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EQUALITY AND ECONOMIC SECURITY TAKE A HIT: THE INDEX OF ECONOMIC WELL-BEING FOR SELECTED OECD COUNTRIES, 1980-2014

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CSLS Research Report 2016-06

June 2016

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Abstract

This report presents new estimates of the Index of Economic Well-Being and its four domains (consumption flows, stocks of wealth, economic equality, and economic security) for fourteen OECD countries for the 1980-2014 period. It finds that in 2014 Norway had the highest level of economic well-being and Spain the lowest. Canada ranked eleventh among the fourteen countries. Over the 1980-2014 period, Australia enjoyed the most rapid increase in economic well-being in absolute terms, and Italy the slowest. In all fourteen countries, over the 1980-2014 period, there was growth in the consumption flows index and the stocks of wealth index. Over this same period, the economic security index and the economic equality index were largely stagnant in most countries. Most importantly, in all fourteen countries except France, the IEWB grew slower than GDP per capita, a measure that is often used to provide indications into the state of well-being in a given country. According to our estimates, economic well-being, therefore, has not advanced as rapidly as GDP per capita. Furthermore, since 2008, growth in economic well-being has been slower than growth over the 1980-2008 period for nine of the fourteen countries considered, with two countries showing negative growth (Italy and Spain).

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Executive Summary

The main objective of this report is to present updated estimates of the IEWB for selected OECD countries over the 1980-2014 period with particular attention to developments since 2008. The report also discusses (1) trends in the four domains of economic well-being that make up the Index (current consumption, wealth, economic equality, and economic security) and (2) the sensitivity of our results to the weights assigned to those four domains.

Methodology

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 reality. Second, an index of economic well-being should recognize that individuals differ in the relative weights they assign to the different domains of economic welfare. In order to be useful to all individuals independent of those value differences, an index of well-being ought to make value judgments as explicit and transparent as possible. For example, real GDP per capita is the most frequently cited indicator of economic well-being. 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.

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; and
- 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. By basing the IEWB on data from each of these domains, we attempt to capture the multifaceted nature of *economic* well-being. Our domain approach also gives the opportunity for individuals to assign weights in accordance with their value judgments.

We do not mean to overlook the importance of non-economic factors by focusing on economic well-being. Instead, we are motivated by the idea that a better measure of

"access to resources needed for a decent standard of living" is required if economic and social trends are to be combined into an index with greater ambitions.

Empirical Results

The study examines economic well-being in fourteen OECD countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, the United Kingdom, and the United States. The key results for the overall index of economic well-being are highlighted below:

- Among the fourteen countries covered in the study, Norway had the highest overall Index of Economic Well-Being in 2014, followed by the Netherlands and Belgium. Spain, Italy, and the United States had the lowest overall IEWB values in 2014. Canada ranked eleventh among the fourteen OECD countries.

- Over the 1980-2014 period, the IEWB increased in all fourteen countries. Australia experienced the largest growth of 1.62 per cent per year. Italy had the least growth at 0.37 per cent per year. In Canada, the IEWB increased 1.33 per cent per year, ranking fifth

- Between 2008 and 2014, Australia saw the fastest growth in the IEWB of all fourteen countries (3.20 per cent per year). Spain had the weakest growth (-2.51 per cent per year). Canada ranked third, growing at a rate of 2.04 per cent per year. Canada's strong growth in this period was driven by thewealth stocks and consumption domains, since growth in the equality and economic security domains was negative.

- Norway had the highest IEWB and GDP per capita, while Spain had the lowest. The relationship was not so close for the other twelve countries. For example, the United States was second in terms of GDP per capita in 2014, while it was twelfth in terms of the IEWB.

- IEWB growth was slower than per capita GDP growth in all countries except France over the 1980-2014 period. For example, Norway grew by 3.02 per cent per year in terms of GDP per capita, but only 1.57 per cent per year in terms of its IEWB.

There are also some interesting findings in terms of the components of the IEWB. Some of the key results of the consumption domain are highlighted below:

- The United States had the highest score in the consumption domain of the Index in 2014, with second-placed Norway well behind. Spain had the lowest score in the consumption domain. Canada ranked fifth.

- Over the 1980-2014 period, the consumption domain of the IEWB saw the fastest growth in Finland (5.29 per cent per year). The Netherlands saw the slowest

growth (1.53 per cent per year). Canada ranked eleventh with growth of 2.57 per cent per year. This was because Canada had the weakest growth in government expenditures on goods and services during this period.

- During the period covering 2008-2014,Norway enjoyed the most rapid growth, while Spain enjoyed the least(2.20 per cent per year and -3.16 per cent per year respectively). Canada ranked third (1.92 per cent per year).

Key highlights for the wealth domain are:

- Norway had the highest score in the wealth domain of the Index in 2014, while the United Kingdom had the lowest scores. Canada ranked third among the fourteen countries.

- Between 1980 and 2014, Norway's wealth domain of the IEWB grew faster than all of the other fourteen countries at 5.02 per cent per year. The United States' wealth domain of the IEWB grew the slowest at 1.49 per cent per year. Canada ranked second with growth of 4.78 per cent per year.

- Over the 2008-2014 period, Canada's growth in the wealth domain was third fastest at a rate of 9.19 per cent per year, reflecting strong investment in the resources sector. This was driven by increases in the total net stock of fixed capital per capita and a reversal from net liabilities to net assets in terms of international investment during this period. Only Australia and Norway had stronger growth (11.13 per cent per year and 9.96 per cent per year). The slowest growth was in the United States where the wealth score of the IEWB grew 1.61 per cent per year.

For the index of economic equality, we find the following:

- Finland had the highest score among the fourteen countries in 2014, followed by the Netherlands. The United States had by far the lowest score. Canada ranked eleventh.

- The index of economic equality declined in nine of the selected fourteen countries over the 1980-2014 period. The largest declined was in Spain, where economic equality fell 1.87 per cent per year. Economic equality increased in five countries. The largest increase was in France at 2.19 per cent per year. Canada ranked tenth among all the countries with a decline of 0.54 per cent per year.

- Over the 2008-2014 period, the index of economic equality declined in eight countries. Australia saw the largest increases in economic equality (2.29 per cent per year), while Spain showed the largest decline (10.62 per cent per year). Canada ranked eleventh with a decrease of 1.63 per cent per year.

We find the following results for the index of economic security:

- Norway had the highest score in 2014, followed by Denmark. The United States had by far the lowest score. Canada ranked tenth in economic security.

- Economic security declined in four of the fourteen countries over the 1980-2014 period. The largest decline was in Spain, where economic security fell 0.58 per cent per year. Of the remaining countries with positive growth, the United States saw the largest increases at 1.42 per cent per year, driven by changes in the overall security from unemployment and the overall financial risk from illness.

- Only three countries showed positive growth in the economic security domain of the IEWB over the 2008-2014 period. The fastest growth among them was in the United States at 1.60 per cent per year. Spain saw the sharpest decline at 2.69 per cent per year.

Equality and Economic Security Take a Hit: The Index of Economic Well-Being for Selected OECD Countries, 1980-2014[1]

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 objective of this report is to present updated estimates of the Index for fourteen OECD countries for the 1980-2014 period.[2]

The report is divided into four sections. 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, by far the longest, provides a detailed discussion of trends in the Index of Economic Well-Being, and in the four domains and the sub-components of the domains, in fourteen OECD countries over the 1980-2014 period. Trends over the 2008-2014 period will also be discussed to highlight recent developments. The third part tests the sensitivity of our results to alternative assumptions regarding the relative weights assigned to the four domains of the Index. The fourth part concludes.

I. The Index of Economic Well-Being: Motivation and Framework[3]

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

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[2] The database that was used to write this report can be accessed at www.csls.ca/iwb/FinalIEWBAlbertaandOECD2014.xlsx.
[3] This section is from Osberg and Sharpe (2011).

idea that a better measure of "access to resources needed for a decent standard of living" is required if economic and social trends are to be combined into an index with larger ambitions.

In focusing on the economic component of societal well-being, our particular emphasis is on the sensitivity of measures of aggregate "command over resources" to the omission or inclusion of measures of income distribution and economic security.

In contrasting GDP and the IEWB as measures of command over resources, we do not intend to denigrate 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, income distribution, 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).

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 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.

Exhibit 1: Conceptual Framework for the Index of Economic Well-Being

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

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 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 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.

When an average flow like GDP per capita (or an alternative, such as average personal income) is used as a summative index of well-being, the analyst implicitly is stopping in the first quadrant of Exhibit 1 – 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 components therefore have a logical rationale and 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, by their personal values of what is important in economic well-being, they would agree with an overall assessment of trends in the economy.

The 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, 2002, and 2005) we have already described the details of the calculation of the four components or dimensions of economic well-being:

- effective per capita consumption flows – which includes 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 and life expectancy;

- 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;

- income distribution - the intensity of poverty (incidence and depth) and the inequality of income;

- economic security from job loss and unemployment, illness, family breakup, and poverty in old age.

Exhibit 2: CSLS Index of Economic Well-Being Weighting Tree for OECD Countries
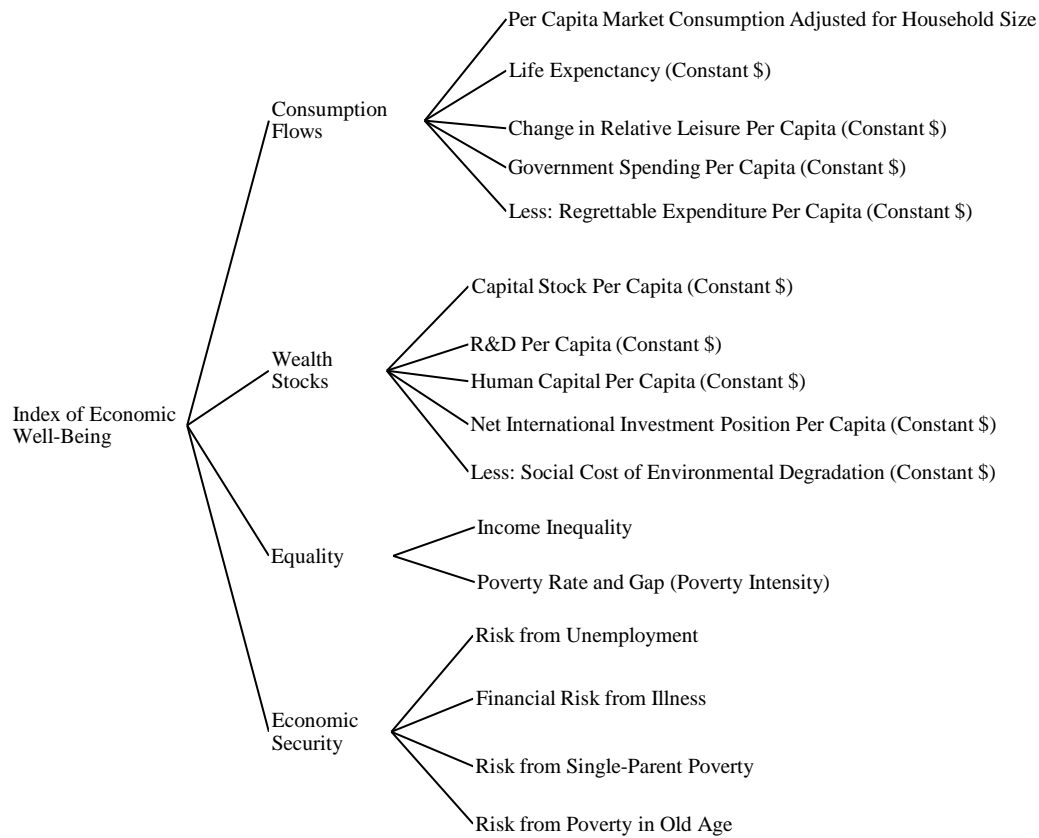
Note: the components that are included in this index differ slightly from the components included in the index for Canada and the provinces (Thomas and Uguccioni, 2016). In particular, the index for Canada and the provinces includes unpaid work per capita and natural resources per capita, while it does not include changes in relative leisure per capita.
Source: CSLS

Each dimension of economic well-being is itself an aggregation of many underlying trends, on which the existing data is of variable 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 countries 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 OECD countries, based on the four domains outlined above.

II. Trends in the Index of Economic Well-Being for Selected OECD Countries, 1980-2014 and 2008-2014

This section of the report examines the level of the Index of Economic Well-Being and its various components in 2014 in 14 OECD countries. The report will focus on discussions of changes since 1980 and changes over the 2008-2014 period. Due to data limitations, values for some of the variables underlying the Index had to be extrapolated for 2014 based on past data. Such cases are identified in footnotes; in all other cases, the Index is based on actual 2014 data.

A. Overall Level and Trends in the Index of Economic Well-Being

i. Levels

In 2014, the country with the highest level of economic well-being among the 14 countries covered was Norway, which had a scaled index value of 0.817 points (Chart 1). Norway was followed by the Netherlands, which had a scaled index value of 0.669 points. The country which had the lowest level of economic well-being was Spain, with an index value of 0.406 points, followed by Italy (0.487 points). Canada ranked eleventh out of fourteen countries, with an index value of 0.568 points.

ii. Trends

There are two ways to measure progress in the Index of Economic Well-Being: the absolute change in the scaled value of the Index, and the per cent change (either the total change or the compound annual rate of change) in the scaled value of the Index. This latter method is influenced by the initial level of the scaled value. For example, suppose that Country A has scaled values of 0.2 and 0.6 in the base and end years while Country B has values of 0.5 and 0.9. In terms of index points, both countries experienced the same improvement in well-being – 0.4 points. In proportional terms, however, Country A increased 200 per cent while Country B advanced only 80 per cent.

During the 1980-2014 period, the Index of Economic Well-Being grew in all countries. Over the 2008-2014 period, three countries showed negative growth in their IEWB. Note, however, that how we choose to measure the magnitude of the growth – in absolute or proportional terms – affects the ranking of countries in terms of growth. Exhibit 3 provides the rank order of the fourteen countries according to both

measurement approaches. In absolute terms, Norway's increase of 0.336 points was the fastest among the countries over the 1980-2014 period. Norway was followed by Australia and France, with growth of 0.269 and 0.256 points respectively. The smallest growth was 0.050 points in Spain.

Over the 2008-2014 period, Norway still showed the fastest absolute growth (0.122 points), followed by Australia and Canada (0.110 points and 0.065 points respectively). Spain had the least growth with an IEWB that fell 0.067 points.

Chart 1: Index of Economic Well-Being, Selected OECD Countries, 1980, 2008, and 2014
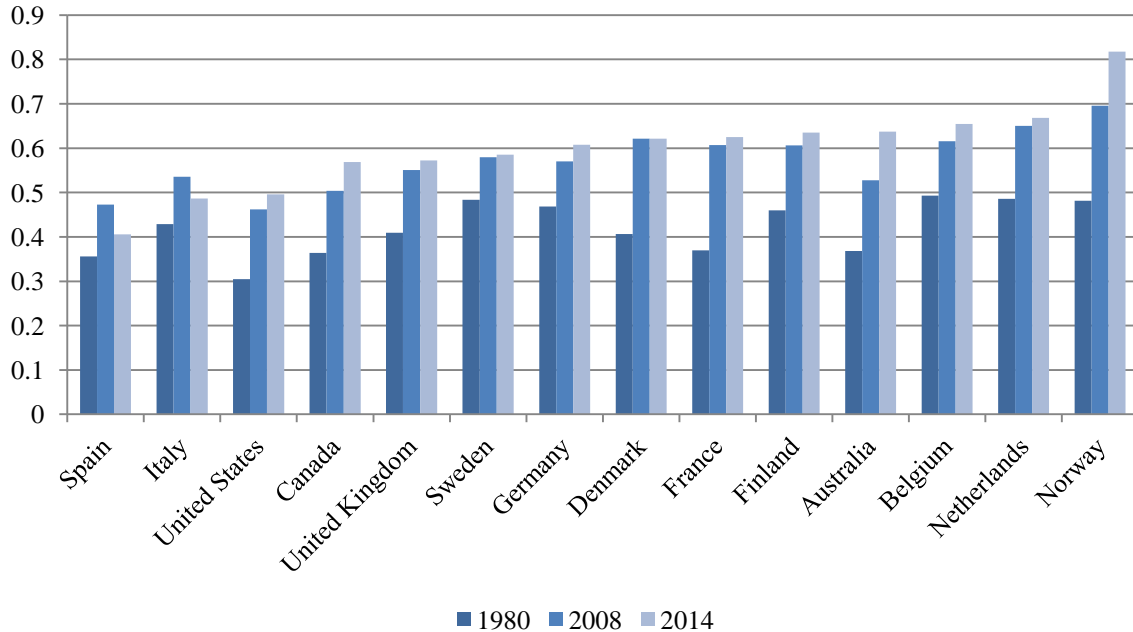
Source: Table 9

In proportional terms, the greatest growth occurred in Australia, where the Index increased 1.62 per cent per year over the 1980-2014 period. Norway and France followed with annual growth rates of 1.57 per cent and 1.56 per cent respectively. The slowest growth was 0.37 per cent in Italy. Over the 2008-2014 period, Australia showed the greatest proportional growth (3.20 per cent per year), followed by Norway and Canada (2.73 and 2.04 per cent respectively). The weakest growth was in Spain, which saw its IEWB fall 2.51 per cent per year. It is interesting to note that over the 1980-2014 period and over the 2008-2014 period, the same two countries showed the strongest and weakest growth, namely Australia and Norway and Italy and Spain.

As the above table illustrates, the choice between absolute and proportional growth measurement does make a difference in the ranking of countries. Throughout this report, we often provide changes over time in both absolute and proportional terms. In general, however, we consider proportional growth to be a better measure of changes in well-being because it takes into account countries' starting points. If a country improves its Index score from 0.1 to 0.2, it has doubled its well-being; this is much more

significant than another country improving its score from 0.8 to 0.9. Proportional growth captures the impact of the base or starting point, whereas absolute changes do not.

Exhibit 3: Ranking of Countries by Absolute and Proportional Growth, Selected OECD Countries, 1980-2014

	1980-2014		2008-2014	
	Absolute (points)	**Proportional (per cent per year)**	**Absolute (points)**	**Proportional (per cent per year)**
1	Norway	Australia	Norway	Australia
2	Australia	Norway	Australia	Norway
3	France	France	Canada	Canada
4	Denmark	United States	Germany	United States
5	Canada	Canada	Belgium	Germany
6	United States	Denmark	United States	Belgium
7	Netherlands	United Kingdom	Finland	Finland
8	Finland	Finland	United Kingdom	United Kingdom
9	United Kingdom	Netherlands	Netherlands	France
10	Belgium	Belgium	France	Netherlands
11	Germany	Germany	Sweden	Sweden
12	Sweden	Sweden	Denmark	Denmark
13	Italy	Spain	Italy	Italy
14	Spain	Italy	Spain	Spain

iii. Comparing the IEWB to Per Capita GDP

It is useful to compare the Index of Economic Well-Being to Gross Domestic Product (GDP) per capita, the measure used most often as an indicator of economic well-being. This comparison can show how GDP per capita can underestimate the quality of life that citizens experience in certain countries, while it can overestimate the quality of life that citizens experience in other countries. In particular, except for Norway (1st), Italy (13th), and Spain (14th), the rank positions for all countries were different between the two indicators in absolute terms. The case of the United States illustrates the stark difference between the two indicators – it ranked second in per capita GDP and second-to-last in level of the Index. Furthermore, in proportional terms the rank positions for all countries were different between the two indicators except for Belgium (10th).

Growth of GDP per capita was greater than the growth of the IEWB in all countries except France over the 1980-2014 period (Chart 2). For example, Norway grew by 3.02 per cent per year in terms of GDP per capita, but only by 1.57 per cent per year in terms of its IEWB. Spain also had a difference of over one percentage point between the two growth rates, with 2.02 per cent per year in terms of GDP per capita, but only 0.39 per cent per year in terms of its overall well-being (Table 2). As shown in Exhibit 4, it was not generally true over the 1980-2014 period that countries with fast per capita GDP growth also experienced fast IEWB growth and vice versa. This divergence shows that certain aspects of the Index of Economic Well-Being, which are not reflected in GDP per capita, have grown slower and thus dampened growth of overall economic well-being relative to GDP per capita growth. Spain presents the most obvious example of this. It

ranked 2nd in terms of average annual GDP per capita growth from 1980 to 2014, but second last (13th) in terms of growth of the Index of Economic Well-Being.

Exhibit 4: Ranking by Level and Growth of Per Capita GDP and the Index of Economic Well-Being, Selected OECD Countries, 1980-2014

	Absolute Level, 2014 (value)		Growth Rate, 1980-2014 (per cent per year)	
	GDP Per Capita	Index of Economic Well-Being	GDP Per Capita	Index of Economic Well-Being
1	Norway	Norway	Norway	Australia
2	United States	Netherlands	Spain	Norway
3	Netherlands	Belgium	Netherlands	France
4	Germany	Australia	United Kingdom	United States
5	Australia	Finland	Germany	Canada
6	Denmark	France	Denmark	Denmark
7	Sweden	Denmark	Finland	United Kingdom
8	Canada	Germany	Australia	Finland
9	Belgium	Sweden	United States	Netherlands
10	Finland	United Kingdom	Belgium	Belgium
11	United Kingdom	Canada	Sweden	Germany
12	France	United States	France	Sweden
13	Italy	Italy	Canada	Spain
14	Spain	Spain	Italy	Italy

Chart 2: Average Annual Growth of the Overall Index of Economic Well-Being and GDP Per Capita, OECD, 1980-2014
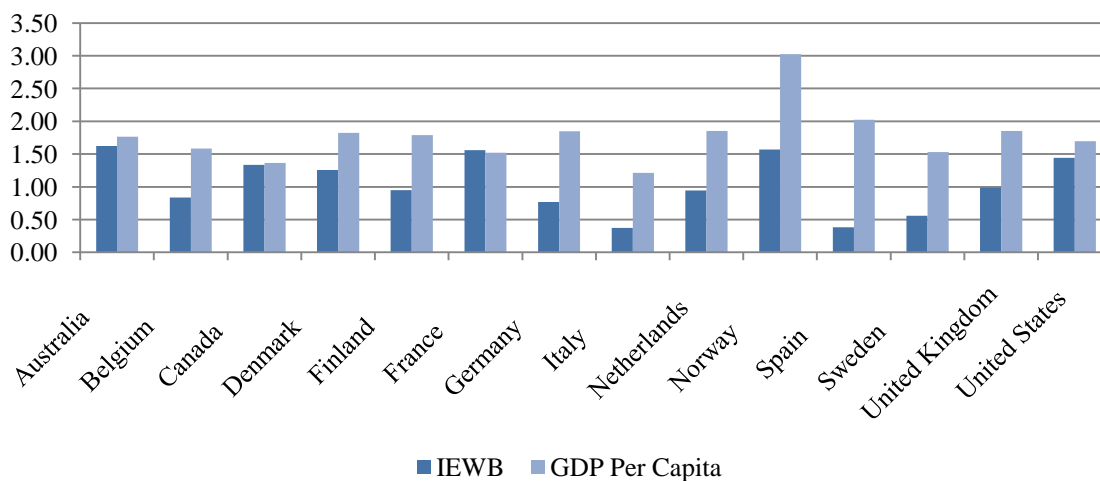
Source: Appendix Table 21 and Table 9.

B. Summary of Trends in the Four Domains of the Index of Economic Well-Being

The IEWB is constructed from four domains: consumption flows, wealth stocks, economic equality and economic security. The following four sections examine in detail the trends in the domains in the fourteen OECD countries over the period of 1980 to 2014 period. Table 1 below provides a brief overview of the four domains in 2014.

Table 1: Index of Economic Well-Being and its Domains, Selected OECD Countries, 2014

	Total Consumption Per Capita, 2010 US$	Scaled Total Consumption Per Capita	Total Per Capita Wealth, 2010 US$	Scaled Total Per Capita Wealth	Index Of Economic Equality	Index Of Economic Security	Overall Index Of Economic Well-Being
Australia	33,674	0.652	350,400	0.641	0.557	0.699	0.637
Belgium	31,288	0.582	292,449	0.518	0.765	0.752	0.654
Canada	32,500	0.618	316,389	0.569	0.377	0.711	0.568
Denmark	29,847	0.540	275,624	0.483	0.656	0.807	0.621
Finland	27,809	0.480	274,866	0.481	0.808	0.769	0.635
France	32,270	0.611	226,506	0.380	0.758	0.753	0.625
Germany	32,251	0.610	255,958	0.442	0.620	0.760	0.608
Italy	28,325	0.495	228,227	0.383	0.358	0.710	0.487
Netherlands	32,719	0.624	268,463	0.468	0.782	0.800	0.669
Norway	38,104	0.782	481,454	0.917	0.737	0.833	0.817
Spain	24,394	0.380	237,714	0.403	0.250	0.590	0.406
Sweden	29,560	0.531	201,527	0.327	0.706	0.776	0.585
United Kingdom	30,872	0.570	192,866	0.309	0.626	0.784	0.572
United States	42,683	0.917	247,103	0.423	0.165	0.479	0.496

Source: Table 1, Table 2, Table 3 and Table 8

Table 2 provides data on the growth rates of the IEWB over the 1980-2014 period broken down into peak-to-peak business cycles. This table shows that in Canada, growth over the 2008-2014 period was stronger than growth in any of the other peak-to-peak business cycles. This was not the case for most of the other countries considered.

