New Estimates of the Index of Economic Well-being for Selected OECD Countries

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Abstract

This paper presents revised estimates of the Index of Economic Well-being (IEWB) for nine OECD countries (France, Italy, Australia, the United States, the United Kingdom, Canada, Germany, Norway and Sweden) for the period 1980 to 2001. The IEWB consists of four components: current effective per capita consumption flows, net societal accumulation of stocks of productive resources, income distribution and economic security. The paper argues that the IEWB represents a better measure of "command over resources" than GDP per capita. The major innovation in the paper is the introduction of a scaling methodology. The paper finds that in 2001 Norway had the highest level of economic well-being, followed by Italy, Germany, Sweden, and France. The four Anglo-Saxon countries (UK, Australia, Canada and the United States) followed. Between 1980 and 2001 Norway enjoyed the largest increase in economic well-being, followed by France.

New Estimates of the Index of Economic Well-being for Selected OECD Countries [1]

Introduction

Is it possible to find a better measure of "access to economic resources"?

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,[2] 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 paper we do not intend to downgrade the importance of non-economic issues. Instead, we are motivated by the idea that a better measure of "access to resources needed for a decent standard of living" is needed if economic and "social" trends are to be combined into an index with larger ambitions. Our work is thus in the spirit of the *Measure of Economic Welfare* (MEW) developed by William Nordhaus and James Tobin (1972) three decades ago.

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. The paper is divided into three main parts. The first part provides an overview of the Index of

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[1] This paper is a significant revision and extension of work that has been previously presented at a number of conferences and published in several journals (e.g. Osberg and Sharpe 2002a,b; 2003, 2003a). We would like to thank the discussants at those meetings and the anonymous referees for their extensive comments. Julia Salzman, Dimitry Kabelyan, Olivier Guilbaud and Lynn Lethbridge did outstanding work as research assistants and deserve much of the credit for all our work. Remaining errors are our responsibility. All data underlying the estimates presented in this paper are freely accessible from the website of the Centre for the Study of Living Standards (www.csls.ca) under "Projects" - Index of Economic Well-being.

[2] The paper (Osberg, 1985) that originated our research was motivated by Solow's observation that in 1980 Ronald Reagan asked the American people a seemingly simple question: "Are you better off today than you were four years ago?" Although U.S. real GDP per capita was, in 1980, some 8.8 per cent higher than in 1976, his audiences typically answered "No!"

Economic Well-being, with particular attention to its conceptual underpinnings. The second part discusses the components of the Index. The third part discusses our revised estimates of the overall index and its components for France, Italy, the United States, the United Kingdom, Germany, Canada, Australia, Norway and Sweden from 1980 to 2001.[3]

I An Overview of The Index of Economic Well-being

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. macro economic 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 the command over resources of individuals. 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 selected OECD countries based on four dimensions of economic well-being – consumption, accumulation, income distribution, and economic security – this paper (like the *Genuine Progress Indicator*[4])

[3]These countries excluding France and Italy are selected because they have a large enough number of public-use micro-data files from the Luxembourg Income Study for construction of reliable long-run time series on certain of the variables we need. Despite shorter time series, Italy and France have been included because of the importance of and high interest in these countries. Estimates for these two countries have a wider margin of error than the other countries and consequently should be treated carefully. We note that maintaining international comparability of estimates has meant that some data used in other papers of ours (Osberg and Sharpe, 1998 and 2002a), and only available for Canada and the United States, have not been used in this paper. This implies that the estimates in this paper for Canada and the United States are not identical to those in these other papers.

[4] The Genuine Progress Indicator (GPI) produced by the think tank Redefining Progress (Cobb, Halstead, and Rowe, 1995) is closely related to the Index of Sustainable Economic Welfare (ISEW). It starts with personal consumption expenditures, makes an adjustment for income distribution, and then adds or subtracts categories of spending based on whether they enhance or detract from well-being. Additions are the value of time spent on household work, parenting, and volunteer work; the value of the services of

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 (and have the moral right to differ) in their subjective valuation of the relative importance of each dimension of well-being.[5] 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,[6] an index of society's well-being is useful in helping individuals answer such questions.

Although conceptually there may be no way to measure some of the different dimensions of well-being in directly comparable units, as a practical matter citizens are frequently called upon to choose between policies that favour one or the other.[7] Hence,

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consumer durables; and the services of highways and streets. Subtractions are defensive expenditures due to crime, auto accidents, and pollution; social costs such as the cost of divorce, household cost of pollution and loss of leisure; and depreciation of environmental assets and natural resources, including loss of farmland, wetlands, old growth forests, reduction in the stock of natural resources, and the damaging effects of wastes and pollution. All categories are expressed in dollars for aggregation purposes. The GPI has a strong downward bias because it treats the (ever increasing) stock of past environmental losses as an annual subtraction from current well being flows. See Hagerty et al. (2001) for an evaluation of the GPI and a large number of other quality of life indexes.

[5] In the same vein, Sen (1999:81) has written: "There is thus a strong methodological case for emphasizing the need to assign explicitly evaluative weights to different components of quality of life (or of well-being) and then to place the chosen weights for open public discussion and critical scrutiny. In any choice of criteria for evaluative purposes, there would not only be use of value judgments, but also, quite often, use of some judgments on which full agreement would not exist. This is inescapable in a social-choice exercise of this kind." Empirically, Clark et al. (2003) report: "We are not able to distinguish empirically between heterogeneities in the utility function (translating income into utility) and the expression function (turning utility into self-reported well-being), but we strongly reject the hypothesis that individuals carry out these joint transformations in the same way. The "marginal well-being effect of income" is very different in the four classes we identify. Descriptive statistics show that there are strong country and demographic patterns across classes."

[6] Formally, if one thinks of individuals as choosing to vote for the public policy alternative that maximizes some index $I = \alpha_1$ (own utility) + α_2 (society's well-being), then a measure of social well-being is useful unless $\alpha_2 = 0$ for all persons, always.

[7] For example, although "knowledge" and "health" are both important to individuals, they cannot be measured directly in comparable units – nonetheless, citizens have to decide how much to spend on

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,[8] *without* necessarily presuming that all individuals have the same values.

Our hypothesis is that indices of social well-being can best help individuals to come to reasonable answers about social choices if information is presented in a way that highlights the objective trends in major dimensions of well-being and thereby helps individuals to come to summative judgments – but also respects differences in values. Although it may not be possible to define an *objective* index of societal well-being, individuals still have the problem (indeed, the moral responsibility) of coming to a *subjective* evaluation of social states, and they need organized, objective data if they are to do it in a reasonable way.[9]

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

When an average flow like GDP per capita (or an alternative, such as the average personal income or the GPI) is used as a summative index of well-being, the analyst implicitly is stopping in the first quadrant – 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.

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hospitals or on schools.

[8] Since individuals must, in any event, make some decisions the presumption is that better information will produce better decisions.

[9] Of course, even if individuals have their own personal subjective evaluations of societal outcomes, the distribution of such evaluations among others is an objective fact that is often of interest – but for each person, the questions of "what do I think is important?" and "what do others (e.g. the median citizen/voter) think to be important?" are interesting for very different reasons.

Table 1 - Dimensions of Economic Well Being or Command over Resources		
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

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 that 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, 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 their personal economic future is secure.[10]

[10] Risk-averse individuals can gain in certainty equivalent income from the availability of insurance, even if expected income falls. For a discussion of the distinction between "risk" and "insecurity" see Osberg

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.[11] 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.[12] 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 paper'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 therefore do not present a specific, formal model here.[13] In a

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(1998).

[11] The "dashboard" strategy of multiple indicators can be seen in operation at http://esl.jrc.it/dc/

[12] Current versions of the GPI and early versions of the HDI (see Anand and Sen, 2000:94) weight average "income" by changes in the Gini index. This presumes a common valuation of economic equality among all citizens (which suggests the puzzle – if everyone has the same preferences for equality, why does the political system does not generate it).

[13] However, a sufficient (but not necessary) set of conditions for the index of economic well-being which we propose would be that societal economic well-being can be represented as the well-being of a "representative agent", if: (1) such an agent has a risk-averse utility function (i.e. diminishing marginal utility); (2) from behind a "veil of ignorance" as to his/her own characteristics, each person draws an individual income stream (and prospects of future income) from the actual distribution of income streams; (3) each person has a utility function in which both personal consumption and bequest to future generations are valued; (4) individual income streams are exposed to unpredictable future shocks; and (5) capital markets and public policies do not always automatically produce a socially optimal aggregate savings rate. A fuller discussion of the rationale for this framework of consumption, accumulation, distribution and insecurity can be found in Osberg (1985).

series of papers (Osberg and Sharpe, 1998, 2002a,b, 2003a) we have described the details of the calculation of the four components or dimensions of economic well-being:

- [1] effective per capita consumption flows – which 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;

- [2] net societal accumulation of stocks of productive resources – which includes net accumulation of tangible capital, housing stocks, net changes in the value of natural resources stocks, environmental costs, net change in the level of foreign indebtedness, and the accumulation of human capital and R&D investment;

- [3] income distribution – the intensity of poverty (incidence and depth) and the inequality of income;

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

Each dimension of economic well-being is itself an aggregation of many underlying trends, on which the existing data is of variable quality – and often differs across countries. 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.

