

Measuring Economic Insecurity in Rich and Poor Nations

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Measuring Economic Insecurity in Rich and Poor Nations

Abstract

In both rich and poor nations, worrying about future economic dangers subtracts from the present well-being of individuals, which is why affluent societies have complex systems of private insurance and public social protection to reduce the costs of economic hazards. However, the citizens of poor nations (i.e. most of humanity) typically find both private insurance and public social protection to be largely unavailable – their lives are both poorer and riskier. How should one measure economic insecurity in these very different contexts?

This paper begins with a discussion of the human rights perspective on ‘economic insecurity’ and its implications for measurement. Because rich nations have better, more easily available data, Section 2 illustrates the measurement of economic insecurity and its importance to trends in relative economic well-being in four affluent OECD countries between 1980 and 2009. Section 3 uses available data to estimate the level of economic security in approximately 2008 in a comparable way, to the extent possible with currently available data sources, in a broader sample of countries. To reflect better the reality of developing countries, it adjusts our previous estimates of the economic security components of the Index of Economic Well-being by: (1) including consideration of the volatility of food production in the risk of loss of livelihood; (2) adjusting the risk of spending on health care to take account of the large non-discretionary proportion of household spending on food in poor countries and (3) adding adult male mortality to the risk of divorce in the calculation of the risk of single parent poverty. Section 4 discusses some implications and concludes.

Measuring Economic Insecurity in Rich and Poor Nations

In analyzing economic well-being, the discipline of economics has tended to start from the utility of present consumption, but the present is really a very short period – just the moving split-second of direct experience which separates the remembered past from the anticipated future. Nevertheless, people can spend a lot of that time worrying about their economic future – which subtracts from their enjoyment of the present. This paper thinks of such worries as “economic insecurity” – specifically defined as: “the anxiety produced by a lack of economic safety – i.e. by an inability to obtain protection against subjectively significant potential economic losses” (Osberg, 1998:17).

In both rich and poor nations, fears about what the economic future may hold are important for two main reasons – they subtract from individuals’ enjoyment of the present and they influence behaviours. To avoid anxieties about the future, people may acquire insurance (either public or private), choose less risky options in their decision making or build formal or informal networks of social support – but the options of public or private insurance are much less commonly available in poor countries and the risks which individuals face differ greatly across nations. Because economic insecurity is important everywhere for predicting both behaviour and well-being, and the risks and choices which individuals face differ greatly in different societies, this paper addresses the question: can one compare the level of economic security in the very different social context of rich and poor countries?

In affluent countries, the ‘economic insecurity’, ‘social protection’ and ‘social security’ literatures have all used different terms to discuss a similar set of issues while in poor nations the ‘vulnerability’ concept has framed much of the discussion. Section 1 of this paper starts with a brief conceptual discussion of the implications of a human rights perspective for measurement of economic security at the national level. However, to actually make comparisons between nations one needs comparable data, and data availability differs greatly across countries. Because rich nations have better, more easily available data, Section 2 illustrates the measurement of trends in economic insecurity using the data available on four affluent OECD countries between 1980 and 2009. In poor countries, similar time series of data do not exist but micro-data from representative surveys in specific years have sometimes become available. Osberg (2010) used such micro-data to estimate the level of economic security in the very different context of a very poor nation (Tanzania in 2006-07). Because it was not feasible for us to obtain and process similar micro data from all the world’s poor nations, widening the set of comparisons in this paper required the use of currently available secondary data sources – Section 3 discusses the compromises that this entails and provides some tentative comparisons. Section 4 concludes.

1. The Human Rights and Social Welfare Function Perspectives

What do we mean by Economic (In)Security or Vulnerability or lack of Social Protection¹? Why might such concepts be useful – and what does that mean for how a social index to measure economic security should be constructed?

Individuals do not need to build social indices to assist their private decision making, since they know their particular personal situation already. The only reason to construct a social index is to assist collective decisions, and a motivating assumption might be the idea that the objective of public policy is to maximize ‘Social Welfare’. In economics², the ‘Social Welfare Function’ is usually thought of as a weighted sum of individual utilities, in which the relative size of the weights attached to the utilities of low-income individuals reflect the degree of inequality aversion in society. In this conception, individuals have diminishing marginal utility of consumption and are therefore risk-averse. Risk-averse individuals will be worse off if they have to face uninsured economic hazards, but complete insurance protection may create incentive and moral hazard problems. As a result, neither complete coverage nor complete risk exposure is optimal. The crucial issue for public policy then is *how much* risk and loss mitigation is desirable. Measuring the actual current level of insecurity or vulnerability or social protection in a society is thus useful because it is an intermediate step in the design of public policy to maximize social welfare.

An alternative point of view starts from the perception that "Necessitous men are not free men." ³ – that individuals must actually be in possession of their basic human rights if they are to exercise meaningful free will in their economic and political choices. Because individuals’ choices must be meaningfully free if we are to want to maximize the (weighted) sum of individual utilities resulting from individual outcomes, the achievement of basic human rights for all citizens is the primary responsibility of government. After this has been achieved, thereby enabling autonomous individuals to pursue freely their own conception of the good life, maximization of the social welfare to be obtained from production is the secondary objective⁴ of public policy.

¹ These literatures refer to the same underlying issues, but rarely cross-reference each other. For example, in their otherwise excellent survey paper on social protection, Norton, Conway and Foster (2001) do not reference Dercon’s work on vulnerability – and Dercon’s 2005 survey of vulnerability similarly omits reference to them. Both papers ignore Osberg’s (1998) paper on economic insecurity and are in turn not referenced in Bossert and D’Ambrosio’s 2009 paper on that subject.

² Equal weights for all individual utilities (the original utilitarian position) and a linear utility function implies zero aversion to income inequality while maximal weight on the lowest utility is the strict Rawls criterion. The textbook presentation of Lambert (1989 – especially Chapters 4 and 5) is particularly clear.

³ Roosevelt, (1936). See also Sen (1999)

⁴ Rawls (1982:162). for example, is quite clear that his ‘maxi-min’ social welfare criterion is the second criterion of ‘social justice’ – i.e. subject to the prior attainment of the first principle of ‘equal basic liberties for all’.

In this ‘human rights’ perspective, national constitutions, international human rights covenants and the systems of jurisprudence they establish are what give concrete meaning to the term ‘human rights’. Specifically, for present purposes, Article 22 of the United Nations’ Universal Declaration of Human Rights stated in 1948 that:

“Everyone, as a member of society, has a right to social security.”

Article 25 of the United Nations’ Universal Declaration of Human Rights declared:

“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 lack of livelihood in circumstances beyond his control.”⁵

Unlike the social welfare function perspective (which thinks in terms of aggregate individual consumption and utility and rarely identifies particular commodities), the human rights approach identifies specific primary goods (in Article 25, “food, clothing, housing and medical care”) and specific contingencies (“security in the event of unemployment, sickness, disability, widowhood, old age”). The residual clause in Article 25 of the Universal Declaration (“or other lack of livelihood in circumstances beyond his control”) is meant to expand the generality of protections, but the focus of human rights discourse is clearly on the particular commodities labeled – which are meant to be available to all citizens, in sufficient amounts (by local social standards) .

A crucially important dimension of this human rights tradition is the fact that the texts articulating human rights are legal documents produced by legislatures and constitutional conventions which can claim democratic legitimacy. Because human rights claim to reflect universal societal preferences, the simple assertion of a right by a single person or group of people is not good enough justification. The credibility of distinctions between what is, and what is not, considered to be a human right depends heavily on the legitimacy of the process by which rights are articulated. Whatever their wisdom, academic books or articles are the product of individual authors. Hence, they cannot credibly claim this “Process Legitimacy” – except by making specific reference to human rights treaties.⁶ The ‘human rights’ conception of the

⁵ Today, the gender specificity of the language of 1948 will strike many people as very odd – but Article 2 makes it clear that all rights are to be guaranteed to male and female persons equally.

⁶ The “Economic Security Index” of Jacob Hacker and his Yale colleagues (see <http://economicsecurityindex.org/>) emphasizes the hazards of experiencing major income decline or large medical expenses in the U.S. without the buffer of adequate financial wealth – but there is no mention of human rights. The ILO’s Socio-Economic Security (SES) Programme comes closer to the human rights discourse, affirming that “Access to an adequate level of social protection is...a basic right of all individuals” (see <http://www.ilo.org/public/english/protection/secsoc/>).

objectives of public policy implies that the measurement of economic insecurity should articulate the link between empirical measures and specific human rights. Consistent with this perspective, the ‘named risks’ with which Osberg (1998) operationalized the general concept of ‘economic insecurity’ were explicitly drawn from those contingencies specified in Article 25 of the UN Universal Declaration of Human Rights. (Note also that in this conception of “economic insecurity”⁷ the anxieties of all citizens are considered⁸ – even if the affluent do not fear actual poverty, they may still be anxious about their economic future.)⁹

“Economic (In)Security” has most often been studied in the context of affluent nations. In these countries, habituated as they are to high and growing average incomes, fine-tuning the social programmes of the welfare state is the focus of much policy analysis and cross-national comparisons are crucial to the interpretation of ‘success’. (A citizen who learns, for example, that economic insecurity in Country A at time *t* was “83” needs some sort of comparator to know if this is low or high.) Cross-jurisdiction comparison of levels or trends over time in economic insecurity can be used as a social policy diagnostic – comparisons which are made easier by the long series of comparable data and nationally representative panel studies available from national statistical agencies and other sources in affluent nations.¹⁰

Arguably, however, poor countries are the places where accurate measurement and analysis of insecurity matters more. In these countries, individuals face many dangers (e.g. famine due to drought, or illnesses such as cholera) which have largely disappeared in rich nations. Moreover, individuals are repeatedly faced with potentially extreme outcomes from hazards that might elsewhere be thought ‘minor’¹¹. Because they lack access to the welfare state

Nevertheless, the range of issues identified by the ILO go well beyond those specifically identified as human rights – see <http://www.ilo.org/public/english/protection/ses/download/docs/definition.pdf>

⁷ Dominitz and Manski (1997), Scheve-Slaughter (2004) and Anderson and Gascon (2007) define economic insecurity as “an individual’s perception of the risk of economic misfortune”. The United Nations Department of Economic and Social Affairs (2008, p.vi) define it as “the exposure of individuals, communities and countries to adverse events, and from their inability to cope with and recover from the costly consequences of those events.” Bossert and d’Ambrosio (2009:1) chose the definition: “economic insecurity is the anxiety produced by the exposure to adverse events and the inability to recover from them.”

⁸ The “Vulnerability” discourse, by contrast, typically concerns only those individuals with a risk of poverty or destitution, defining “vulnerability” as “the existence and the extent of a *threat* of poverty and destitution; the danger that a socially unacceptable level of wellbeing may materialise.” Dercon (2005a); Naudé et al (2008).

⁹ The ‘right to security’ in named contingencies (see Article 25 of the UN Universal Declaration) can be interpreted either as avoiding poverty or being able to maintain one’s social identity and accustomed patterns of living. The former perspective has often been ascribed to Beveridge, and is popular in the US and UK. The latter point of view goes back at least to Bismark (1884) and continues to inform social insurance plans with earnings related benefits – which dominate social spending in most affluent countries.

¹⁰ For example, in their cross-national comparisons, Osberg and Sharpe (2002, 2005, 2011) use the harmonized micro-data available from the Luxembourg Income Study (LIS).

