Measuring Economic Insecurity in Rich and Poor Nations

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Abstract

Worrying about possible 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 provide a degree of economic security. However, such protections are largely unavailable to the citizens of poor nations (i.e. most of humanity). How can one measure economic security in these very different contexts? This paper examines trends in the IEWB Economic Security Index for four affluent OECD countries and compares a cross-section of seventy rich and poor countries in 2007/8. To reflect better the reality of developing countries, it revises the IEWB index to: (1) include the volatility of food production in the risk of loss of livelihood; (2) adjust the risks of health care costs to consider the proportion of household spending on food (which is non-discretionary, and large in poor countries) and (3) add adult male mortality to the risk of divorce in calculation of the risk of single parent poverty.

Measuring Economic Insecurity in Rich and Poor Nations

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. Although the present is just the moving split-second of direct experience which separates the remembered past from the anticipated future, many people spend a significant part of it worrying about their economic future – anxieties which subtract 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).

To avoid anxieties about the future, individuals may acquire insurance (either public or private), choose less risky[1] options in their decision making or build formal or informal networks of social support – but the options of formal private insurance or public social security are much less commonly available in poor countries. As Morduch (1999) has argued, the informal insurance arrangements of low-income countries are also typically weak, provide little effective coverage to poor households and "tend to be least effective just when they are most needed" (1999:197).

Clearly, anxieties about future outcomes include many non-economic issues – we would stress from the outset that *economic* security refers to a subset of all security concerns.[2] Nevertheless, we think that the economic dimensions of insecurity deserve attention – so this paper asks: "can one construct and compare an index of the level of economic security in rich and poor countries?"

Section 1 discusses why one might want to measure economic security and how the rationale for measurement might matter. Section 2 illustrates how trends in economic insecurity in four affluent OECD countries between 1980 and 2009 have been measured. However, rich nations have better, more easily available statistics and their citizens face a somewhat different set of hazards, compared to the citizens of poor countries. Widening the set of comparisons, as in this paper, must therefore take account of both key differences in social context and the constraints of currently available secondary data sources – Section 3 discusses the compromises that this entails and provides some tentative comparisons. Section 4 concludes.

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[1] In this paper, the term 'risk' is used synonymously with what Akay et al (2009) call 'uncertainty'. In their terminology, 'risk' refers to known probabilities of future hazard and 'ambiguity' refers to unknown probabilities of hazards. Their experimental study concludes Ethiopian peasants are highly averse to both, so this paper avoids the distinction.

[2] We do not, for example, address here personal security hazards (as in OECD (2011) Chapter 11) or food security (see Maxwell (2001) or Guha-Khasnobis et al (2007)) or natural disasters or the pain and suffering dimensions of illness. Our approach is best seen as complementary to those concerns.

1.   Why measure Economic Security?
        What might this imply for how it should be measured?

This paper is intended to illustrate that it is possible to construct a 'rights-based' index of economic security[3] at the national level and compare it across both rich and poor countries. The main reason to do this is the hope that such an index, if developed further, might possibly assist public policy decisions. In many affluent countries, in the aftermath of the 2008 Financial Crisis, greater volatility in financial markets and continued high unemployment has heightened concerns about how public policies can maintain the economic security which the institutions of the welfare state were intended to provide. In poor countries, where such institutions are generally lacking but the risk-pooling norms of the extended family are under ever-increasing pressures from urbanization, demographic change and modernizing social values, the question is which policies could create such a sense of economic security in the first place.

In thinking about how public policy might improve social outcomes, one perspective starts by asking what a mythical, 'Social Welfare maximizing', planner would do[4]. In economics, the 'Social Welfare Function' is often 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.[5] 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 which they wish to avoid, but offering complete insurance protection may create incentive and moral hazard problems. As a result, it is not optimal for public policy to offer either complete insurance coverage or to leave citizens completely exposed to all risks. The crucial policy issue is how much risk and loss mitigation should be made available to individuals.[6] Measuring the actual current level of insecurity or

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[3] In affluent countries, there are distinct literatures on 'economic insecurity', 'social protection' and 'social security' while in poor nations the 'vulnerability' concept has been very influential. Although they share the same core issue of protection from economic hazards, these literatures 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.