Table 2: Growth Rates of the Index of Economic Well-Being, 1980-2014

	1980-2014	1980-1989	1989-2000	2000-2008	2008-2014
Australia	1.62	1.03	1.47	1.34	3.20
Belgium	0.84	1.14	0.50	0.83	0.99
Canada	1.33	1.96	0.25	1.60	2.04
Denmark	1.26	1.16	2.43	0.71	0.00
Finland	0.95	1.43	0.24	1.52	0.78
France	1.56	2.06	2.20	0.92	0.50
Germany	0.77	0.86	1.32	-0.31	1.08
Italy	0.37	1.39	0.50	0.52	-1.58
Netherlands	0.94	0.29	1.49	1.30	0.47
Norway	1.57	1.06	1.05	2.01	2.73
Spain	0.39	1.65	1.14	0.15	-2.51
Sweden	0.56	-0.01	0.69	1.35	0.15
United Kingdom	0.99	-0.66	2.17	1.51	0.65
United States	1.44	0.76	2.69	0.71	1.18

Source: IEWB database.

The number of years it took for the IEWB and GDP per capita to return to the 2008 peak value after the Great Recession of 2009. In three countries, the IEWB has still not returned to its 2008 peak value (Denmark, Italy, and Spain) by 2014. In five countries, the IEWB had surpassed its peak value in 2009 (Germany, the Netherlands, Norway, the United Kingdom and the United States).

The number of years for GDP per capita to return to its 2008 peak is similarly divergent across countries. For example, six countries had still not regained their 2008 peak in 2014 (Finland, Italy, the Netherlands, Norway, Spain, and the United Kingdom).

The cases of the Netherlands, Norway and the United Kingdom are particularly interesting, since the IEWB had surpassed its peak within one year, while GDP per capita had still not regained its peak after six year.

On the other end of the spectrum, five countries had regained their 2008 GDP per capita peaks by 2010.

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

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

Three adjustments are made to these components. First, since economies of scale exist in private household consumption, private consumer expenditure is adjusted for changes in family size. Second, an adjustment is made to private consumption flows to account for the large international differences in growth rates and levels of annual hours worked. Third, an adjustment for the positive impact of increased life expectancy on well-being is made by adjusting total consumption flows by the percentage increase in life expectancy.[4]

i. Private Consumption

In 2014, private consumption was greatest in the United States, where it had a per capita value of $33,724 in 2010 US dollars (Chart 3). The second highest per capita private consumption was in Australia at $23,562. Spain had the lowest per capita private consumption for 2014 at $16,071, just over half of the US value.

Chart 3: Private Consumption Per Capita, Selected OECD Countries, 2010 US Dollars, 1980, 2008 and 2014
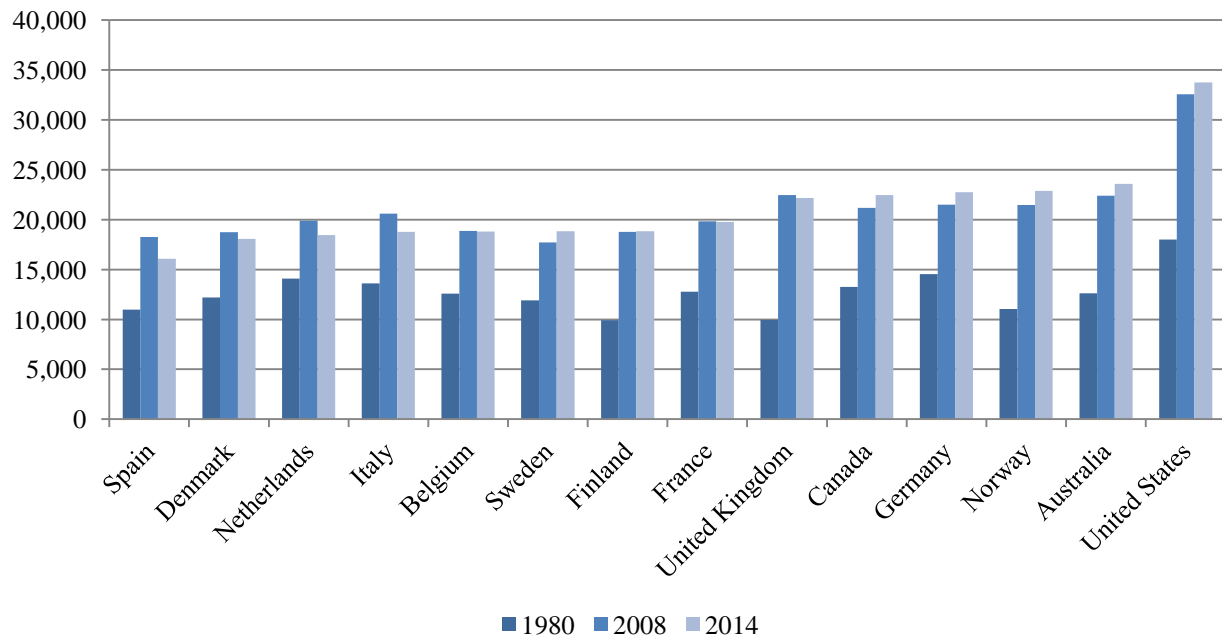
Source: Table 1

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[4] In our estimates of the Index of Economic Well-Being for Canada and the provinces (Thomas and Uguccioni, 2016), the consumption domain also includes the value of unpaid work and regrettable expenditures. Data limitations currently prevent us from including these concepts in our international estimates. Gee (2015) contains estimates of household production of non-market services for various OECD countries.

Between 1980 and 2014, all fourteen countries saw growth in their private consumption per capita. The greatest growth in per capita private consumption was 2.38 per cent per year in the United Kingdom. Private consumption grew the least in the Netherlands at 0.80 per cent per year. Canada ranked sixth with growth of 1.56 per cent per year.

Over the 2008-2014 period, there was no overall trend: seven countries saw growth in their per capita consumption per capita, while seven countries saw decreases in their per capita consumption per capita. Growth was highest in Norway at 1.07 per cent per year, followed by Sweden at 1.03 per cent per year. The slowest growing country was Spain, falling at 2.09 per cent per year. Canada ranked third in growth from 2008 to 2014 at a rate of 0.98 per cent per year.

ii. Average Family Size

It is important to adjust the dollar value of per capita private 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).

Chart 4: Average Family Size, Selected OECD Countries, Persons, 1980, 2008, 2014
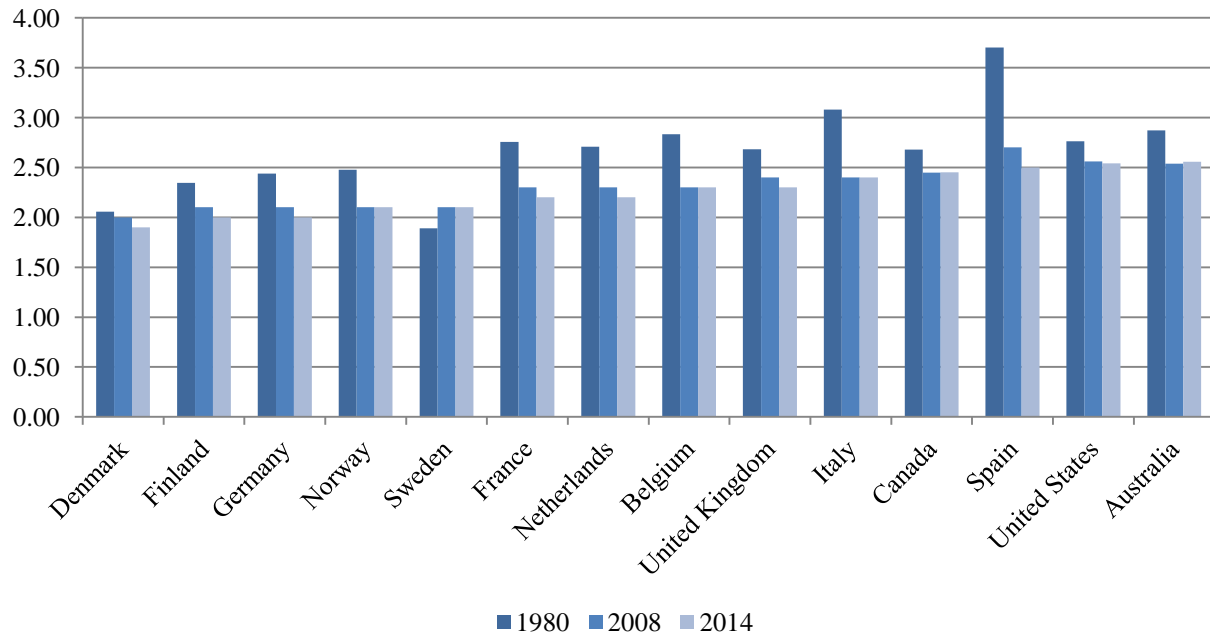
Source: Table 1

To account for this issue, we use the Luxembourg Income Study equivalence scale, which is the square root of family size. For a given country in a given year, we compute the square root of family size in that country and year relative to the square root of family size in the United States in 1980. This ratio is then multiplied by the per capita private consumption value to produce an estimate of private consumption adjusted for family size. Changes in our

equivalence scale from year to year capture changes in average family size both within countries over time and across countries relative to the United States in 1980.[5]

Average family size was greatest in Australia in 2014, with 2.56 persons per household (Chart 4).[6] It was followed by Spain and the United States with 2.54 and 2.50 persons per household respectively. Denmark had the smallest family size at 1.90 persons per household.

Over the 1980-2014 period, the size of families declined in all but one country (Sweden) although Sweden's decline may be purely an aberration due to the use of two different data sources, the Luxembourg Income Study pre-2004, and Eurostat from 2004 onwards. Whatever the source of this result, Sweden had a remarkably small family size in 1980 (1.89 persons per household), and over the period Sweden merely approached the all-country average of 2.21 persons per household. Spain, the country with the largest average family size in 1980 at 3.70 persons per family, experienced the greatest decline among the countries; Spain's average family size fell 1.20 persons to 2.50 persons per household.

Between 2008 and 2014, family size stayed constant in four countries, it declined in eight countries, and it increase in two countries (Australia and Canada), although these increase were exceptionally small and may be accounted for by the margin of error.

iii. Government Expenditures on Goods and Services

Government expenditures include spending by all levels of government on current goods and services. These expenditures are part of social consumption and therefore contribute to increased well-being.[7] The largest government expenditures for 2014 were unsurprisingly in Norway, the Netherlands, and Denmark, where per capita government expenditures were respectively $12,791, $11,507, and $11,212 (Chart 5). Other countries with well established welfare states followed (Sweden, Belgium, France, and Finland – in that order). Notably Germany, which is traditionally thought of as another country with a well-established welfare state, spent less per capita than the laissez-faire United States. Spain had the lowest government expenditures in 2014 at $6,158 per capita.

Over the 1980-2014 period, all fourteen countries saw increases in their government expenditures per capita. Spain grew at the highest rate, 2.86 per cent per year, although this is

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[5] The rationale for this approach is that the equivalence scale would take a value of 1.0 in 1980 in every country if we simply used within-country changes in family size over time. We would not be accounting for cross-country differences in family size in the base year (1980). Measuring family size relative to the baseline of the United States in 1980 solves that problem. The choice of the United States as the baseline country is arbitrary.

[6] Average family size data for Canada and Australia is from the Luxembourg Income Study (LIS) for 1980-2014. Since the LIS data are only available intermittently, we used the growth rates for the nearest observations to interpolate values for missing observation. The most recent year of observation for Canada and Australia is 2010. The values for average family size for 2011-2014 are assumed to be equal to 2010. For the United States, average family size data is from the U.S. Census Bureau. For all European countries, average family size data for 1980-2003 was obtained from the LIS, while average family size data for 2004-2014 are from EU-SILC for 2004-2014. For additional information on data sources, see the accompanying database.

[7] Some might wish to argue that government expenditures actually reduce economic well-being because the private sector would likely have put those funds to more productive or welfare-enhancing uses had the government not taxed them away in the first place. Whether or not this argument is valid, the fact remains that government expenditures on goods and services form a component of total consumption, and therefore total economic welfare as measured by the Index of Economic Well-Being. The Index makes comparisons of well-being across time and space, not between factual and counterfactual worlds.

unsurprising considering that in 1980 Spain spent the least per capita ($2,362). The weakest growth in government expenditures occurred in Canada (0.51 per cent per year). This likely reflects Canada's relatively high government expenditures per capita in 1980 – the only country to spend more per capita was Sweden.

Between 2008 and 2014, only four countries saw declines in their government expenditures per capita: Spain, Italy, the United States and Finland. The weakest growth was in the United States, where per capita government expenditures shrank at a rate of 1.24 per cent per year. On the other end of the spectrum, Germany had the highest growth rate in per capita government expenditures at 1.74 per cent per year during this period.

Chart 5: Per Capita Government Expenditures on Current Goods and Services, Selected OECD Countries, 2010 US Dollars, 1980, 2008, 2014
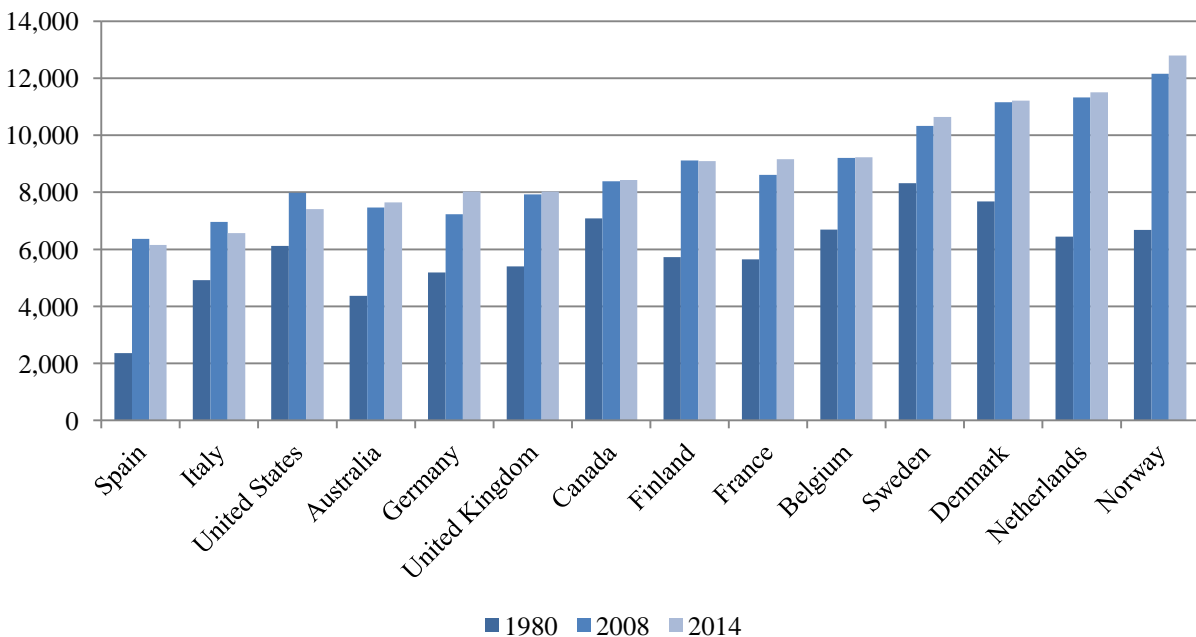
Source: Table 1

## iv. Adjusted Relative Change in Non-Working Time

One potential benefit of economic progress is that people may be able to take more leisure time. A measure of economic welfare should account for time spent on leisure, but the value of leisure time is difficult to estimate. Our approach is based on the idea that if a person takes an additional hour of leisure time, then he or she values that leisure time at least as much as the next best alternative use of his or her time. We assume that the next best alternative use of leisure time is paid work in the labour force, the value of which is the total labour compensation (that is, after-tax wages and benefits) that could have been earned during that time.

We assume that there is a negative value to unemployment. Our estimate of the marginal opportunity cost of not being employed is calculated using estimates of average after-tax labour compensation and average number of hours of leisure. Note, however, that we are putting a money value on differences in time use (both changes over time and differences across

countries), not on total leisure hours themselves. We standardize leisure hours as the number of hours of leisure relative to a benchmark – namely, the United States in 1980. Ours is a relative cost measure. When leisure hours exceed the benchmark, we add to measured money income the value of leisure relative to the benchmark; if leisure hours fall short of the benchmark, we subtract from measured money income the cost in foregone leisure. The adjusted relative cost of leisure measures the foregone income that people could have earned in the labour force if they had worked the benchmark hours instead of taking more leisure. By the reasoning outlined in the preceding paragraph, this cost measure can be taken as an estimate of the value (or, at least, a lower bound on the value) of the benefits of the leisure time itself.

For each country in each year, we compute the average annual number of hours worked per working-aged person, to which we add an estimate of the average annual hours of unemployment per working-age person.[8] This gives a measure of average hours spent in the labour force. We then take the difference between these values and the value of the United States in 1980. That difference represents the country's leisure hours (that is, time not spent in the labour force) relative to those of the United States in 1980.

Chart 6: Average Annual Hours Worked Per Employed Person, Selected OECD Countries, Hours, 1980, 2008, 2014
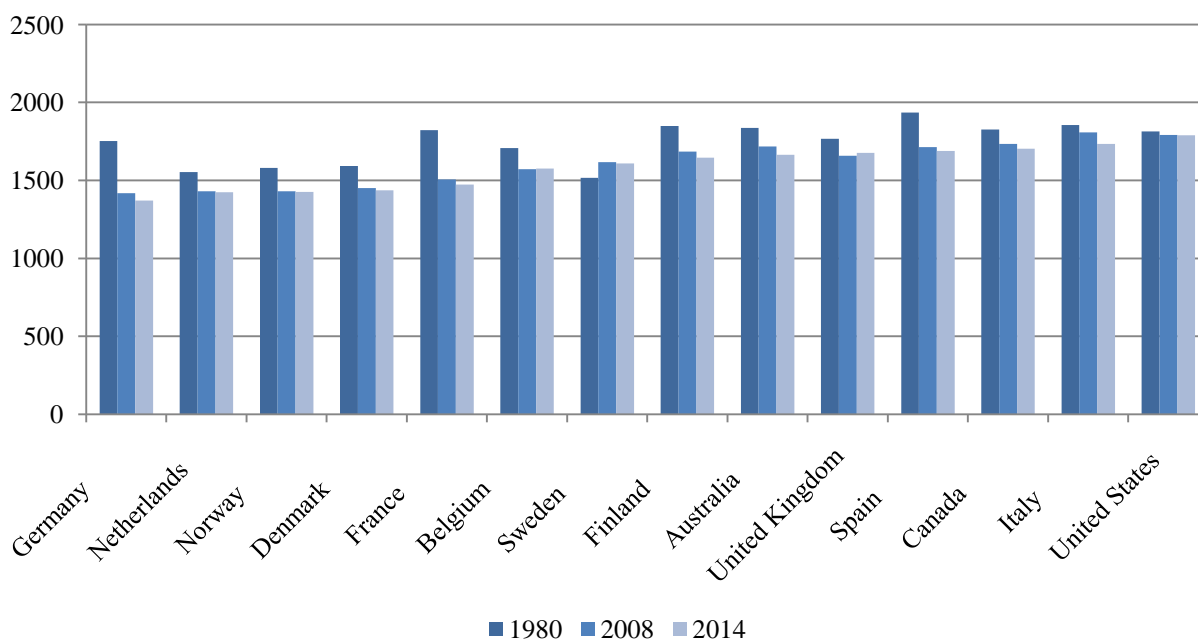
Source: Appendix Table 5-101

Trends in the value of leisure (relative to the United States in 1980) are determined by a number of factors: average hours worked per employed person, employed persons as a proportion of the working-age population (the employment rate), and average hours of unemployment per working-age person.[9]

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[8] Average annual hours of unemployment are estimated by multiplying average hours worked per employed person by the proportion of working-aged persons who are unemployed. We assume that if they were employed, unemployed persons would work the average number of hours worked by those who are currently employed.

[9] Some data required for the calculations of the relative cost of leisure per capita were missing. For details on how these values were interpolated or extrapolated, see the accompanying database. Since the last publication of IEWB estimates in 2011, the

Chart 6 illustrates average annual hours worked per employed person in the fourteen countries.[10] This average declined in all countries except Sweden between 1980 and 2014, but the declines were greater in the European countries, Canada, and Australia than in the United States.

In comparison, five countries saw average hours worked per working-age person increase over the 1980-2014 period, due in part to increased employment rates over the period (Belgium, Canada, Netherlands, Spain, and Sweden). However, this trend has recently reversed in Canada as the average hours worked per working-age person decreased between 2008 and 2014.

Chart 7: Adjusted Relative Value of Changes in Leisure Per Capita Relative to the United States in 1980, Selected OECD Countries, 2010 US$, 1980, 2008 and 2013

■ 1980 ■ 2008 ■ 2014
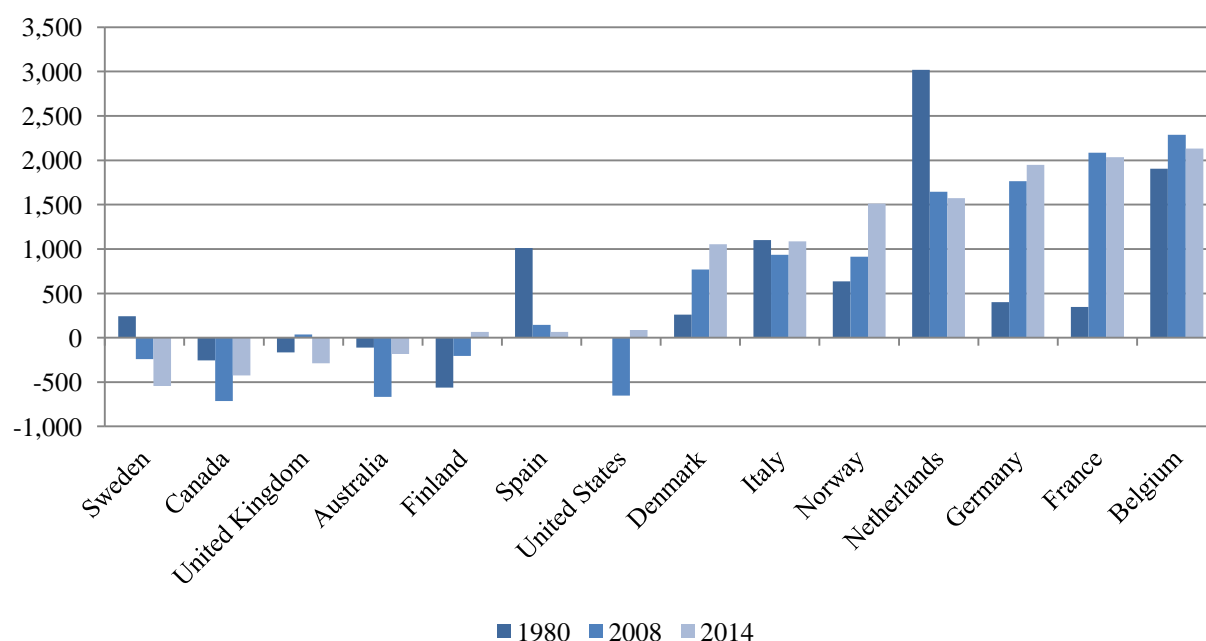
Source: Table 1

In 2014, all European countries except Sweden had a positive relative change in the benefit of leisure, showing that they spent more time on leisure than the United States did in 1980 (Chart 7). Aside from Sweden, only three other countries had a negative relative change in the benefit of non-working time in 2014: Australia, Canada, and the United Kingdom. This is because these countries spent more time in the labour force than the United States in 1980.

Sweden had the most negative adjusted relative cost of leisure per capita of all the fourteen countries at negative $544 2010 US dollars. Belgium had the most positive adjusted

OECD has terminated its time series on labour compensation per employee. However, the OECD now published data on the annual growth rate of labour compensation per hour and average hours per worker. Using these growth rates, it is possible to extend the previous time series forward and obtain labour compensation per hour.

[10] Average annual hours worked per employed person are obtained from the OECD. In Germany and Italy, data were missing for 1980-1990 and 1980-1994, respectively. The Federal Reserve Bank of St. Louis has data on average annual hours worked per employed person for both of these countries during these time periods. Hence, growth rates from the latter time series were used to extend the former time series back to 1980.

relative cost, $2,131 2010 US dollars, with France and Germany following closely at $2,033 and $1,948 2010 US dollars per capita respectively. Canada had the second lowest cost of leisure at negative $169 2010 US dollars per capita.

Over the 1980-2014 period, the benefit of leisure increased in seven countries, while it decreased in the other seven countries. The most dramatic change was experienced by France where the relative cost of leisure increased significantly from $348 per capita to $2,034. Finland, which was the only European country to experience a sustained period of negative leisure costs in the 1980s, also experienced significant growth, from negative $561 per capita in 1980 to positive $65 in 2014. The country that saw the most dramatic decline in their relative cost of leisure was the Netherlands, where the cost of leisure halved from $3,020 in 1980 to $1,571 in 2014.