¹¹ For example, in a poor country, the daily task of splitting firewood carries with it the repeated risk of putting an axe in the foot. The absence of hospital care may then imply, if an infected wound produces lameness, permanently

social programmes or private sector risk-pooling financial mechanisms which might cushion the impact of such hazards, these dangers can be expected to have much larger impacts on behaviour and on well-being than in affluent countries.

2. Measuring Economic Insecurity in Affluent Nations¹²

In Article 25, the United Nations' Universal Declaration of Human Rights of 1948 affirmed the "right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control." This section therefore follows a "named risks" approach and examines four key objective economic risks - unemployment, sickness, widowhood and old age. As in Osberg and Sharpe (2002, 2005, 2009), we assume that changes in the subjective level of anxiety about a lack of economic safety are proportionate to changes in objective risk.¹³ Because our index of economic security is one of the four components of the Index of Economic Well-Being (IEWB) – the other three being: (1) a measure of augmented current per capita consumption; (2) the value of aggregate accumulation of productive resources and (3) an index of inequality and poverty in the distribution of current income – we refer to it as "The IEWB Index of Economic Security"

a. The IEWB Index of Security in the Event of Unemployment

The Osberg/Sharpe IEWB index of security in the event of unemployment is conceptually driven by three variables: the unemployment rate, the proportion of the unemployed receiving unemployment benefits, and the average proportion of earnings that are replaced by such benefits.¹⁴ A consistent finding in the economics literature on happiness and well-being in

lower lifetime earnings. Both the risk and its possible consequences are far smaller in affluent nations – and there are many other similar possible examples.

¹² Osberg and Sharpe (2009) constructed a measure of economic security for seven affluent nations (Canada, Australia, Germany, Norway, Sweden, the United Kingdom and the United States) as part of their Index of Economic Well-Being (IEWB) – see also Osberg and Sharpe (2002, 2005). This section substitutes Denmark for Norway because Section 3 calculates that Denmark edges out Norway as "most secure" – but differences are slight.

¹³ Green et al (2000:1) report that "subjective employment insecurity tracks the unemployment rate," while Dominitz and Manski (1997) report that "Expectations and realizations of health insurance coverage and of job loss tend to match up closely" for the United States.

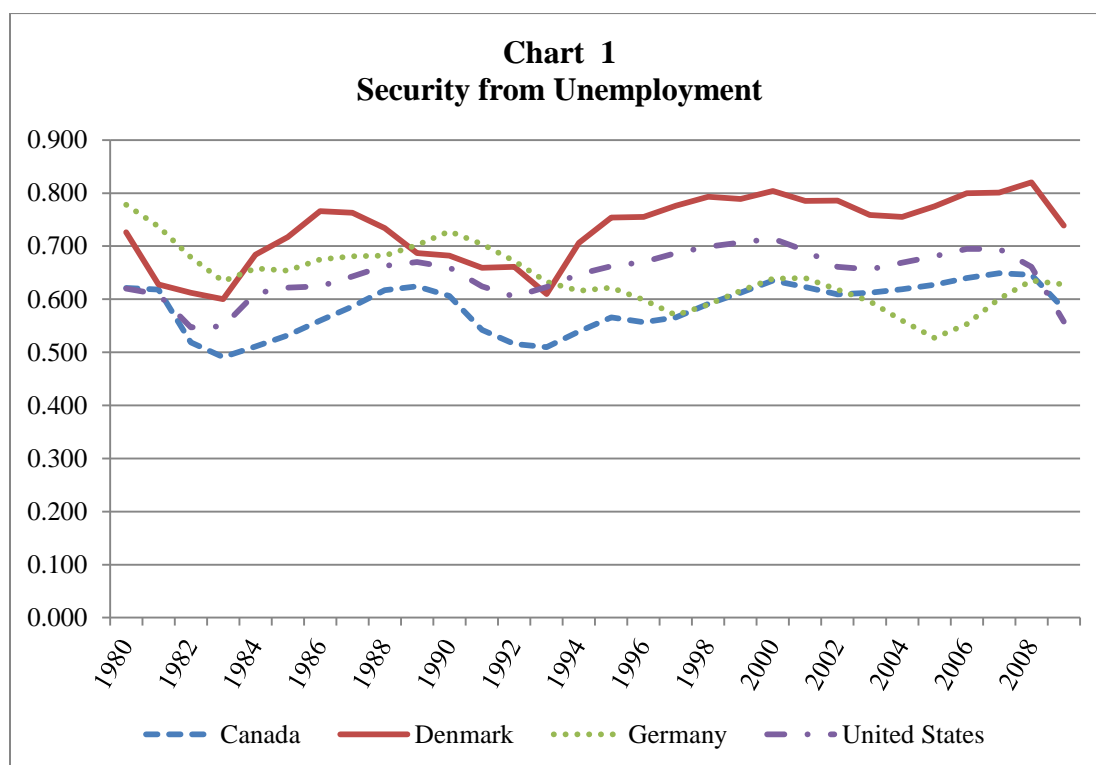
¹⁴ This paper models "Security in the event of Unemployment" using just the unemployment rate and the average percentage of lost earnings replaced by unemployment benefits (i.e. the "Gross Replacement Rate") for two earnings levels and three family situations. Source: OECD, Tax-Benefit Models. See Martin (1996) for a fuller discussion. http://www.oecd.org/document/3/0,3343,en_2649_34637_39617987_1_1_1_1,00.html In analyses using just Canadian data, we can use: (probability of not having a job) * (probability of not getting UI/EI benefits) * (fraction of wage not replaced by UI/EI). See Osberg and Sharpe (2009).

affluent nations has been the large negative impact of unemployment – an impact much stronger than the mitigating effect of unemployment compensation (see Di Tella, MacCulloch and Oswald 2003:819). The psychological and social impacts of unemployment (Jahoda, 1979) doubtless explain much of this – and there is also the long run impact of job loss on the wages of displaced workers, which many researchers have found to be significant (Ruhm, 1991; Chan and Stevens, 1999). Influenced by these literatures, the employment security index gives unemployment a weight of four-fifths, compared to a weight of one-fifth for the financial protection variable.

The risk of unemployment component of the economic security domain recognizes two distinct issues – the risk of unemployment and the risk of financial loss from unemployment. Both the unemployment rate and the financial protection index are scaled, using the linear scaling procedure (see Sharpe and Salzman, 2003). The scaled values of the two indexes are weighted to produce the overall index of security from the risk imposed by unemployment. The relative ease of obtaining a job provides employment security by enabling attractive options (in a low unemployment labour market) in the event of unemployment. A higher probability of obtaining unemployment benefits, or higher benefits, provides security by compensating individuals for their earnings loss¹⁵.

Chart 1 presents estimates of the IEWB Index of Security from Unemployment sub-index for Canada, Denmark, Germany and the United States, for the period 1980-2009. The general methodological point to underline is that “security from unemployment” is a compound probability, which mingles the chances of the hazard (unemployment) and the probability of benefitting from insurance against that hazard. Assessment of trends depends partly on the relative weight ascribed to each component. However, in all four countries examined, the decline in security from unemployment since the Great Recession of 2008 is notable.

¹⁵ We make the unemployment rate and the financial protection rate additive in weighted impacts, not multiplicative, which dampens the evolution of the risk to unemployment component over time. This also implicitly assumes no interdependence of the marginal impacts of changing unemployment or unemployment benefits. This represents a revision of our original conceptual basis of the unemployment security component, which calculated the expected value of financial loss – i.e. the probability of financial loss for the “typical” labour force participant, calculated as (probability of not having a job) * (fraction of wage not replaced by unemployment insurance). This probabilistic approach ignored any non-economic costs to non-employment, implicitly assumed it was irrelevant which component of the compound probability of financial loss changed and counted only the immediate wage loss of unemployment – all that mattered was the “bottom line” of short run financial loss due to unemployment.



b. The IEWB Index of Security in the Event of Sickness

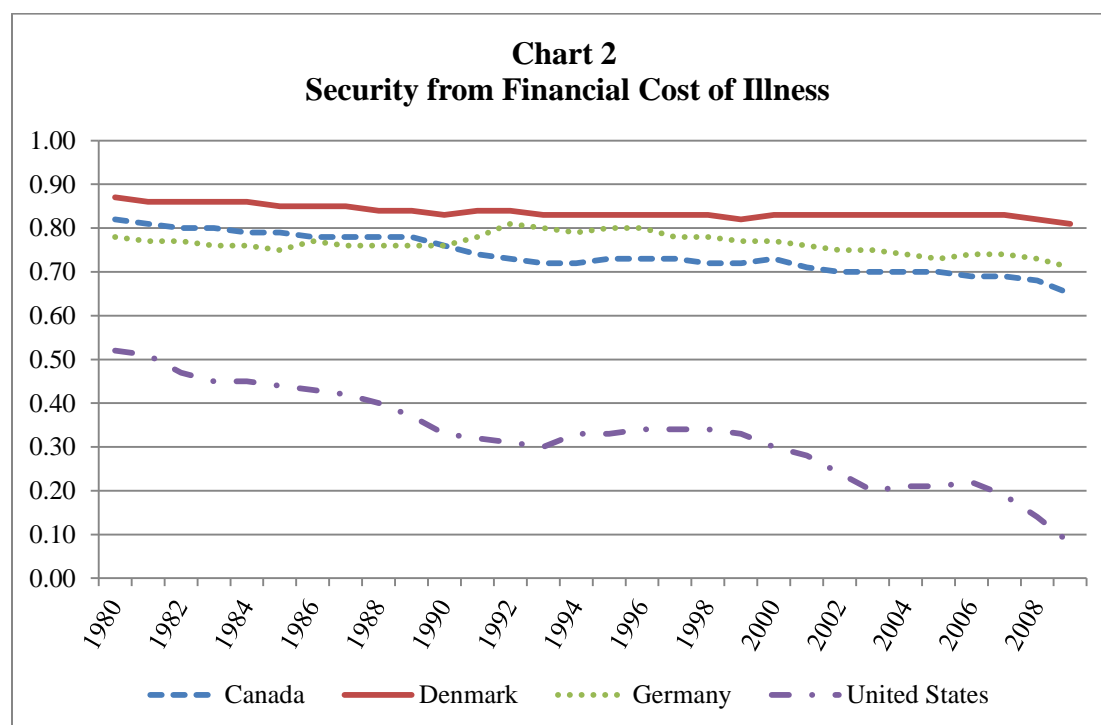
The focus of this component of the economic security domain of the IEWB is the financial risk imposed by illness, which in international comparisons is dominated by the coverage of public health care. In all the affluent countries, except the United States, publicly financed health insurance programs pay for medically necessary health care. Nevertheless, countries have different mixes of public and private services, with varying combinations of co-pay for services rendered¹⁶. Conceptually, one has ‘security’ if one can obtain protection from the adverse implications of an event that is *ex ante* uncertain – the voluntary choice of medically discretionary services is not an ‘insecurity’ issue.¹⁷ Nevertheless, for index-building purposes the issue is whether unreimbursed medical expenses are proportionate to unreimbursed medically necessary medical expenses, as a fraction of disposable income. We assume that the income elasticity of medically discretionary health care expenditures and the health insurance reimbursement of such costs is sufficiently similar across jurisdictions or over time that the error

¹⁶ E.g. in Canada, unlisted medical services (such as acupuncture), dental care and most drugs taken outside hospitals are not covered. These costs have been rising rapidly, which implies increased risk exposure.