[4] In general, social indices are not useful for private utility maximization, since individuals already know their particular personal situation far more accurately than any aggregate social index could indicate. Nevertheless, unless both voters and public policy makers are always and totally self-regarding, they may sometimes also want to know if a particular policy will make their country 'better off', and therefore may find a social index to be useful.

[5] Equal weights for all individual utilities (the original utilitarian position) and a linear utility function implies zero aversion to income inequality (or uninsured income risk) 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.

[6] National political systems have to make a social decision on how much insurance coverage should be on offer, but individuals have differing risk preferences and will choose how much personal risk to assume, given their available insurance options. As Witt and Schubert (2008) note, when risk preferences are heterogeneous and innovations come with expected gains but unknowable chances of adverse external effects, some form of social insurance for losses inflicted and some "limited liability" for innovators will dominate extreme liability regimes, such as "no

vulnerability or social protection in a society may thus be useful as an intermediate step in the design of public policy to maximize social welfare.

A complementary motivation for measuring economic security starts from the perception that "Necessitous men are not free men" [7] – 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 policy makers are to have an ethical basis for wanting to maximize the (weighted) sum of individual utilities resulting from individual outcomes, the achievement of basic human rights for all citizens can be seen as the primary responsibility of government. Achieving this objective enables autonomous individuals to pursue freely their personal conceptions of the good life, and maximization of the social welfare to be obtained from production and consumption is then the secondary objective[8] of public policy.

In the 'human rights' perspective, it is international human rights covenants, national constitutions and the systems of jurisprudence they establish which give concrete meaning to '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."[9]

The human rights approach identifies specific primary goods (in Article 25, "food, clothing, housing and medical care") – which are meant to be available to all citizens, in sufficient amounts (by local social standards) – and in the event of specific contingencies ("security in the event of unemployment, sickness, disability, widowhood, old age").

But why choose this particular list of human rights and not some other list? The credibility of distinctions between what can, and what cannot, be considered a human right

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liability" or "strict liability." However, given any specific level of limited liability and social insurance, individuals choose their personal risk exposure by choosing their own level of consumption of risky commodities/activities.
[7] Roosevelt (1936). See also Sen (1999) and Van Langendonck (2007).
[8] Rawls (1982:162), for example, states clearly that his 'maxi-min' social welfare criterion is a secondary criterion of 'social justice' – i.e. subject to the prior attainment of the first principle of 'equal basic liberties for all'.
[9] Today, the gender specificity of the language of 1948 will strike many readers as very odd – but Article 2 makes it clear that all rights are to be guaranteed to male and female persons equally.

depends heavily on the legitimacy of the process by which rights are articulated. Academic books or articles are the product of individual authors and therefore cannot, whatever their wisdom, credibly claim "Process Legitimacy" – except by making specific reference to human rights treaties.[10] A crucial dimension of human rights is whether the texts articulating them can claim democratic legitimacy – i.e. whether they are legal documents signed by elected governments and produced by elected legislatures and constitutional conventions.

If one sees the provision of basic human rights as the primary responsibility of government, then it may be useful to measure the comparative success of nations in fulfilling that goal. One measurement implication of this perspective is that since the conception of 'human rights' applies to all persons, framing economic security as a human right implies that the anxieties of all citizens must be considered.[11] A second implication is that empirical measures of economic security should be clearly linked to specific named human rights – as we try to do below.[12]

2.   Measuring Economic Insecurity in Affluent Nations

"Economic (In)Security" has up to now[13] been studied in the context of affluent nations, where high quality data has been available for many years. The starting point of this paper[14] is to demonstrate how, in affluent nations, a "named risks" approach, which examines four key objective[15] economic risks named in Article 25 of the UN Universal Declaration of Human Rights, (i.e. unemployment, sickness, widowhood and old age), can compare trends in economic security. Because our index is one of the four components of the Index of Economic Well-Being (IEWB) we refer to it as "The IEWB Economic Security Index."

