of ecosystem services such as pollination of crops, surface water flow regulation and pollution absorption could be added in the longer term.