¹⁷ Choice induced change in the probability of adverse events does not lessen its medical necessity after the fact – e.g. fixing a broken leg is medically necessary, whether or not personal choices (e.g. going skiing) changed its probability.

introduced by comparing the unreimbursed trend in total private health care expenditures is small.¹⁸

The IEWB uses the percentage of disposable household income spent by households on health care services that is not reimbursed by public or private health insurance as its indicator of the financial risk raised by illness. Chart 2 illustrates how Canada, Germany and Denmark are clustered in a fairly narrow band, and also illustrates the much lower level of, and larger deterioration in, security in the event of illness in the United States, relative to other countries.



c. The IEWB Index of Security in the Event of Widowhood

Illness, unemployment or old age happen directly to individuals, but the hazard of “widowhood” arises because the underlying event (death) happens to somebody else – i.e. the husband with whom the widow had linked her fortunes by marriage. When the UN Universal Declaration of Human Rights was drafted in 1948, the implicit social context in signatory nations

¹⁸ See Osberg, 2009, Appendix 1, which also discusses the risk of medical bankruptcy.

was the nuclear family in an industrial economy – specifically, the “male bread-winner model” of a single earner household with a non-employed spouse. At that time, the percentage of single parent families was relatively high partly as a result of the casualties of World War II, and “widowhood” was therefore the primary way in which women and children lost access to male earnings.

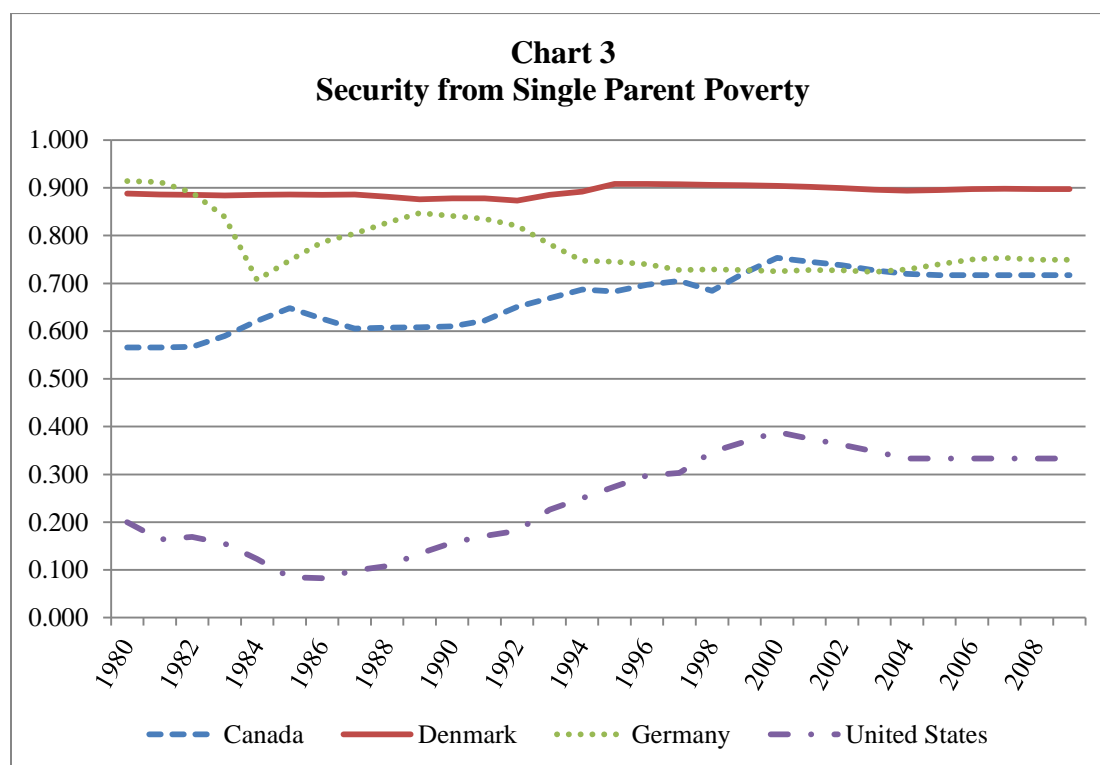
Since 1948, the two-earner family has become the social norm in affluent countries, and divorce and separation have become the primary origins of single parent families. However, it is still often true in affluent nations that many women and children are “one man away from poverty.” The prevalence of poverty among single parent families is much higher than in the general population, and family break-up is a hugely important determinant of entry into poverty¹⁹. We model the risk of becoming poor because of family breakup in an ‘expected value’ sense – i.e. we multiply (the probability of divorce) * (the poverty rate among single female parent families) * (the average poverty gap ratio among single female parent families).²⁰ The product of these last two variables is proportional to the intensity of poverty. Poverty is defined in relative terms as the proportion of households below one half median equivalent income.

The divorce rate per thousand was 2.2 in Canada in 2007, not so different from Germany or Denmark (2.3), but less than the United States (4.2). The United States was also an outlier in the poverty gap for single parent families at 42.7 per cent, compared to a range for other nations from 32.3 per cent in Germany. Canada (43.4 per cent) and the United States (43.7 per cent) were quite similar in the rate of poverty for single female headed households with children – well above Germany (34.9 per cent) and very different from Denmark.

Hence, the United States is an outlier on all dimensions, while other countries were sometimes relatively high, and sometimes relatively low, on particular dimensions. As a result, except for the United States, Chart 3 shows the product of these influences to be clustered in a fairly narrow band. Empirically, the moral is that similar aggregate levels of risk and insecurity can be the result of offsetting differences in component hazards – but an outlier on all components is sure to be an outlier in the aggregate.

¹⁹ Although divorce and separation can have large emotional impacts and substantial transactions costs (e.g. in legal bills) and although the termination of abusive or dysfunctional relationships can have social benefits, we do not attempt to model these issues. Our focus is a more limited financial one.

²⁰ This procedure effectively ignores single male parents. In Canada, males comprise only about 17 per cent of the single parent population, and have substantially smaller increases in poverty probability following separation.



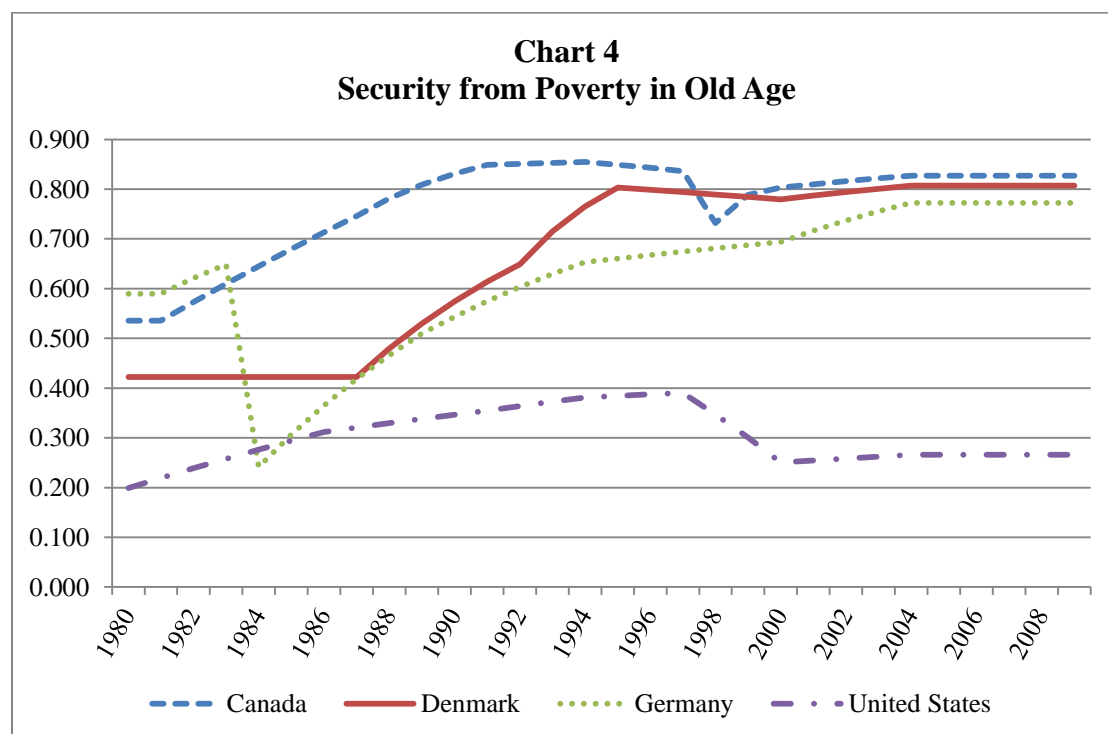
d. The IEWB Index of Security in the Event of Old Age

In the IEWB perspective, feelings of economic insecurity about old age are driven by fears of a worst case outcome, and the likelihood of that worst case outcome. Hence, the fourth component of the economic security domain is the risk of poverty in old age²¹, which is proxied by the poverty intensity (= poverty rate * average poverty gap ratio) experienced by households headed by a person 65 and over.

Chart 4 indicates fluctuations over time in poverty intensity among senior citizens – e.g. in Germany – which sometimes seem to follow a “saw-tooth” type of pattern. A characteristic feature of the income distribution of the elderly in affluent countries is a “spike” in the incomes of the elderly at the minimum income base defined by the structure of the country’s old age security system, which is often quite close to the ‘one half median income’ poverty line. Since many of the elderly, in all countries, do not have significant private pensions or income from

²¹ In this perspective, the IEWB is much closer to Beveridge and the vulnerability literature than to Bismark. (see footnote 9 above).

capital, in affluent nations many depend entirely on public pensions. For many people, the incomes from pension entitlements are much the same, because they are determined by the same formula for the minimum income base defined by pension legislation. When the resulting spike in the income distribution is close to the poverty line, and the formula is imperfectly adjusted for annual inflation, but revised periodically, ‘saw-tooth’ fluctuations over time in the poverty rate among the elderly are the result.²²



- e. Security in the event of disability or other loss of livelihood in circumstances beyond one's control

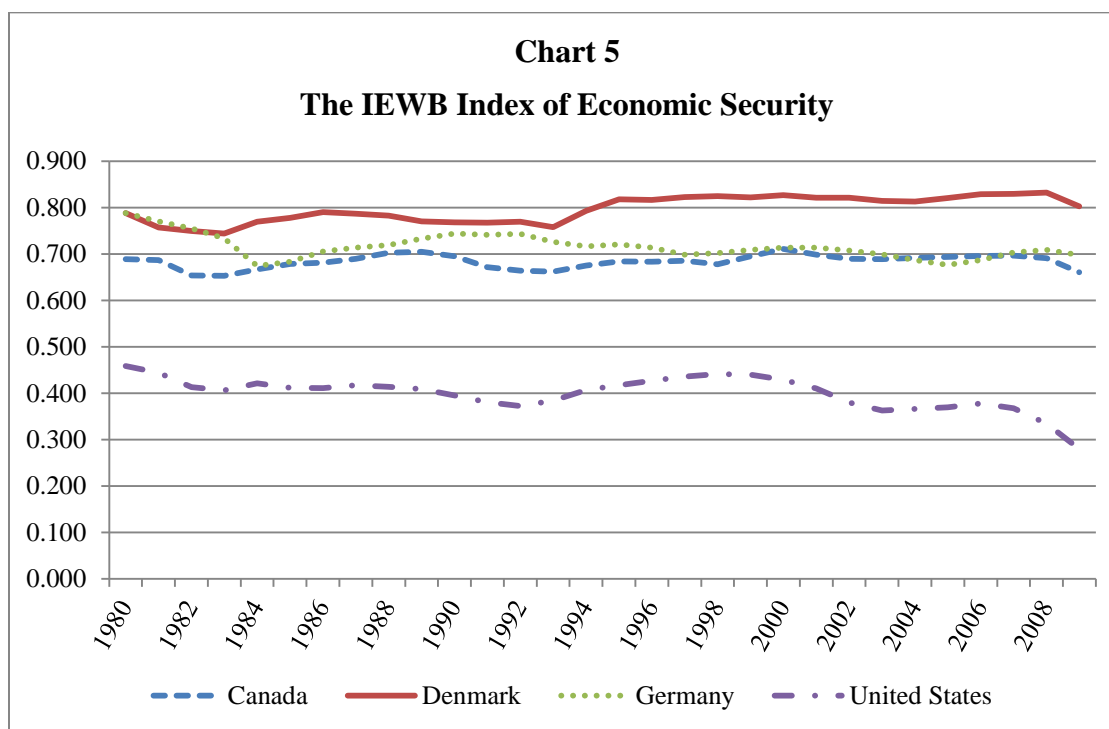
“Disability” is a term that covers a number of specific hazards, for which some insurance coverage is available in affluent nations – but the non-availability of comparable international