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[10] 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 without mention of human rights. The ILO's Socio-Economic Security (SES) Programme states 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/). Nevertheless, the issues identified by the ILO go well beyond those specifically identified as human rights in international covenants – see http://www.ilo.org/public/english/protection/ses/download/docs/definition.pdf

[11] 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).

[12] By contrast, although measures of consumer confidence may reflect generalized anxieties about the future (see Ludvigson, 2004), such indices are not linked to specific human rights.

[13] See Dominitz and Manski (1997), Scheve and Slaughter (2004), Anderson and Gascon (2007).

[14] As in Osberg (1998) and Osberg and Sharpe (2002, 2005, 2009).

[15] Implicitly, we are assuming that changes in the subjective level of anxiety about a lack of economic safety are proportionate to changes in objective risk. 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.

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

The IEWB index of security in the event of unemployment is conceptually driven by the probability of unemployment and the size of financial loss it produces, i.e. the average proportion of earnings replaced by unemployment benefits.[16] Because the literature on happiness and well-being in affluent nations has consistently found that the large negative impact of unemployment on happiness is stronger than the mitigating effect of unemployment compensation,[17] the IEWB index gives unemployment a weight of four-fifths, compared to a weight of one-fifth for the financial protection variable. The relative ease of obtaining a job provides 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 reassuring individuals that they will be partially compensated for their earnings loss[18], should it occur. Both the unemployment rate and the financial protection index are scaled, using the linear scaling procedure (see Sharpe and Salzman, 2003)[19] and then weighted to produce the overall index of security from the risk imposed by unemployment.

Figure 1 presents estimates for Canada, Denmark, Germany and the United States, for the period 1980-2009. "Security from unemployment" depends on both the chances of the hazard (unemployment) and the probability of benefitting from insurance against that hazard, so 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.

[place Figure 1 here]

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[16] This paper uses 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 http://www.oecd.org/document/3/0,3343,en_2649_34637_39617987_1_1_1_1,00.html   .

[17] 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 impact of job loss on the long run wages of displaced workers (Ruhm, 1991, Chan and Stevens, 1999).

[18] Making the unemployment rate and the financial protection rate additive in weighted impacts, not multiplicative, 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.

[19] 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 $I_i = (1.05 * r_{max} - r_i) / [1.1 * (r_{max} - r_{min})]$. Linear scaling (also used in the Human Development Index) essentially asks, for a given observed range, where a country sits compared to the worst observed outcome. As is common in the literature, 10%, is added to the observed range to allow for possible change at the extremes.

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

In international comparisons, the financial risk of health care costs imposed by illness, 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 most medically necessary health care – but with different mixes of public and private services, and varying combinations of co-pay[20] for services rendered.[21] Hence, 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 implied by illness.[22] Figure 2 illustrates the much lower level of security in the event of illness in the United States, relative to Canada, Germany and Denmark.

[place Figure 2 here]

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 economic fortunes by marriage. When the UN Universal Declaration of Human Rights was drafted in 1948, the implicit social context in signatory nations was the nuclear family in an industrial economy. At that time, the "male bread-winner model" of a single earner household with a non-employed spouse was both an empirically accurate description and a strong social norm, but the percentage of single parent families was relatively high (partly as a result of the casualties of World War II). "Widowhood" was then 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 often produced single parent families. However, it can still be true that 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 an

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[20] For example in Canada, unlisted medical services (such as acupuncture), dental care and most drugs taken outside hospitals are not covered, and their costs have been rising rapidly. Rising costs for the supply of unreimbursed medical expenses implies increased financial risk exposure.

[21] We assume that unreimbursed medical expenses are proportionate to unreimbursed medically necessary medical expenses, as a fraction of disposable income. For a full discussion, see Osberg (2009) Appendix 1, which also discusses the risk of medical bankruptcy.