II Constructing the Components of the Index of Economic Well-Being (IEWB)

This section of the paper summarizes briefly how the practical details of estimation of the four key components of our Index of Economic Well-Being (IEWB) used in this paper – consumption flows, stocks of wealth, equality, and security – differ from our previous work (see Osberg and Sharpe, 2002b). Figure 1 provides an overview of the components and sub-components, and variables that make up the Index.

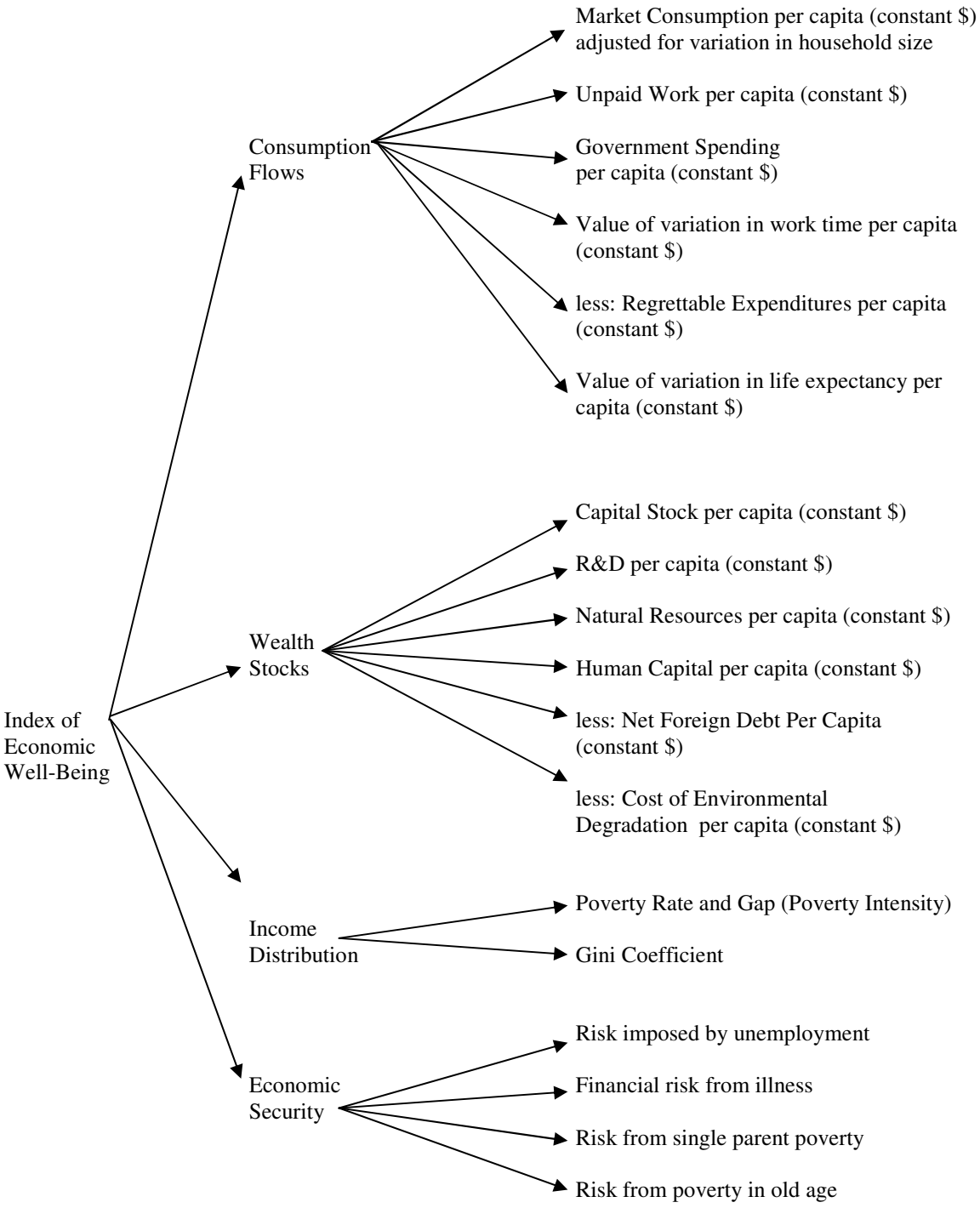
Average Consumption Flows

Data on aggregate real personal consumption per capita expressed in national currency units, and in constant prices, are available from the OECD National Accounts publication. However, a more accurate measure of trends in effective consumption flows would include changes in leisure, household size, regrettables, the underground economy and life expectancy. Osberg and Sharpe (2003a) discuss in some detail the measurement of each element – here we emphasize only the issues raised when one uses the IEWB as the index of "command over resources".

In particular, we have every reason to believe that having a long life is an important component of economic well-being – but for two different types of reason. Presumably people care both about how much they consume per year, and how many years they get to consume it. If one wants to measure the "command over resources" of people now alive, the economic value of consumption during these extra years of life should be included in the total consumption flows of individuals (Usher, 1980). However, if life itself is valuable, then one also has a reason for including life expectancy as an argument in an index of well-being that is quite distinct from the "more consumption (over more years)" rationale. Average life expectancy is one of the three components of

the Human Development Index, quite independently of the consumption level of individuals during extra years of life.

Figure 1: The CSLS Index of Economic Well-being



Although a longer life span is valuable to people, GDP numbers will not reveal its importance, and may move in a contrary direction. If people can make more money by assuming more workplace risk, increases in marketed output that come from greater risk taking will have costs in decreased longevity that should be counted in an index of economic well-being.[14] To obtain an estimate of the average impact on "command over resources" of decreased mortality, we adjust per capita consumption flows in each year upward by the percentage increase in average life expectancy relative to the base year (1980).[15]

To ensure comparability of consumption per capita estimates across countries given international differences in life expectancy, the estimates of life expectancy in the United States are used as a benchmark and estimates for other countries adjusted by the ratio of that country's life expectancy to the U.S. estimate. Consumption is thus adjusted upward in countries with higher life expectancy than the United States and downward in countries with lower life expectancy. Implicitly this means that we are valuing extra years of life differently in different countries and at different times, because the current average level of consumption differs across countries and over time. This is appropriate in a measure of *economic* well-being or *command over resources*, but economics is only part of a broader conception of well-being. It would be inappropriate (ethically and socially) in a summative index of overall "well-being" to imply that a life in a poor country is worth less than a life in a rich country. However, it is accurate to say that consumption (and economic well-being) during a lifetime is greater in a rich country.

Data on life expectancy are taken from the OECD Health Data CD-ROM. Between 1980 and 1999 (1999 is the last year for which data are currently available for

[14]Ideally, a full appraisal of the value of increased longevity should also consider trends in morbidity and health-adjusted life expectancy (HALE). Wolfson (1996) found for 1990-1992 that the HALE for 15-year-old Canadians was 7.8 years less than life expectancy (55.6 versus 63.4 years). However, since there is no time series on health-adjusted life expectancy for Canada, we do not know if the rate of increase in the HALE has been greater or lower than life expectancy over time.

[15] Implicitly, this procedure assumes the higher values that older individuals might place on changes in mortality probability are offset by the lower valuations of younger people. As well, it ignores the distribution, by age, of actual changes in mortality probability. Some recent research suggests we may be underestimating the importance of increased life expectancy for economic well-being. Murphy and Topel (2002) find that the gains in life expectancy between 1970 and 1990 in the United States were worth about $2.8 trillion per year in the aggregate or about $12,000 per person per year. Nordhaus (2002) finds that the value of increases in life expectancy over the twentieth century is about as large as the value of measured growth in non-health goods and services.

all nine countries), all countries enjoyed increased life expectancy, but there was a significant variation across countries in the size of the increase, which is given in brackets: Norway (3.4 per cent), the United States (4.1 per cent), Canada (4.6 per cent), Sweden (4.9 per cent), United Kingdom (5.7 per cent), Australia (5.9 per cent), Italy and France (6.1 per cent), and Germany (6.6 per cent). In terms of life expectancy in 1999, Sweden had the higher level at 79.5 years, followed by Australia (79.0), Canada (79.0), France (78.8), Italy (78.5), Norway (78.4), Germany (77.7), the United Kingdom (77.4), and in last place, the United States (76.7).

Total per capita consumption is defined as the sum of personal consumption (adjusted for changes in average household size and longevity of life), government services, and the adjusted relative value of working time. Between 1980 and 2001 the increase in real per capita total consumption flows was 24.4 per cent in Canada and 24.7 per cent in Sweden, but much higher in the United Kingdom (64.7 per cent), Germany (54.2 per cent), Norway (53.7 per cent), France (51.9 per cent) and Italy (50.4 per cent). Australia (47.4 per cent) and the United States (45.9 per cent) were intermediate cases.