²² As well, since our data for this variable are drawn from the Luxembourg Income Study, which has periodic observations from each country, we have been forced to interpolate between data points and accept data (e.g. from Germany in 1983 and 1984) which are drawn from different original surveys – and both these compromises may introduce error.

data has thus far prevented comparative measurement. When we entirely omit consideration of this dimension of (in)security we are implicitly setting its weight to zero. This is not satisfactory, but we do not yet have a better alternative.

f. Aggregation of the Components of Economic Security into The IEWB Index of Economic Security

Chart 5 aggregates the scaled values of the four components of the economic security domain into an overall scaled index. To do this, we must choose weights for each risk. Equal weighting implicitly assumes that all the named risks are of equal importance, although the number of people facing each type of risk may not be equal. Arguably, it is more ethically defensible to weight each risk by the relative size of the populations deemed to be subject to it.



It is assumed that the population of working age (i.e. 15 to 64 years) either is, or could be, employed and is thus affected directly by the risk of unemployment. For illness, it is assumed that 100 per cent of the population is at risk. For the risk of single parent poverty, it is assumed that all married women and their children who are under 18 are at risk. On the presumption that individuals only really start to worry about poverty in old age as their retirement years start to near, it is assumed that the population 45-64 are most at risk. The component specific weights

are generated by adding up all the proportions of the population subject to the four risks and then standardizing to unity by dividing each proportion of the population affected by the risk by that total²³. For example, in Canada in 2007, the weights for the four components of economic security were 0.146 for security from single-parent poverty; 0.117 for security from poverty in old age; 0.438 for security from the financial risk of illness; and 0.298 for security from unemployment.

The contribution of each component is the product of its scaled value and weight. Because the demographic structure of each country differs, and shifts over time, the proportion of the population affected by the different risks, and hence the weights, varies by country and over time. This cross-country and over-time variation creates the difficulty that changes in the aggregate index of economic security may be driven by shifting population weights rather than by changes in the underlying components of economic security – a problem which becomes more acute, the greater the differences across countries in demographic structure and in demographic change. (Given the extent of such differences in the broader sample of countries considered in Section 3, that section summarizes the data using equal weights.)

Chart 5 presents the summary IEWB Index of Economic Security for all four countries. The immediately obvious lesson is the much lower level, and downward trend, of economic security in the United States – well before the advent of the current recession. The United States is not particularly an outlier in security from the costs of unemployment, but in all the other three dimensions of economic security it falls well short of the comparator nations. Largely because our weighting for unemployment benefits in the costs of unemployment de-emphasizes the replacement rate of UI/EI benefits and ignores entirely the decline in UI/EI coverage in Canada, the IEWB Index of Economic Security shows essentially no change for Canadians. However, in both level of economic security and in trends over time, the United States stands out clearly.

²³ In the Canadian case in 2007, adding up to 228 = 68 per cent of the total population of working age + 100 per cent for illness + 33 per cent married women plus children + 27 per cent aged 45 to 64.

3. Measuring Economic Insecurity in Poor and Rich countries – to the extent possible with available data

Poor countries typically do not have long time series of reliable micro-data statistics of the type which Section 2 has relied on – but most of humanity lives in such places. If comparisons are central to the interpretation of measurement, and if discussions of economic insecurity across jurisdictions or over time rely on comparable measurements, is it possible to meaningfully compare the economic insecurity of the world's population – i.e. including those who live in poor countries?

Osberg (2010) used Tanzania as a case study of the possibility of calculation of a meaningful index of economic insecurity for people who live in a very different context than that of Section 2. In that study, international data bases (e.g. from the World Health Organization, the FAO and the World Bank) were used in conjunction with the 2007 Household Budget Survey of the Tanzania's National Bureau of Statistics – henceforth HBS2007).²⁴ As Section 2 noted, the risk and depth of poverty for specific demographic groups (single parents and the elderly) was explicitly part of two of the four calculations of 'economic security' (i.e. security in the event of old age and 'widowhood'). Since Osberg (2010) had the micro-data from the HBS2007, and only had to calculate these dimensions of poverty for one country, this could be done – but making similar calculations for a large number of countries would have required resources that are not available to us, so compromises were inescapable.²⁵

Given the vast differences in living standards around the world and given also the present purpose of poverty measurement, one must also ask if the poverty line should be drawn: [1] relative to local standards of living or [2] with reference to a minimum absolute standard of living. In this paper, poverty is being measured because people are sometimes anxious about their future chances of poverty and we want a measure of 'insecurity' that reflects those personal anxieties. In section 2, the criterion used was explicitly relative – the poverty line was set at one half the median equivalent income of individuals in each country. This methodology was adopted on the grounds that local norms of poverty are in practice determined by the standard of living seen as 'normal' in a society at a point in time – and that median income is a reasonable approximation²⁶ of prevailing consumption norms in affluent nations. Within the set of countries similar to those examined in Section 2, the 'relative' criterion of one half the median equivalent income is commonly used in the literature on poverty comparisons because of its conceptual consistency across countries and its concordance with generally accepted local norms of poverty within countries.

²⁴HBS2007 randomly sampled 10,466 households. Expenditures, and other data, were recorded for 28 days.

²⁵ The data underlying all the calculations of Section 2 are available, as an Excel file, for these four countries and for ten other OECD nations, at www.csls.ca – see <http://www.csls.ca/iwbtool.asp>. The data used in this section are available at www.csls.ca/data/eirpn2011.asp

²⁶ For an extended discussion see Osberg (2007).

Osberg (2010) argued that if one wants to measure ‘insecurity’ about the future – i.e. individuals’ own subjective perceptions of ‘vulnerability’, it is the subjective anxieties of local people which matter, and local norms of deprivation are relevant to those anxieties. Because, in practice, local measures of poverty in Tanzania bracketed a “one half the median equivalent income” poverty line²⁷, Osberg (2010) used that relative poverty line criterion (which was calculated using the HBS2007 micro-data) to compute his measures of the economic insecurity associated with old age and widowhood (recognizing that local poverty lines in Tanzania are extremely low in absolute terms – well below international norms, such as the \$1 or \$2 (PPP) per day criterion).

Advocates of an ‘absolute’ poverty line methodology argue that the poverty line, as an objective criterion of deprivation for all humans, should be set at the cost of the bundle of commodities necessary for subsistence. For example, an absolute standard of poverty (\$2 per day per person, measured in PPP terms) is used in the Millennium Development Goals. This criterion implies that in very poor countries, a large percentage of the population are considered deprived²⁸, but in rich countries the poverty rate is miniscule. It is an undeniable reality that extreme physical deprivation (as evidenced, for example, in widespread ‘stunting’ of children’s stature) is common in some countries (e.g. Tanzania) and very rare elsewhere.

Osberg and Xu (2008) argued that the rapid pace of economic development in some countries (e.g. China) in recent years has rendered the absolute \$1 or \$2 per day criteria irrelevant to their new circumstances. They noted that the technical uncertainties involved in PPP calculations, and their enormous impact on poverty measurements, are a strong argument for the use of a relative income criterion of the poverty line, measured in own currency units—on the grounds of transparency and robustness. Furthermore, when Adam Smith was writing, roughly 230 years ago, about how the “established rules of decency” depended on prevailing standards of consumption, the absolute living standard of Europe was not very different from the average income in some less developed countries – e.g. India – in recent years, so poverty lines always have been relative to prevailing income norms.

In the context of these differing perspectives, this paper adopts the compromise position between poverty line relativism and absolutism that if Z_A is the \$2 per day PPP “absolute”

²⁷ In 2007, Tanzania’s National Bureau of Statistics used a criterion of 2200 calories per adult equivalent per day to establish the “food poverty line” at 10,219 Tshs per adult equivalent per month in mainland Tanzania (in PPP terms, equivalent to \$19.59 monthly, assuming a food bundle similar to that of the poorer half of the population and no other expenditures). The Basic Needs Poverty Line was set 37% higher at 13,998 Tshs per adult equivalent per month or \$26.84 (PPP) monthly. The criterion of “one half median expenditure per equivalent adult” would set the poverty line at 11,985 Tshs per month. In 2007, the ‘food poverty line’ Head Count rate of poverty was 0.164 while half median total expenditure implies the poverty rate was 0.235, compared to 0.333 if the ‘Basic Needs’ poverty line is used.

²⁸ In Tanzania, the \$1.25 PPP US per day poverty line implied 89% were poor in 2000 and a further 8% had incomes between \$1.25 and \$2 per day – see WDI Online series SI.POV.DDAY and SI.POV.2DAY.

poverty line, and Z_R a “relative” poverty line, the poverty line Z in a given country should be $Z = \max[Z_A, Z_R]$. This position reflects the fact that absolute poverty matters hugely in very poor countries but several developing countries (such as China) are clearly moving rapidly from the group of nations in which absolute poverty might be the key concern to the group of countries in which relative poverty is the socially relevant issue for poverty line definition. Because calculation of the median household income requires access to micro-data on the distribution of income, estimates of mean income are much more commonly available than estimates of median income. Hence, we adopt “one half the mean income” as our “relative” poverty line criterion (Z_R).

In calculating the Human Development Index or the Index of Economic Well Being or other compound indices with components that cannot be measured in comparable units, the standard methodology adopted is to use “Linear Scaling”, in which each observation’s value is expressed as a proportion of the observed range of values. That methodology is used here, as it was in Section 2.²⁹

a) Unemployment and the Risk of Loss of Livelihood

In 1948, when the UN’s Universal Declaration of Human Rights was drafted and adopted, overwhelmingly its signatories were industrialised nations. In such countries, the vast majority of the population depend on money earnings from formal employment in the labour market to enable household consumption. When paid employment is unavailable, they rely on unemployment insurance systems for mitigation of the hazard of being unable to exchange their labour time for commodities. The reason for writing “security in the event of unemployment” as a basic human right in Article 25 was the fact that in the context of industrialized countries, for most people, involuntary unemployment and loss of livelihood were synonymous.

In poor countries, there is often no social welfare or unemployment insurance system to support the jobless. Most people there depend either on farming their own land or on working in the informal sector of petty trading and self-employment.³⁰ Growth and urbanization are changing the relative proportions of these sectors, but they are likely to remain important for the

²⁹ In Linear Scaling, where r_{\max} is the highest risk jurisdiction and r_{\min} is the lowest, a specific *risk* (r_i) is translated into an index of *security* by calculating $I_i = (1.05 * r_{\max} - r_i) / [1.1 * (r_{\max} - r_{\min})]$. This procedure essentially asks, for a given observed range, where a country sits compared to the worst observed outcome. In this section, 10%, is added to the observed range to allow for possible change at the extremes.