Since 2008, six countries have seen their cost of leisure decrease: Belgium, France, the Netherlands, Spain, Sweden, and the United Kingdom. The time devoted to leisure clearly decreased in these countries over the 2008-2014 period. The remaining eight countries saw increases in the value of non-working time during this time frame.
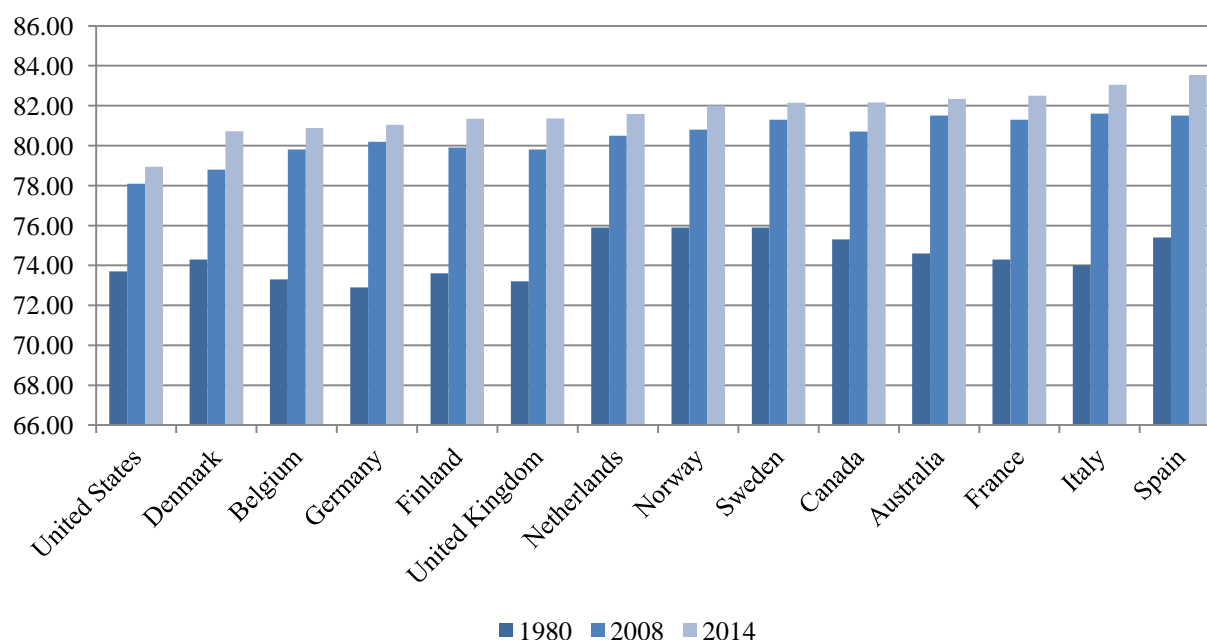
v. Life Expectancy

The final adjustment to consumption flows is to account for the increase in consumption arising from rising life expectancy. Life expectancy for each country was converted into a relative index where the value for the United States in 1980 equals 1.00. This index is multiplied by total consumption flows in order to adjust consumption for life expectancy. Thus, the adjustment captures changes in life expectancy both over time within countries and across countries relative to the United States in 1980.

The country with the highest life expectancy in 2014 was Spain, which had an average life expectancy of 83.5 years (Chart 8).[11] The lowest life expectancy, 78.9 years, was in the United States.

Over the 1980-2014 period, life expectancy increase in all fourteen countries considered. Life expectancy in Italy grew the most, from 74.0 years to 83.0 years, a total increase of 12.2 per cent. Germany and the United Kingdom experienced the second and third largest increases in average life expectancy, respectively growing 11.2 per cent and 11.2 per cent. Life expectancy in the United States grew the least at only 7.1 per cent. Increased life expectancy, and the additional consumption inherent to it, increased consumption flows in all of the OECD countries covered in this report.[12]

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[11] Data on life expectancy were available for every country up to 2013, except Canada, which had data available up to 2011. The values for the missing years up to 2014 were extrapolated based on the growth rate of the most recent five-year period.

[12] OECD (2014) decomposes increases in multidimensional living standards into increases in inequality, income growth, longevity, unemployment and economic growth. In all of the countries studied, increases in longevity were a significant contributor to increases in multidimensional living standards. On average, increases in longevity contributed 1.6 percentage points to annualized growth in living standards over the 1995-2007 period. Calver (2016) decomposes growth in living standards due to increases life expectancy in Canada between 2000 and 2011 by cause of death and estimates the equivalent value of these reductions in mortality in terms of billions of dollars of income.

Chart 8: Life Expectancy at Birth, Selected OECD Countries, Years, 1980, 2008, 2014

Source: Table 1

Similarly to the 1980-2014 period, over the 2008 to 2014 period, life expectancies rose in all fourteen countries. Life expectancies rose the most in Spain by 2.0 years, followed by Denmark at 1.9 years. Each of the fourteen countries studied saw increases in their life expectancies during this period. The smallest increase was in Australia at 0.8 years.

## vi. Total Adjusted Consumption Flows

Total adjusted consumption is computed by summing family size-adjusted private consumption, government expenditures, and the benefits from changes in non-working time, and then multiplying the total by the life expectancy index. The country with the highest level of consumption flows per capita in 2014 was the United States with $42,683 in 2010 US dollars (Chart 9). The United States was significantly ahead of second placed Norway, which had consumption flows of $38,104 per capita. Spain was last with $24,394 per capita, well behind the United States.

Between 1980 and 2014, total adjusted consumption per capita increased in all fourteen countries considered. Norway had the fastest consumption growth over the 1980-2014 period at 2.18 per cent per year. The United Kingdom ranked a close second with growth of 2.16 per cent per year. The slowest growth was 0.90 per cent per year in the Netherlands. Canada claimed ninth place with total adjusted growth of 1.39 per cent per year.

Over the 2008 to 2014 period, ten out of fourteen countries experienced increases in their total adjusted consumption per capita. Only four countries saw declines: Spain, Italy, the United Kingdom, and the Netherlands. The fastest positive growth was again in Norway at 1.50 per cent per year, while the most negative consumption growth was in Spain, where consumption shrank

at a rate of 1.77 per cent per year. Canada ranked in third place with positive growth of 1.22 per cent per year.

Chart 9: Total Adjusted Consumption Per Capita, Selected OECD Countries, 2010 US Dollars, 1980, 2010, 2014
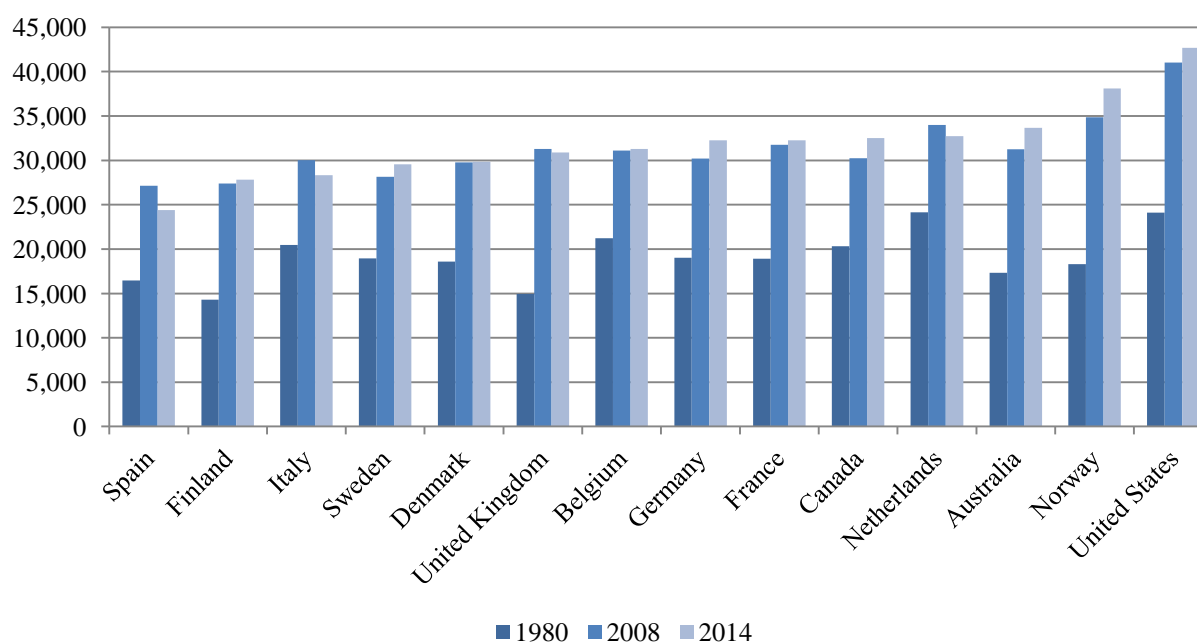
Source: Table 1

Table 3 shows the growth rates of the consumption domain index over the 1980-2014 period broken down into peak-to-peak business cycles. In most countries, the strongest growth in the consumption domain was seen over the 1980-1989 period, although there are some notable exceptions, including the Netherlands and Denmark.

Table 3: Growth Rates of the Consumption Domain, 1980-2014

	1980-2014	1980-1989	1989-2000	2000-2008	2008-2014
Australia	3.99	4.54	4.53	4.20	1.94
Belgium	2.10	4.14	2.12	1.27	0.16
Canada	2.57	2.99	1.62	3.91	1.92
Denmark	2.82	3.18	3.95	2.98	0.06
Finland	5.29	12.39	2.59	5.03	0.43
France	3.06	5.83	3.08	1.98	0.42
Germany	3.01	4.24	4.23	0.95	1.75
Italy	1.86	5.48	2.39	-0.22	-1.57
Netherlands	1.53	0.39	3.28	2.35	-0.96
Norway	4.08	3.75	5.26	4.25	2.20
Spain	2.82	6.65	3.51	2.28	-3.16
Sweden	2.63	3.36	2.65	2.73	1.35
United Kingdom	5.18	8.03	6.31	4.73	-0.35
United States	2.69	3.50	3.05	2.63	0.93

Source: IEWB database.

Within two years of the Great Recession, eleven out of fourteen countries had recovered to consumption index values above the 2008 peak. The three remaining countries, the United

Kingdom, Spain and the Netherlands, however, had yet to regain their peak values of 2008 six years after the crash.

D. Trends in the Components of the Sustainability/Stocks of Wealth Domain

A society's stock of wealth – both man-made and naturally occurring – determines the sustainability of its current level of consumption. The measure used in this report contains, as explained earlier, four components: the physical capital stock, the R&D capital stock, the stock of human capital, and the net international investment position.[13] To account for the social costs of environmental degradation, we subtract the estimated annual cost of greenhouse gas emissions.

i. Physical Capital

Australia had the largest stock of physical capital per capita, defined as net residential and non-residential capital stock based on geometric depreciation, in 2014 at $283,333 in 2010 US dollars (Chart 10).[14] Norway, Canada, Finland, and Spain rounded out the top five with $254,186, $209,274, $176,995, and $173,057, respectively. The lowest stock of net capital was in Sweden at $110,284 per capita.

Between 1980 and 2014, all fourteen countries saw increases in their physical capital stock per capita. The greatest growth in the per capita physical capital stock was experienced by Canada at 4.54 per cent per year. Spain experienced the second largest growth rate at 4.18 per cent per year. The extremely rapid growth of capital in Canada and in Spain over the period is understandable considering that both countries had initial stocks of capital which were quite small (they ranked eleventh and thirteenth respectively in terms of 1980 net capital stock per capita). The slowest growth rate was in United States at 1.75 per cent per year.

Similarly to the overall period between 1980 and 2014, all fourteen countries saw increases in their physical capital stock per capita over the 2008-2014 period. During this time frame, per capita physical capital stock growth ranged from a high of 12.41 per cent per year in Australia to a low of 2.62 per cent per year in the United States. Notably, Canada saw extremely rapid growth of 12.15 per cent per year, which was only out done by Australia.

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[13] In our estimates of the Index of Economic Well-Being for Canada and the provinces (Thomas and Uguccioni, 2016), the wealth domain also includes the value of natural resource stocks. Data limitations prevent us from including natural resources in our international estimates.

[14] Data on physical capital are from the Penn World Tables 8.0 for 1980-2011. The values for 2012-2014 were extrapolated based on the average annual growth rate over the most recent five-year period of available data.

Chart 10: Physical Capital Stock Per Capita, Selected OECD Countries, 2010 US Dollars, 1980, 2008, 2014
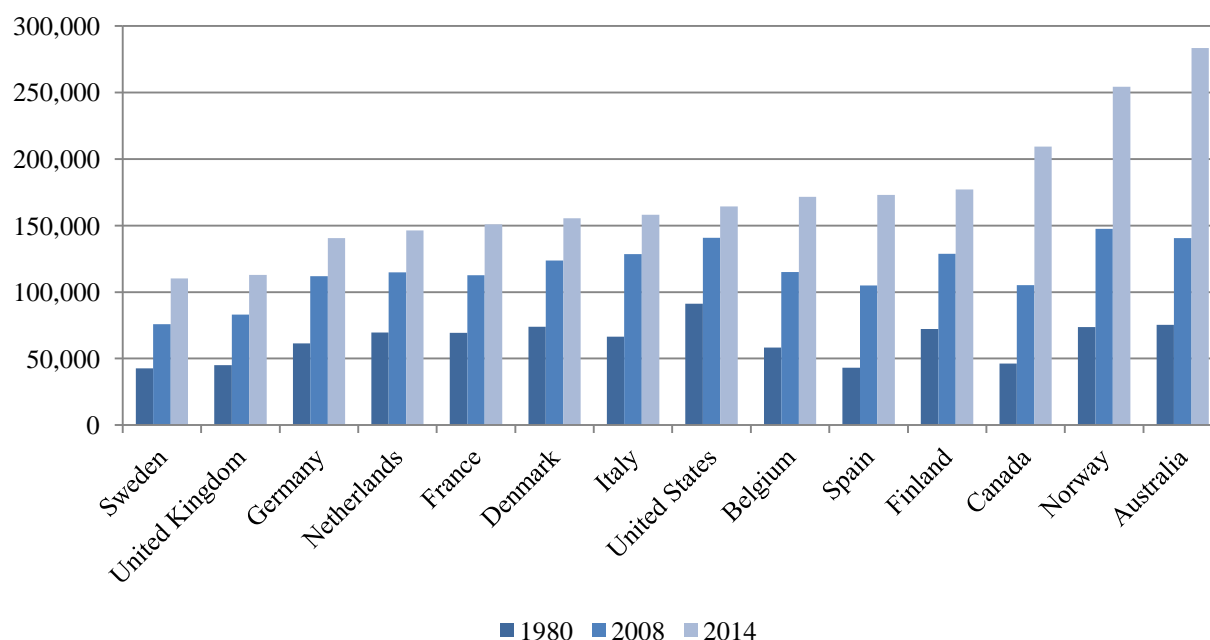
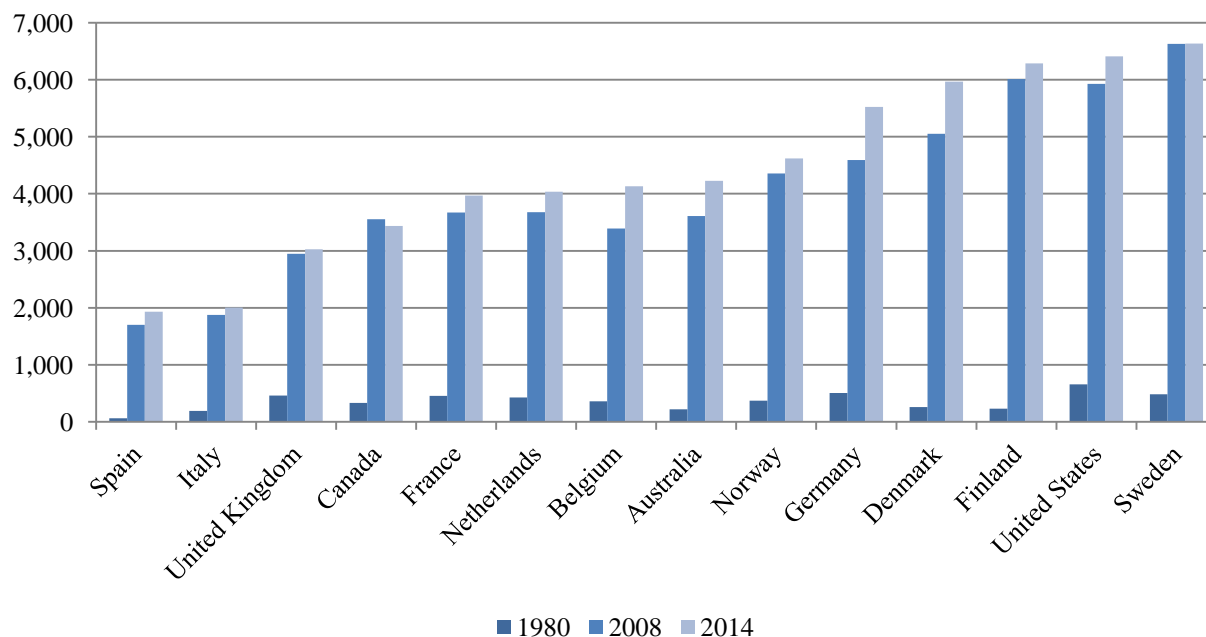Source: Table 2

ii. R&D Capital

In 2014, the stock of total business expenditures on R&D per capita was the greatest in Sweden at $6,631 in 2010 US dollars (Chart 11).[15] The United States had the second largest stock of R&D expenditures at $6,408 per capita.[16] Spain had the lowest stock of R&D expenditures per capita at $4,622.

All fourteen countries saw increases in R&D capital stock per capita between 1980 and 2014. In many countries, the increases in R&D expenditures per capita were extremely rapid, with the growth rates in Spain and Finland topping 10 per cent per year (10.45 per cent per year and 10.17 per cent per year respectively). The range of growth rates for R&D capital stock per capita for the remaining countries was a high of 9.67 per cent per year (Denmark) and a low of 5.67 per cent per year (the United Kingdom).

Over the 2008-2014 period, R&D expenditures per capita increased in thirteen of the selected fourteen countries. Only Canada saw a decline in R&D expenditures per capita of 0.56 per cent per year. Growth in R&D expenditures per capita was the highest in Belgium at 3.34 per cent per year.

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[15] We compute the stock of R&D capital using data on gross annual R&D expenditures (from the OECD Science and Technology database) and convert the estimates to 2010 US dollars using the fixed capital formation deflator, also from the OECD. 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 SNA 2008 recommended 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.

[16] Data availability for R&D expenditures vary greatly by country. See the accompanying database for more details.

Chart 11: Per Capita Stock of R&D, Selected OECD Countries, 2010 US Dollars, 1980, 2008, 2014

Legend: ■ 1980 ■ 2008 ■ 2014

Source: Table 2

iii. Human Capital

The value of human capital in 2014, defined in the Index of Economic Well-Being as the accumulated private and public expenditures on all levels of education, was highest for Canada at $102,835 in 2010 US dollars per capita (Chart 12).[17] The United States and Belgium placed second and third, with human capital levels of $98,715 and $95,667 respectively. The lowest human capital levels belonged to Italy and France at $78,043 and $80,926 per capita respectively.

During our 35-year period of observation, human capital per capita increase in all of the fourteen countries considered. Spain and Belgium experienced the greatest improvement in human capital per capita over the 1980-2014 period, growing by 1.98 and 1.70 per cent per year, respectively. In contrast, the United States and Germany, starting from the first and second highest levels of per capita human capital in 1980, experienced the second lowest and lowest annual average growth rates at 0.82 per cent per year and 0.74 per cent per year respectively.

Over the 2008 to 2014 period, ten countries saw increases in their human capital per capita, while four saw decreases (the Netherlands, Norway, Sweden, and the United Kingdom). The worst declines were posted in Norway at 0.45 per cent per year and the United Kingdom at

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[17] Human capital values are based on education cost estimates for the United States for 2011 applied to estimates of population (25-64) proportions by highest level of educational attainment. Due to changes in the OECD's reporting procedure for educational attainment data, educational attainment statistics in the United Kingdom and Norway show odd growth. For example, in the United Kingdom the share of the population with early childhood, primary and lower secondary education skyrocketed between 2013 and 2014 from 18.59 per cent to 38.38 per cent.

0.40 per cent per year. The largest increases were seen in Belgium at 2.42 per cent per year and Germany at 1.23 per cent per year.

Chart 12: Human Capital Stock Per Capita, Selected OECD Countries, 2010 US Dollars, 1980, 2008, 2014
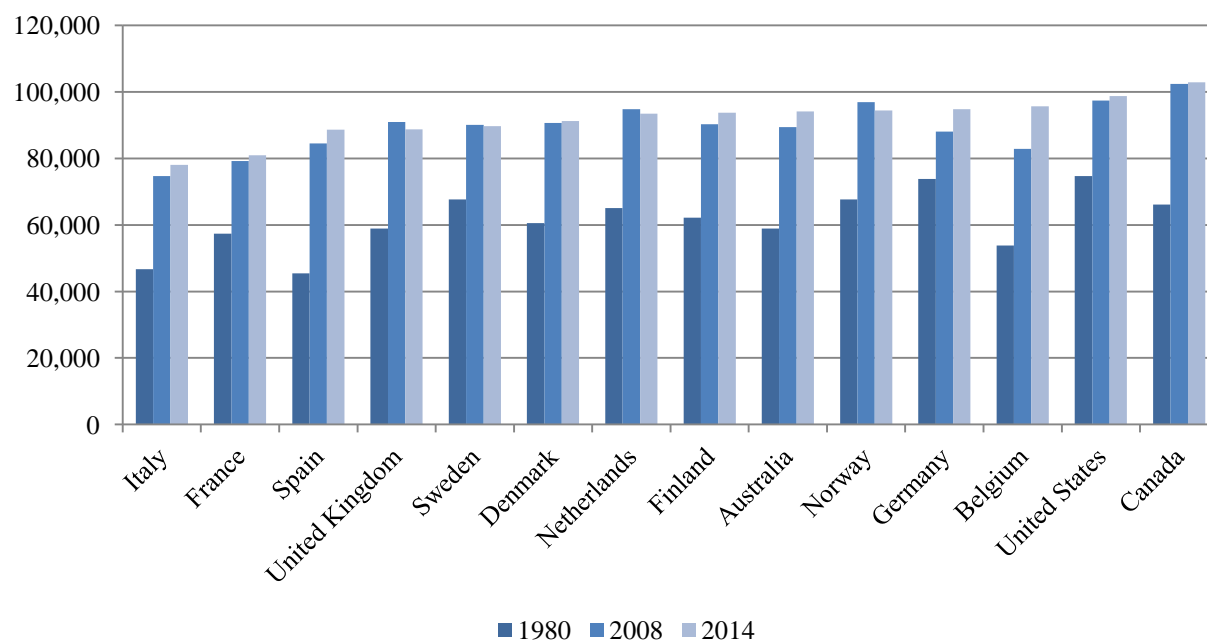
Source: Table 2

iv. Net International Investment Position

Six countries had positive net international investment positions in 2014 (Chart 13). Norway had the best net international investment position with a per capita investment surplus of $131,164 in 2010 US dollars. The other five countries were Belgium, Canada, Denmark, Germany, and the Netherlands. Out of the countries with negative investment positions, the highest deficit of $29,002 per capita belonged to Australia. The second largest international investment deficit of $24,327 per capita belonged to Spain.

Chart 13: Net International Investment Position Per Capita, Selected OECD Countries, 2010 US Dollars, 1980, 2008, 2014
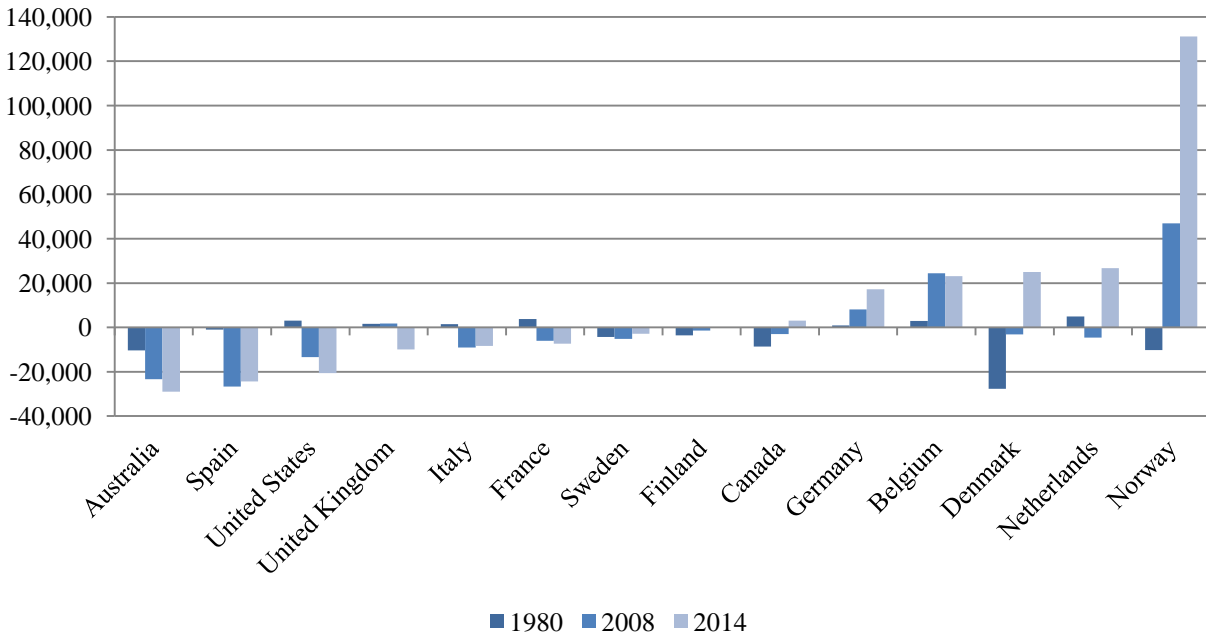
Source: Table 2

The net international investment position deteriorated over the 1980-2014 period in six of the fourteen countries, reflecting faster growth in foreign liabilities than in foreign assets. The largest deterioration was in the United States, where the net international investment position fell $23,568 per capita in 2010 US dollars from a position of $2,983 in international assets per capita to $20,585 in international liabilities per capita. Among the countries in which the net foreign investment position increased over the period, the largest increase was $141,341 per capita in Norway (from a net debt position of $10,177 per capita to a net asset position of $131,164 per capita). Denmark also saw a large increase from a net liability of $27,687 to a net asset of $24,948, or an increase of $52,635 per capita.

v. Social Costs of Environmental Degradation

Degradation of the environment negatively affects the sustainability of stocks of wealth. Placing a value on the environment or the "services provided by ecosystems" is a massive and controversial task and is 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 environment issues can be accommodated in our framework for quantifying economic well-being, the Index does include estimates of the social costs of greenhouse gases (GHGs), which contribute to climate change. In each year, we adjust the total wealth stock estimates by subtracting the social costs of greenhouse gas emissions in that year.