Accumulation, Sustainability and the Intergenerational Bequest

If we think of "economic well-being" in the sense of "command over resources", then both present and future command over resources are relevant to current economic well-being. Both the future consumption of the current generation and the well-being of future generations depend on the accumulation of real productive assets, broadly conceived to include natural and human resources as well as physical capital stock. These real stocks will determine whether a society is on a long-run sustainable trajectory of aggregate consumption, irrespective of the distribution among persons of financial and legal claims on aggregate consumption flows at the individual level.

Only if one is willing to assume that the aggregate savings rate, summed over all types of assets (public or private, priced or non-market) is always and everywhere optimal, can one ignore the division of current income between consumption and savings (as is implicit in, for example, use of GDP per capita as a measure of "command over resources"). We are not willing to make that assumption because (1) individuals may

have different value judgments/preferences for their own future income and the income of future generations, which implies differing criteria of "optimality" and (2) given the empirical importance of assets that are not priced in the market (e.g. environmental assets), have substantial externalities (e.g. education or research and development) or are heavily influenced by public policy decisions (all assets), it is implausible to believe that optimality emerges automatically.

The physical capital stock includes residential and non-residential structures, machinery, and equipment in both the business and government sector – all of which enable future potential consumption flows, and economic well-being. In an era of rapid technological change, expenditure on R&D is also a crucial ingredient in the ability of society to innovate and create wealth. Since current consumption levels could be increased by running down stocks of non-renewable natural resources or by exploiting renewable resources in a non-sustainable manner (at the cost of the consumption of future generations) or by degrading the environment, we also want to measure net changes in the value of natural resources and the cost of increased air and water pollution (in particular, carbon dioxide emissions).

In Osberg and Sharpe (2003a) we discuss the detailed measurement choices necessary to get an accurate estimate of each of these assets. In addition, in a knowledge-based economy, the stock of skills embodied in the workforce is also a crucial determinant of future economic well-being. There is a strong relationship between educational attainment and individual income and there is substantial evidence that education yields significant social benefits, over and above its impact on individual earnings.[16] Although school retention and participation in post-secondary education have increased dramatically in many countries over the last three decades, human capital is intangible and is not now counted in balance sheet estimates of national wealth.

This paper estimates investment in human capital from the cost side, using the cost per year of education expenditures at the primary, secondary and post-secondary levels. OECD data on the educational attainment of the 25-64 population and expenditure per student (available in both local currency and U.S. dollars) for the early

[16] Wolfe and Haveman (2001:245) conclude that in estimating the non-market effects of schooling "a conservative estimate of the value of non-labor market influences is of the same order of magnitude as

childhood, primary, secondary, non-university tertiary and university level education are used to estimate the per capita stock of human capital. In order to distinguish clearly inter-country differences in the quantity of education obtained, as opposed to differences in its cost of production, we apply a common cost base (the cost of education in the United States) to all countries.

Since we are interested in an index of *economic* well-being, we want to know the stock of assets that will produce "command over resources" in future years – hence estimating the dollar value of "human capital" in the stock of education is appropriate, as part of the capital accumulation component of the Index of Economic Well-being. However, education also has a deeper role to play. In considering education as a separate, independent component of the "Human Development Index", the UNDP recognizes a broader concept of the role of education. If education were *only* valuable as "human capital", then it would be double-counting for the HDI to include both education and GDP per capita, since GDP already includes both the expenditure of resources needed to produce schooling and the increment to money income produced by education. However, if education is also valuable because it increases the human capability to lead a life of understanding and meaning, in which greater knowledge is in itself an aspect of a good life (see Anand and Sen, 2000), then it is appropriate to consider its contribution to well-being over and above its contribution to "command over resources". Hence, we do not consider it "double-counting" to include separately the dollar value of the human capital stock of education as a productive asset and an index of education as part of "human development".

As the estimates of the physical capital stock, the R&D capital stock, net foreign debt, and environmental degradation are expressed in value terms, they can be aggregated and presented on a per capita basis. Net foreign debt per capita is a negative entry, and the social costs of CO2 emissions are subtracted from the stocks of wealth.

For the 1980-2001 period, estimates for the five components of the wealth stock included in this paper indicate per capita real wealth stocks increased by 15.1 per cent in France and 15.7 per cent in the United States, much less than Norway's 58.1 per cent. Sweden (29.2 per cent), Germany (36.1 per cent), the United Kingdom (37.3 per cent),

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estimates of the annual, marketed, earnings-based effects".

Australia (37.1 per cent), Italy (40.9 per cent) and Canada (42.1 per cent) were intermediate cases.

Income Distribution – Inequality and Poverty

Would economic well-being remain the same if a society in which everyone has $500 income became one in which half the population had $999 and the other half had $1? Average income would remain unchanged, but the more equal society is likely to generate more aggregate utility.[17] The idea that the "Social Welfare / Economic Well-being" generated by a given aggregate "command over resources" depends, in general, on *both* average income and the inequality of incomes has a long tradition in welfare economics. However, in measuring the level of social welfare, the exact relative weight to be assigned to changes in average incomes, compared to changes in inequality, cannot be specified by economic theory.

As well, poverty is not quite the same issue as inequality. Since the economic well-being of the population is affected both by inequality in the distribution of income among all people and by the adequacy of incomes for the least well-off (i.e. the extent of poverty), there are two issues: 1) one's perspective on the importance of inequality/poverty compared to trends in average income, and 2) one's view of the relative weight to be placed on poverty compared to inequality. We, therefore, suggest that a compound sub-index to recognize explicitly these issues would place some weight (β) on a measure of inequality in the aggregate distribution of income (the Gini index of after-tax, after transfer household income) and some weight ($1-\beta$) on a measure of poverty (the Sen-Shorrocks-Thon measure of poverty intensity). In each case, we use a Linear Scaling Technique to linearly scale variables to a uniform range.[18]

[17] Because an additional dollar of income means less to a millionaire than to a pauper, economists tend to agree that "diminishing marginal utility" is a reasonable assumption.

[18] See the following sub-section for a discussion. Note that this represents a change in our methodology from earlier papers in which indices of poverty or inequality were multiplied by -1 in order to reflect the convention that increases are desirable.

Insecurity

If the human situation is one of "living in the present, anticipating the future", then uncertainty and worry about what the future may hold will decrease the current economic well-being of risk averse individuals. Although people can try to avoid risk through social and private insurance, such mechanisms do not completely eliminate economic anxieties, which have to be considered a subtraction from well-being. This paper adopts a "named risks" approach to economic security, focusing on four key objective economic risks. Over fifty years ago, the United Nations' Universal Declaration of Human Rights stated:

> *Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other loss of livelihood in circumstances beyond his control.* [Article 25][19]

For this paper, as in Osberg and Sharpe (2003a), we construct measures of the percentage change over time in the economic risks associated with unemployment, illness, "widowhood" (interpreted here as single female parenthood) and old age. In each case, we model the risk of an economic loss associated with the event as a conditional probability, which itself is the product of a number of underlying probabilities. We weight the prevalence of economic risks by the proportion of the population that it affects. The core hypothesis underlying the measure of economic insecurity we propose is that changes in the subjective level of anxiety about a lack of economic safety are proportionate to changes in objective risk.

The economic risk associated with unemployment is modeled as the product of the risk of unemployment and the extent to which people are protected from the income losses of unemployment by unemployment insurance. In estimating the economic losses associated with illness, we assume that risk is proportional to the share of uninsured private medical care expenses in disposable income. Because divorce and separation have

[19]Today, the gender specificity of the language of 1948 will strike many people as odd – but Article 2

become the primary origins of single parent families and of poverty among single parent we model trends in this aspect of economic insecurity, as the product of the probability of divorce, the poverty rate among single female parent families, and the average poverty gap ratio among single female parent families. Since income in old age is the result of a lifelong series of events and decisions, which we cannot hope to disentangle in this paper, we model the idea of "insecurity in old age" as the chance that an elderly person will be poor, and the average depth of that poverty.

The four risks discussed above have been aggregated into an index of economic security using as aggregation weights the relative importance of the four groups in the population, normalized for all years to one.

The Adoption of Linear Scaling

The major methodological innovation of this paper relative to our earlier papers on the Index of Economic Well-being is the adoption of a "Linear Scaling Technique" (LST) to standardize the range of a variable.[20] To do this, an estimate is made for the high and low values which represent the possible range of a variable for all time periods and for all countries, and denoted Min and Max, respectively. The data is then scaled according to these values. If a variable increase corresponds to an increase in overall welfare, the variable, VALUE, is scaled according to the formula

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

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

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makes it clear that all rights are to be guaranteed to male and female persons equally.

[20] For a detailed discussion of methodological issues associated with the construction of composite indexes of well-being, see Salzman (2003).

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

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

In this case, we see that increases in the VALUE correspond to decreases in the scaled VALUE. In both cases, the range of values is 0-1, and 0 corresponds to the lowest level of welfare, and 1 corresponds to the highest. Note that this formula reduces to (Max-Value)/Max when Min is set to 0. This technique is used to scale all variables in many indices, including the following: the Human Development Index produced by the UNDP; the Index of Social Health produced by Human Resources Development Canada; the Index of Economic Freedom developed by the Heritage Institute; and Economic Freedom produced by the Cato Institute."