³⁰ In Tanzania, for example, 89.6% of people over age 15 were economically active in 2006. The National Bureau of Statistics adds those with marginal attachment to employment and those available for work to those “without work and looking for work” and gets an estimate of 11% unemployment. Three quarters of the employed (75.1%) worked in agriculture (67.2% worked on their own farm while 7.9% were unpaid family helpers). The non-agricultural sector was split between informal and household employment (13.2%) and paid jobs with government, parastatal and other private employers (11.6%). See United Republic of Tanzania, 2007: Pages 7, 19, 30, 36, 38, 56;

foreseeable future. This suggests that a plausible index of risk of loss of livelihood in the global context might be a population weighted average of the risks of loss of livelihood associated with agricultural and non-agricultural employment.

If the objective is to measure insecurity as a component of economic well-being, then one should phrase the issue as constructing an “Index of Livelihood Security”.

$$\begin{aligned} \text{IEWB Index of Livelihood Security} &= P_E * I_E + P_A * I_A \\ &= (\% \text{ of employed population in non-agricultural employment}) * (\text{Index of Security from Unemployment}) \\ &+ (\% \text{ of employed population in agriculture}) * (\text{Index of Agricultural Livelihood Security}) \end{aligned}$$

Section 2a of this paper reported calculations of the first component – the IEWB Index of Security from Unemployment. In affluent nations, generalizing its implications to the entire population of working age can be defended as a reasonable approximation since agricultural employment is a very small percentage of the population. This is not reasonable in the poor countries of this world.

Columns A and C of Table 1 report the unemployment rates and unemployment benefit replacement rates which were used to calculate the Index of Security from Unemployment in Section 2. Columns B, D and E use Linear Scaling to calculate the IEWB Index of Security from Unemployment.³¹

Column F shows the very different percentages of the workforce who are directly affected by variability in the agricultural sector. As a ‘reduced form’ estimate of the riskiness of agriculture³², Column G calculates the percentage deviation from ten year trend of the gross per capita Food Production Index of the FAO, which is the basis of Column H, the sub-index of Agricultural Variability. Column I reports the population weighted average of Columns E and H. For the affluent countries whose agricultural labour force is around 2% of the total, adding consideration of agricultural variability clearly makes little difference – but for many other countries, it is central.

³¹ See footnote 14 above for benefit calculations. Note that since Table 1 includes the maximum and minimum nations from the larger list of nations enumerated in Table 6, the range is the same. However, although it is straightforward to use the unemployment rates as reported by the ILO for different countries, an important area for further research is the international comparability of reported unemployment rates. Even among very similar nations which ostensibly use the same ‘search’ criterion (e.g. the U.S. and Canada), the details of survey design and administration have been shown (e.g. by Riddell, 2005) to be important. In developing countries which lack any financial supports for the unemployed, the ‘search’ criterion is also less clearly appropriate – see footnote 30 above – so one can question the meaning of, for example, the 2.4% unemployment rate reported for Vietnam in Table 1.

³² The variance is a measure influenced by extremes of both good and bad, but insecurity of agricultural livelihood is about the bottom tail of the distribution of crop outcomes. Appendix B discusses briefly the importance of drought in determining crop failure, and the possibility of satellite measurement of such risks.

Table 1.
Security from Loss of Livelihood

	Unemployment Rate	Scaled Unemployment Rate	Replacement Rate (%)	Scaled GRR	Index of Security from Unemployment	Per Cent Agricultural Employment	FAO Food Production Index Per Cent Deviation from Trend, 2007	Index of Agricultural Deviation	Index of Livelihood Security
	A	B = Scaled from A	C	D = Scaled from C	$E = (0.8*B) + (0.2*D)$	F	G	H = Scaled from G	$I = \frac{H*(F/100)+E*(1-(F/100))}{1}$
Brazil	8.3	0.765	0.0	0.000	0.612	19.3	43.2	0.405	0.572
Canada	8.3	0.765	11.7	0.222	0.656	2.5	4.4	0.628	0.656
Denmark	6	0.830	47.7	0.909	0.846	2.7	-0.3	0.654	0.841
Germany	7.7	0.782	23.7	0.451	0.716	2.2	0.0	0.652	0.714
Mexico South	5.2	0.853	0.0	0.000	0.682	13.5	16.0	0.561	0.666
Africa United States	23.8	0.326	0.0	0.000	0.261	8.8	2.8	0.637	0.294
	9.3	0.737	13.6	0.258	0.641	1.4	1.0	0.647	0.641
Vietnam	2.4	0.932	0.0	0.000	0.746	57.9	36.5	0.444	0.571

Column A: KILMnet, International Labour Organization: Key Indicators of the Labour Market, 7th Edition, <<http://kilm.ilo.org/kilmnet/>>, 2008 or most recent year

Column C: The OECD summary measure of benefit entitlements, 1961-2007, <www.oecd.org/dataoecd/52/9/42625593.xls>, 2007

Column F: KILMnet, International Labour Organization: Key Indicators of the Labour Market, 7th Edition, <<http://kilm.ilo.org/kilmnet/>>, 2004 or most recent year

Column G: FAOSTAT, Food and Agriculture Organization of the UN, <<http://faostat.fao.org/site/612/default.aspx#ancor>>, 2007

b) Security in the Event of Sickness

In many nations, the health care system combines profit and non-profit private facilities, with a residual care role for an overburdened public network of dispensaries and hospitals, within which individuals must often pay for some services and pharmaceuticals. Health care costs are thus a significant worry to people in poor nations. As Gertler, Levine and Moretti (2003) noted: “Families in developing countries face enormous financial risks from major illness both in terms of the cost of medical care and the loss in income associated with reduced labor supply and productivity.” When asked what their “main problem” was during the past year, the most common (16.7%) response of Tanzanian respondents in 2007 was “sickness,” while 11.4% mentioned “shortage of drinking water” and 11.2% said “cost of medical treatment.”³³

As Column A of Table 2 documents, the differences in health care spending between countries are even more dramatic than the differential in GDP per capita. However, the focus of this paper is on the financial risks which health care costs impose on households, and the economic insecurity that this implies – not on the morbidity and premature mortality produced by health care inadequacies.³⁴ Columns B and C of Table 2 are included to show the variation across countries in the percentage of health care costs that are borne by the private sector and the percentage of those costs that are not reimbursed by private insurance, respectively. Column D puts those two elements together and compares the risk exposure of households to a given level of health care spending (i.e. Out of pocket costs as a percentage of the total spent) and Column F expresses it as a fraction of GDP per capita.

Out of pocket spending as a percentage of GDP per capita is conceptually similar to the index of health care cost risk used in the IEWB, and the relative magnitudes of that measure of risk, across the affluent nations of Table 1, align with the ranking of those nations in Chart 3 of Section 2. However, in rich countries there is much more discretionary income available to be spent on health care, if necessary. The IEWB has used out of pocket health care costs as an indicator of health care cost risk, and Section 2 expressed it as a percentage of disposable household income³⁵, because the impact of health care costs on well-being depends on ability to pay. But what we would really like to measure is out of pocket costs as a percentage of

³³ REPOA’s “Views of the People Survey” of 2007 randomly selected a primary respondent from among adults over age 25 within 4,987 sampled households. Calculations by author.

³⁴ The Human Development Index (an equally weighted sum of indices of Life Expectancy, Education and ln(GDP per capita)) is based on the premise that greater well-being depends on living a longer and better informed life, as well as on more access to economic goods and services. It has, therefore, a larger conception of human well-being than purely “economic”. “Economic Security” is being measured here as one domain of the Index of Economic Well Being, whose focus is quite consciously narrowly economic (not because we think non-economic sources of well-being are unimportant, but because of their importance – i.e. we think they should be explicitly recognized and not implicitly traded off for GDP). Osberg and Sharpe (2005) also argue that the IEWB is a better measure than GDP per capita of the access to economic goods and services component of the HDI.

³⁵ This variable is not available in the World Development Indicators data set – hence the use of GDP per capita.

household discretionary income, since even if illness strikes a household, food must be found, even before medicines. In the rich countries considered in Section 2, spending on food is a small enough share of total household consumption that its neglect can perhaps be justified. But in poor countries ability to pay is really better measured by income net of food expenditures than by total income, so direct comparison of the share of out of pocket health care costs in total income arguably distorts the impact of health care cost risk.

The FAO, as part of its mandate to monitor world food security, maintains a comparative database of the share of food consumption expenditure in total household expenditure (Column G of Table 2).³⁶ This is used to calculate out of pocket health care costs as a percentage of GDP per capita after adjustment for food expenditure share (Column H). Column I is the linearly scaled value corresponding to Column H.

³⁶ <http://www.fao.org/economic/ess/food-security-statistics/en/>

Table 2.
IEWB Index of Security from Health Care Costs

	Per Capita Total Health Spending (\$)	Private Expenditures on Health as % Total on Health (2008)	Out of Pocket Expenditure on Health as % Private Expenditure on Health	Out of Pocket on Health as % Total on Health Spending	GDP per capita PPP US Current \$	Out of Pocket on Health as % GDP per Capita	Food as % of Household Spending	Out of Pocket Health Costs as % of Income After Food Spending	Index of Security from Cost of Illness
	A	B	C	D = $100 \times (B/100) \times (C/100)$	E	F = $(A \times (D/100) / E) \times 100$	G	H = $(F / (100 - G)) \times 100$	I = Scaled from H
Brazil	875	56.0	57.1	32.0	10,416	2.69	20.8	3.389	0.808
Canada	3,867	30.5	50.9	15.5	39,459	1.52	18.0	1.855	0.895
Denmark	3,814	15.3	89.0	13.6	38,525	1.35	17.1	1.626	0.908
Germany	3,922	22.0	53.9	11.9	37,352	1.25	20.0	1.556	0.912
Mexico	837	53.1	92.9	49.3	14,186	2.91	34.0	4.410	0.750
South Africa	843	60.3	29.7	17.9	10,280	1.47	25.0	1.958	0.889
United States	7,164	52.2	24.4	12.7	47,131	1.94	13.6	2.242	0.873
Vietnam	201	61.5	90.2	55.5	2,791	3.99	50.1	8.004	0.546

Column A, B, C, E: World Health Statistics 2011; footnotes below are replicated from the source:
http://www.who.int/whosis/whostat/EN_WHS2011_Full.pdf, 2010

Column G: "Share (%) of food consumption expenditure in total consumption expenditure." Food and Agriculture Organization of the UN,
<www.fao.org/fileadmin/templates/ess/.../food.../ShareOfFood_en.xls>2000 or most recent

c) Security in the event of “Widowhood”

Security in the event of “Widowhood” is the most clearly gendered component of the IEWB. In all countries, most people live in families. However, market income is typically received by individuals, and pooled within households for consumption purposes. Hence, the economic well-being of most people, around the world, depends on both the risk of interruption of individual income flows (e.g. from loss of livelihood – see (a) above) and on the risk of shocks to the composition of the household. The gendered dimension of this risk arises from the fact that males typically have higher individual earnings than females, but women usually retain responsibility for the care of children, even if male earnings are no longer available to the family. When the Universal Declaration of Human Rights included ‘security in the event of widowhood’ as a basic human right in 1948, it recognized a right that was especially relevant for women – protection against the risk of poverty of women and children due to loss of male earnings.