Although it is emitted from a particular location, a given tonne of a GHG (especially emissions of CO_2) imposes damages at the global level. In measuring well-being, then, it is the global level of GHG emissions that matters. Our approach is to estimate the total social costs of global GHG emissions (Chart 14), and then allocate those costs across countries in proportion to

each country's share of world GDP (Chart 15).[18] The estimates are derived by multiplying global GHG emissions (measured in tonnes of CO_2-equivalent emissions, or tCO_2-e) by the per tonne social cost of such emissions. In a review of 211 published estimates of the social cost of carbon, Tol (2007) finds that the average estimate from peer-reviewed studies is approximately $21/t$CO_2$-e in 2010 US dollars.[19] We take this as our estimate of the social costs of GHG emissions.

Chart 14: Global CO_2 Emissions, Millions of Metric Tons, 1980-2014
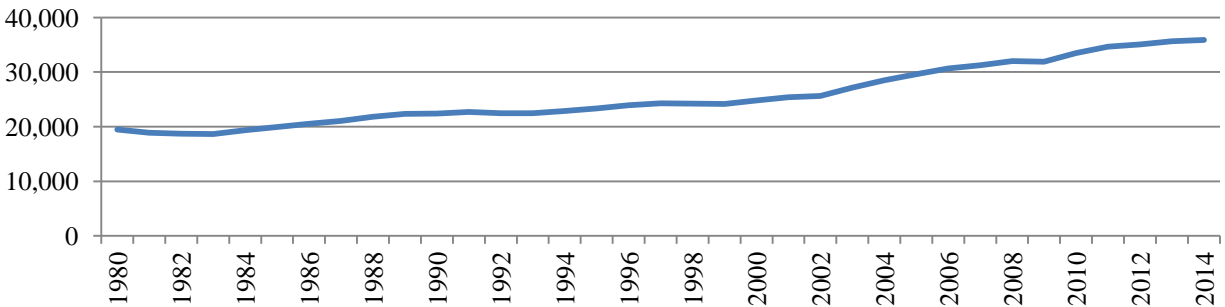
Source: Table 10

**Chart 15: Share in World GDP, Selected OECD Countries, Per Cent, 1980, 2010, 2013**
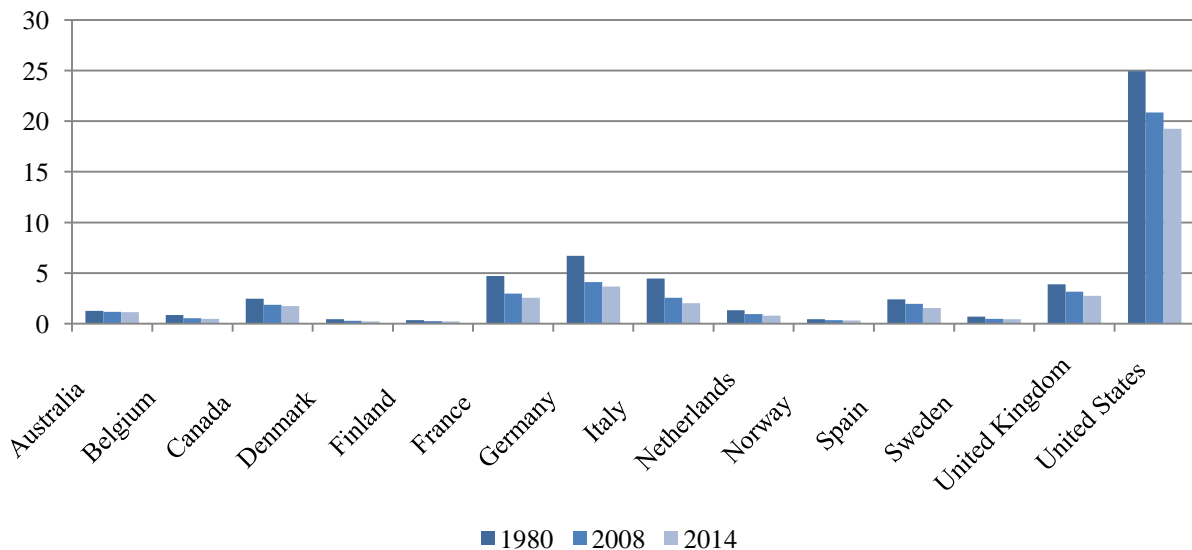
Source: Table 2

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[18] An alternative approach is to use country-specific GHG emissions data and assume that the social costs of GHG emissions are entirely borne by the country in which the emissions occur. We use this approach in our estimates of the IEWB for Canada and its provinces (Thomas and Uguccionio, 2016). GHG emissions are affected by the composition of national output as well as the volume, so some countries (such as Australia and Canada) emit more GHGs than their share of global GDP would imply while others (such as Norway and Sweden) emit less. If we used the country-specific emissions approach rather than the global emissions approach, the measured social costs of GHG emissions would be higher in countries like Australia and Canada and lower in countries like Norway and Sweden. The IMF provides estimates of GDP shares up to 2014, but 2012-2014 are listed as projections.

[19] It is also common to express estimates of the social cost of carbon in dollars per tonne of carbon ($/tC) rather than per tonne of carbon dioxide ($/$CO_2$-e). Our assumed social cost of $21/t$CO_2$-e roughly corresponds to $76/tC. See Sharpe, Arsenault, Murray, and Qiao (2008) for a detailed discussion of the appropriate assumptions regarding the social cost of greenhouse gas emissions in the context of the valuation of the Alberta oil sands.

Norway had the highest social cost associated with greenhouse gasses in 2014 at $2,861 per capita in 2010 US dollars (Chart 16) because it had the highest GDP per capita. The second highest social cost was $2,252 per capita in Canada. The country with the lowest total in 2014, Italy, had greenhouse gas costs of $1,526 per capita. In general, greenhouse gas costs made almost no impact on the total stock of wealth per capita. This is because of the small size of social costs of CO_2 emissions relative to the size of wealth stocks. Nevertheless, greenhouse gas costs are only a small part of the total environmental costs that every country faces (such as water pollution, other forms of air pollution, nuclear pollution, etc.), which are likely to have a much greater negative effect on total wealth stocks. This is a ripe area for future advancements of the IEWB.

Chart 16: Greenhouse Gas Emission Cost Per Capita, Selected OECD Countries, 2010 US Dollars, 1980, 2010, 2013
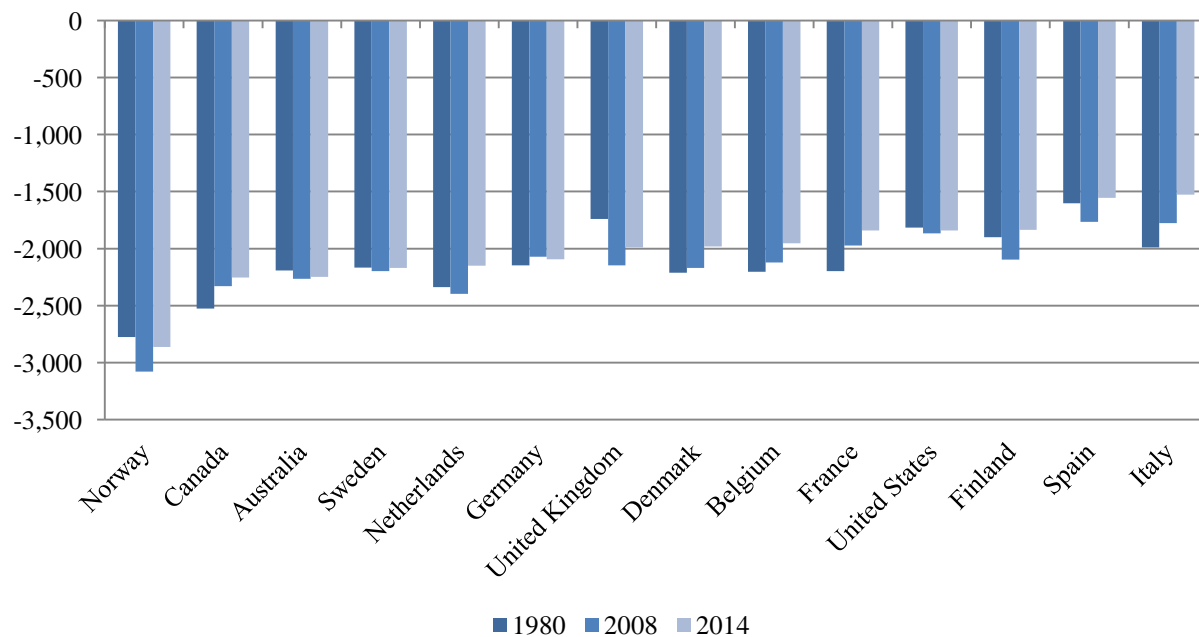
Source: Table 2

Over the 1980-2014 period, greenhouse gas emissions costs per capita, and therefore the social costs associated with greenhouse gasses, increased in five of fourteen countries, specifically Australia, Norway, Sweden, the United Kingdom, and the United States, although it is important to note that this is linked to growth in relative world GDP per capita shares and not necessarily to increased emissions in these countries. The United Kingdom experienced the fastest growth, with costs increasing by 0.40 per cent per year over the period. Sweden experienced the lowest growth in costs, with growth of 0.00 per cent per year (marginally above zero beyond the second decimal place). In contrast, Italy experienced the steepest drop in greenhouse gas emissions costs per capita at 0.78 per cent per year, followed by France at 0.52 per cent per year.

Between 2008 and 2014, greenhouse gas emissions costs per capita increased in only one country: Germany, at 0.17 per cent per year. In all other countries, greenhouse gas emissions costs per capita decreased over the 2008-2014 period. The greatest decline was seen in Italy at

2.50 per cent per year, followed by Finland at 2.19 per cent per year. This reflects their diminishing shares of world GDP per capita.

vi. Total Wealth Stocks

Total wealth stocks are computed by summing physical capital, human capital, R&D stock, and the net international investment position, and then subtracting the social costs of GHG emissions. In 2014, Norway had the greatest total stock of wealth at $481,454 per capita in 2010 US dollars (Chart 17). The second-place country, Australia, was well behind with $350,400 per capita in wealth. Canada ranked third at $316,389. The smallest stock of wealth, with a value of $192,866, belonged to the United Kingdom.

Total wealth stocks per capita increased in all fourteen countries over the 1980-2014 period. Norway and Canada had the fastest growth in total wealth per capita at 3.96 per cent and 3.40 per cent per year respectively. The slowest growth was 1.15 per cent per year in the United States.

Similarly to the overall period between 1980 and 2014, all fourteen countries saw increases in their total wealth stocks over the 2008-2014 period. The greatest increase in total wealth per capita was in Australia at 9.10 per cent per year, followed by Norway at 8.66 per cent per year.

The index of the wealth domain is obtained by applying the linear scaling procedure to the total wealth stock data for all countries over the 1980-2014 period. This does not affect the cross-country rankings in terms of levels (though it can affect rankings in terms of growth rates).

Chart 17: Total Wealth Stocks Per Capita, Selected OECD Countries, 2010 US Dollars, 1980, 2008, 2014
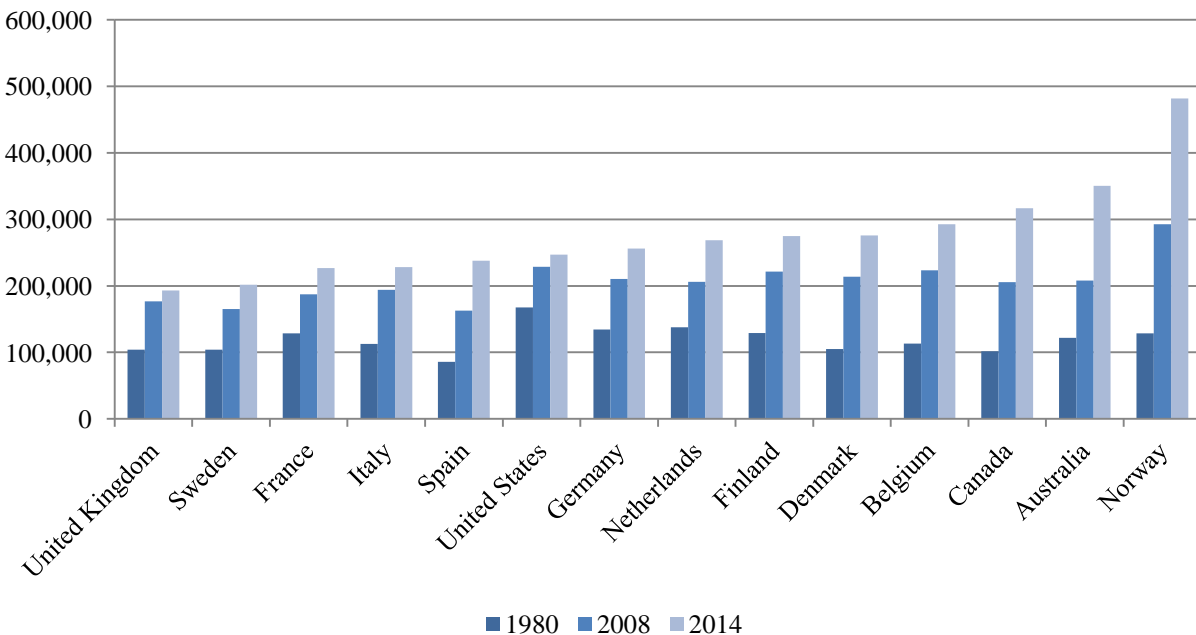
Source: Table 2

Table 4 shows the growth rates of the wealth domain over the 1980-2014 period broken down into business cycles. In many countries, the 2008-2014 period saw the strongest growth out of all four peak-to-peak cycles considered. Denmark, Finland, Italy, the United Kingdom and the United States are exceptions.

Table 4: Growth Rates of the Wealth Domain, 1980-2014

	1980-2014	1980-1989	1989-2000	2000-2008	2008-2014
Australia	4.17	3.06	2.69	2.45	11.13
Belgium	3.90	3.23	4.43	2.66	5.64
Canada	4.78	4.43	3.93	3.11	9.19
Denmark	4.10	5.63	3.46	2.36	5.36
Finland	3.03	3.33	-0.53	6.63	4.52
France	2.33	2.41	2.15	1.13	4.15
Germany	2.58	3.36	1.71	1.74	4.15
Italy	3.01	3.95	3.02	1.56	3.52
Netherlands	2.65	2.94	1.10	2.28	5.64
Norway	5.02	3.73	3.85	4.47	9.96
Spain	4.75	4.85	4.81	1.72	8.64
Sweden	2.94	2.42	2.20	3.37	4.55
United Kingdom	2.77	3.29	2.71	2.86	1.99
United States	1.49	2.06	1.24	1.11	1.61

Source: IEWB database.

Every country considered in our sample had returned to their 2008 peak index value for wealth stocks by 2011. Most countries surpassed their 2008 peak values in 2009. The only countries that took slightly longer were Spain (two years), the United Kingdom (two years) and Australia (three years).

E. Trends in the Economic Equality Domain

The third domain of the Index of Economic Well-Being is economic equality. At current levels in all countries, a fall in equality, or rise in inequality, is considered to decrease economic well-being and vice versa. The equality domain consists of two component concepts: income inequality and poverty. We measure income inequality using the Gini coefficient, which we computed for the total population of family units (including unattached individuals) based on after-tax equivalent income data.[20]

To measure poverty, we use poverty intensity, which is the product of the poverty rate and the poverty gap. The poverty line is defined as fifty per cent of the median family income, while the poverty rate is the proportion of persons whose income is below the poverty line, and

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[20] In general, data on income inequality and poverty for European countries are obtained from the Luxembourg Income Study for the 1980-1994 period and from Eurostat for the 1995-2014 period. There are minor differences in data availability at the country level. For specifics, see the accompanying database. Data on income inequality and poverty for Canada are obtained from Statistics Canada's Canadian Income Survey available through CANSIM. Data for Australia for 1980-2000 are from the Luxembourg Income Study; for 2001-2013, the estimates were calculated using microdata based on the Household, Income and Labour Dynamics in Australia Survey. The estimation procedure is provided in Andrews and Thomas (2015). Data for 2014 in Australia were assumed to be equal to the values in 2013. Data for the United States are from the Luxembourg Income Study for 1980-1994; for 1995-2014, the estimates were calculated using microdata from the Annual Social and Economic Supplement to the Current Population Survey. The estimation procedures is provided in Andrews, Palesch and Thomas (2015). These data sources apply to all income inequality and poverty statistics, including those for the elderly and single-parent families in the economic security domain of the IEWB.

the poverty gap is the average per cent difference between the poverty line and the incomes of those in poverty.

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. Inequality

In 2014, the Gini coefficient was greatest for the United States at 0.397, followed by Spain and Australia at 0.347 and 0.338, respectively (Chart 18). The Nordic social democracies had the lowest measured inequality: Norway had a Gini coefficient of 0.235, followed by Sweden and Finland with coefficients of 0.254 and 0.256. Belgium and the Netherlands rounded out the top 5 with coefficients of 0.259 and 0.262 respectively.

Over the 1980-2014 period, only one country – France – achieved a reduction in economic inequality (0.028 points or 8.9 per cent) (Chart 19). Every other country saw increases in their Gini coefficient. In terms of growth, Sweden experienced the greatest increase in the income gap: its Gini coefficient grew by 0.054 points or 27.1 per cent over this 35-year period. In absolute terms, the United States saw the largest increase at 0.085 points – however given its relatively high Gini coefficient in 1980, this only represents a 26.3 per cent growth in inequality.

Between 2008 and 2014, the Gini coefficient was reduced in six countries out of fourteen. This compares to one in the 1980-2008 period. The largest absolute reduction was seen in the United Kingdom at 0.023 points or 6.79 per cent, followed by Norway and the Netherlands both at 0.016 points, or 6.38 per cent and 5.07 per cent respectively. The greatest absolute increase was seen in Spain at 0.028 points or 8.78 per cent, followed by Denmark at 0.026 points or 10.36 per cent.

Chart 18: Gini Coefficient Based on Family Unit After-Tax Equivalent Income, 1980, 2008, 2014
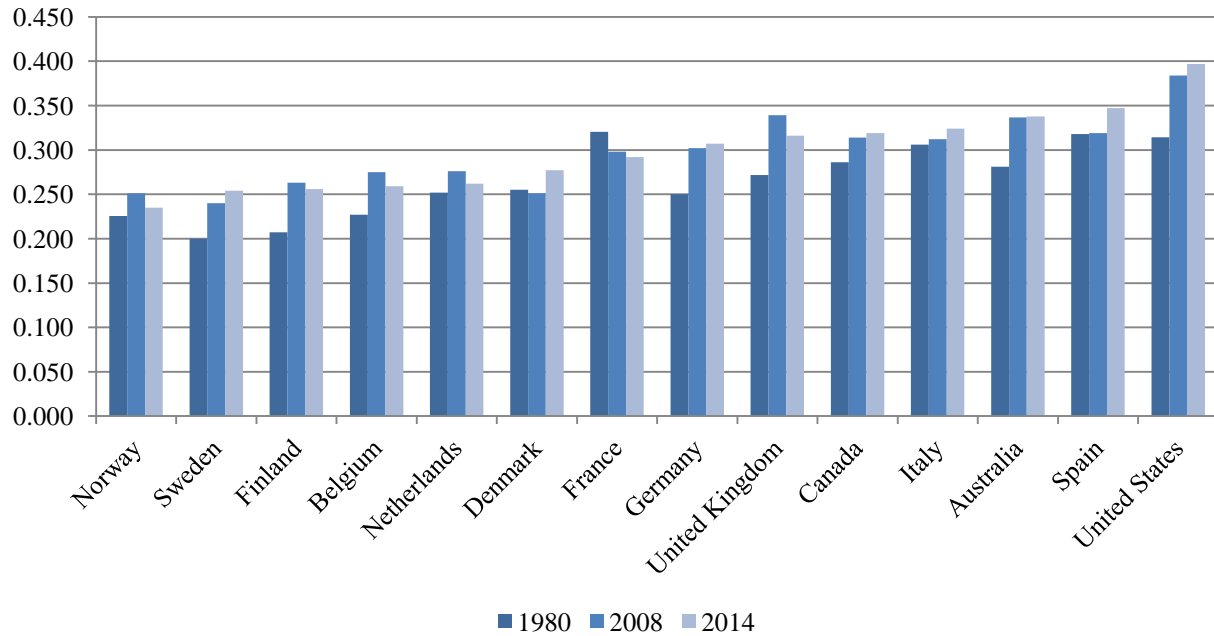
■ 1980 ■ 2008 ■ 2014

Source: Table 3

Chart 19: Change in the Gini Coefficient, 1980-2014 and 2008-2014

■ 1980-2014 ■ 2008-2014
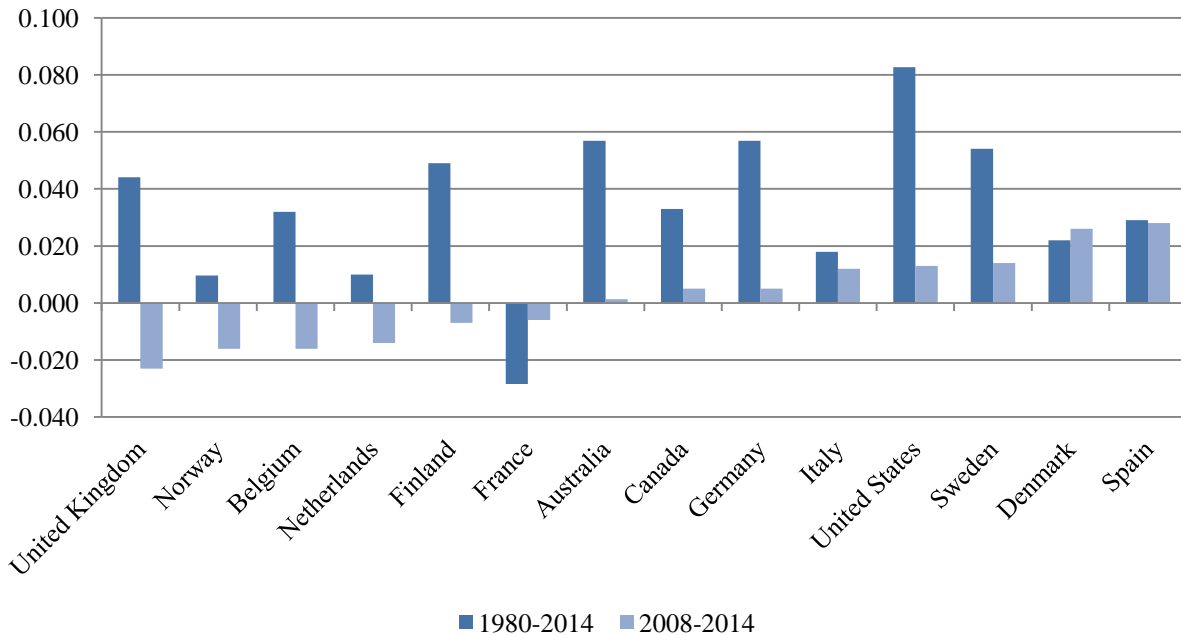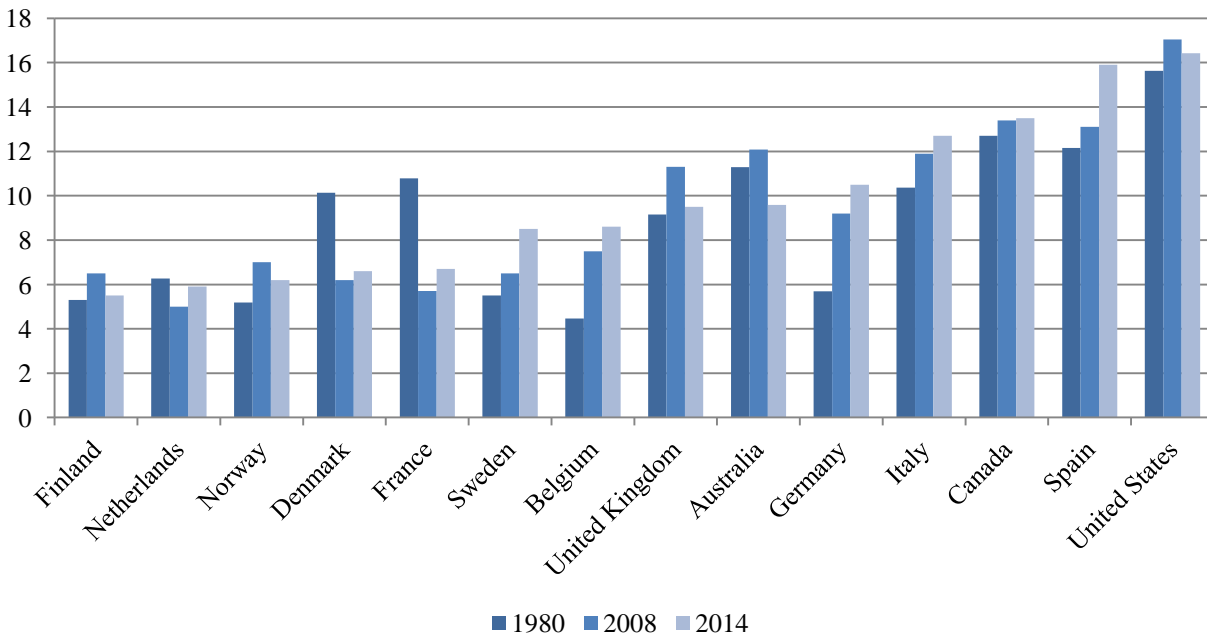
Source: Table 3

ii. Poverty

The United States had the highest poverty rate in 2014 of the fourteen countries in the IEWB sample of OECD countries, with 16.4 per cent of the total population defined as poor (Chart 20). Spain and Canada followed, with poverty rates of 15.9 and 13.5 per cent,

respectively.[21] Considering the fact that the United States had the highest per capita income and consumption flows, its high poverty rate has to be attributed to a very unequal distribution of income (as reflected in its high Gini coefficient). This is supported by the fact that the Nordic countries, which had some of the lowest Gini coefficient values, also had some of the lowest poverty rates, over 8-10 percentage points lower than the poverty rate of the United Sates. In particular, four of the six countries with the lowest poverty rates are Nordic. The lowest poverty rates belonged to Finland, the Netherlands, and Norway, which had rates of 5.5 per cent, 5.9 per cent and 6.2 per cent, respectively.