[22] Thanks to an anonymous referee for the suggestion to calculate the correlation (-0.63) of our Health Security index with the proportion of the population who reported unmet health care need due to cost in the 2007 EU SILC survey of 24 nations – see Figure 1 in Allin (2012).

important predictor of entry into poverty.[23] 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).[24] 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 in Canada in 2007 was not so different from Germany or Denmark (2.2 compared to 2.3), but considerably less than the United States (4.2). The United States also has a high poverty rate and large poverty gap for single parent families. As Figure 3 shows, an outlier on all components is sure to be an outlier in the aggregate. Because other countries were sometimes relatively high, and sometimes relatively low, on particular dimensions, they clustered in a fairly narrow band (the moral is that similar aggregate levels of risk and insecurity can be the result of offsetting differences in component hazards).

[place Figure 3 here]

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

The fourth component of the IEWB economic security domain is the risk of poverty in old age, as measured by the poverty intensity (= poverty rate * average poverty gap ratio) experienced by households headed by a person aged 65 and over.

Figure 4 illustrates how fluctuations over time in poverty intensity among senior citizens – e.g. in Germany – can sometimes seem to follow a "saw-tooth' type of pattern. In affluent nations, when the elderly do not have significant private pensions or income from capital, they can rely on a basic public pension. This implies 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 – a spike which is often quite close to the 'one half median income' poverty line. When the minimum pension is only occasionally adjusted for inflation, 'saw-tooth' fluctuations in the elderly poverty rate result.

[place Figure 4 here]

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[23] We do not attempt to model the emotional impacts and transactions costs (e.g. in legal bills) of divorce – or the social benefits of the termination of abusive or dysfunctional relationships.

[24] Both the poverty rate and poverty gap are calculated using equivalent income, thereby accounting for household size. Because males are a small fraction of the single parent population (17% in Canada) and have substantially smaller increases in poverty probability following separation, we ignore single male parents.

e. Aggregation into the IEWB Economic Security Index

To aggregate the scaled values of the four components of the economic security domain into an overall index, we must choose weights for each component risk. Equal weighting implicitly assumes that all the named risks are of equal importance, even though the number of people facing each type of risk may be unequal. In this section, we weight each risk by the relative size of the populations most affected (to check robustness, we experiment with alternative weightings in Section 3).

[place Figure 5 here]

We assume that illness risk directly affects everyone but that it is the population of working age (i.e.15 to 64 years) who are, or could be, employed and are thus affected directly by the risk of unemployment. We assume that all married women and their children who are under 18 are at risk of single parent poverty. We suppose that individuals only really start to worry about poverty in old age as their retirement years start to near, and therefore assume 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 total.

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 implies that changes in the aggregate index of economic security may be partly driven by shifting population weights rather than by changes in the underlying components of economic security – an issue which becomes more acute, the greater the differences across countries in demographic structure and in demographic change.

Figure 5 presents the summary IEWB Economic Security Index for all four countries. During 1980 to 2009, the U. S. was not an outlier in security from the risks of unemployment, but in all the other three dimensions of economic security it falls well short of the comparator nations. The United States has the highest GDP per capita of these countries, but it also has a much lower level, and downward trend, of economic security. Evidently, in affluent nations economic security is a dimension of well-being that cannot necessarily be predicted from GDP per capita.

3.   Measuring Economic Insecurity in Poor and Rich Countries

How should measurement of economic security be modified if it is to be compared across the world – i.e. in poor as well as in rich nations? Although reliable data is much more comprehensive and easily available in affluent nations, it is arguably in poor countries where accurate measurement and analysis 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 minor.[25] Because they lack access to the welfare state social programs 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.

However, meaningful comparisons of the economic insecurity of the world's population (i.e. including those who live in poor countries) must address both practical and conceptual difficulties. The practical problem is that poor countries typically do not have long time series of reliable comparable data of the type which Section 2 has relied on. Although recent years have seen high quality household surveys become available within many poor countries,[26] locating and assembling a large number of such data sets requires resources that were not available to us. Instead, this paper has had to depend on compilations by international agencies, which have in recent years produced increasingly detailed data on a wide cross-section of countries.[27]

Given the vast differences in living standards around the world, a conceptual issue for comparisons of economic security to confront is the meaning of poverty. In the IEWB approach, economic insecurity due to widowhood or old age is driven by the chances and depth of poverty for widows and the elderly, but should the poverty line within countries be drawn: [1] relative to local standards of living or [2] with reference to a minimum absolute standard of living?