III Estimates of Index of Economic Well-being over Time and across Countries

The trend and level of any index are determined by the choice of variables that are included in the index, the trends and levels of those variables, and the weights they receive. Since we want to ensure that individuals with different values / preferences regarding the components of economic well-being can still find our methodology useful, we identify separately the four main dimensions of average current consumption, asset accumulation / sustainability, inequality / poverty and insecurity. With a simple spreadsheet, it is easy to conduct sensitivity analyses of the impact on comparative levels of well-being of different weighting of these dimensions.[21] However, for discussion

[21] An Excel spreadsheet with the required data and programs is available on request from the authors to enable readers to experiment with the implications of their own preferences. If such sensitivity analysis produces the same rankings of policy options, it is useful information to the policy process to know that differences in individual values do *not* matter to policy choices. If sensitivity analysis sometimes produces changes in policy rankings, it is useful to know *how much* one has to weight a particular dimension of well being (e.g. inequality) if the rankings of alternative policy options are to be reversed.

purposes, we have to start somewhere and our "base" weighting gives each component an equal weight of 0.25. Readers who are familiar with some of our earlier work (e.g. Osberg and Sharpe, 2002a, 2002b) should be aware that the current paper presents results which embody a different scaling methodology. In the current paper, each component is scaled linearly to the [0,1] interval.

We recognize that our methodology makes strong demands of the data and we are acutely conscious that the data sources available to us are far from what we would like – there is no escaping the fact that paying attention to more of the dimensions of economic well being means that we need better data. As a practical matter, our attempt to incorporate income distribution and insecurity means that only a few affluent nations with well-developed statistical systems can be examined now. These tend to be countries that also have more developed "welfare states", and it has often been suggested (e.g. Barr, 2001) that the basic objective of the welfare state has been to reduce economic insecurity and economic inequality.

Writing in 1931, before the development of the welfare state in the UK, R.H. Tawney argued that: "Contrasts of economic security, involving, as they do, that, while some groups can organize their lives on a settled plan with a reasonable confidence that the plan will be carried out, others live from year to year, week to week, or even day to day, are even more fundamental than contrasts of income."(1964:147). Since that time, a good deal of evidence – not least from the studies of the determinants of self-reported happiness available at http://www.eur.nl/fsw/research/happiness/ – has concluded that satisfying long-term personal relationships in a supportive community are crucial to personal well-being. Since such relationships are far harder to maintain when economic life is more insecure, it is arguable that insecurity and inequality are *more* important to personal well-being than the average level of consumption.

Nevertheless, the empirical estimates of this paper are constrained by data availability to fairly recent data from affluent developed countries. As a consequence, although this paper stresses the importance of considering inequality and insecurity in assessing economic well-being, the sample of nations that we use is arguably the group of nations in the world within which there is the least inequality and insecurity. Even though the prevalence of poverty and the precariousness of economic life, and its impact on

economic well-being, are undoubtedly far greater in many of the world's poorer nations, we do not now have the data to monitor it. Furthermore, since the objective grounds of economic insecurity (e.g. crop failure or unemployment) vary in relative importance as economic development progresses, measurement of "economic insecurity" should reflect these differences.

Even so, restricting ourselves to internationally comparable data series has meant that we have neglected issues (such as the decline in unemployment insurance coverage in Canada) that are important for some countries. Our reliance on interpolation between the data points available in the Luxembourg Income Study also implies that we cannot detect short period fluctuations in the distribution and security components of our index.

However, if available statistical data improves over time, one can hope for better estimates of well-being in the future – and we note that the increase in recent years in high quality micro-data from household surveys in poor nations is quite remarkable. Hence, we think that it will be possible in future to consider a wider range of nations, and to improve our estimates for the sample countries. The objective of the present paper is to give a preliminary indication now of trends in economic well-being from a broader perspective than that provided by GDP accounting and to provide a motivation for future data collection – e.g. to better measure economic security.

Chart 1 provides estimates of the level of the Index of Economic Well-being for nine OECD countries for 2001 and Chart 4 shows trends over the 1980-2001 period.[22] Norway has the highest level of economic well-being, followed by Italy, Germany, Sweden, and France. The four Anglo-Saxon countries trail, with the United Kingdom in sixth place, Australia in seventh, Canada in eighth and the United States in ninth or last place.

The overall ranking of a country of course depends on its ranking for the four components of the Index. Chart 6 shows levels of consumption, Chart 7 levels of wealth,

[22] Each of the four components of economic well-being is assigned an indexed value which represents the relative position of that country, in that year, on the range from Maximum (feasible value) to Minimum (feasible value), where both maximum and minimum are set at the actual extremes of the values observed in all countries and all years of the present study, plus (or minus) 10 per cent of the actual observed range. The source for the Charts is the Index of Economic Well-being MS EXCEL database file, posted for free download at www.csls.ca under "Projects" – "Index of Economic Well-being" – "The Index for OECD Countries."

Chart 8 levels of equality and Chart 9 levels of security for the nine countries over the 1980-2001 period. In terms of consumption levels in 2001, the United States was, not surprisingly, number one, followed by Norway, France, Canada, Italy, Germany, Australia, the UK, and Sweden. In terms of levels of wealth, Italy was number one, followed by Norway, Germany, the United States, the UK, Sweden, Australia, France, and Canada. Problems with the comparability of capital stock estimates across countries however introduce a large margin of error into these wealth estimates. In terms of equality, France ranks first, followed by Norway, Sweden, Germany, the UIK, Italy, Canada, Australia, and the United States. In terms of security, Norway ranks first, followed by Sweden, France, Italy, Canada, Germany, Australia, the UK, and the United States. The overall low ranking of the Anglo-Saxon countries consequently reflects their poor showing in terms of equality and security.

Chart 2, based on Chart 4, shows the change over the 1980-2001 period in the Index of Economic Well-being for the nine OECD countries. Norway enjoyed the largest increase, followed by France, Germany, Italy, the United States, Canada, Australia, the UK, and finally Sweden. Charts 6-9 show the changes over the period for the four components of the Index. All countries experienced increases in consumption and wealth. The UK, Italy, and Australia experienced large falls in equality, with other countries relatively stable. Economic security fell significantly in the UK over the period, but was relatively stable in the other countries.

Chart 3 compares trends in GDP per capita with two estimates of the Index of Economic Well-being for France over the 1980-2001 period. One estimate is based on equal weighting of the four components and the other based on a heavy weighting to consumption. Two observations can be made. First, the increase in GDP per capita was much greater than in either of the two estimates of Economic Well-being. This is largely explained by the lack of increases (or even declines) in equality and economic security over the period. Consequently, the inclusion of equality and economic security in the Index of Economic Well-being, a much broader measure of well-being than GDP per capita, results in a downward bias in the IEWB compared to GDP per capita. Second, the Index of Economic Well-being that gives a large weight to consumption increased more than the one that gave consumption a low weight. This follows from the fact that the

increase in consumption over the period was much greater than that of equality and economic security.

Conclusion

This paper has been about *how* we should calculate an index of well-being, but it is also useful to consider *why* such an index should be constructed. The motivation for the research reported in this paper is the idea that a better index of well-being may help citizens to organize their perceptions of social and economic outcomes and thereby help them make better political and public policy decisions, *according to their own valuations of outcomes.* We think that affecting public policy is the whole point of constructing an index of society's well-being. After all, if people only cared about their personal well-being, and only made decisions about their own lives, then one could assume that individuals can be trusted to calculate what is in their own self-interest – and there would be no point to calculating an index of *society's* well being. It is because individuals exercise choices (e.g. in voting) on issues that affect the collectivity that they have reason to ask questions of the form: "Is 'society' better off?"

The purpose of an index of a nation's well-being is therefore to help citizens think systematically about public policy, on the presumption that better information will produce better decisions. Communicability is therefore key – the social payoff to construction of an index occurs when it is actually used in social decision-making, and actually improves those decisions. In this respect, the measurement of economic and social well-being differs fundamentally from measurement in some other domains, such as the natural sciences. Public communicability is of little concern to measurement issues (such as the mass of sub-atomic particles) which are intermediate steps in the work of elite researchers with the skills (e.g. the mathematics training) and the time to digest highly abstract and complex measures – but the whole point of constructing an index of societal well-being is lost if it is only used by specialist researchers.

Hence, "Keep it Simple" is a useful slogan in index construction, and the constraint of use in the public debate means that it is crucial for an index of well-being to

have an intuitive justification that can be easily communicated. We think that there is an intuitive appeal to identifying the dimensions of current consumption, asset accumulation / sustainability, equality and economic security – and we hope that our presentation has been "simple enough" to be communicable (while still complex enough to be accurate).

We believe that one can easily justify the idea that citizens are "better off" economically when consumption is sustainable, when total income is more equitably shared and when individuals have more security in their economic lives. If this were not so, it would be hard to understand why modern states devote so many resources to reducing economic inequality and economic insecurity – but it is also clear that nations differ substantially in these efforts. We therefore think that the Index of Economic Well-being has a greater claim to indicating the "command over resources" of a nation's citizens than GDP per capita, which is blind to the savings rate and to inequality and insecurity.