Over the 1980-2014 period, four countries experienced falling poverty rates: Australia, Denmark, France and the Netherlands. On the other end of the spectrum, Belgium and Germany led the pack increasing 4.14 percentage points and 4.82 percentage points, or 1.95 per cent per year and 1.82 per cent per year over the period. Surprisingly, Sweden also had a significant increase in its overall poverty rate – 3.00 percentage points, or 1.29 per cent per year. As the poverty rate depends not only on the distribution of income but also on economic growth which increases income, the growth of poverty rates over the sub-periods greatly varied with the changing economic conditions in the countries.

Between 2008 and 2014, five countries experienced falling poverty rates: Australia, the United Kingdom, Finland, Norway, and the United States. The largest decreases in terms of growth rates were seen in Australia (3.8 per cent per year), while the largest increases were swwn in Sweden (4.6 per cent per year).

Chart 20: Poverty Rate for All Persons, Selected OECD Countries, Per Cent, 1980, 2010, 2014
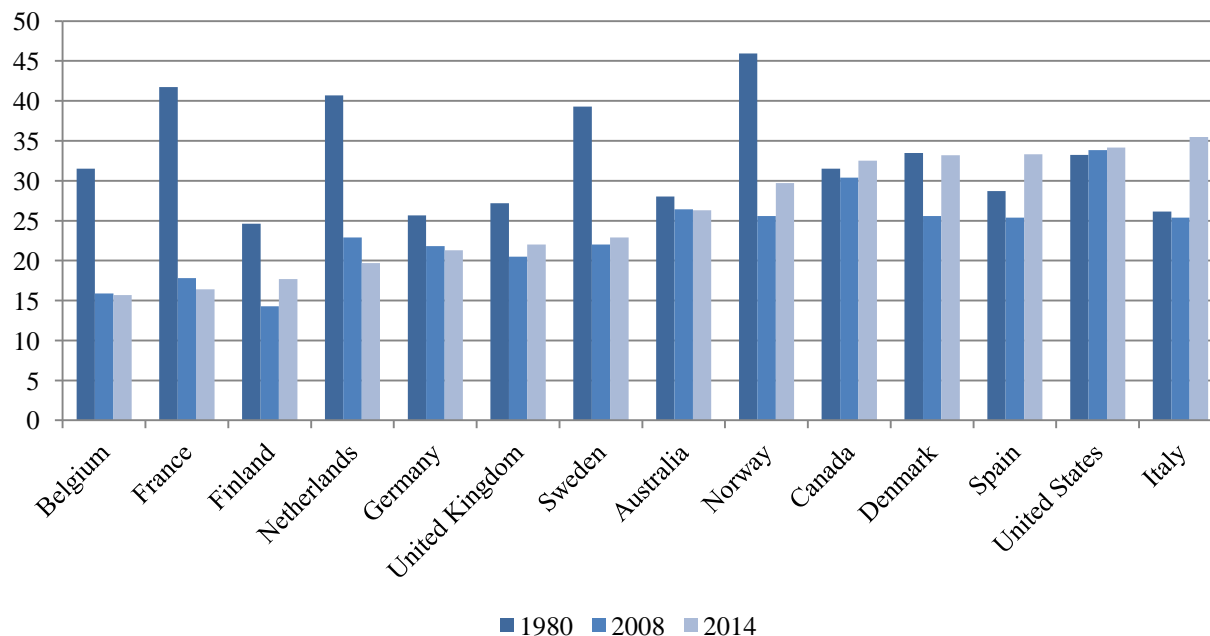

Source: Table 3

The poverty gap is the average difference between the poverty line and the incomes of individuals living below the poverty line. In this report, we express it as a percentage of the poverty line. In 2014, the poverty gap was greatest in Italy, at 35.5 per cent (Chart 21). The United States followed with a poverty gap of 34.2 per cent. The smallest poverty gaps were in Belgium and France, at 15.7 per cent and 16.4 per cent, respectively.

Over the 1980-2014 period, most countries experiences decreases in their poverty gaps. Only four countries experienced increases. The greatest increase was in Italy, where the poverty gap grew by 10.1 percentage points, or 35.86 per cent. Among countries in which the poverty gap declined, the greatest improvement was 25.3 percentage points, or 60.3 per cent, in France. The Netherlands' and Belgium's poverty gaps also decreased impressively, shrinking 51.6 per cent and 50.2 per cent, respectively. In absolute terms, the poverty gap decreased 21.0 percentage points in the Netherlands and 15.8 percentage points in Belgium.

Chart 21: Poverty Gap for All Persons, Selected OECD Countries, Per Cent, 1980, 2008, 2014

Source: Table 3

Between 2008 and 2014, only five countries saw their poverty gap decrease, namely Australia, Belgium, France, Germany, and the Netherlands. The greatest absolute decrease was in the Netherlands at 3.20 percentage points or 13.97 per cent. The remaining nine countries in our sample saw increases in their poverty gap during this period. The largest absolute increase was seen in Italy (10.1 percentage points or 39.76 per cent), followed by Spain and Denmark at 7.9 percentage points (31.10 per cent) and 7.6 percentage points (29.69 per cent).

Poverty intensity is defined as the product of the poverty gap and the poverty rate (also multiplied by a constant). Due to its extremely high poverty rate, and its moderately high poverty gap, the United States had the highest poverty intensity in 2014. Conversely, Finland was among the countries with the lowest poverty gaps and poverty rates, and therefore had the lowest poverty intensity in 2014.

Chart 22: Total Change in Poverty Intensity, 1980-2014 and 2008-2014
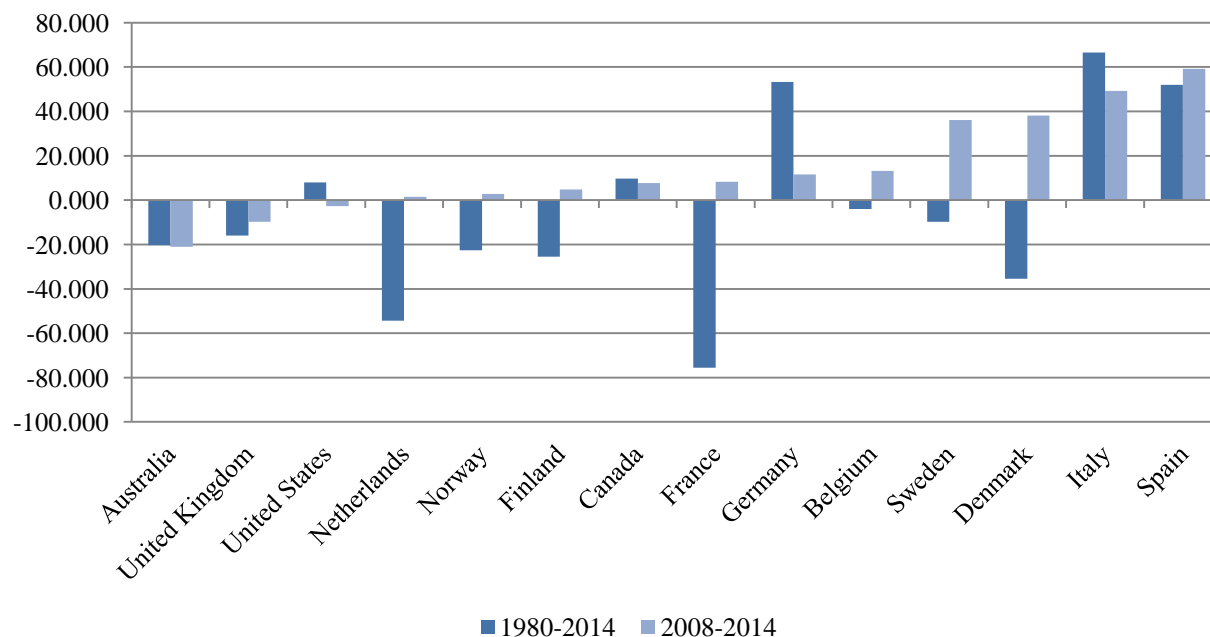
Source: Table 3

The trends of poverty intensity are the result of the trends of the two constituent parts. During our 35-year period of observation, nine countries saw their poverty intensity measure decrease. Due to the considerable drop in its poverty gap and poverty rate, French poverty intensity declined by 75.57 per cent – the largest drop of the 14 countries studied (Chart 22). On the other hand, due to its considerable increase in the poverty gap, Italy's poverty intensity grew by 66.54 per cent.

Over the 2008-2014 period, eleven countries saw increases in their poverty intensity measure. Spain's poverty intensity increased the most (59.12 per cent) because its poverty gap increased the fastest over this period. On the other end of the spectrum, three countries saw declines in their poverty intensity during this 7-year period: Australia, the United Kingdom and the United States. Australia's poverty intensity decreased the most (21.03 per cent), which is unsurprising given its decline in both its poverty rate and poverty gap.

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 2014, Finland had the highest economic equality score, at 0.808 (Chart 23). The United States was the country with the least equality by far: its index score of 0.165 was only 66 per cent of the next lowest score (Spain with 0.250). Canada ranked eleventh among the fourteen countries with a score of 0.377.

Economic equality increased in only five countries over the 1980-2014 period. The most progress among them was made by France, where the index of equality grew 0.395 points, or

108.65 per cent, from 1980 to 2014. Spain, the United States, and Italy experienced the greatest setbacks in terms of equality with declines of 0.224 points, 0.130 points, and 0.212 points respectively.

Chart 23: Index of Economic Equality, Selected OECD Countries, Per Cent, 1980, 2008, 2014
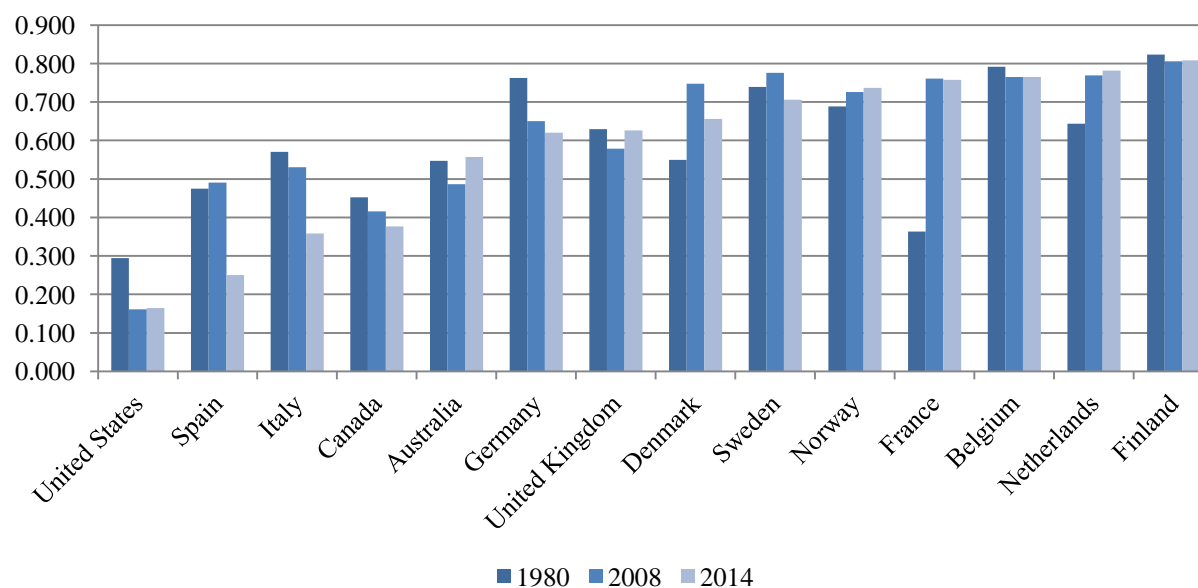
Source: Table 3

Over the 2008-2014 period, six countries saw increases in their index of economic equality, while eight countries saw declines. Australia saw the greatest increases (0.071 points or 14.55 per cent), while Spain saw the largest declines (0.240 points or 49.00 per cent). Italy and Denmark also saw large declines of 0.172 points and 0.092 points (32.44 and 12.27 per cent) respectively. Chart 23 clearly shows the Mediterranean and the Anglo-Saxon countries in our sample performed much worse in 1980, 2008 and 2014 than the Continental and the Nordic countries in our sample.

Table 5: Growth Rates of the Equality Domain, 1980-2014

	1980-2014	1980-1989	1989-2000	2000-2008	2008-2014
Australia	0.05	-1.02	0.28	-0.70	2.29
Belgium	-0.10	0.49	-1.11	0.55	-0.01
Canada	-0.54	2.45	-2.69	-0.04	-1.63
Denmark	0.52	0.51	3.13	-0.95	-2.16
Finland	-0.05	-0.07	0.45	-0.80	0.05
France	2.19	3.52	3.62	0.45	-0.06
Germany	-0.61	-0.36	0.77	-2.61	-0.78
Italy	-1.36	0.85	-1.58	0.32	-6.33
Netherlands	0.58	-0.38	1.60	0.49	0.27
Norway	0.20	1.20	-0.82	0.44	0.26
Spain	-1.87	1.93	0.20	-1.99	-10.62
Sweden	-0.13	-1.63	0.71	1.51	-1.56
United Kingdom	-0.01	-4.36	2.87	0.07	1.34
United States	-1.69	-6.51	4.13	-5.36	0.36

Source: IEWB database.

Table 5 shows the growth rate of the equality index over the 1980-2014 period broken down into peak-to-peak business cycles. There was no overall trends for these fourteen countries – in all four peak-to-peak business cycles considered, some countries saw increases in their equality, while other saw declines. In addition, there is no consistency in which period had the strongest or weakest growth for the majority of countries.

Six countries had still not regained their 2008 peak values by 2014 (Sweden, Spain, Italy, France, Denmark and Belgium). This suggests that the Great Recession may have had longer lasting impacts on the index of equality in these six countries than in the other eight countries. The other eight countries had surpassed their 2008 peak value by 2009 or 2010.

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.[22] The domain consists of 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.

i. Risk from Unemployment

Risk imposed by unemployment is determined by two variables: the unemployment rate and the proportion of earnings that are replaced by unemployment benefits.[23] Each of these measures is scaled, and then summed with weights of 0.8 and 0.2, respectively. This weighted sum is the unemployment component of the security index.

a. Unemployment Rate

In 2014, the lowest standardized unemployment rate was in Norway, where 3.52 per cent of the labour force was unemployed (Chart 24). Norway was followed by Germany and Australia, which had unemployment rates of 4.98 and 6.07 per cent, respectively. Spain had the highest unemployment rate of 24.44 per cent, followed by Italy at 12.68 per cent.

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[22] For a discussion of the role of economic security in the index of economic well-being and an assessment of the CSLS approach to the measurement of economic security, see Heslop (2009).

[23] In our estimates of the Index of Economic Well-Being for Canada and the provinces (Thomas and Uguccioni, 2016), security from unemployment is also determined by the unemployment insurance coverage rate (the proportion of the unemployed who receive unemployment insurance benefits). The unemployment component of the economic security domain is a weighted sum of the scaled unemployment rate and the scaled product of the unemployment insurance coverage and replacement rates, with eighty per cent of the weight assigned to the unemployment rate. Data limitations prevent us from using the coverage rate in our international estimates.

Chart 24: Unemployment Rate, Selected OECD Countries, Per Cent, 1980, 2008, 2014
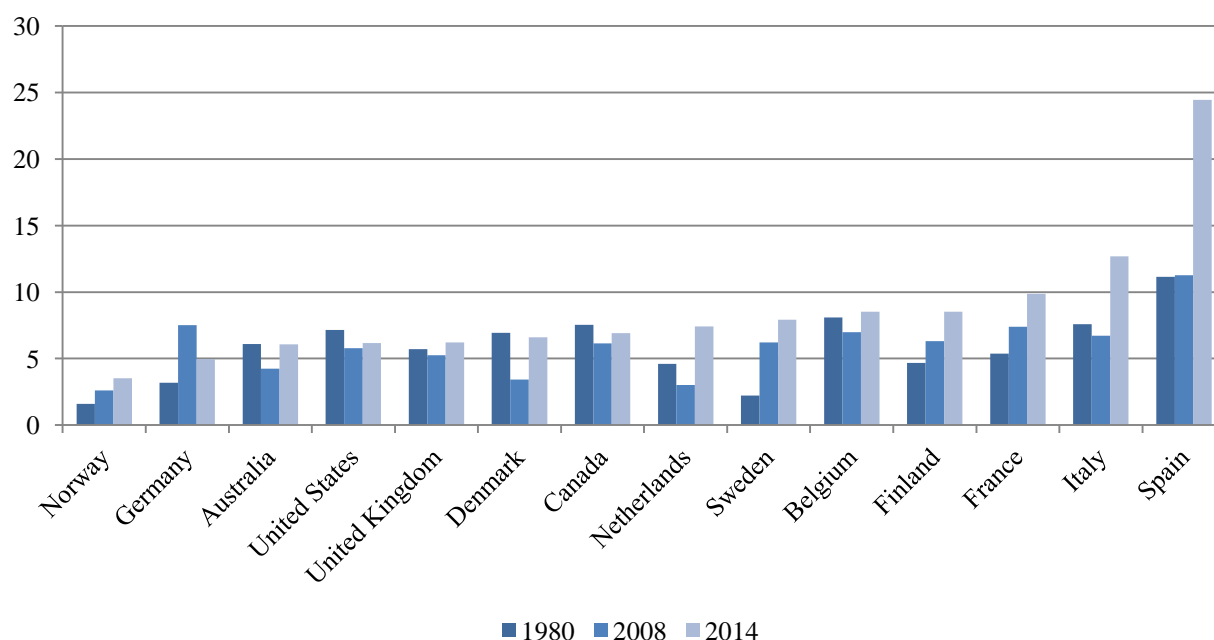
Source: Table 4

Over the 1980-2014 period, the standardized unemployment rate decreased in four countries (and increased in ten countries). It decreased the most in the United States where the unemployment rate fell by 0.97 percentage points, or 13.29 per cent, from 7.14 per cent to 6.17 per cent. The two countries to experience the greatest increases in their unemployment rates were Spain and Sweden. Spain's unemployment rate grew 13.30 percentage points (119.32 per cent) while Sweden's unemployment rate increased by 5.70 percentage points (256.27 per cent). The higher per cent increase in Spain reflects the low base.

Between 2008 and 2014, unemployment rates fell in only one country: Germany. The decline in this country was quite significant: 2.54 percentage points, or 33.75 per cent. The greatest increase during this six year period was in Spain, which saw unemployment rates rise by 13.19 percentage points, or 117.17 per cent. Italy saw the next largest increase at 5.96 percentage points, or 88.64 per cent.

b. Unemployment Insurance Replacement Rate

The unemployment insurance replacement rate is defined as the share of labour earnings replaced by unemployment insurance.[24] It is computed as an average replacement rate for two earnings levels, three family situations, and three durations of unemployment (Martin, 1996). The proportion of income replaced by unemployment benefits was greatest in Sweden in 2014 at

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[24] The IEWB switched from using the traditional Average Production Wage (APW) to the Average Wage (AW) model since the previous report because of data availability issues (Osberg and Sharpe, 2011). This has greatly affected the replacement rate levels. One notable case is Italy, where replacement rates are 9.0 per cent in 2005 under the AW model, while they are 33.0 per cent under the APW model. For details on data availability and the linkage of the two time series, see the accompanying database.

37.47 per cent (Chart 25).[25] Sweden was followed by Belgium, which had a replacement rate of 37.19 per cent. Italy had the lowest replacement rate at 10.98 per cent, followed by the United Kingdom at 11.71 per cent.

Chart 25: Unemployment Insurance Gross Replacement Rate, Selected OECD Countries, Per Cent, 1980, 2008, 2014
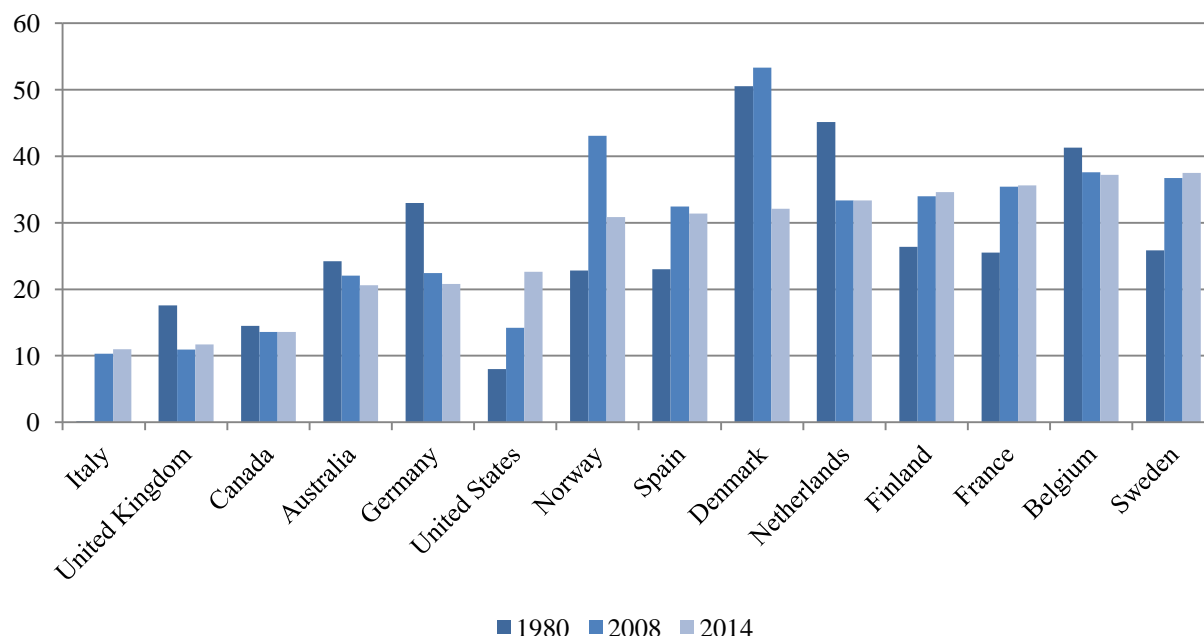
Source: Table 4

Over the 1980-2014 period, the replacement rate increased in half of the fourteen countries. By far the greatest positive growth occurred in the United States, where the replacement rate grew by 14.59 percentage points from 8.02 per cent in 1980 to 22.61 per cent in 2014. The next largest increase was in Sweden with an 11.64 percentage point change. The largest decline was in Denmark, where the rate fell by 18.38 percentage points from 50.49 per cent in 1980 to 32.11 per cent in 2014.

Between 2008 and 2014, the replacement rate increased the fastest in the United States (8.40 percentage points). It also increased in six other countries. The seven remaining countries saw declines in their replacement rates. The greatest fall was seen in Denmark (21.18 percentage points), while the smallest fall was seen in Canada (0.03 percentage points).

c. Overall Security from Unemployment

In order to obtain the measures of scaled unemployment protection, the replacement rates and the unemployment rates of all countries are scaled, then multiplied by 0.2 and 0.8 respectively, and finally summed together. Due to the fact that it had both a high replacement rate and a low unemployment rate, Norway had the highest scaled level of protection from unemployment in 2014 at 0.780 points, followed by the Netherlands at 0.779 (Chart 26). On the

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[25] Data on the unemployment insurance replacement rate are available to 2011. Values for 2012-2014 are assumed to be equal to the 2011 values.

opposite end, mostly due to its high unemployment rate, Spain had the lowest scaled level of protection from unemployment at 0.211 points.