The UN Universal Declaration arguably interpreted the risk of widowhood within the implicit framework of the nuclear family. Although, even in affluent countries, voluntary sharing within the extended family in hard times is common, such sharing is usually seen as an act of generosity, not as a right of the recipient and an obligation of the donor. It is only in countries governed by sharia law that the teachings of the Koran on the duty of men to care for their brother’s widows and orphaned nieces and nephews have legal force. Because our objective is to measure economic security, certainty of access to resources is the crucial issue, and ‘generosity’ is by its nature uncertain. Although in many poor countries, social norms of sharing within the extended family are strong, relatives are also often poor and sharing norms are not rights and cannot be legally enforced. Hence the focus here is on the nuclear family and enforceable claims to resources.

The methodology of Section 2 was based on the assumption that in affluent nations, the main source of the risk of loss of male earnings is now divorce/abandonment, rather than mortality. In poor countries, male mortality is more important than family breakup – in sub-Saharan Africa³⁷, HIV/Aids has rightly been emphasized as a cause, but other sources of

³⁷ Because Tanzania does not report internationally comparable divorce rate data, this paper does not report the Index of Economic Security for Tanzania. To get his estimates of Tanzanian divorce rates, Osberg (2010) calculated the probability (annualized and averaged) of divorce and no remarriage within 5 years, for 5 year intervals ages 24 to 44 based on survey self-reports using HBS2007 micro-data. In Tanzania, HBS2007 micro-data indicate that 22.2 % of Tanzanian households with a head under 60 were female-headed in 2007. Of those, about three in ten (29.2%) were headed by widows and slightly fewer (27.3%) by (self-reported) separated or divorced women. It was not feasible to do similar calculations for all countries – but it would probably be desirable, since the official reports of divorce rates are so low in some countries (e.g. Peru 0.09 or Guatemala 0.15) as to be scarcely credible. A more likely possibility is that in some countries family breakup produces single parent families who never manage to legally formalize separation and thus remain statistically invisible.

mortality are also very significant (e.g. traffic or industrial accidents, malaria, etc.). However, although South Africa (reported divorce rate at 0.68, male mortality of 11.58) is a strong example, data from other poor countries paint a more nuanced picture. In Trinidad and Tobago, for example, the divorce rate (2.15) is not so very different from that in Sweden (2.32) even if the male mortality rate (5.0 compared to 1.64) is significantly higher. Furthermore, in some rich countries, male mortality is far from negligible as a cause of loss of male earnings compared to divorce (e.g. the U.S. with a divorce rate of 3.7 and male mortality of 2.98).

In Table 3, the annualized risk of adult male mortality (Column B) is therefore added to the probability of divorce (Column A) to produce the annual hazard of loss of male earnings due to either death or divorce (Column C). One lesson of Table 3 is the non-negligible continuing importance of male mortality in the hazard of loss of male earnings, even in affluent nations – in concentrating solely on divorce, the calculations of Section 2 may have prematurely ignored the level, and the international variation, in traditional widowhood.

Column H of Table 3 calculates the risk of single parent poverty as the product of the Poverty Rate (Column F), the average poverty gap (Column G) and the annual hazard of loss of male earnings (Column C). To calculate an index of security, rather than a risk of poverty, Column I uses Linear Scaling to report the relative level of security from the compound hazard.

It is not surprising that South Africa's very high male mortality rate means a high risk of loss of male earnings – in this respect it is sadly representative of much of sub-Saharan Africa. However, one lesson from the Tanzanian micro data is that in poor countries, male earnings can often be very low to begin with. If the poverty rate among husband/wife families is high in any event, and not much different than that among single parent families³⁸, loss/departure of the husband may make much less of a difference to the probability and depth of female poverty than in rich countries.

An unfortunate consequence of being unable to access micro-data for each country is that we cannot calculate the difference in poverty rate and depth associated with a woman being married and living in a male-headed household or being the head of household for all these eight countries. To maintain consistency, this paper therefore applies the national rate and depth of poverty (using one half mean income as the poverty line).

³⁸ This may reflect a selection bias effect if women with better earnings options choose not to move in with relatives after the loss/departure of their spouse. Cross-sectional micro-data like the HBS2007 do not enable distinction between extended family households which have expanded to accommodate widows and their children.

Table 3.
IEWB Index of Security from Widowhood

	Annual Divorce Rate per 1,000	Annualized Adult Male Mortality Rate	Annual Hazard (Divorce + Widowhood)	Poverty Rate	Poverty Gap	Risk of Single Parent Poverty	Index of Security from Widowhood
	A	B	C = A + B	F	G	H = C*F*G/1000	I = Scaled from H
Brazil	0.87	4.56	5.43	42.89	44.49	10.35	0.77
Canada	2.21	1.93	4.14	19.76	31.45	2.58	0.94
Denmark	2.68	2.38	5.05	7.44	30.13	1.13	0.97
Germany	2.34	2.20	4.54	14.85	25.01	1.69	0.96
Mexico	0.77	3.49	4.26	39.84	41.21	6.99	0.84
South Africa	0.68	11.58	12.26	61.57	53.37	40.27	0.09
United States	3.70	2.98	6.68	27.07	36.99	6.69	0.85
Vietnam	0.21	3.84	4.06	25.08	22.17	2.26	0.95

Column A: UN Demographic Yearbook 2008 (Table 25) <http://unstats.un.org/unsd/demographic/products/dyb/dyb2008.htm>

UN World Marriage Data 2008 http://www.un.org/esa/population/publications/WMD2008/WP_WMD_2008/Data.html

Column B: A: World Health Statistics 2011 http://www.who.int/whosis/whostat/EN_WHS2011_Full.pdf

Column F,G: Primary Source: "PovcalNet: the on-line tool for poverty measurement developed by the Development Research Group of the World Bank": <http://iresearch.worldbank.org/PovcalNet/povcalSvy.html>

Secondary Source: LIS Datacenter (for Canada, Denmark, Germany and United States)

Index of Security from Widowhood Scaled from H

d. Security in the Event of Old Age

Around the world, countries differ hugely in age. The median age of the population of Niger and Uganda is under 16, and other sub-Saharan Africa countries are typically under 20 in median age. By contrast, median age in Japan is 44.7, in Germany 44.3 and in Italy 43.2³⁹. In a relatively young society, old age security simply does not have the salience as a policy issue that it has in the older countries.

Countries also differ hugely in the stability and shape of their age distribution. Demographers have used the term “demographic transition” to describe the change from societies which at one time had a high and stable birth and mortality rates, followed by a period of rapidly declining mortality and birth rates, and eventual population stability (or contraction) at low and stable mortality and birth rates. Countries such as the U.S., where the crude birth rate per thousand was relatively low (15 in 1980-85) and has since changed relatively little (-2 by 2005-2010), is an example of the ‘low and stable’ scenario – an implication of which is that age cohorts are of comparatively even size. Countries like Uganda, with a very high crude birth rate (49 per thousand in 1980-85, dropping only by 3 by 2005-2010) exemplify the initial scenario – an implication is that the age structure is like a steeply sloping pyramid, with each younger generation significantly larger than the previous cohort. But countries like Brazil, which has seen almost a 50% reduction in crude birth rate in 25 years (from 31 per thousand in 1980-85) are in the middle of the transition, implying that there is a huge demographic bulge working its way rapidly up the age distribution.⁴⁰

The bottom line, for consideration of old age security, is a substantial variation in the percentage of the population that now is, or soon will be, elderly. Among the eight countries examined here, the ‘medium variant’ population projection of the UN estimates that in 2035 those over 65 will comprise 8.2% of the South African population but 30.6% of the German, with Mexico (13.8%), Vietnam (15.4%), Brazil (15.7%), the U.S. (20.6%), Denmark (23.6%), and Canada (24.1%) in between.

In countries without public pension systems, where many of the elderly live with their extended families, and continue to work like younger cohorts (because they have to, in order to survive), there may not actually be much difference between poverty among the elderly and poverty among younger cohorts⁴¹. Where micro-data enabling calculation of elderly poverty is unavailable, Table 4 calculates the ‘Index of Security in the Event of Old Age’ using the national average rate and depth of poverty – elsewhere it is calculated in the same way as in Section 2.

³⁹ See http://esa.un.org/unpd/wpp/Sorting-Tables/tab-sorting_ageing.htm

⁴⁰ Data from <http://esa.un.org/unpd/wpp/Excel-Data/fertility.htm>

⁴¹ See Mboghoina and Osberg (2010a, 2010b) for discussion of the Tanzanian example.

Table 4.
IEWB Index of Security in Old Age

	Poverty Rate	Poverty Gap	Poverty Intensity	Index of Security in Old Age
	A	B	$C = A*B/100$	D = Scaled from C
Brazil	42.9	44.5	19.080	0.470
Canada	19.8	31.5	6.215	0.827
Denmark	7.4	30.1	2.243	0.938
Germany	14.9	25.0	3.714	0.897
Mexico	39.8	41.2	16.420	0.544
South Africa	61.6	53.4	32.860	0.087
United States	27.1	37.0	10.015	0.722
Vietnam	25.1	22.2	5.560	0.846

Column C, D: Primary Source: "PovcalNet: the on-line tool for poverty measurement developed by the Development Research Group of the World Bank":
<http://iresearch.worldbank.org/PovcalNet/povcalSvy.html>

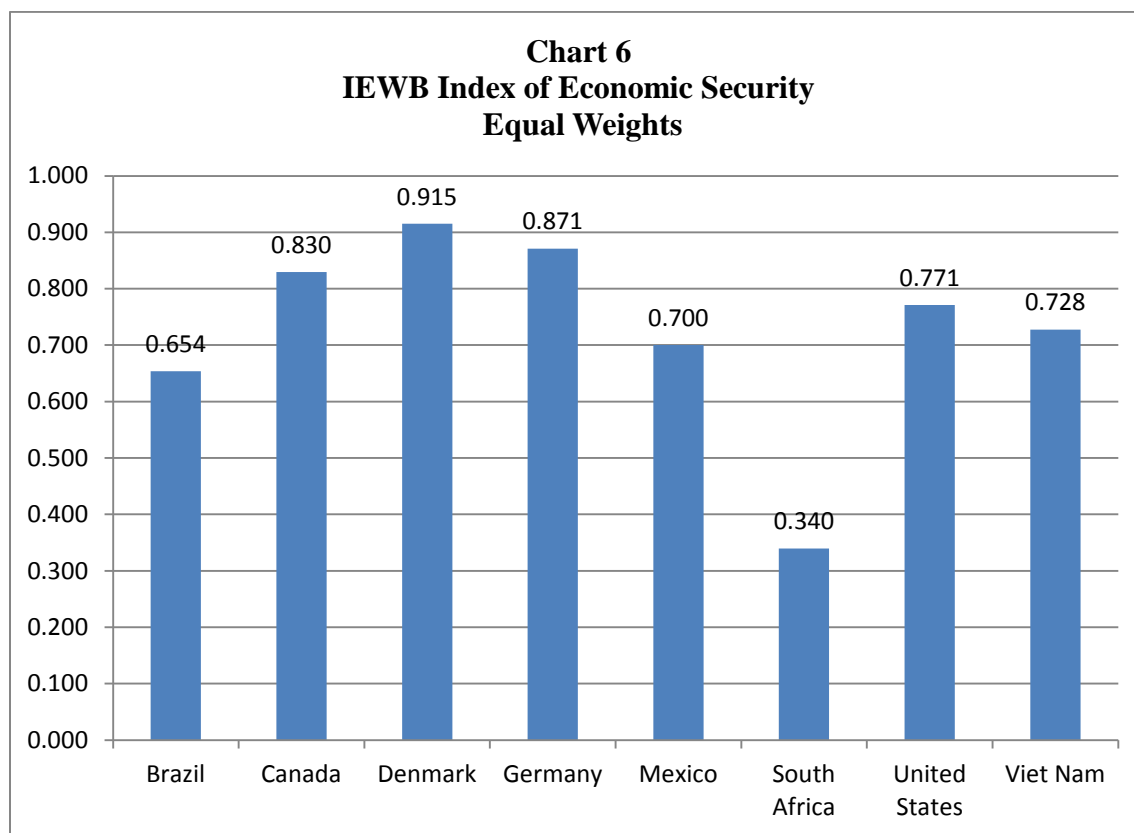
Secondary Source: LIS Datacenter (Canada, Denmark, Germany and United States)

e. The IEWB Index of Economic Security

Chart 6 and Table 5 put the pieces together, weighting the four sub-indices of economic security equally. As discussed earlier, weighting by relevant population size has some conceptual advantages but implies that comparative rankings may be driven by population weightings rather than by differences in component measures of security – so Chart 6 emphasizes equal weightings, while Chart 7 illustrates the sensitivity of the aggregate index to population weightings.