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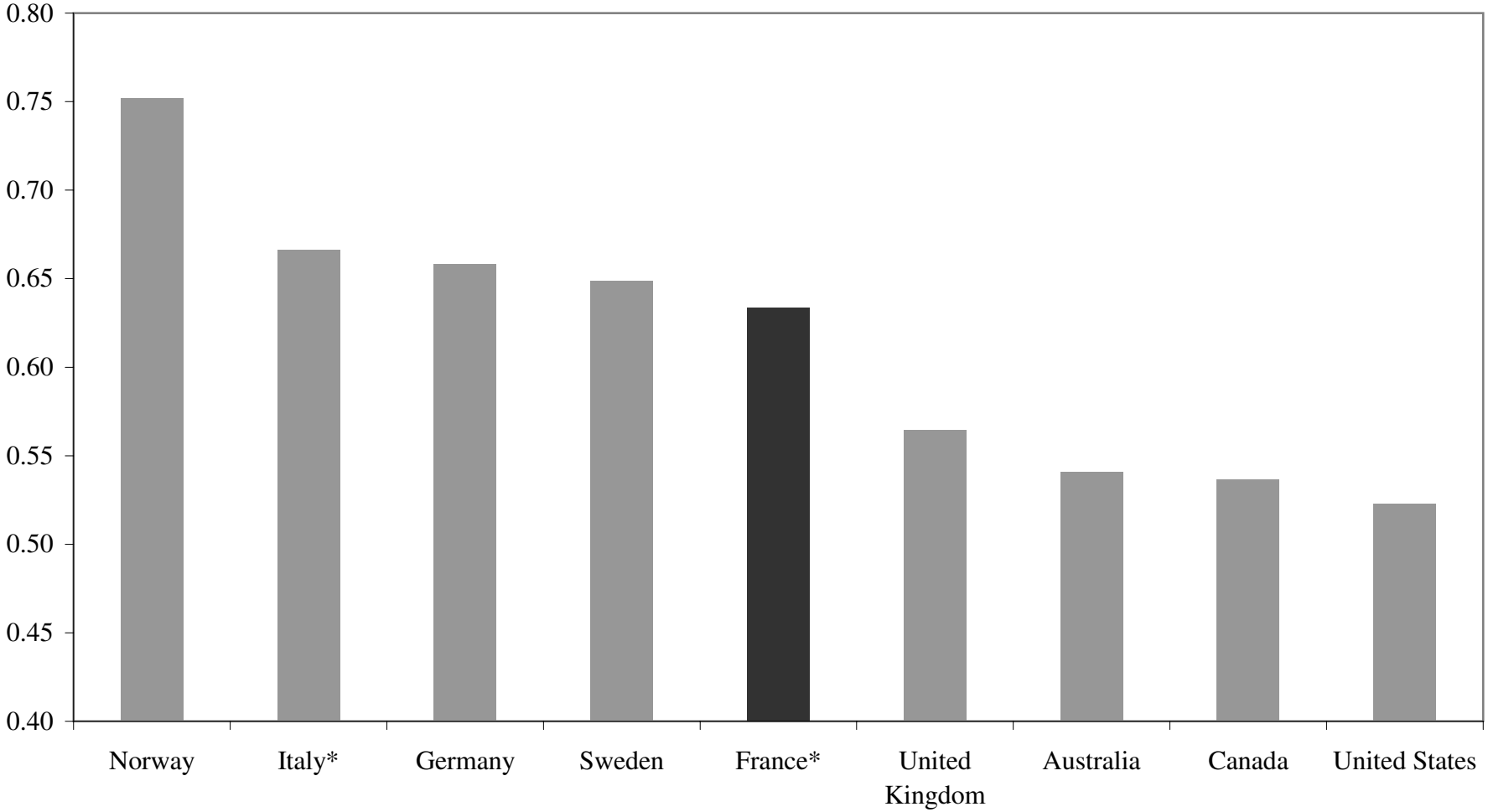
Chart 1: Index of Economic Well-being in Selected OECD Countries, 2001

Equal Weighting, Scaled Index Level

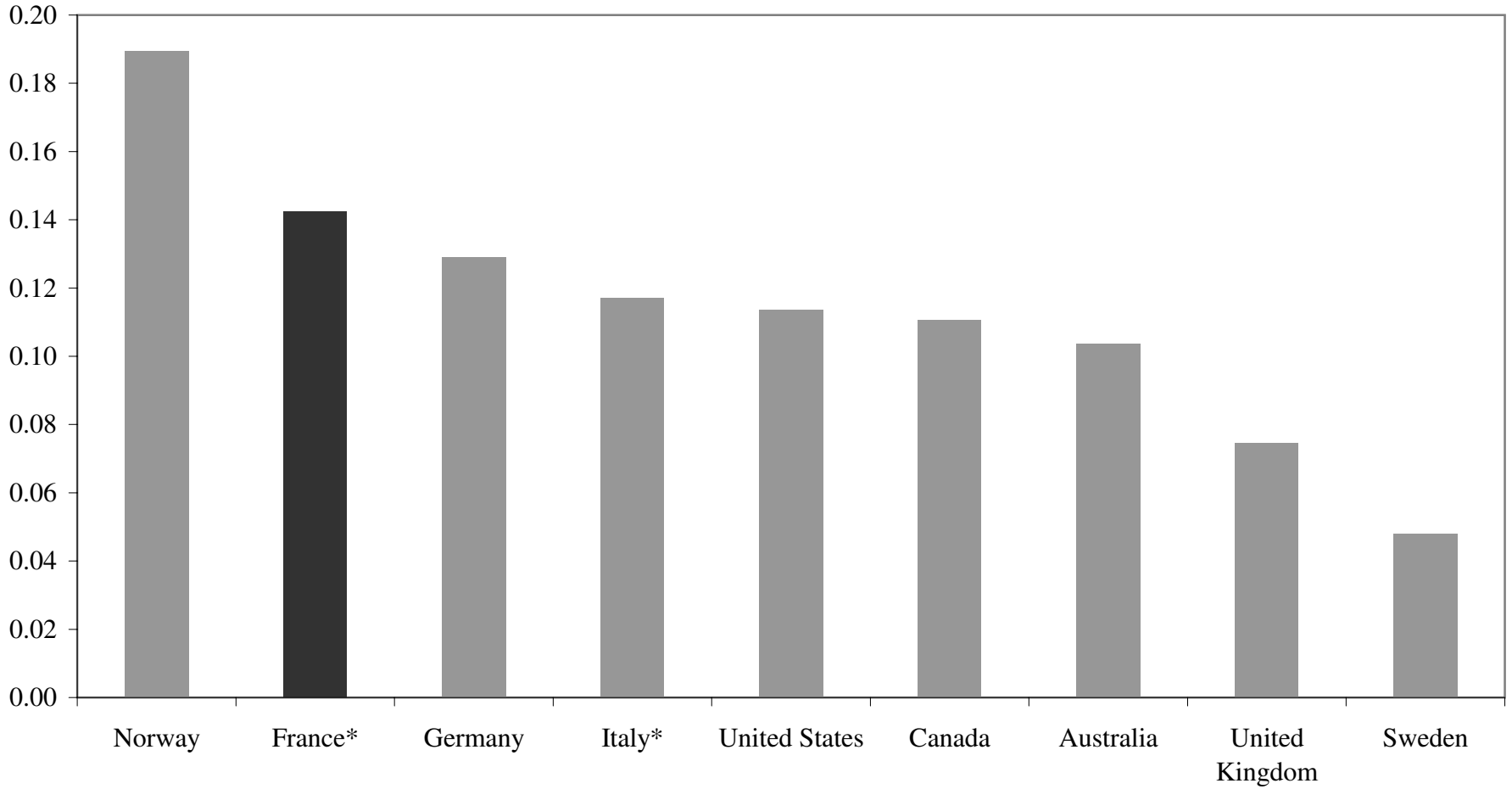


Source: Centre for the Study of Living Standards, database for OECD countries, last updated July 2003.

* Data for some variables are available for only a short time period for France and Italy, meaning that greater use of extrapolation has been necessary for some of the underlying variables for these countries, and consequently that the indexes for these countries are considered less reliable than for other countries.

Chart 2: Growth in the Index of Economic Well-being in Selected OECD Countries, 1980-2001

Equal Weighting, Absolute Change in the Scaled Index Level



Source: Centre for the Study of Living Standards, database for OECD countries, last updated July 2003.