Chart 26: Index of Security from the Risk of Unemployment, Selected OECD Countries, Per Cent, 1980, 2008, 2014

■ 1980 ■ 2008 ■ 2014
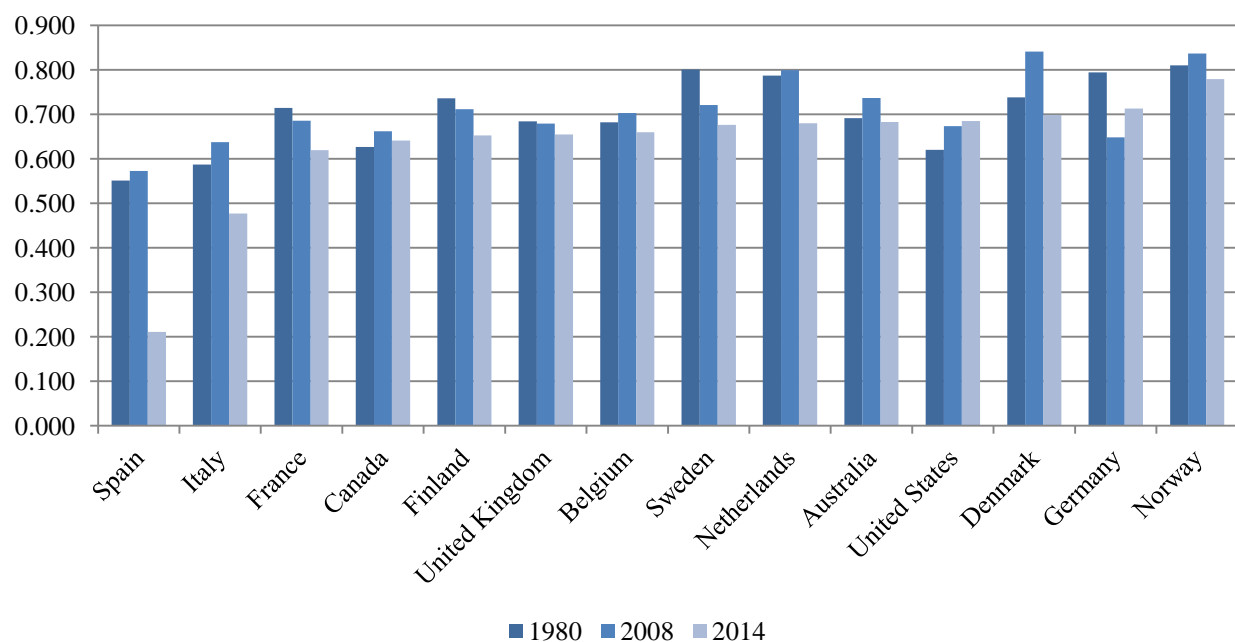
Source: Table 4

Between 1980 and 2014, the unemployment protection index fell for twelve of the fourteen countries. Spain experienced the greatest decline, falling 0.340 points, or 61.66 per cent. Two countries, Canada and the United States, saw their indexes rise by 0.014 points and 0.065 points respectively. The growth pattern of the index over the sub-periods very closely followed the growth of the unemployment rate, which is unsurprising given the weight that is applied to this variable in the index.

Over the 2008-2014 period, two countries saw their respective index of security from the risk of unemployment increase (the United States by 0.012 and Germany by 0.065). All other countries saw their indices decline. The largest decrease was seen in Spain, whose index fell 0.361 points. The next largest decline was seen in Italy at a much smaller 0.160 points.

ii. Financial Risk from Illness

The second component of the economic security domain is the financial risk imposed by illness. In almost all countries included in this study, health care deemed medically necessary by hospitals and doctors' offices is provided free of charge to all citizens through public medical care programs. In this sense the financial risk imposed by illness is much less than in countries which historically have not had such universal coverage, like the United States.[26] But there is still significant private expenditure on health care in public medical care countries, and these expenditures have been rising rapidly.

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[26] Obamacare was introduced in 2014 and is similar to a universal coverage program.

The measure of health spending in this report includes dental care, drugs taken outside hospitals, unlisted medical services such as acupuncture, and delisted medical services (physiotherapy and vision care are examples of various medical services that have been recently delisted in certain jurisdictions, like Canada). It also includes procedures considered personally desirable though medically unnecessary, such as plastic surgery.

An increase in the share of expenditures on healthcare in personal disposable income will be considered as deterioration in economic security, as increased private health expenditures are usually brought about by poor health and thus represent a growing financial burden for low income persons.

Chart 27: Private Health Care Expenditures as a Proportion of Personal Disposable Income, Selected OECD Countries, Per Cent, 1980, 2008, 2014
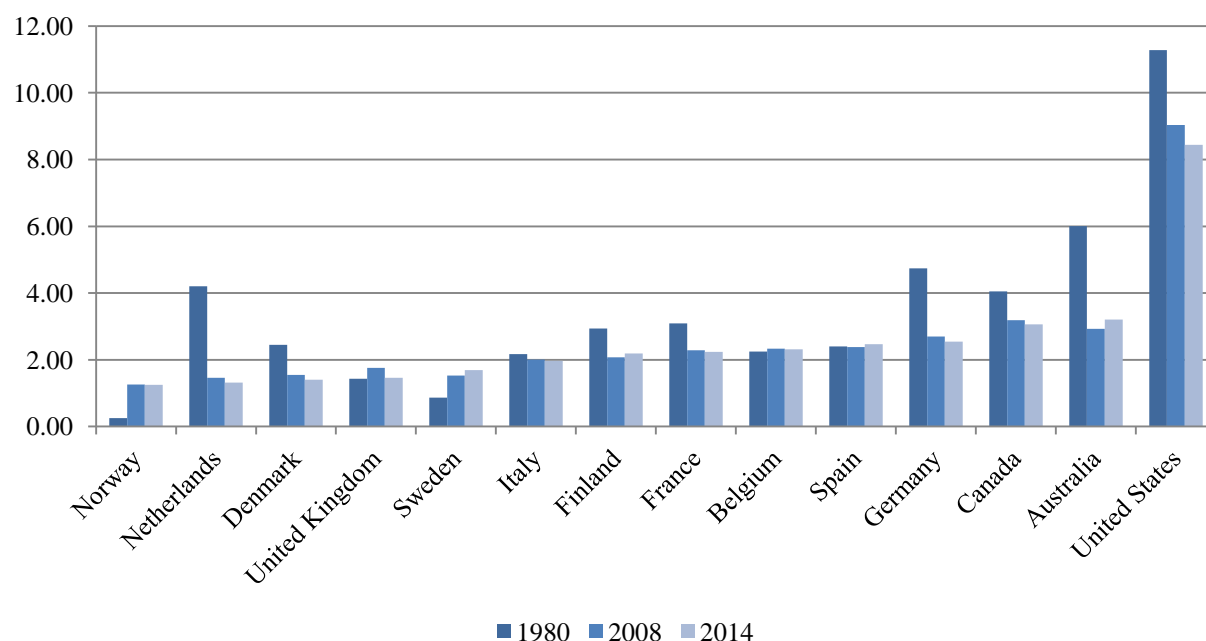
Source: Table 5

In 2014, the highest share of private expenditure on healthcare in personal disposable income was 8.44 per cent in the United States, giving it the smallest scaled protection from illness value of 0.297 points (Chart 27).[27] The United States, being the only country without a comprehensive universal medical coverage program, was far ahead of all other studied countries in terms of private expenditures on healthcare. Norway had the lowest medical expenses as a share of personal disposable income, 1.25 per cent, giving it a scaled index value of 0.839 points.

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[27] Data on private health care expenditures are from the OECD Health Database. For details on data availability and the estimation procedure used, see the accompanying database. OECD health data are for private expenditures on health care. Private expenditure on health care includes out-of-pocket payments (both over-the-counter and cost-sharing), private insurance programmes, charities and occupational health care. These payments can be for hospitals, nursing and residential care facilities, providers of ambulatory health care, retail sale and other providers of medical goods, provision and administration of public health programmes, general health administration and insurance, other industries (rest of economy), and rest of world as health care provider.

From 1980 to 2014, medical expenses as a share of personal disposable income fell for nine of the fourteen countries. In absolute terms, the Netherlands fell the most, dropping 2.88 percentage points, or 68.55 per cent (leading to a 35.18 per cent improvement in its scaled security from illness index).

Over the 2008-2014 period, four countries saw their share of medical expenses in personal disposable income rise: Australia, Finland, Spain, and Sweden (0.27 percentage points, 0.11 percentage points, 0.09 percentage points, and 0.16 percentage points respectively). Every other country saw their share of medical expenses in personal disposable income fall. The greatest fall was in the United States at 0.59 percentage points, followed by the United Kingdom at 0.30 percentage points.

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 into poverty), the poverty rate for lone parent-headed families and the poverty gap for these families. As in the economic equality domain, the poverty line is defined as fifty per cent of median after-tax equivalent income. The poverty rate is the proportion of lone parents with young children whose income is below the poverty line. The poverty gap is the average per cent difference between the poverty line and the incomes of the single parents whose incomes are below the poverty line.

a. Divorce rate

In 2014, Denmark had the highest divorce rate for married couples, 3.37 per 1,000 inhabitants (Chart 28).[28] The United States followed Denmark with a divorce rate of 3.20 per 1,000 inhabitants. The lowest divorce rate was in Italy (perhaps due to more traditional or religious values), 0.86 per 1,000 inhabitants, one quarter of the Danish rate. The divorce rate in Canada was 2.11 per 1,000 inhabitants in 2014, sixth highest among the fourteen countries.

Over the 1980-2014 period, divorce rates grew in ten of the fourteen countries. The largest proportional increases were 310.44 per cent in Italy and 259.31 per cent in Spain; these were the countries with the two lowest divorce rates in 1980, so it is unsurprising that they experienced the largest per cent increases. Similarly, the largest decline of the period was 38.70 per cent in the United States, which had the highest divorce rates in 1980.

Over the 2008-2014 period, divorce rates declined in nine of the fourteen countries. The steepest declines were 25.51 per cent in Belgium and 15.05 per cent in Spain. The largest increase over this period was seen in Denmark at 25.70 per cent (0.69 percentage points).

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[28] Data on divorce rates are from the UN Demographic Yearbook unless otherwise stated in the database. For details on the most recent year of data availability for each country, see the accompanying database.

**Chart 28: Divorce Rate, Selected OECD Countries, Incidence per 1,000 Inhabitants, 1980, 2008, 2014**
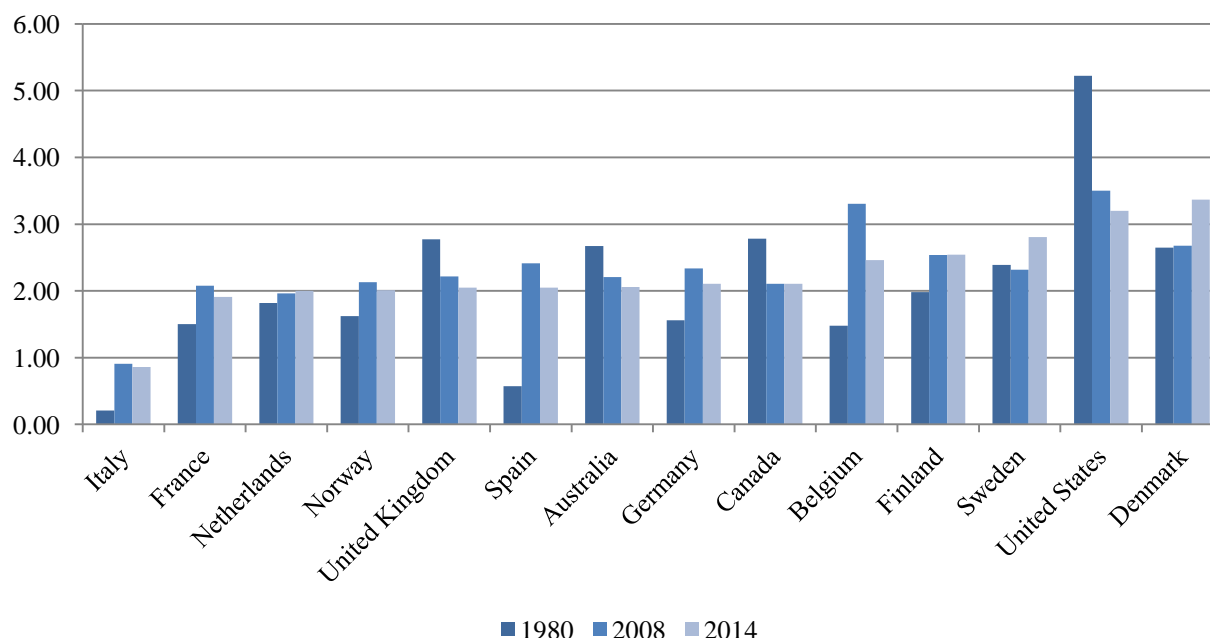
Source: Table 6

b. Poverty

The poverty rate for single parents with children in 2014 was greatest for the United States at 40.25 per cent (Chart 29). Canada had the second highest poverty rate, at 34.00 per cent. Similar to the ranking of the general poverty rate, the poverty rate for single parents with children was lowest in Denmark (essentially non-existent at 0.90 per cent), Finland (at 7.10 per cent) and the Netherlands (at 11.00 per cent).

The poverty rates for single parents with children increased in six out of fourteen countries over the 1980-2014 period. The greatest growth was experienced by Spain, where the rate increased by 15.97 percentage points, from 17.53 per cent in 1980 to 33.50 per cent in 2014. Among the countries in which the poverty rate fell, the greatest decline was in Australia; its poverty rate fell by 15.77 percentage points. Although they had the two highest single parent poverty rates in 2014, both Canada and the United States experienced declines in their rates (by 9.40 percentage points and 2.60 percentage points, respectively) over the 1980-2014 period.

Similarly to the overall period between 1980 and 2014, six out of fourteen countries saw increases in their poverty rates for single parents with children over the 2008-2014 period. Sweden saw the greatest increase in the poverty rate for single parents with children (7.00 percentage points), followed by France at 6.70 percentage points. No other country saw increases near this magnitude. However, the United Kingdom saw massive declines over this seven year period from 24.60 per cent to 12.60 per cent (12.00 percentage points).

Chart 29: Poverty Rate for Single Parents with Children Under 18, Selected OECD Countries, Per Cent, 1980, 2008, 2014
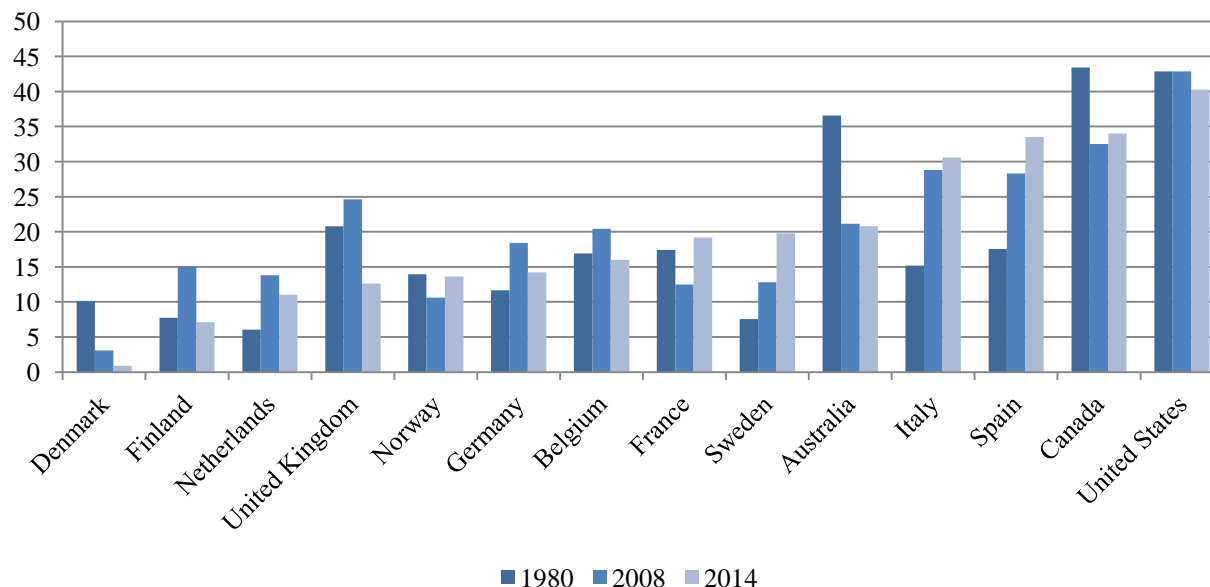
Source: Table 6

The poverty gap in 2014 for single parent headed families with children was greatest in the Spain at 40.86 per cent, followed by Italy at 39.30 per cent (Chart 30). The lowest poverty gaps were 20.79 per cent in the United Kingdom and 21.68 per cent in Australia. Canada had the fourth highest rate at 31.70 per cent.

Over the 1980-2014 period, the single parent poverty gap fell in nine of the fourteen countries. The largest decline was 21.46 percentage points in Denmark. Out of the five countries that experienced positive growth in their poverty gaps, the largest increase was 11.34 percentage points in Spain. In Canada, the poverty gap fell 6.90 percentage points; this was the fourth largest absolute decline among the fourteen countries.

Chart 30: Poverty Gap for Single Parents with Children, Selected OECD Countries, Per Cent, 1980, 2008, 2014
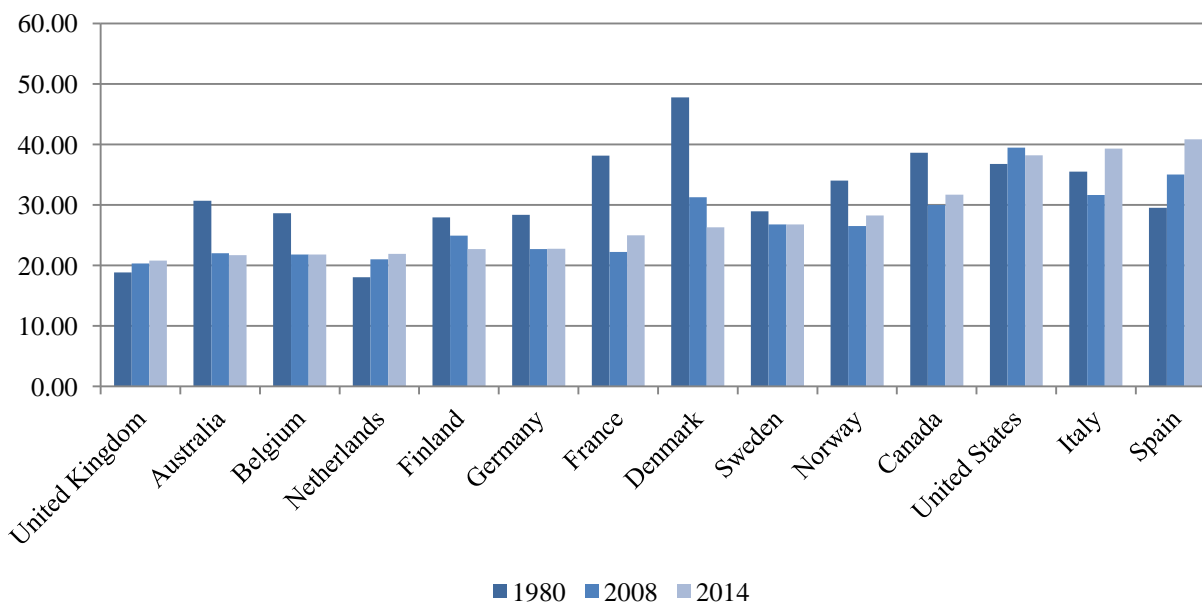
Source: Table 6

Between 2008 and 2014, the poverty gap among single parents with children fell in only four countries. The largest fall was in Denmark (4.93 percentage points or 15.76 per cent). The largest increase was in Italy (7.68 percentage points or 24.29 per cent).

## c. Overall Security from Single-Parent Poverty

The overall measure of the risk imposed by single parent poverty is calculated as the product of the divorce rate, the poverty rate for lone single parent-headed families, and the poverty gap for lone parent-headed families. That measure is then converted into a scaled index. Due to its very low poverty rate, Denmark was the country where single parents were safest from poverty in 2014, with a scaled index value of 0.917 points (Chart 31). The United States had the lowest index score (0.488 points) by a wide margin as the next lowest score was Spain at 0.675 points.

Between 1980 and 2014, half of the fourteen countries considered saw increases in their index of security from single parent poverty, while the other half saw decreases. On the one hand, the United States showed the most improvement; its index grew 149.58 per cent (or 0.292 points). Canada showed the second largest improvement (41.35 per cent). One the other hand, the largest declines occurred in Spain (24.76 per cent or 0.222 points), Sweden (9.74 per cent or 0.085 points), and Italy (8.96 per cent or 0.082 points).

Over the period between 2008 and 2014, eight countries saw increases in their index of security from single parent poverty. The United States saw the largest increase in its measure of security from single parent poverty (0.089 points or 18.15 per cent). The next fastest growing index was in Belgium at 0.054 points or 6.39 per cent. The slowest growing indexes of security

from single parent poverty were found in Sweden and Spain, which shrank 0.061 points (7.75 per cent) and 0.037 points (5.45 per cent) respectively between 2008 and 2014.

Chart 31: Index of Security from Single Parent Poverty, Selected OECD Countries, 1980, 2008, 2014

■ 1980 ■ 2008 ■ 2014
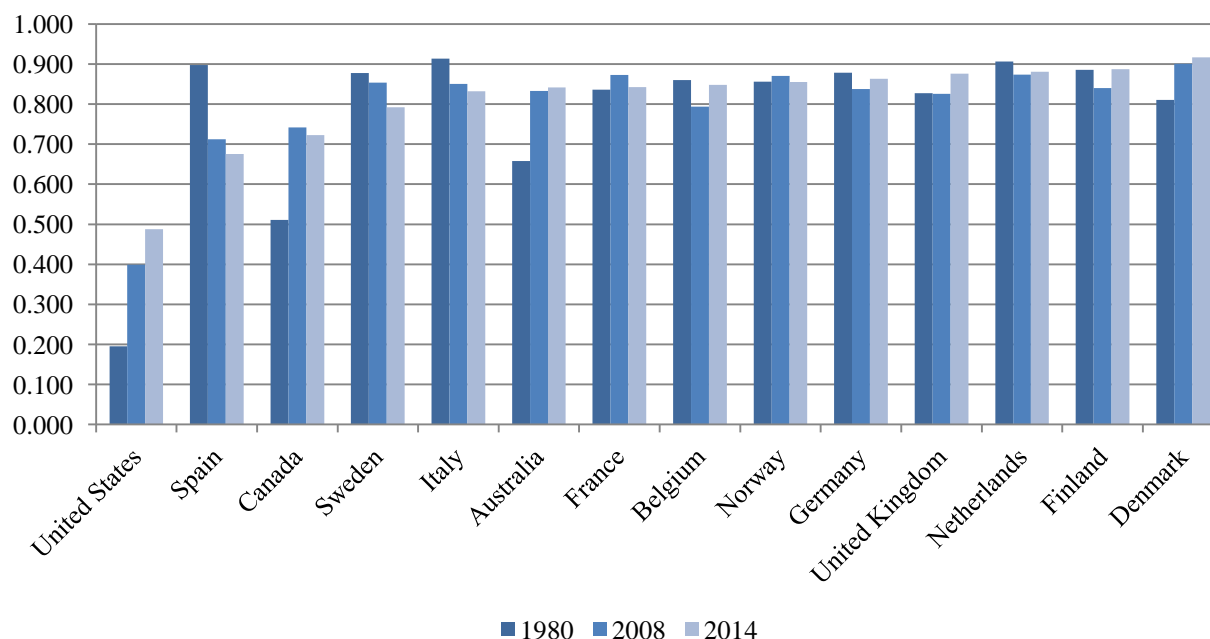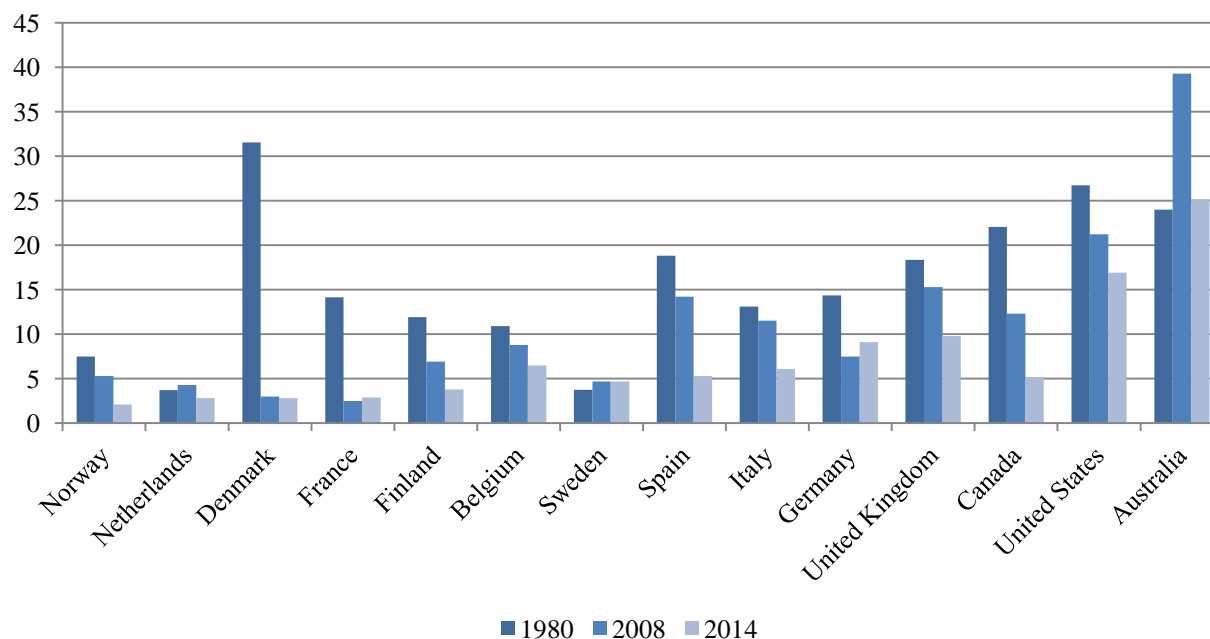
Source: Table 6

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 intensity experienced by households headed by a person 65 years and over.

a. Poverty

In 2014, the elderly poverty rate was greatest in Australia at 25.18 per cent, followed by the United States at 16.90 per cent (Chart 32). The lowest elderly poverty rates were 2.10 per cent in Norway and 2.80 per cent in the Netherlands.