Table 5.
Estimates of the Components in IEWB Index of Economic Security (Brazil, Canada, Denmark, Germany, South Africa, United States, Vietnam)

	Overall Index Equal Weights	Index of Livelihood Security	Index of Security from Cost of Illness	Index of Security from Widowhood	Index of Security in Old Age
Brazil	0.654	0.572	0.808	0.766	0.470
Canada	0.830	0.656	0.895	0.942	0.827
Denmark	0.915	0.841	0.908	0.974	0.938
Germany	0.871	0.714	0.912	0.962	0.897
Mexico	0.700	0.666	0.750	0.842	0.544
South Africa	0.340	0.294	0.889	0.089	0.087
United States	0.771	0.641	0.873	0.849	0.722
Viet Nam	0.728	0.571	0.546	0.949	0.846



To examine the potential impact of alternative population weightings, Chart 7 computes the aggregate index using three alternative weightings of the four components: (1) equal weighting; (2) using U.S. population weights and (3) using the population weights for a fairly typical sub-Saharan African country (specifically, Tanzania - See Appendix C). Because the demography of South Africa, with a relatively high birth rate, differs from the other comparator nations, changing population weights matters for South Africa, while having relatively small impacts for other nations.

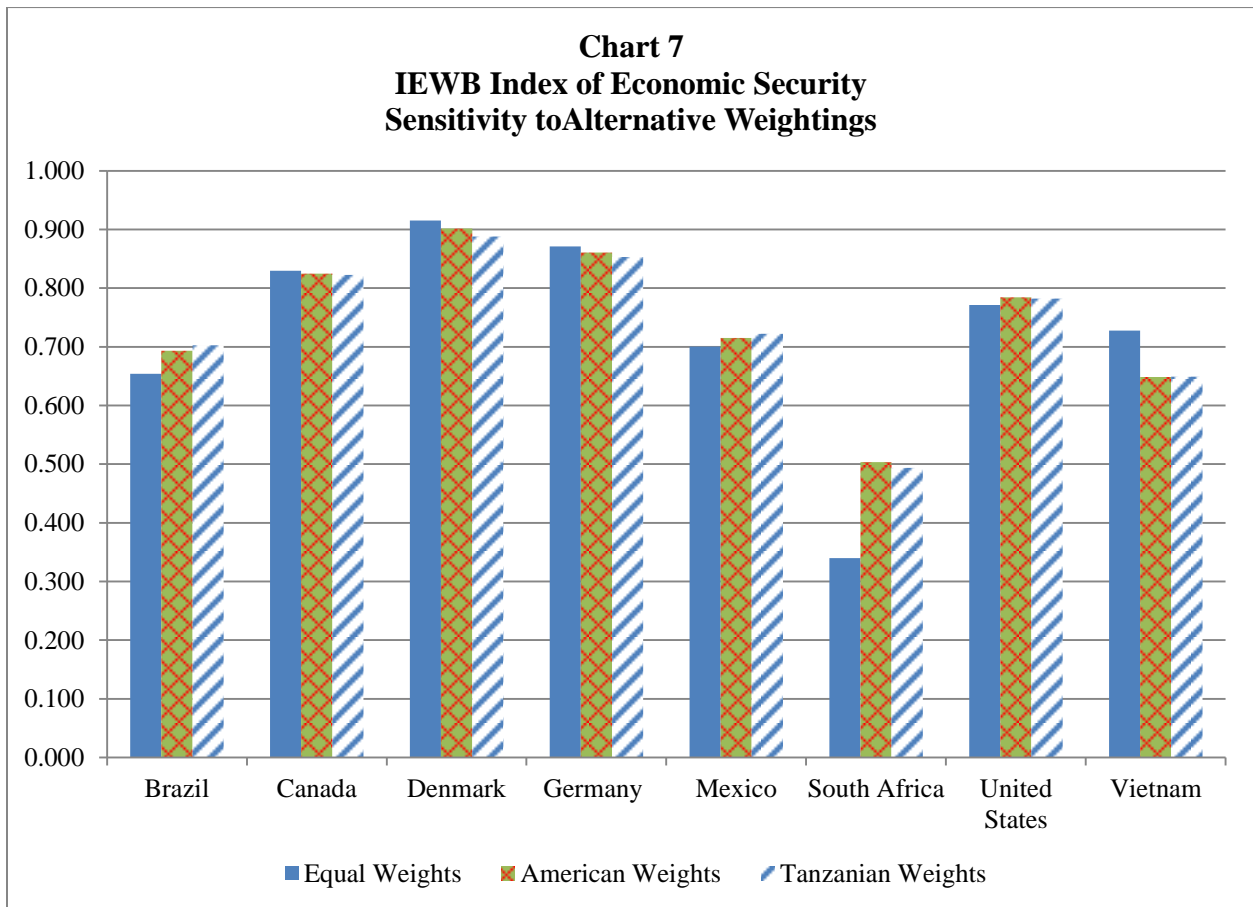


Table 6 expands the list of comparator nations to the 70 on which we have data for all four dimensions.

Table 6.
Estimates of the Components Index in Economic Security (Ranked by Overall Index)

	Overall Index Equal Weights	Index of Livelihood Security	Index of Security from Cost of Illness	Index of Security from Widowhood	Index of Security in Old Age
Denmark	0.915	0.841	0.908	0.974	0.938
Norway	0.913	0.851	0.911	0.973	0.916
Netherlands	0.909	0.848	0.963	0.960	0.864
Luxembourg	0.894	0.785	0.941	0.962	0.888
Austria	0.890	0.804	0.888	0.964	0.904
Sweden	0.887	0.735	0.899	0.979	0.934
Finland	0.884	0.739	0.888	0.973	0.937
Czech Republic	0.880	0.674	0.909	0.980	0.959
France	0.877	0.742	0.940	0.952	0.875
Belgium	0.871	0.772	0.847	0.960	0.906
Germany	0.871	0.714	0.912	0.962	0.897
Slovenia	0.863	0.670	0.919	0.966	0.897
Ireland	0.856	0.681	0.908	0.967	0.866
Switzerland	0.849	0.826	0.754	0.953	0.863
Romania	0.846	0.659	0.893	0.942	0.890
Italy	0.840	0.743	0.872	0.956	0.788
Republic of Korea	0.839	0.749	0.832	0.937	0.838
Croatia	0.839	0.605	0.899	0.959	0.890
United Kingdom	0.836	0.684	0.929	0.928	0.802
Hungary	0.834	0.629	0.862	0.940	0.903
Poland	0.831	0.655	0.869	0.934	0.867
Canada	0.830	0.656	0.895	0.942	0.827
Slovakia	0.815	0.565	0.855	0.945	0.895
Iraq	0.810	0.456	0.915	0.948	0.921
Syrian Arab Republic	0.803	0.616	0.785	0.949	0.863
Thailand	0.802	0.672	0.933	0.851	0.753
Algeria	0.802	0.527	0.914	0.941	0.827
Kazakhstan	0.801	0.528	0.836	0.920	0.918
Spain	0.790	0.536	0.851	0.939	0.834
Sri Lanka	0.787	0.625	0.812	0.901	0.808
Ukraine	0.783	0.587	0.661	0.942	0.942
Estonia	0.775	0.492	0.902	0.886	0.821
Egypt	0.773	0.574	0.616	0.969	0.932
United States of America	0.771	0.641	0.873	0.849	0.722
Trinidad and Tobago	0.771	0.671	0.845	0.841	0.726
Greece	0.771	0.640	0.657	0.952	0.834
Turkey	0.763	0.557	0.907	0.891	0.695
Israel	0.760	0.627	0.841	0.904	0.667

Jordan	0.753	0.510	0.743	0.916	0.842
Peru	0.744	0.623	0.885	0.901	0.568
Russian Federation	0.739	0.605	0.882	0.720	0.748
Venezuela (Bolivarian Republic of)	0.737	0.626	0.787	0.861	0.674
Tunisia	0.734	0.487	0.777	0.922	0.750
Iran (Islamic Republic of)	0.730	0.546	0.660	0.922	0.791
Vietnam	0.728	0.571	0.546	0.949	0.846
Jamaica	0.722	0.565	0.787	0.859	0.679
Latvia	0.722	0.418	0.780	0.869	0.822
Yemen	0.720	0.520	0.586	0.932	0.841
Bulgaria	0.716	0.661	0.716	0.825	0.664
Azerbaijan	0.716	0.491	0.544	0.945	0.884
Maldives	0.713	0.502	0.690	0.865	0.795
Panama	0.712	0.665	0.859	0.831	0.494
Chile	0.709	0.577	0.800	0.902	0.559
Ecuador	0.708	0.636	0.780	0.833	0.583
Costa Rica	0.705	0.671	0.775	0.819	0.557
Mexico	0.700	0.666	0.750	0.842	0.544
Ethiopia	0.697	0.514	0.809	0.732	0.733
Armenia	0.692	0.120	0.764	0.961	0.924
Republic of Moldova	0.681	0.674	0.399	0.840	0.811
Saint Lucia	0.672	0.412	0.696	0.881	0.699
Albania	0.672	0.530	0.290	0.968	0.898
Dominican Republic	0.671	0.483	0.786	0.818	0.599
Colombia	0.657	0.536	0.964	0.791	0.337
Brazil	0.654	0.572	0.808	0.766	0.470
The former Yugoslav Republic of Macedonia	0.631	0.165	0.757	0.906	0.694
Guatemala	0.621	0.687	0.663	0.704	0.429
Nicaragua	0.621	0.590	0.574	0.791	0.527
Georgia	0.564	0.592	0.088	0.861	0.714
Botswana	0.491	0.480	0.952	0.190	0.344
South Africa	0.340	0.294	0.889	0.089	0.087

4. Discussion and Conclusions

Economic insecurity affects well-being both directly and indirectly. Using panel micro-data, Smith et al (2009:15) have been able to show that “economic insecurity is an important cause of weight gain” for US males between 1988 and 2000. Motivated in part by the observation that the upward trend in US obesity and its sharply higher level compared to other affluent nations matches the differentials in economic security presented in Section 2, Offer et al (2010) have used the IEWB Index of Economic Security to argue that:

“Economic insecurity and ‘market-liberal’ welfare regime are the two strongest determinants of the level of obesity. The gap between the survey with the lowest level of security and the one with the highest level is 26 percentage points of obesity prevalence. Of this, economic insecurity would explain about 12 percentage points, and market liberalism another 5, i.e. together about two thirds.”