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Chart 3: The Index of Economic Well-being Versus GDP per Capita in France, 1980-2001

Scaled Index Levels

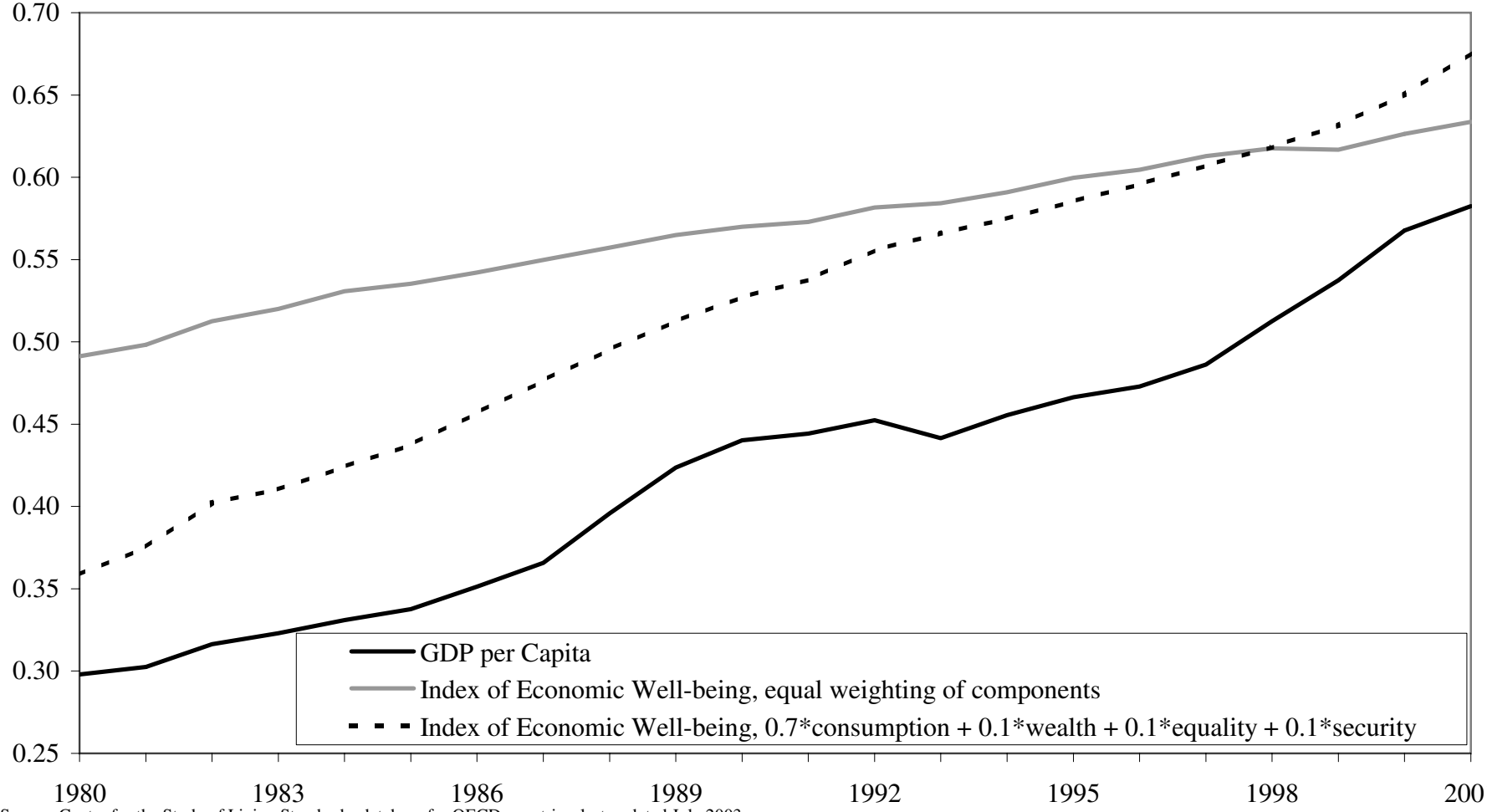

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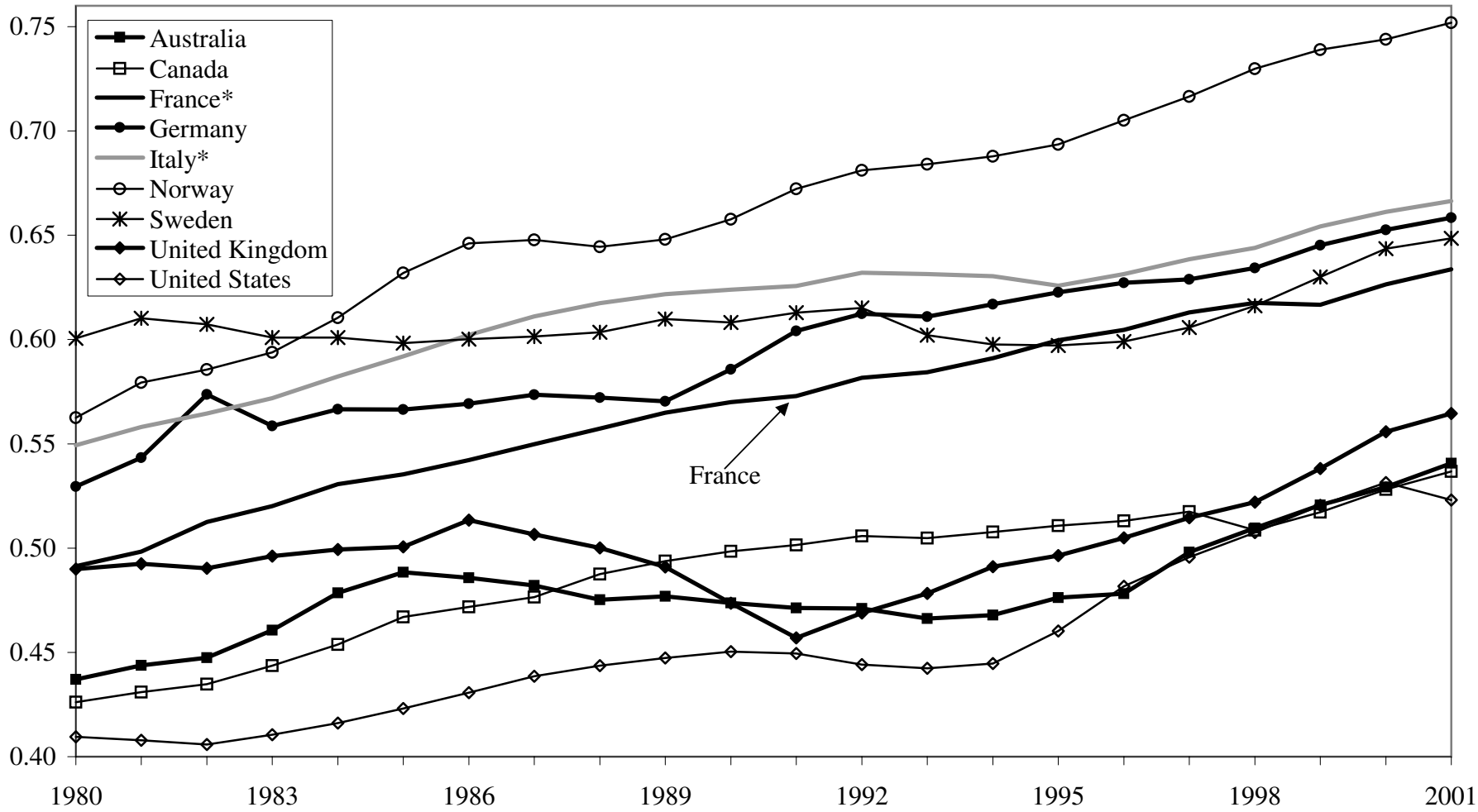
Chart 4: The Index of Economic Well-being in Selected OECD Countries, 1980-2001

Equal Weighting, Scaled Index Levels



Source: Centre for the Study of Living Standards, database for OECD countries, last updated July 2003.