Over the 1980-2014 period, twelve of the fourteen countries sampled experienced decreases in their elderly poverty rates, which implies that only two countries experienced increases in their elderly poverty rates: Sweden and Australia. In absolute terms Sweden saw the most growth at 0.95 percentage points. On the other end of the spectrum, Denmark and France had the largest declines at 28.74 and 19.20 percentage points respectively.

Between 2008 and 2014, eleven countries saw decreases in their elderly poverty rates, while two countries saw increases in their elderly poverty rates: Germany (1.60 percentage points) and France (0.40 percentage points). Of the countries that showed declines, the largest were seen in Australia (14.09 percentage points). One country, Sweden, saw absolutely no change in its elderly poverty rate over this period.

Chart 32: Poverty Rate for Elderly Families, Selected OECD Countries, Per Cent, 1980, 2008, 2014

Source: Table 7

Chart 33: Poverty Gap for Elderly Families, Selected OECD Countries, Per Cent, 1980, 2008, 2014
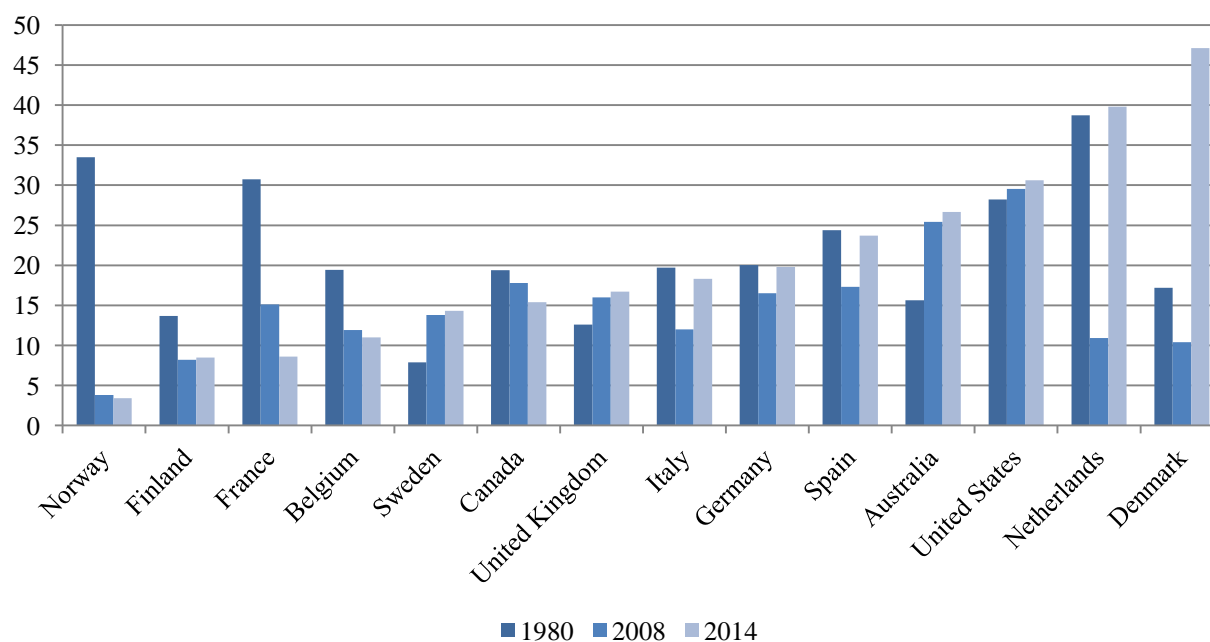
Source: Table 7

The elderly poverty gap ratio was highest in Denmark in 2014 at 47.10 per cent, followed by the Netherlands with a poverty gap ratio of 39.80 per cent (Chart 33). The lowest gap, 3.40 per cent, belonged to Norway.

There were no overall trends in terms of changes in the poverty gap over the 1980-2014 period. Six countries experience increases, while eight countries experienced declines. The greatest absolute increase of 29.90 percentage points was experienced by Denmark. Of the seven countries that experienced drops in the elderly poverty gap, the largest decline was 30.07 percentage points in Norway.

Over the 2008-2014 period, ten out of fourteen countries saw increases in their elderly poverty gap. The largest absolute increase in the elderly poverty gap ratio was in Denmark (36.70 percentage points), followed by the Netherlands (28.90 percentage points). Only four countries saw declines in their elderly poverty gap ratio during this time period. The largest decline was seen in France (6.50 percentage points).

b. Index of Security from Poverty in Old Age

To compute the index of security from the risk of poverty in old age, we calculate poverty intensity (the product of the poverty gap and the poverty rate) and then convert it into a scaled index using the linear scaling procedure.

Residents of Australia were least secure from poverty due to old age in 2014, with the lowest scaled index level of 0.557 (Chart 34). This is unsurprising, since Australia had the highest elderly poverty rate and the fourth-highest elderly poverty gap in 2014.[29] The second most insecure elderly citizenry was in the United States (0.640 points). The country with the greatest security from elderly poverty was Norway, which had a scaled index level of 0.916. France and Finland followed with scores of 0.906 and 0.902 respectively.

Chart 34: Index of Security from Poverty in Old Age, Selected OECD Countries, 1980, 2008, 2014
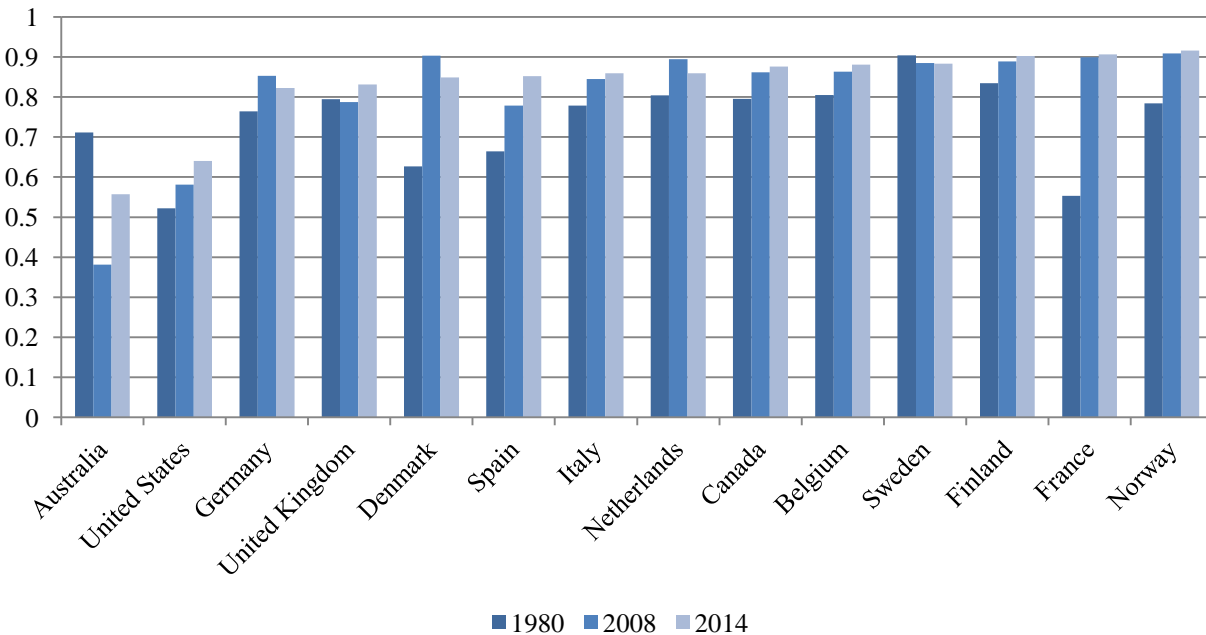
Source: Table 7

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[29] For a discussion of developments in Australia, see Andrews and Thomas (2015).

Twelve countries experienced increases in their scaled security from the risk of elderly poverty over the 1980-2014 period. Australia was the country that experienced the sharpest drop in its index during this 35-year period, losing 0.154 points off its 1980 index level. Most likely due to their drastically declining poverty rates, Denmark experienced the most significant improvements in the index of security from old-age poverty, increasing from 0.627 to 0.848 points (0.221 points).

Over the 2008-2014 period, ten countries saw increases in their scaled security from poverty in old age, while four countries saw declines. Security from poverty in old age declined the most in Denmark (0.054 points or 1.0 per cent per year), which is surprising at first glance given that this country saw the largest increase over the entire time series. However, Denmark's decline can be explained by their large increase in the poverty gap for elderly families during this period. On the other end of the spectrum, the largest increase in security from poverty in old age was seen in Australia where the index increased 0.176 points or 46.19 per cent. This is likely due to the rapid declines in the poverty rate for elderly persons during this time frame.

v. Weighting of the Components in the Index of the 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. The total population (i.e. 100 per cent) is assumed to be subject to financial risk associated with illness. In terms of the risk of single parent poverty, it is proxied by the share of married women with children under 18.[30] Finally, it is assumed that the population aged 45 to 64 is most likely to feel anxiety regarding the risk from poverty in old age.

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.

As a result of demographic shifts, the proportion of the population affected by various risks has changed over time. As a result of ageing, the proportion of the population aged 15-64 years and the proportion of the population aged 45-64 years increased for almost all countries over the 1980-2014 period, while the proportion of married women with children under 18 declined.

The contribution of each component of the security domain index is the product of its scaled value and weight. For example, for Canada in 2014, the weighted scaled security from risk imposed by unemployment was 0.190 (0.641*0.296), the weighted scaled security from risk

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[30] A more appropriate measure would be couples with children, but this data could not be obtained. due to methodological and definitional changes to the Luxembourg Income Study. As a result, it has been kept constant since 2003, 2004 or 2005 for all countries. See the accompanying database for more details.

imposed by illness was 0.306 (0.703*0.436), risk of single parent poverty was 0.105 (0.722*0.145) and risk of poverty from old age was 0.107 (0.876*0.122). The sum of the four components was 0.708, the index value of the overall security domain for Canada in 2014.

vi. Overall Index of the Economic Security Domain

Economic security was the greatest in Norway, with a value of 0.833 points, in 2014 (Chart 35). Norway was followed by Denmark with a value of 0.807 points. The United States had by far the lowest score for economic security at 0.479; the next lowest was 0.590 in Spain. Canada ranked eleventh with a score of 0.708.

Chart 35: Index of Economic Security, Selected OECD Countries, 1980, 2008, 2014
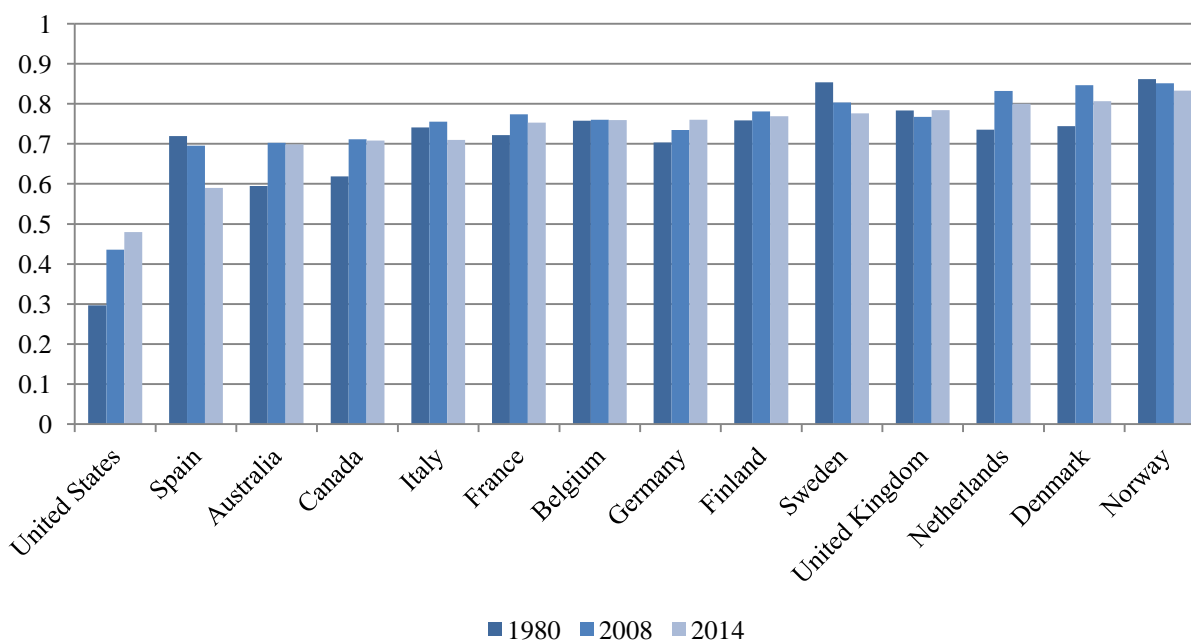
Source: Table 8

Of the fourteen countries considered, four experienced a decline in economic security over the 1980-2014 period (Table 2). Spain and Sweden saw the largest falls in absolute terms, with declines of 0.129 points and 0.078 points, respectively. The United States experienced the greatest positive growth at 0.183 points over the period. Australia and Canada also experienced significant growth in their respective indices of economic security, growing 0.104 points and 0.090 points. Despite this growth, Australia and Canada were still well below all Europeans countries in the sample except Spain.

Over the 2008-2014 period, three countries saw positive growth in their economic security index. The largest growth was again in the United States (0.044 points). The largest declines were in Spain and Italy at 0.105 points and 0.045 points respectively.

Table 6 shows the growth rates of the index of security over the 1980-2014 period broken down into peak-to-peak business cycles. In general, most countries saw positive growth in their

security domain over the 2000-2008 period and negative growth over the 2008-2014 period. The other two periods, 1980-1989 and 1989-2000, showed less consistency across countries.

Table 6: Growth Rates of the Security Domain, 1980-2014

	1980-2014	1980-1989	1989-2000	2000-2008	2008-2014
Australia	0.48	1.01	0.46	0.33	-0.09
Belgium	0.01	0.06	-0.03	0.00	-0.01
Canada	0.40	0.56	0.50	0.40	-0.03
Denmark	0.24	0.08	0.86	0.35	-0.81
Finland	0.04	0.59	-0.57	0.49	-0.25
France	0.12	-0.36	0.52	0.55	-0.45
Germany	0.23	0.15	0.13	0.19	0.56
Italy	-0.12	-0.60	0.07	0.82	-1.02
Netherlands	0.25	0.04	0.45	0.90	-0.65
Norway	-0.10	-0.44	-0.15	0.55	-0.35
Spain	-0.58	-0.37	-0.02	0.02	-2.69
Sweden	-0.28	-0.08	-0.43	-0.09	-0.57
United Kingdom	0.00	-0.45	0.06	0.16	0.36
United States	1.42	1.18	2.65	-0.11	1.60

Source: IEWB database.

Four countries had exceeded their 2008 peak values of the index economic security by 2014 (the United Kingdom, the United States, Germany and Australia). This suggests that the other ten countries' indices of economic security may have been more strongly affected by the Great Recession, as they have still not fully rebounded. Furthermore, this suggests that economic security is recovering more slowly than consumption and wealth (and even equality) at the country level.

III. 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.

We compute the Index of Economic Well-Being under three alternative weighting schemes (Exhibit 5). They are outlined in the table below. The baseline results are those reported in earlier sections of this report, with each domain given equal weight. Alternative 1 keeps the weights for equality and security unchanged, but shifts some of the 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 the economic equality domain, which includes both income inequality and poverty, is set to zero.[31] Alternative 3 was recently suggested by the French business magazine *L'Expansion* (Dedieu, 2009). It assigns high weights to economic equality and security and low weights to consumption and wealth.

Exhibit 5: Weighting Schemes for Sensitivity Analysis

	Weights			
	Consumption	Wealth	Equality	Security
Baseline (Alternative 0)	0.25	0.25	0.25	0.25
Alternative 1	0.40	0.10	0.25	0.25
Alternative 2	$^1/_3$	$^1/_3$	0.00	$^1/_3$
Alternative 3	0.20	0.10	0.40	0.30

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[31] If an emphasis on distributional issues is thought to be 'left-wing', then putting zero weight on such issues might be thought to be an extreme 'right-wing' perspective.