Over-eating may be a feasible (if dysfunctional) individual response to economic insecurity in high income countries where food is abundant, but low incomes mean that this option is not as readily available to most people in poor countries. Das et al (2009: 44) instead argue that micro-data from Indonesia, India and Tonga “provide strong evidence that while income and poverty are not strong predictors of mental health status, shocks that affect the economic or demographic nature of the household may have significant influences on mental health.” For both the rich and the poor nations of this world, insecurity has both direct and indirect impacts on well-being – but the pathways of impact depend heavily on economic context.

Section 1 of this paper began with a discussion of the human rights perspective’s emphasis on the anxieties of all citizens about the hazards of uninsurable economic dangers. Section 2 presented a summary of recent trends in economic security in a sample of affluent nations to illustrate the methodology of calculation of the IEWB Index of Economic Security. Section 3 then used a broader sample of countries to examine the changes needed to make this measure relevant to the very different context of poor nations.

Economic insecurity is driven by fears of the uninsured hazards of an uncertain future – something which is conceptually distinct from (although correlated with) current poverty and current inequality. Somebody who knows their future real income with certainty is not ‘insecure’ about that future income (e.g. a retiree with an inflation-indexed pension). If their known future income is miserably low, then they will be certain of their level of future poverty. However, a poor pensioner at least knows that their real income in future will not be worse than the present, so they can plan their future, and they are better off than people who are both currently poor *and* anxious about the possibility of losing the little they now have.

As well, economic insecurity is distinct from economic inequality. Although the total variation in individual incomes can be decomposed, *ex post*, into the sum of permanent and transitory variations in income, insecurity is not just about transitory shocks. Job loss and unemployment will, for example, certainly contribute to short-term volatility in income, but individuals do not typically know, *ex ante*, whether or not a shock is transitory misfortune (i.e. another job will soon be found at comparable wages) or the start of a transition to a lower long term earnings trajectory. As they contemplate their futures, individuals' *ex ante* anxieties about the hazards they face are partly about transitory income variations but they are also about the possibility of losses in permanent income, and the chance that short term losses morph into permanent disadvantages.

In affluent countries, private insurance and capital markets are well developed and the welfare state provides a set of transfers and services that shield citizens from many hazards. In poor nations these mechanisms of risk mitigation are typically much less available, but that does not imply that people are any less aware of the dangers that they face. In this paper we have tried to enlarge the set of nations for which we can measure the level of economic security – but we are very conscious that the very poorest, and arguably most insecure, nations do not have the easily available statistics that we need. Although Botswana and South Africa come at the bottom of Table 6, they are considerably more affluent, and have more of the protections that affluence brings, than the other nations of sub-Saharan Africa – they are in Table 6 because their statistics are more complete, but other available data indicate that their neighbours in sub-Saharan Africa are more insecure.

Nevertheless, the core argument of this paper is that it is possible to measure economic security in a comparable way across countries – including both very poor countries and the most affluent. Among the eight countries examined in Section 3 of this paper, economic security broadly correlated with national income but it is not least in the poorest of the eight countries (Vietnam) and not greatest in the nation with highest GDP per capita (the United States). Economic security is therefore a dimension of economic well-being that deserves to be analyzed in its own right – and one which can be measured in a conceptually comparable way.

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Appendix A

Other related concepts (not used in this paper, but should be mentioned)

“Social Protection” is a term which blurs the distinction between economic insecurity and vulnerability and is often used as a generic label for the public policy response to both. For Norton, Conway and Foster (2001:1), “social protection is taken to refer to: ‘the public actions taken in response to levels of vulnerability, risk and deprivation which are deemed socially unacceptable within a given polity or society.’ They go on to argue explicitly that: “Social protection thus deals with both the absolute deprivation and vulnerabilities of the poorest, and also with the need of the currently non-poor for security in the face of shocks and life-cycle events.” Wuyts (2006:6) is even broader in approach: “Social protection, therefore, is not just a question of finding a technical fix to the problem of vulnerability in society, but instead involves the creation, sustenance and expansion of political and social institutions through which mechanisms of redistribution and social insurance are negotiated and articulated.” As might be expected, the breadth of the ‘social protection’ perspective means that both human rights and social welfare are appealed to.

In their 2008 report “*Can low-income countries afford basic social security*” the ILO discusses the relationship between ‘social protection’ and ‘social security’:

“In the literature and public debate on social issues, the term “social security” which widely used for decades, is often understood as the set of transfers that originate from formal sector employment. “Social protection” is considered to be a wider concept. (2008:1)”

Within the set of ‘social security’ programmes⁴² that are such a large part of the ‘welfare state’, a further distinction is often drawn between ‘social insurance’ and ‘social assistance’. Social insurance (e.g. workers compensation, unemployment insurance, public old age pensions) provides benefits, usually earnings related, to all eligible beneficiaries who experience a specific loss, or who meet specified non-income criteria. The aim is to provide security by redistributing between events or contingencies – for both poor and non-poor individuals. Eligibility for “Social assistance” programmes, on the other hand, is determined by assessment of family need.

Although the emphasis of ‘vulnerability’ discourse on preventing poverty might seem to fit nicely with the policy focus of ‘social assistance’ programmes and ideas of ‘social insurance’ might seem to match up similarly with “economic insecurity”, this paper does not emphasize these connections. In affluent countries, although all citizens may be somewhat exposed to the hazards relevant for social insurance programmes (like work place injury or spells of

⁴² The 2008 ILO report in fact goes on to use the terms “social security” and “social protection” interchangeably. Van Langendonck (2007) also uses the term ‘social security’ in a very broad sense.

unemployment), the odds are typically much worse for low-wage workers – hence such programmes play an important anti-poverty, as well as risk-reduction, role. Social policy planners therefore need to pay close attention to the interactions between social insurance and social assistance programmes and insisting on the insurance/assistance distinction is not very useful, in practice. In the countries where the vulnerability literature is typically focussed (like Ethiopia or Tanzania), there is no ‘social assistance’ to speak of, and ‘social insurance’ programmes touch only a tiny fraction⁴³ of the population – which more or less implies the irrelevance of the distinction between them.

“Food Security” has been the subject of high profile international summit conferences (most recently, in 1996 and 2009) and is often a major focus of agricultural and trade policy within nations.⁴⁴ Maxwell (2001:15) notes that the term has at least 32 distinct definitions in the published literature. He argues that over time the focus of that literature has shifted somewhat from a concern with aggregate food production to greater emphasis on the household poverty that determines individual access to available food. However, Webb and Thorne-Lyman (2007) emphasize that income is not enough – food quantity is not sufficient for the vitamin and micro-nutrient intake necessary for health. Guha-Khasnobis et al (2007) have drawn explicit links between food security and both vulnerability and the human rights discourse.

Appendix B

Drought is a risk factor in loss of livelihood which varies with type of agriculture – e.g. pastoralist herders are particularly vulnerable to small rainfall changes on already marginal terrain. Crop choices (e.g. cassava) can help mitigate risk and other risks (like crop disease or pests) also matter, but the main event for many peasant farmers is rainfall. To model risk exposure to drought, one needs to know the probability distribution of the chance that a peasant farmer will have significant crop losses due to inadequate rainfall. Complicating issues are:

- Local – level variability in precipitation determines the actual rainfall risk exposure of individuals. Both floods and droughts can produce local crop losses. Geographically based national average precipitation figures may be misleading guides to the aggregate risk exposure of individuals because regions vary greatly in population density.
- Rainfall risk exposure depends partly on cropping patterns. Both rainfall timing and total amounts matter. Terrain and soil type help determine runoff and the retention of water available for agriculture.

⁴³ In Tanzania, for example, only 4.4% of the elderly were able to depend on pension income in 2007 – see Mboghoina and Osberg (2010)

⁴⁴ Historically, “Food Security” has been, and remains, a particularly important issue for agricultural policy in Tanzania – see, for example, Bryceson (1990)

- Global Climate Change is expected to raise average temperatures, increase year to year precipitation variability, impact the mean level of rainfall unevenly (increasing in some areas while decreasing in others) and increase the frequency of extreme weather events. All these trends will affect climate risk exposure.

Tanzania, Burkina Faso, Cambodia and Nepal are the four poor nations for which the FAO, as part of its effort to model the impact of climate change on agriculture, has done detailed analysis of local level rainfall variability and drought over the 1961-2002 period.⁴⁵ Local conditions are analyzed from satellite imagery and local weather stations and evaluated on a pixel by pixel basis (in Tanzania, this implies monthly resolution at approximately 0.5 degrees spatially). The FAO then constructs a “Water Satisfaction Index” which summarizes up to a specific growth stage the degree to which cumulative water requirements have been met for the locally relevant reference crop (for Tanzania, maize). The modelling considers rainfall timing by crop growth stages, the impact of wind and heat on evapo-transpiration from cropped areas and the impact of terrain and soil type on soil retention of water.

Motivated by a desire to model emerging famines reliably, NASA has used a similar methodology. Verdin et al (2005) describe their technique as follows:

“ Satellite RFE have been especially useful as input to a geospatial crop water balance model that evaluates the availability of moisture to a crop relative to its needs over the course of the growing season. Frere & Popov (1986) originally developed the water requirement satisfaction index (WRSI) for calculation with rainfall station data. It has been adapted to use on a geospatial basis to facilitate wide area monitoring (Verdin & Klaver 2002; Senay & Verdin 2003). The WRSI varies from 0 to 100, and is the ratio of actual crop evapotranspiration to the amount that would occur with a full water supply. This quantity has been shown to be a good indicator of yield reduction due to water limitation (Doorenbos & Kassam 1986).

The geospatial implementation of the WRSI, in effect, treats each grid cell as if it were a station location. To do so requires gridded estimates of soil water holding capacity (WHC) and daily potential evapotranspiration (PET). The FAO digital soil map of the world is used to assign a value of WHC to each cell. Reference crop PET is calculated according to the Penman–Monteith equation (Shuttleworth 1992) using 18 analysis fields from the NOAA global data assimilation system (Kanamitsu 1989) for air temperature, atmospheric pressure at the surface, wind, relative humidity and radiation. Published crop coefficients (FAO 1998) are used to modify PET to simulate the demand for water of a staple crop of interest. The daily crop water balance calculation includes a regularly updated estimate of available soil moisture. The maps that are forthcoming from these geospatial calculations reveal zones of poor crop performance due to dry spells or drought, as corroborated by field reports. Furthermore, maize

⁴⁵ see Climate Impact on Agriculture, Environment, Climate Change and BioEnergy Division, Food and Agriculture Organization http://www.fao.org/nr/climpag/nri/index_en.asp

yield estimates based on WRSI (calculated with RFE) were found to agree ($r=0.8$) with official reports in a test with 1996/1997 data for Zimbabwe” (Verdin & Klaver 2002).

Unfortunately, past estimates of WRSI have been discarded by NASA, which implies that the risk of variability cannot be assessed. Furthermore, estimates are currently presented for geographic areas, without weighting for population density. For these reasons, this index has not been used in the current paper.

Appendix C

Weights Used for the Index of Economic Security

	Equal	United States	Tanzania
Working Age as % of Total Population	n.a.	64.8	56.1
Sickness	n.a.	100.0	100.0
Women & Kids at Risk of Widowhood	n.a.	33.4	51.3
45-64 as % Population	n.a.	26.7	12.6
Sum	n.a.	224.9	220.0
Livelihood	0.25	0.288	0.249
Health Care	0.25	0.445	0.445
Widowhood	0.25	0.149	0.228
Old Age	0.25	0.119	0.056