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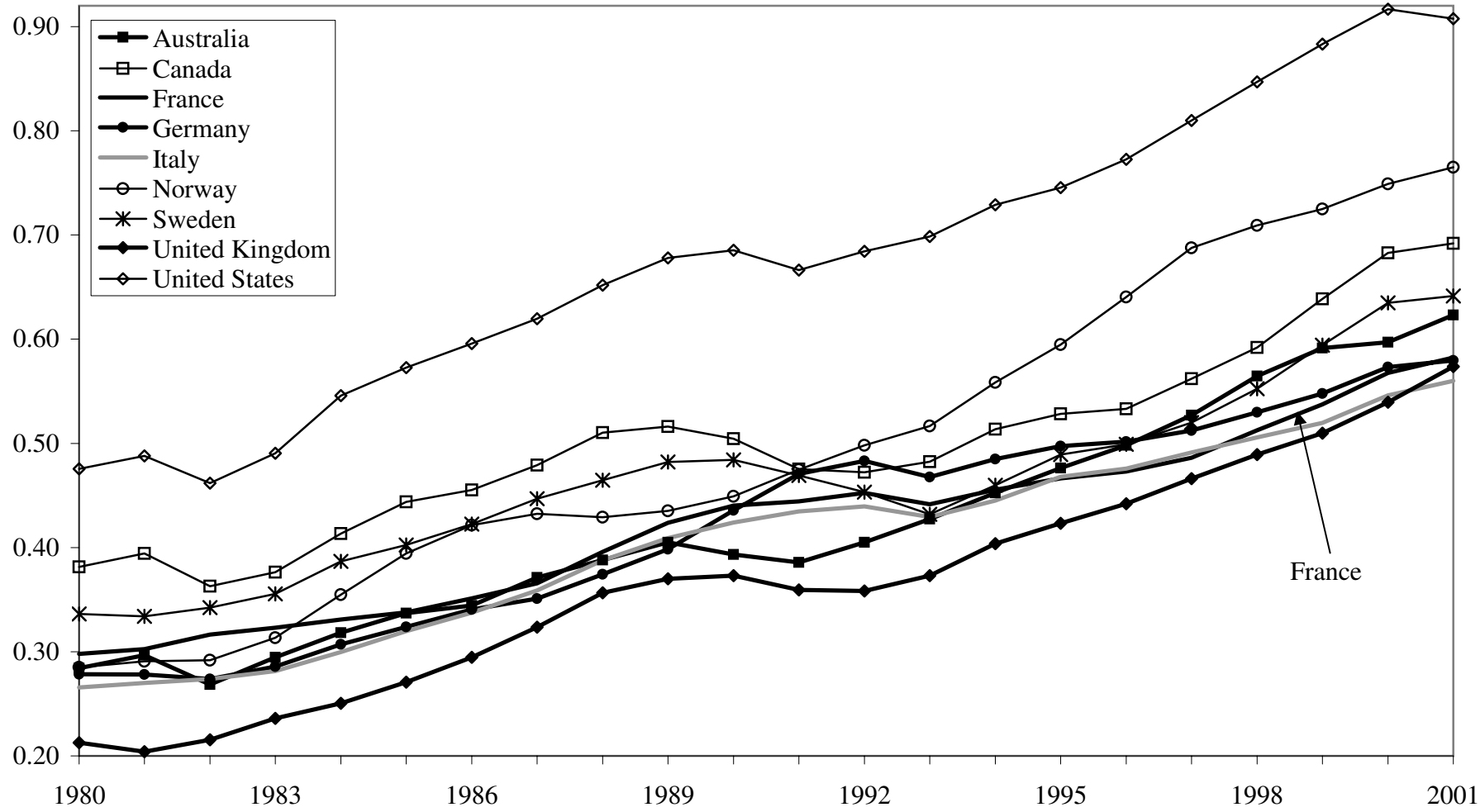
Chart 5: GDP per Capita in Selected OECD Countries, 1980-2001

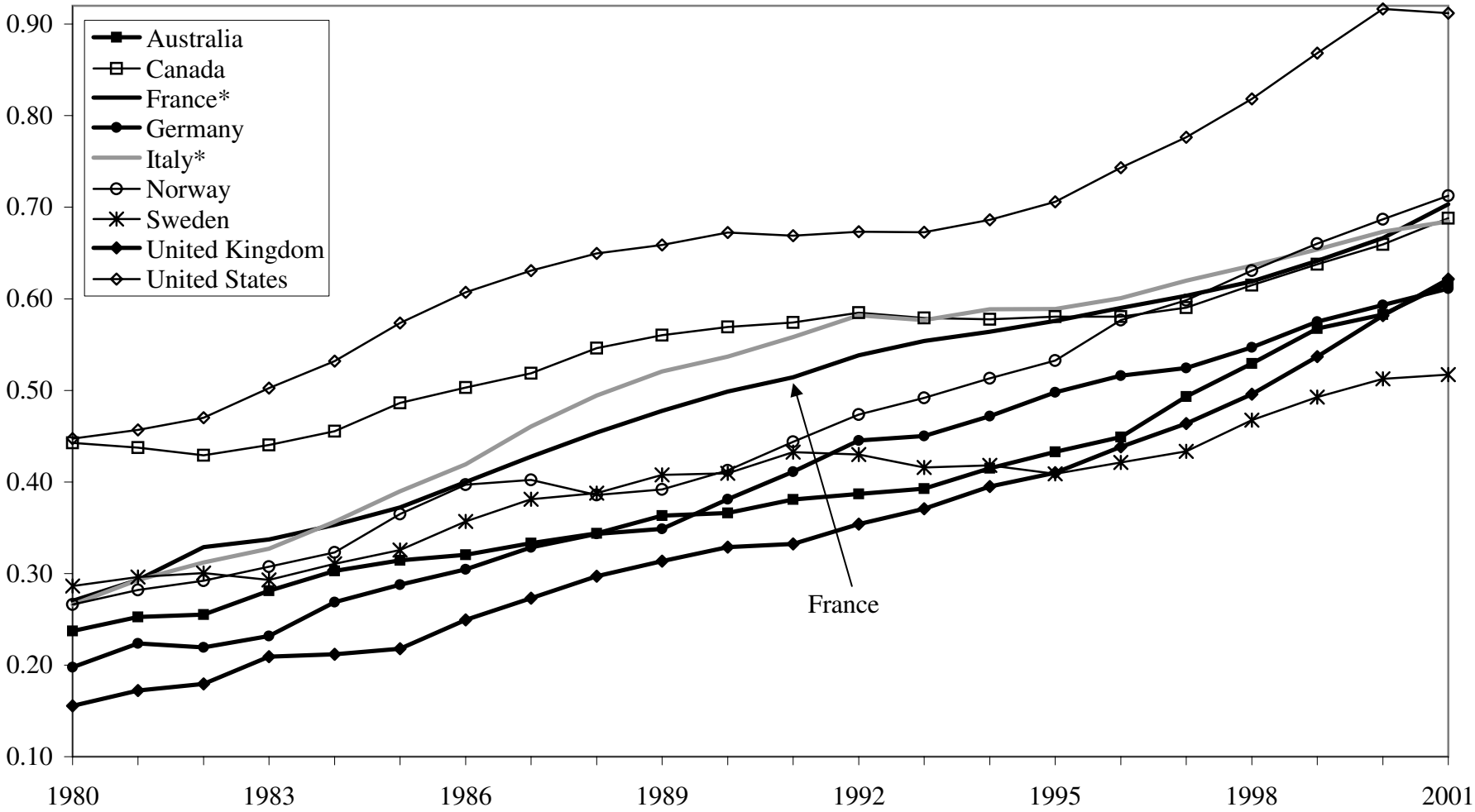
Scaled Index Levels



Source: Centre for the Study of Living Standards, database for OECD countries, last updated July 2003.

Chart 6: Effective Consumption Flows in Selected OECD Countries, 1980-2001

Scaled Index Levels



Source: Centre for the Study of Living Standards, database for OECD countries, last updated July 2003.

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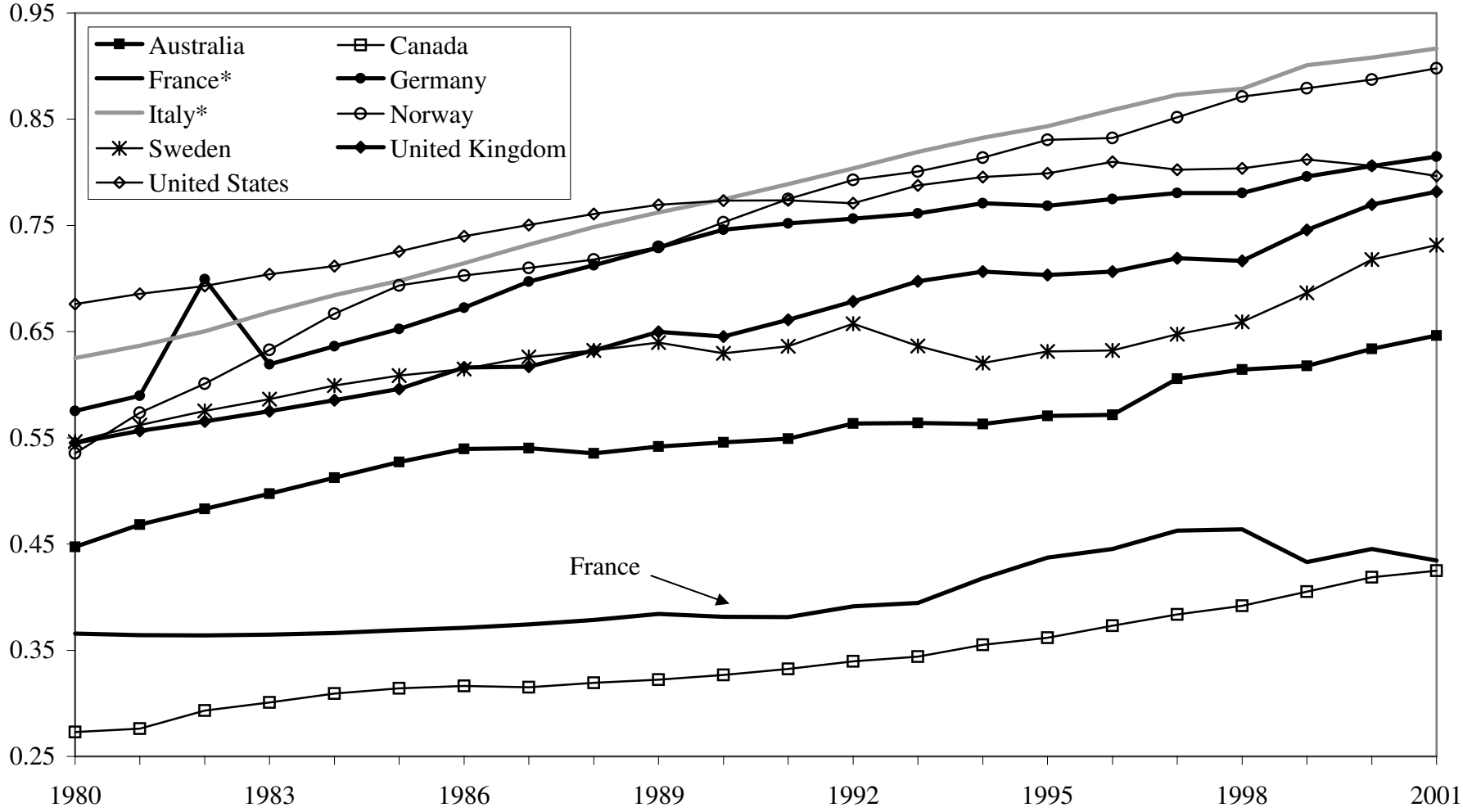
Chart 7: Stocks of Wealth in Selected OECD Countries, 1980-2001

Scaled Index Levels



Source: Centre for the Study of Living Standards, database for OECD countries, last updated July 2003.