In section 2, the poverty line criterion used was explicitly relative – one half the median equivalent income of individuals in each country. Within affluent OECD nations, this criterion 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.[28] In a global context, advocates of an 'absolute' poverty line methodology argue that

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[25] For example, in a poor country, the daily task of splitting firewood carries the repeated risk of putting an axe in the foot. Poor medical care may then imply, if an infected wound produces lameness, permanently lower lifetime earnings. Both the risk and its possible consequences are far smaller in affluent nations.

[26] Osberg (2010) used the 2007 Household Budget Survey of the Tanzania's National Bureau of Statistics.

[27] e.g. the World Health Organization, the FAO and the World Bank. The data used in this section are available at www.csls.ca/data/eirpn2011.asp The data underlying all the calculations of Section 2 are also 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.

[28] For an extended discussion see Osberg (2007).

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, the Millennium Development Goals use a $2 per day per person, measured in PPP terms. Using this criterion would imply that in very poor countries, a large percentage of the population would be considered deprived, but in rich countries the poverty rate would be miniscule.

This paper adopts a compromise position. Absolute poverty matters hugely in very poor countries but several developing countries (such as China) are 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.[29] Hence, if Z_A is the $2 per day PPP "absolute" poverty line, and Z_R a "relative" poverty line, the poverty line Z in a given country should be $Z = max[Z_A, Z_R]$. We adopt "one half the mean income" as our "relative" poverty line criterion (Z_R) because calculation of the median household income requires access to micro-data on the distribution of income, and estimates of mean income are much more commonly available.

a)   Unemployment and the Risk of Loss of Livelihood

In all countries, some citizens have always been anxious about the possible future loss of their livelihood, but anxieties always depend on context. In 1948, the signatories of the UN's Universal Declaration of Human Rights were, overwhelmingly, industrialised nations, in which the vast majority of the population depended on money earnings from formal employment in the labour market to enable household consumption. In this context, unemployment insurance systems may mitigate the hazard of being unable to exchange labour time for commodities when paid employment is unavailable, but the reason for writing "security in the event of unemployment" as a basic human right in Article 25 was the fact that for most people in industrialized countries, involuntary unemployment and loss of livelihood are synonymous.

In poor countries today, 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

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[29] Osberg and Xu (2008) also noted that the enormous impact on poverty measurements of technical uncertainties involved in the PPP calculations underlying the absolute $1 or $2 per day criteria is a strong argument – on the grounds of transparency and robustness – for a relative income poverty line, measured in own currency units. As well, poverty lines have long been seen as relative to prevailing income norms. When Adam Smith was writing, roughly 240 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. Maddison (2003; 59) put GDP per capita in 1820 at $1706 in the UK and $1,245 in Europe (1990 Geary–Khamis $) while World Development Indicators estimates Indian GDP per capita in 1990 at $1208 and in 2007 at $2,756 (current PPP international $).

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 foreseeable future. The changing weights of employment sectors imply that a population weighted average of the risks of loss of livelihood associated with agricultural output and non-agricultural employment might be a plausible "Index of Livelihood Security."

IEWB Index of Livelihood Security $= P_E * I_E + P_A * I_A$

= (% of employed population in non-agricultural employment) * (Index of Security from Unemployment)

+ (% of employed population in agriculture) * (Index of Agricultural Livelihood Security)

Section 2a of this paper reported the first component – the IEWB Index of Security from Unemployment. In affluent nations, agricultural employment is a very small percentage of the population, so generalizing from an index of unemployment risk can be defended as a reasonable approximation. This is much less 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 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 agriculture, Column G calculates the percentage deviation from ten year linear 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.