Chart 36: Index of Economic Well-Being under Alternative Weighting Schemes, Selected OECD Countries, 1980-2014
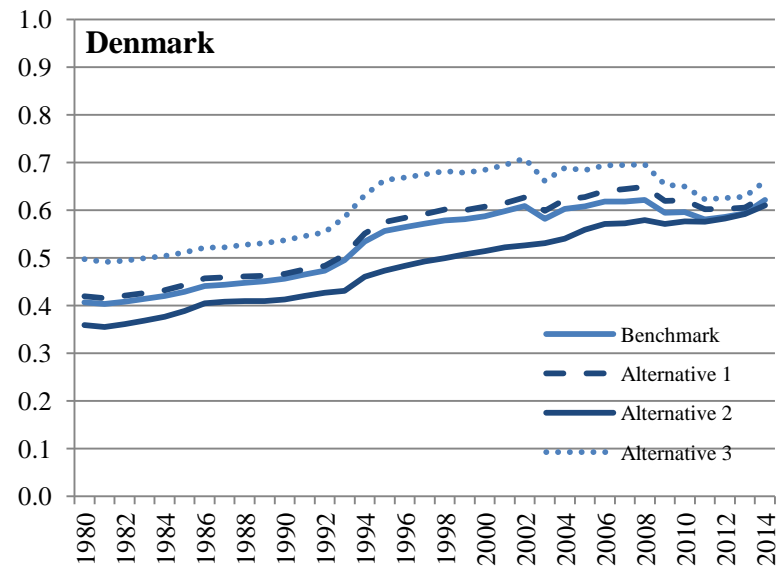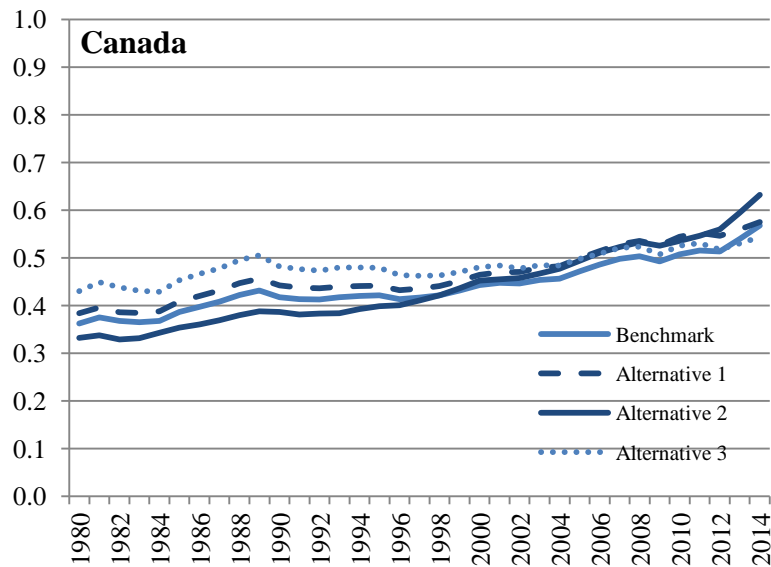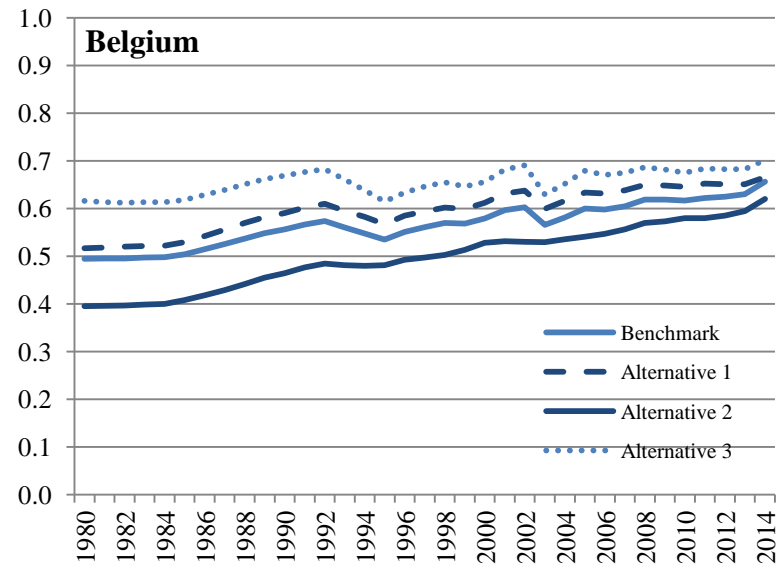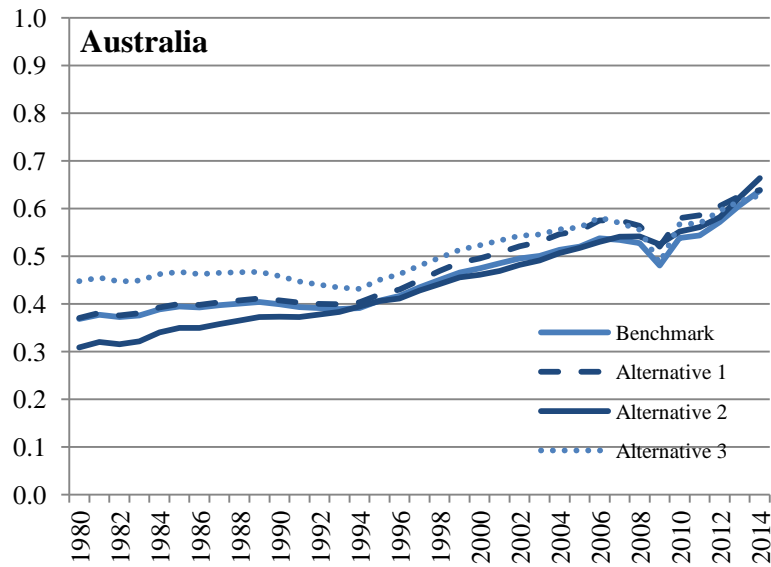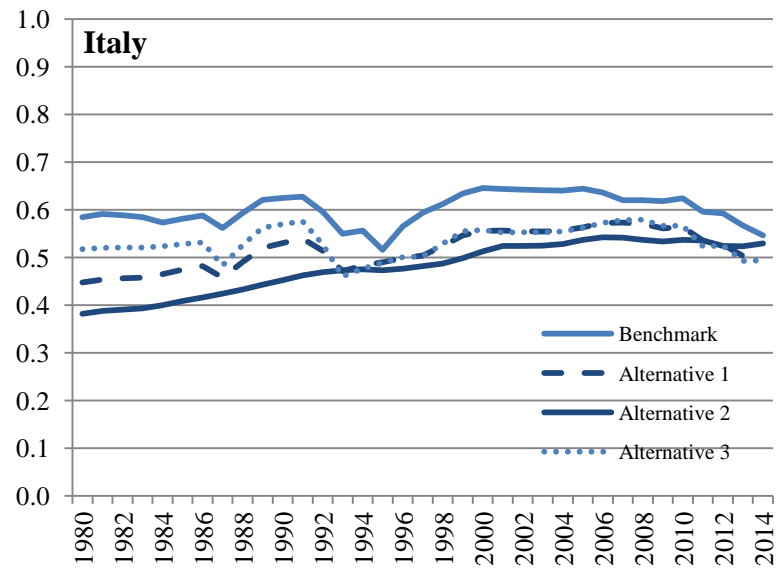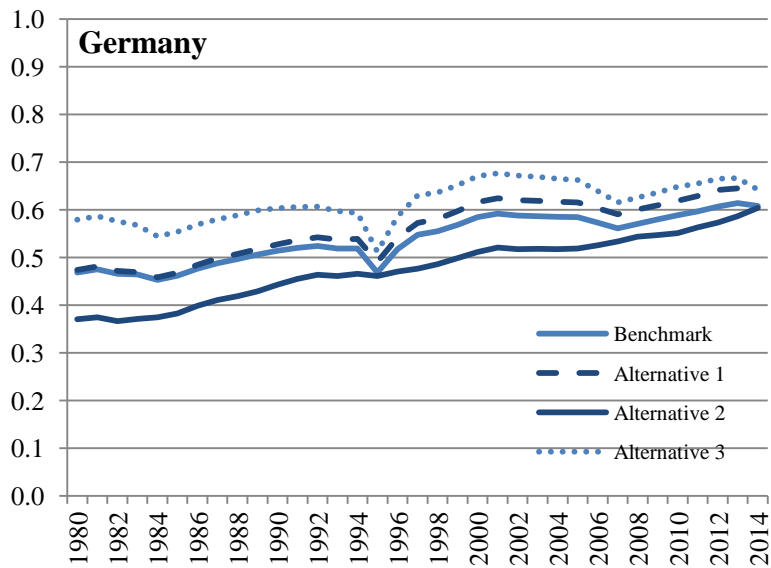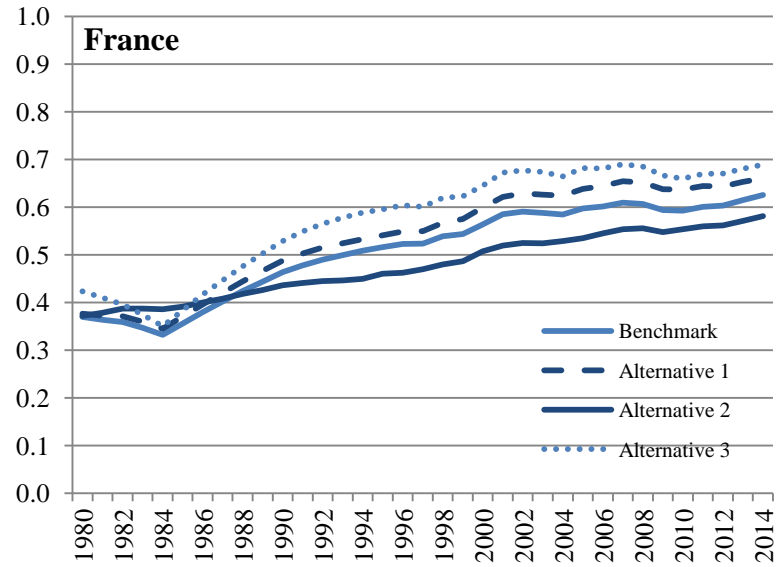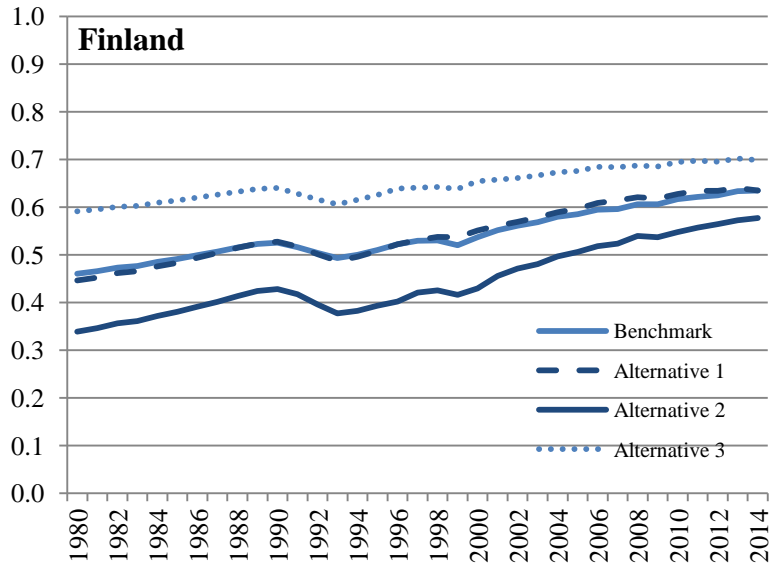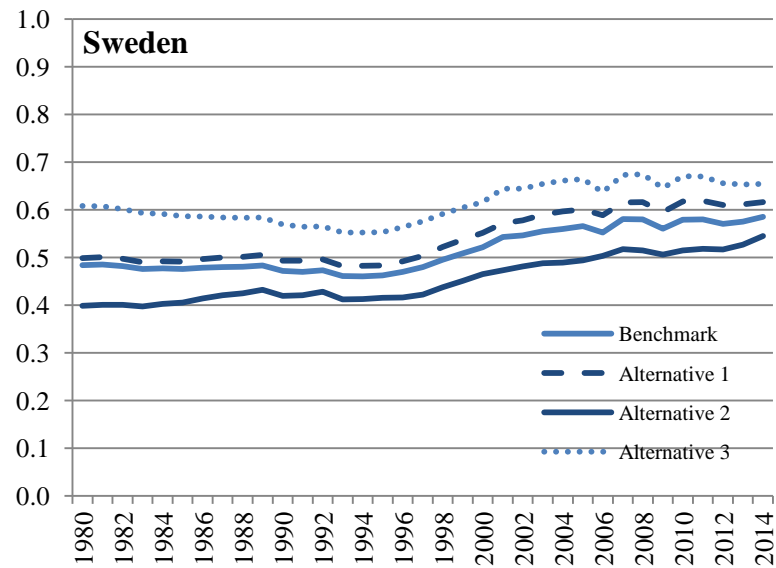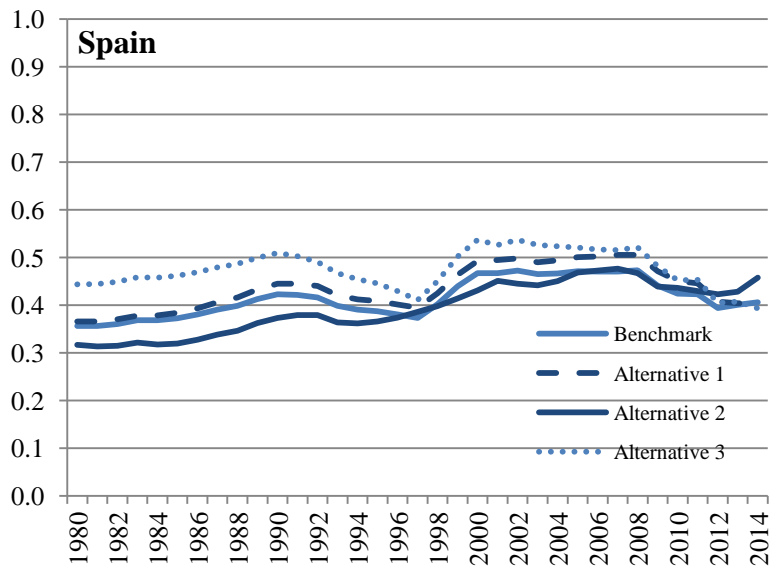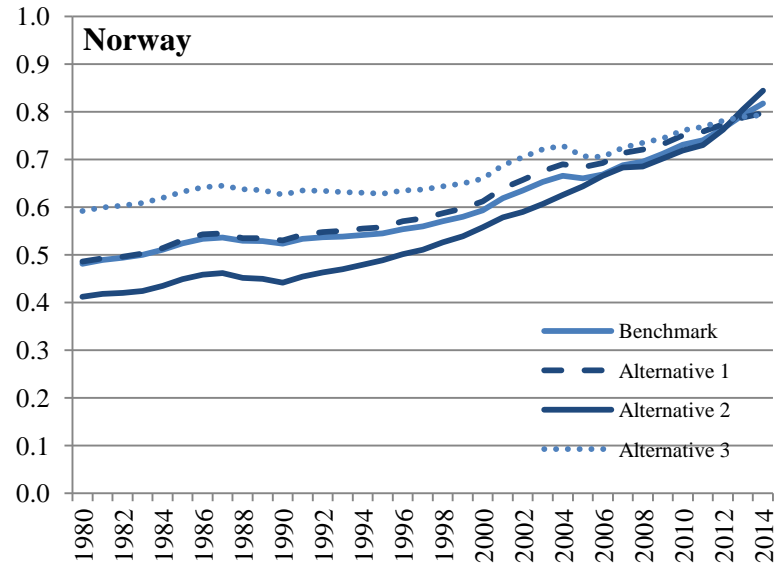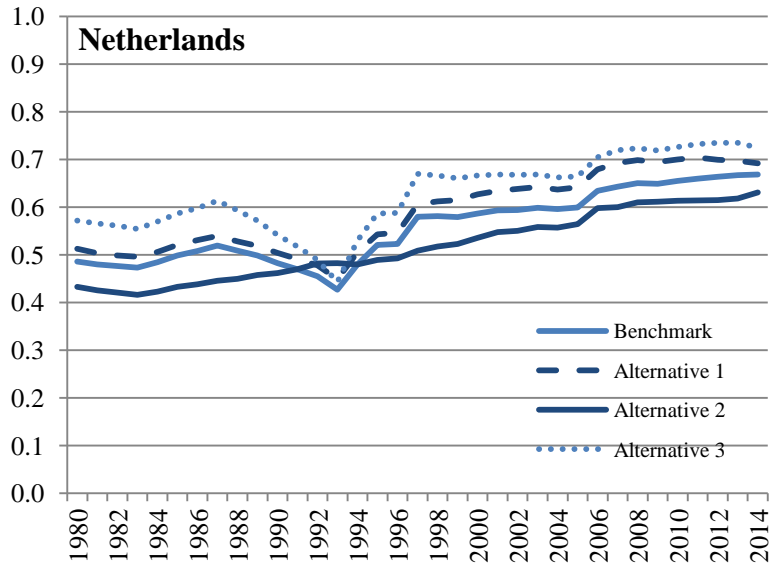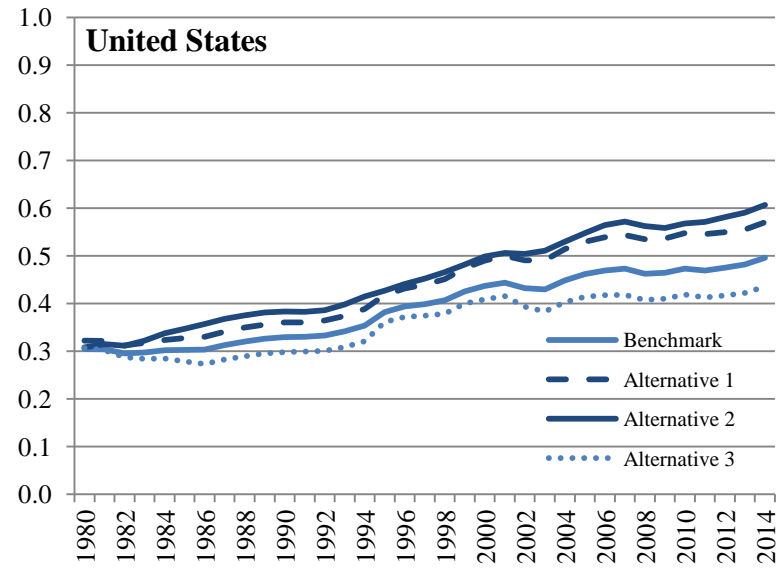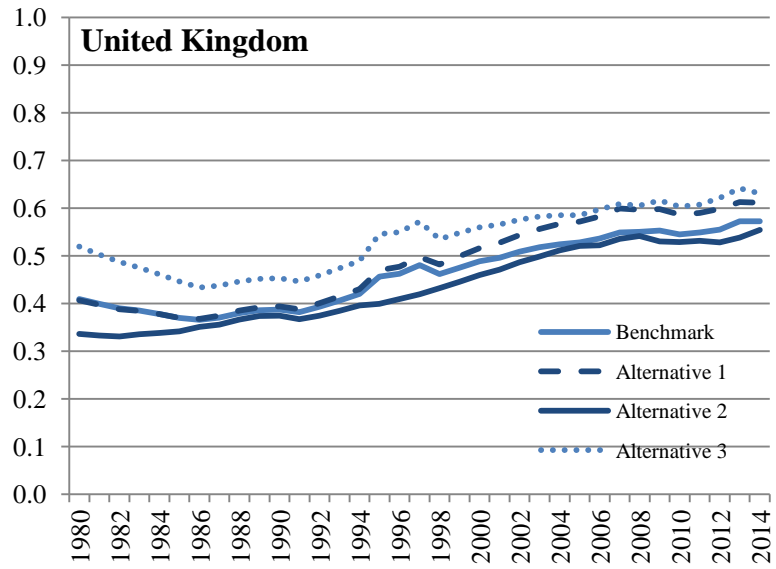
A. Alternative 1: Consumption Weighted More Heavily than Wealth

Under Alternative 1, the weights are 0.4 for consumption, 0.1 for wealth, and 0.25 for each of economic equality and economic security. Thus, relative to the baseline, weight is shifted from the wealth domain to the consumption domain. Nearly all of the fourteen countries experience increases in measured well-being in all years after reweighting. This is illustrated in Chart 36 where the line representing Alternative 1 is shifted upward for all years between 1980 and 2014 relative to the line representing the baseline results in Australia, Belgium, Canada, Denmark, France, Germany, the Netherlands, Spain, Sweden, the United Kingdom, and the United States. Italy is the only country for which the exact opposite is true: reweighting according to Alternative 1 lowers measured well-being in all years. The remaining countries, Norway and Finland, showed increases in measured well-being near the end of the time series and decreases in measured well-being near the beginning of the time series.

These changes reflect the relative magnitudes of the indices of the consumption and wealth domains within each country. Intuitively, countries with higher scores in the consumption domain than the wealth domain have higher measured well-being when the consumption domain receives higher weight, and vice versa for countries with higher wealth scores than consumption scores.

Exhibit 6 provides the rankings of the countries according to the levels and growth rates of their overall Index scores under the baseline and alternative weighting schemes. The shift from the baseline weights to Alternative 1 has no effect on the ranking of the countries.

For half of the countries (Australia, Belgium, Canada, Denmark, the Netherlands, Norway, and Spain), the IEWB grew faster over the 1980-2014 period under Alternative 1 than under the baseline weights. However, the differences are small in many cases (compound annual growth rates differed by 0.10 percentage points in Norway for example). There were only three countries in which the difference exceeded ±0.2 percentage points: Italy (0.55 percentage points), the United Kingdom (0.22 percentage points), and the United States (0.25 percentage points).

Over the 2008-2014 period, compound average annual growth rates were lower for Alternative 1 in all countries except Denmark, Italy, the Netherlands, Spain, and Sweden. During this time period, there were actually significant differences between the IEWB benchmark growth rates and the growth rates in Alternative 1, reaching up to 2.1 percentage points in magnitude in Australia and 1.69 percentage points in magnitude in Norway.

Exhibit 6: Ranking of Countries According to Economic Well-Being under Baseline and Alternative Weights

	Level (2014)			
	Baseline	Alternative 1	Alternative 2	Alternative 3
Highest Well-Being	Norway	Norway	Norway	Norway
	Netherlands	Netherlands	Australia	Netherlands
	Belgium	Belgium	Canada	Belgium
	Australia	Australia	Netherlands	Finland
	Finland	Finland	Belgium	France
	France	France	Denmark	Denmark
	Denmark	Denmark	United States	Sweden
	Germany	Germany	Germany	Germany
	Sweden	Sweden	France	United Kingdom
	United Kingdom	United Kingdom	Finland	Australia
	Canada	Canada	United Kingdom	Canada
	Italy	Italy	Sweden	Italy
	United States	United States	Italy	United States
Lowest Well-Being	Spain	Spain	Spain	Spain

	Growth Rate (1980-2014) (Per Cent Per Year)			
	Baseline	Alternative 1	Alternative 2	Alternative 3
Fastest IEWB Growth	Australia	United States	Australia	France
	Norway	France	Norway	United States
	France	Australia	United States	Australia
	United States	Norway	Canada	Norway
	Canada	United Kingdom	Finland	Denmark
	Denmark	Denmark	Denmark	Netherlands
	United Kingdom	Canada	United Kingdom	Canada
	Finland	Finland	Germany	United Kingdom
	Netherlands	Netherlands	Belgium	Finland
	Belgium	Germany	France	Belgium
	Germany	Belgium	Netherlands	Germany
	Sweden	Sweden	Spain	Sweden
	Spain	Italy	Italy	Italy
Slowest IEWB Growth	Italy	Spain	Sweden	Spain

	Growth Rate (2008-2014) (Per Cent Per Year)			
	Baseline	Alternative 1	Alternative 2	Alternative 3
Fastest IEWB Growth	Australia	Australia	Norway	Australia
	Norway	Norway	Australia	Norway
	Canada	Canada	Canada	United States
	United States	United States	Germany	United Kingdom
	Germany	Germany	Belgium	Canada
	Belgium	Belgium	United States	Germany
	Finland	United Kingdom	Finland	Belgium
	United Kingdom	Finland	Sweden	Finland
	France	France	Denmark	France
	Netherlands	Sweden	France	Netherlands
	Sweden	Netherlands	Netherlands	Sweden
	Denmark	Denmark	United Kingdom	Denmark
	Italy	Italy	Italy	Italy
Slowest IEWB Growth	Spain	Spain	Spain	Spain

Although the changes in the compound annual growth rates are small over the 1980-2014 period, they do affect the ranking of countries because several countries had similar growth rates under the baseline results. In most cases, the change to Alternative 1 weights does not affect a country's rank by more than one or two places; for example, Norway falls to second place from first place and Canada falls to seventh place from fifth place. The one major exception is the United States, which rises from fourth place under the baseline to first place under Alternative 1. The results are also extremely robust over the 2008-2014 period, where all countries stayed within one rank of their baseline position under Alternative 1.

Overall, shifting emphasis from wealth stocks to current consumption does not radically change absolute rankings in 2014 or proportional rankings over the 1980-2014 and 2008-2014 periods. There are no cases in which the change in weights moves a country from a low rank to a high rank or vice versa. Hence, the results are robust to the change from the baseline weights to Alternative 1. The cross-country patterns are essentially the same under both weighting schemes, as are the general trends over time within each country.

B. Alternative 2: No Weight Given to Economic Equality

Under Alternative 2 it is assumed that inequality and poverty do not matter to national economic well-being; no weight at all is given to this domain and a weight of one-third is given to each of the remaining three domains. The new time series based on these weights are plotted in Chart 36. Notably, Canada's values under Alternative 2 are significantly below the baseline until around 1994 and are significantly above the baseline beyond 2000. This reflects the fact that Canada initially had high scores in the equality domain relative to the other domains (particularly consumption and wealth), but their consumption and wealth scores grew quickly over the period while their inequality scores stagnated.

By contrast, a second group of countries – Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, and Sweden – share a different pattern. In these countries, deemphasizing economic equality leads to a systematically lower measurement for well-being in all years. Naturally, these are countries that have high scores in the economic equality domain and have maintained that performance over time.

The United States is unique in that deemphasizing poverty and inequality improves its measured well-being in every year between 1980 and 2014. In addition, the Index for the United States exhibits faster growth over the 1980-2014 period when poverty and inequality are given zero weight. The IEWB for the United States grew by 2.01 per cent per year under Alternative 2; under the baseline weights, it grew by 1.44 per cent per year. This reflects the very poor performance of the United States in the economic equality domain over the full 1980-2014 period.

The sensitivity of the US results to the weight of the economic equality domain is also illustrated in the ranking of the countries under Alternative 2. In the baseline results,

the United States ranks second-to-last in measured well-being in 2013; under Alternative 2, it jumps to seventh place among the fourteen countries.

As in the baseline results, the top two countries under Alternative 2 are Norway and the Netherlands. Norway's 2014 Index score increased from 0.815 under the baseline weights to 0.844 under Alternative 2; Norway had high values in all four domains for 2014. Similarly, the Netherlands increased from 0.669 under the baseline weighting to 0.692 under Alternative 2. Once again, Spain ranked at the bottom of the rankings, though its Index score improved from 0.406 under the baseline to 0.458 under Alternative 2.

The rankings of countries under Alternative 2 are significantly different than the baseline. As noted, the United States moves from thirteenth under the baseline to seventh under Alternative 2. Canada experiences an even greater change in its ranking than the United States, moving from eleventh under the baseline to third overall under Alternative 2. In contrast, Finland falls from fourth under the baseline to tenth under Alternative 2.

Overall, omitting consideration of the economic equality domain alters the results substantially. Countries vary significantly in their economic equality performances. For countries with relatively high levels of economic equality, Alternative 2 leads to lower measured well-being. The opposite is true for the United States, a country characterized by high economic inequality throughout the 1980-2014 period. In addition, for the countries in which the index of the equality domain declined substantially over the period, the Alternative 2 weights alter the pattern of overall well-being over time.

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

In contrast to Alternative 2, Alternative 3 gives much greater weights to economic equality and security relative to consumption and wealth. Under Alternative 3, the equality and security domains receive weights of 0.4 and 0.3, while consumption and wealth are assigned weights of 0.2 and 0.1. It represents the judgments of the French business magazine *L'Expansion* (Dedieu, 2009), and it is an example of how our data can be used to test the implications of differing value judgments on the relative importance of the dimensions of economic well-being. As one might have expected, the qualitative results under Alternative 3 are in essence the opposite of the results under Alternative 2. The countries with high scores in the equality domain relative to the other three domains see their IEWB scores improve in all years under Alternative 3 relative to the baseline. These countries include Australia, Belgium, Denmark, Finland, France, Germany, the Netherlands, Norway, Spain, Sweden, and the United Kingdom.

For Canada, shifting weight from consumption and wealth to equality and security raises measured well-being (relative to the baseline results) in the early years of the 1980-2014 period and lowers it in the later years. This reflects the fact that Canada initially had high scores in the equality domain relative to the other domains (particularly

consumption and wealth), but their consumption and wealth scores grew quickly over the period while their inequality scores stagnated or declined.

Once again, the United States is very different from most other countries. It is not, however, unique as it is joined by Italy. Shifting weight from consumption and wealth to equality and security reduces measured well-being in Italy and the United States (relative to the baseline results) in every year in the 1980-2014 period.

Under the Alternative 3 weights, Spain again ranks last among the fourteen countries in overall economic well-being in 2013. Its score for 2014 is 0.393 under Alternative 3, compared to 0.406 in the baseline results. The United States rank second-last with an IEWB score of 0.435 under Alternative 3, much lower than its baseline result of 0.496.

Norway, the Netherlands, and Belgium are the top three countries in the ranking; respectively, their scores are 0.793 (down from 0.817 under the baseline weights), 0.724 (up from 0.669 under the baseline weights), and 0.702 (up from 0.656 under the baseline weights). Between 1980 and 2014, all countries except Italy experienced slower growth in measured economic well-being under Alternative 3 than under the baseline weights. This reflects the fact that the indices of the consumption and wealth domains experienced robust growth in every country over the period, while those of the equality and security domains either grew slowly or declined.

Over the 2008-2014 period, there was far less cross-country consistency. Some countries experienced faster growth under Alternative 3, while other countries experienced slower growth under Alternative 3.

Nevertheless, the ranking of countries by IEWB growth was remarkably similar under the baseline and Alternative 3 weights. Only Australia, which plummeted from fourth under the baseline to tenth under Alternative three, moved more than two places either up or down the ranking of absolute IEWB scores. Overall, the effects of the Alternative 3 weights are the opposite of the effects of the Alternative 2 weights. Countries that perform well in the economic equality and security domains have higher measured well-being under Alternative 3 than under the baseline weights, and vice versa.

D. Summary

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 countries according to the Index of Economic Well-Being. Our main results are fairly robust to changes in the relative weights of the domains, but other results are highly sensitive. Norway has the highest Index value under all four weighting schemes, while Spain is always last. The results for the United States are particularly sensitive to the weights on economic equality and security relative to those on consumption and wealth, ranking it second last under three of the weighting schemes, but seventh under Alternative 3.

Although economic well-being increases between 1980 and 2014 in almost every country under all four weighting schemes, the magnitudes of the increases vary dramatically with the weights. In general, consumption and wealth have increased faster over time than economic equality and security (if the latter two increased at all), so economic well-being grows faster when the consumption and wealth domains are weighted heavily relative to the equality and security domains. One notable observation is that since the United States has high consumption and wealth scores, but very low equality and security scores (with a negative trend), it follows that the relative ranking of the United States depends heavily on the importance of inequality and security.

IV. Conclusion

This report presents new estimates of the Index of Economic Well-Being for fourteen OECD countries for the 1980-2014 period. The results reveal that there were significant differences across countries in terms of economic well-being in 2014. Norway and the Netherlands had the highest levels of economic well-being in 2014, while the United States and Spain had the lowest levels. Canada ranked eleventh among the fourteen countries.

In all fourteen countries sampled, the IEWB experienced an increase in economic well-being over the 1980-2014 period. Across the OECD, this rising economic well-being was driven by growth in consumption and stocks of wealth, as there was weak growth or declines in economic equality and economic security.

Over the 2008-2014 period, overall results for the IEWB are more divergent. Some countries experienced strong growth, while other countries experienced large declines, and still other countries stagnated. For example, the IEWB decline in two countries during this time period (Spain and Italy), showed essentially no growth in one country (Denmark), and increased in the other eleven countries. Some of these increases were large (3.2 per cent per year in Australia), while other increases were minimal (0.2 per cent per year in Sweden).

Canada saw growth of 2.0 per cent per year over this period, a result of extremely strong growth in the wealth domain (9.2 per cent per year) and moderately strong growth in the consumption domain (1.9 per cent per year), offset by declines in equality and economic security (1.6 per cent per year and 0.0 per cent per year).

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 ensuring that the choice of weights for the four domains is as transparent as possible. We test the sensitivity of our baseline results to three alternative weighting schemes and find that our key baseline results are largely robust. Economic well-being increased in almost every country over the 1980-2014 period under all four of the weighting schemes. Norway always had the highest level of economic well-being in 2014, while Spain always ranked in last.

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.

For example, the IEWB could obtain new data estimates on the share of people in couples with children in the total population, replacing the share of married mothers and children in the total population, thereby improving the estimate of the population at risk of single parent poverty in the economic security domain.

Other methodological advances or increased data availability could also improve the accuracy and reliability of the IEWB. In particular, better estimates of the social costs of environmental degradation would greatly advance the wealth stocks component of the index. These estimates would need to (1) provide information on a wider range of pollutants and environmental damages and (2) more appropriately distribute environmental damages across nations, since environmental damages are not bounded by country borders. The index could also be improved by including estimates of unpaid work, regrettable expenditures, and natural resource wealth stocks, components that are included in the IEWB for Canada and the provinces, but are not included for OECD countries due to data constraints.

Nevertheless, even as it stands, the Index captures more aspects of economic well-being than does real GDP, and is therefore a step in the right direction.

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