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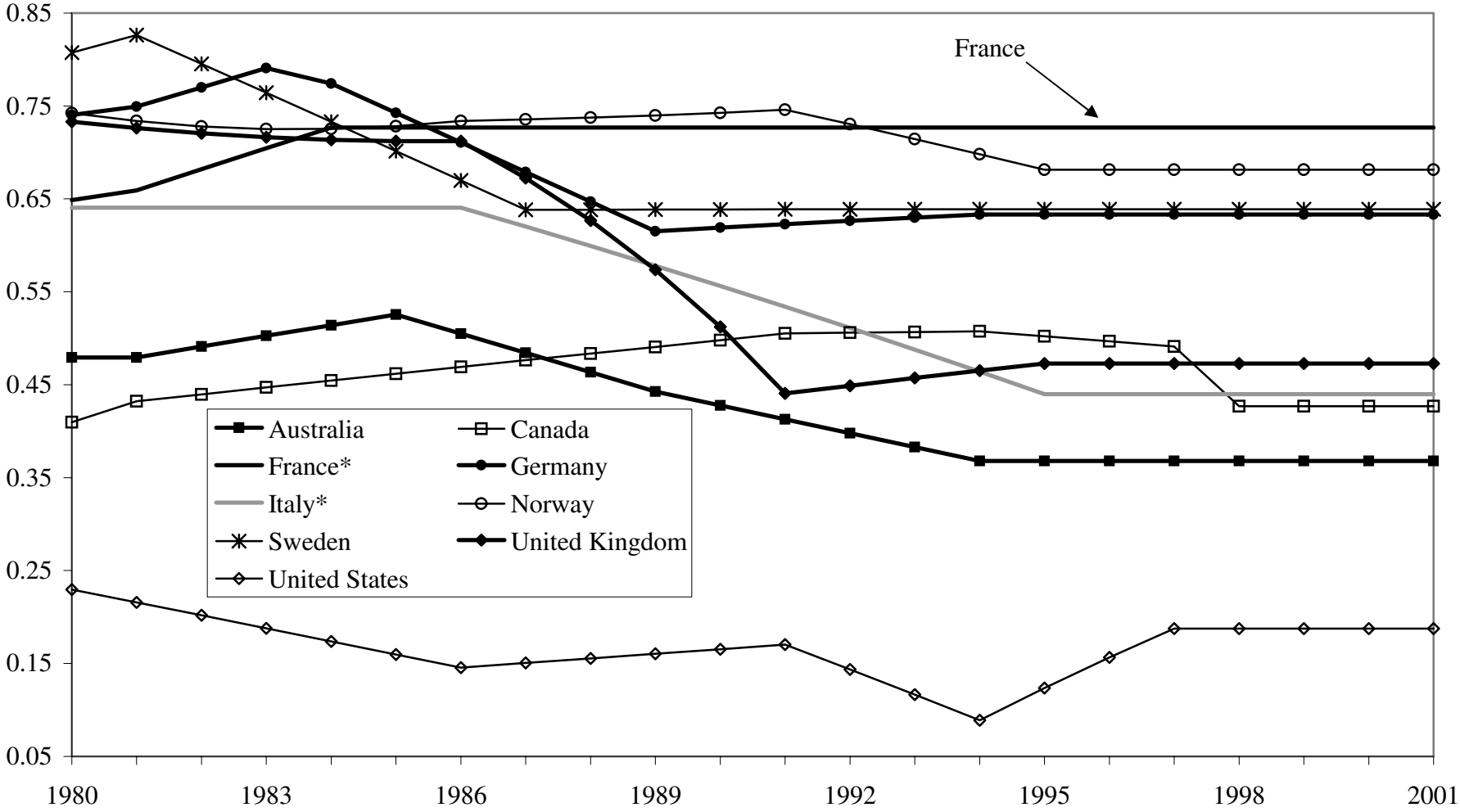
Chart 8: Equality in Selected OECD Countries, 1980-2001

Scaled Index Levels

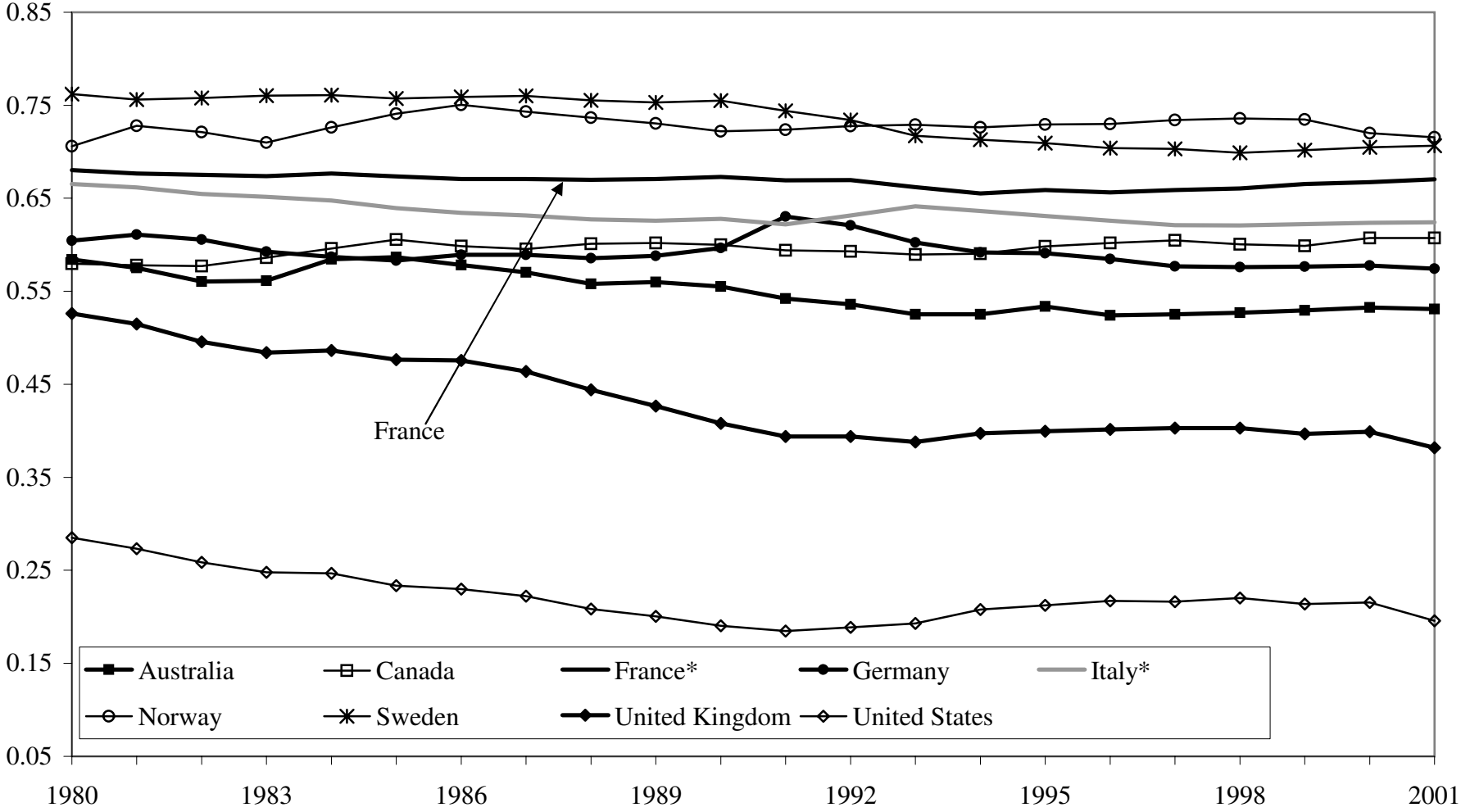


Source: Centre for the Study of Living Standards, database for OECD countries, last updated July 2003.

* Data for some variables are available for only a short time period for France and Italy, meaning that greater use of extrapolation has been necessary for some of the underlying variables for these countries, and consequently that the indexes for these countries are considered less reliable than for other countries.

Chart 9: Economic Security in Selected OECD Countries, 1980-2001

Scaled Index Levels



Source: Centre for the Study of Living Standards, database for OECD countries, last updated July 2003.

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