[place table 1 here]

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[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, 2007a: Pages 7, 19, 30, 36, 38, 56;

[31] See Section 2a 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.

b)   Security in the Event of Sickness

In many poor nations, the health care system combines for-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. As Gertler, Levine, and Moretti (2003) have noted: "Families in developing countries face enormous financial risks from major illness."[32]

Table 2 addresses the financial risks which health care costs impose on households, and the economic insecurity that this implies. Columns B and C 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. Column D multiplies 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), while 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 calculations of Section 2. The relative magnitudes of that measure of risk, across the affluent nations of Table 1, align with the ranking of those nations in Figure 3. However, in rich countries there is much more discretionary income available to be spent on health care, if necessary. In Section 2, average out of pocket health care costs was expressed as a percentage of disposable household income,[33] because the impact of health care costs on well-being depends on ability to pay. But 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. However, in poor countries ability to pay is better measured by income net of taxes and food expenditures than by total income. Fortunately, 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 (see Column G of Table 2).[34] 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.

[place table 2 here]

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[32] When asked what their "main problem" was during the past year, "sickness," was the most common (16.7%) response of Tanzanian respondents to REPOA's "Views of the People Survey." 11.4% mentioned "shortage of drinking water" and 11.2% said "cost of medical treatment." Calculations by author.

[33] This variable is not available in the World Development Indicators data set – hence we use GDP per capita.

[34] http://www.fao.org/economic/ess/food-security-statistics/en/

c) Security in the event of "Widowhood"

Economic security depends partly on household composition because in all countries most people live in families, and although market income is typically received by individuals, it is pooled within households for consumption. Hence, the economic security of household members depends on *both* the risk of interruption of individual income flows (e.g. from loss of individual livelihood – see (a) above) and the risk of shocks to the composition of the household. The gendered dimension of this component of economic security arises because 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. Hence, when the Universal Declaration of Human Rights included 'security in the event of widowhood' as a basic human right in 1948, it recognized a risk that was especially relevant for women and children.

Arguably, the UN Universal Declaration interpreted the risk of "widowhood" within the implicit framework of the nuclear family. This paper continues in that tradition because although voluntary sharing within the extended family in hard times is common (even in affluent countries) this sharing is not an enforceable legal right of the recipient. 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 nieces and nephews may have legal force. Because our objective is to measure economic security, certainty of access to resources is the crucial issue, and although social norms of sharing within the extended family are strong in many poor countries, these norms cannot be legally enforced (and relatives are also often poor themselves).

Section 2 assumed the main source of the risk of loss of male earnings is divorce/abandonment, rather than male death – an assumption that is less defensible in poor countries where male mortality is often high[35] (e.g. South Africa, where the reported divorce rate is 0.68 per 1,000, compared to adult male mortality of 11.58). In sub-Saharan Africa, HIV/Aids is a major cause of high adult male mortality, but other sources of mortality are also very significant (e.g. traffic or industrial accidents, malaria, etc.).

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 (e.g. the U.S. with a divorce rate of 3.7 and adult male mortality of 2.98 – both per thousand). In concentrating solely on divorce, the calculations of Section 2 may have prematurely ignored the level, and the international variation, in traditional widowhood.

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[35] Some official reports of divorce rates are so low as to be scarcely credible (e.g. Peru 0.09 or Guatemala 0.15 – per thousand), and may primarily reflect an inability to legally formalize separations.

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, in poor countries, male earnings can often be very low, which implies that the loss/departure of the husband may make much less of a difference to the probability and depth of female poverty than it would do in rich countries.[36] An unfortunate consequence of our being unable to access micro-data for all countries 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. To maintain consistency, this paper applies the national rate and depth of poverty (using one half mean income as the poverty line).[37]

[place table 3 here]

d.   Security in the Event of Old Age

The context of old age security differs hugely around the world, because countries vary so much in the percentage of their population that is elderly, in the rate of change of that percentage and in the living arrangements and labour force status of the elderly. In younger nations like South Africa (4.6% aged over 65 in 2010[38]), the issue of old age security may be less salient now compared to older countries like Germany (currently 20.4% over 65). However, the many nations which have seen large recent declines in their birth rates can anticipate large changes in the percentage elderly (e.g. Mexico, where the percentage over 65 is forecast to be 2.6 times higher by 2040, rising from 6.3% to 16.2%). These rapidly changing demographics will increase the existing pressures on informal, family-based institutions of elderly care coming from

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[36]Osberg (2010), using Tanzania's Household Budget Survey (2007), found only about 3 percentage points difference in poverty rate between married women living in a male-headed household and widowed heads of household. However, cross-sectional micro-data, like the HBS, cannot distinguish which extended family households may have expanded to accommodate widows and their children. If it is women with better earnings options who choose not to move in with relatives after the loss/departure of their spouse there may be a selection bias effect in comparing household poverty rates in such data.

[37] There are 31 countries for which we can also obtain Luxembourg Income Study micro-data. When we check the consistency of our index with the most recent year's data available on poverty rates in single parent families and the percentage of children in single mother families, the correlation between LIS variables (poorsm* pkidsm) and Column 5 of Table 6 is 0.85.

[38] All statistics in this section are the "Medium" projections from the UN *World Population Prospects*, http://esa.un.org/unpd/wpp/unpp/panel_indicators.htm

changing social mores, mobility and urbanization – so the public policy issue of pensions and income security in later life is sure to be high on many nations' agendas.

However, in the many poor countries now without effective public pension systems, where most of the elderly continue to live with their extended families and work like younger cohorts (because they have to), there may not actually be much difference between poverty among the elderly and poverty among younger cohorts.[39] In these contexts, income pooling within extended families implies that the current level of economic security among the elderly is effectively similar to that of the general population. For that reason, and because micro-data enabling calculation of elderly-specific poverty rates and gaps is unavailable for most nations, Table 4 calculates the 'Index of Security in the Event of Old Age' using the national average rate and depth of poverty.

[place table 4 here]

e.   The IEWB Economic Security Index

Table 5 puts the pieces together, weighting the four sub-indices of economic security equally. Table 6 expands the list of comparator nations to the 70 on which we have data for all four dimensions. However, weighting by relevant population size implies that comparative rankings may be driven by population weightings rather than by differences in the component measures of security. Figure 6 therefore illustrates the sensitivity of the aggregate index to population weightings by presenting three alternative population weightings: (1) equal weighting; (2) U.S. population weights and (3) Tanzania weights (See Appendix A). 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.

[place table 5 here]

[place Figure 6 here]

[place table 6 here]

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[39] See ILO (2008) for general discussion and Mboghoina and Osberg (2010a, 2010b) for in depth analysis of the Tanzanian example.

4.	Discussion and Conclusions

When risk averse individuals face uncertain future incomes and know they cannot fully smooth their income and consumption flows over time, income uncertainty decreases their well-being.[40] If this causes them also to choose less risky, and less remunerative, options to reduce their hazards, their income growth prospects will suffer. These direct costs of insecurity can arguably be expected to be greatest in poor countries. Since very low incomes imply that the consequences of short run hazards can be very severe – perhaps including survival itself – the world's poorest people have the strongest individual incentives to avoid risky innovations, even if the long run consequences for them may include greater chances of economic stagnation[41].

As well, the indirect impacts of economic insecurity may include an erosion of social capital – with significant implications for development. As a United Nations report has put it: "spaces in which individuals, households, firms and communities are able to pursue their day-to-day activities with a reasonable degree of predictability and stability, and with due regard for the aims and interests of others…..(are) particularly vital in societies with an increasingly complex division of labour, where high levels of trust, long-term investments in physical, human and social capital and openness to innovation and change are key ingredients of long-term prosperity and stability. In this respect, providing economic security is a complementary component of any virtuous circle involving creative markets and inclusive political structures." (2008: vii)

Other indirect impacts of a lack of economic security may include poorer health – although probably differently in rich and poor countries. Offer et al (2010) have used the IEWB Economic Security Index presented in Section 2 to estimate that economic insecurity explains about 12 percentage points of the 26 percentage point gap in obesity prevalence[42] among affluent nations. However, in poor countries over-eating is not an affordable response to stress for most people. Das et al (2009: 44) instead find that micro-data from Indonesia, India and Tonga "provide strong evidence that … shocks that affect the economic or demographic nature of the household may have significant influences on mental health."

Economic insecurity is conceptually distinct from (although empirically correlated with) current poverty and current inequality. Income insecurity is, for example, something which a retiree with a secure, inflation-indexed pension does not face, because they know their future real

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[40] To put some numbers on the impacts, Morduch (1995:195) notes that relatively low income risk (a coefficient of variation of 0.4) and moderate risk aversion (a coefficient of relative risk aversion of 2) together imply a willingness-to-pay, for complete income smoothing, equal to 16% of expected income.

[41] See Dercon (1996, 2002)

[42] Using panel micro-data, Smith et al (2009:15) have also been able to show that "economic insecurity is an important cause of weight gain" for US males between 1988 and 2000.

income with near certainty. If their known future income is miserably low, then poor pensioners will be certain of their level of future poverty – but they also know that their real income in future years will not be worse than the present. Hence, 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 that they now have.

As well, economic insecurity is distinct from economic inequality. Although, *ex post,* the total variation in individual incomes can perhaps be decomposed into the sum of permanent and transitory variations in income, insecurity is about *ex ante* anxieties. Job loss and unemployment will, for example, certainly contribute to short-term volatility in individual income, but individuals cannot typically be sure, *ex ante*, whether or not a shock is a transitory misfortune (i.e. another job will soon be found at comparable wages) or the start of a long jobless spell and 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 can 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 help shield citizens from many of these hazards. There is no reason to think that the residents of poor nations are less conscious of the economic hazards that they face, but these mechanisms of risk mitigation are typically much less available to them.

Economic security thus affects well-being both directly and indirectly, in both rich and poor countries. This article is motivated by the hypothesis that measurement can sometimes assist the evaluation of public policies which affect well-being – in this instance, public policies that influence the level of economic security. Hence it has proposed a possible measure – the IEWB Index of Economic Security. However, we would not, for an instant, want to claim that this article represents anything more than a first possible estimate.

We are acutely conscious of the many ways in which the data used in this paper need improvement. Specifically, 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 the rankings 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. These countries are in Table 6 because their statistics are more complete, but the fragmentary data that is available would indicate that the citizens of other sub-Saharan African nations are even more insecure. As well, in Sections 3c and 3d above, limitations of data availability forced us to use national poverty rate and gap estimates rather than the poverty rate and gap of single parent families and elderly persons that would be more appropriate. In Section 3a, we noted the problem of comparability of unemployment rate estimates and unemployment insurance availability. And the list could go on and on.

We can at most claim this paper to be a "first effort" – certainly not a "last word." We are encouraged by the proliferation, and increasing coverage, of high quality international data sets in recent years to believe that better data will enable the comparisons of this paper to be improved and broadened in future. Our core argument is that it is possible to measure and compare the level of economic security, from a common set of hazards, in different nations. By providing a concrete example which enlarges the set of nations for comparisons we hope to encourage others to suggest revisions, improvements and extensions.

At this stage, among the eight countries examined in Section 3 of this paper, we can conclude that economic security is 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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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 = H*(F/100)+E*(1-(F/100))
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	5.2	0.853	0.0	0.000	0.682	13.5	16.0	0.561	0.666
South Africa	23.8	0.326	0.0	0.000	0.261	8.8	2.8	0.637	0.294
United States	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

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*(B/100)*(C/100)	E	F = (A*(D/100)/E)*100	G	H = (F/(100-G))*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

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

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)

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

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

Appendix A

Weights Used for the Index of Economic Security

	Equal	United States	Tanzania
Working Age (15 to 64) 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

Figure 1
Security from Unemployment

Figure 2
Security from Financial Cost of Illness

Figure 3
Security from Single Parent Poverty

Figure 4
Security from Poverty in Old Age

Figure 5
The IEWB Economic Security Index

Figure 6
IEWB Index of Economic Security
Sensitivity to Alternative Weightings