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The Extent of and Explanations for International Disparities in Human Security

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Introduction

Efforts at composite indexing are ultimately concerned with the philosophical question of determining and assessing "what makes a good life" (Sen, 1992, p. 4; Sugden, 1993, p. 1947). The measures of human security presented here are based on a very specific conceptualization of this 'good life'. The concern is with the specific dimensions of quality of life included in the United Nations Development Programme (UNDP) concept of human security. Human security does not merely refer to the broadening of people's choice. It entails more than human development. It refers to the need of people to be able to "exercise their choices safely and freely" and to be "relatively confident that the opportunities they have today are not totally lost tomorrow" (United Nations Development Programme, 1994, p. 23).[1] Thomas (1999b, p. 3) presents a similar definition, defining human security as a "condition of existence in which basic material needs are met and in which human dignity, including meaningful participation in the life of the community, can be realized". According to Meddings (2001, p. 1553), the main focus of definitions of human security is sustainable access to certain needs and the guarantee of certain rights. These definitions all encompass the three main focus areas highlighted in the *Millennium Declaration* of the United Nations (2001) (i.e. freedom from want and from fear, and the importance of sustaining our future). This current concern with human security was also the theme of Kofi Annan's (1999) address to the United Nations General Assembly on 20 September 1999.

The origins of the human security concept can be traced to a specific school of thought within security studies, which represents a specific area of study in the field of International Relations and International Political Economy; namely, that of Barry Buzan and the so-called Copenhagen School, which is also known as the 'new' security approach. Buzan originally expanded the traditional notion of security horizontally to go beyond the political and military security of states, an idea that in the post-Cold War era was expanded vertically to conceptualize security from the bottom-up and across borders (Thompson and Leysens, 2000, pp. 1–7). Hence, humans

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became the ultimate focus of security rather than states, which often represent a source of human insecurity (Thompson and Leysens, 2000, p. 9; Axworthy, 2001, pp. 19–20). Meddings (2001, p. 1553) argues that this increased concern with human security following the end of the Cold War has been the result of increased ethnic conflicts and other crises highlighting the failures of the post-colonial process of state building. He also points out that the international community has actually, since 1864, been involved in this debate, given that its efforts to develop international humanitarian law and human rights law were essentially guided by the same principles. The current human security debate is also affecting institutional change and has seen the establishment of the Human Security Network, which includes more than a dozen countries representing all regions of the world. The Network works toward promoting international support for efforts by the United Nations (UN) to protect civilians and identifying opportunities for collective action aimed at achieving human security (Axworthy, 2001, pp. 20–21).[2]

No composite index currently exists for assessing human security as defined by the UNDP. The present paper was in part motivated by this consideration. Thomas (1999a, pp. 181–182) emphasizes this "need to map the human security experience of social groups within a global framework" using 'a range of indicators'. Yet, the measures developed here are neither truly novel nor original in attempting to combine some set of development objectives in measurement. The twentieth century, in fact, has witnessed the articulation of many multidisciplinary concepts of development and the development of a variety of alternative composite indices of development.

The novelty and originality of the Human Security Indices (HSIs) lie in the fact that, unlike other efforts at composite indexing, the indices have two variants that respectively represent an effort and outcomes-based development index. In attempting this, this measurement effort recognizes the distinction between the assessment of the commodity determinants of well-being (goods and services acting as inputs) as opposed to the actual well-being of the constituents of well-being (capabilities of individuals) (McGranahan, 1972, pp. 95–100; Dasgupta *et al.*, 1994, p. 42). The human security Effort Index includes measures of the extent to which government makes an effort at meeting certain development objectives. Efforts are assessed in terms of the delivery of those means required for meeting specific objectives. Where valid indicators for quantifying these efforts were not available, measures of the degree in which governments have committed themselves to meeting those objectives are employed as proxies. The human security Outcome Index includes measures reflecting the extent to which these particular development objectives have actually been achieved and the extent to which people possess the particular capabilities. The concern, therefore, is with "those states, qualities and activities valued for their own sake" (Galston, 1980, p. 55). These two sets of indices allow one to analyze the extent to which efforts at human security are translated into actual achievement. This is measured by means of the so-called Inefficiency Ratio. This ratio is calculated by dividing the Effort Index by the Outcome Index.

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A ratio of one means that outcome is commensurate with effort. Ratios smaller than one imply that efforts are translated into relatively greater achievements, and *vice versa*. The term Inefficiency Ratio is preferred to that of Efficiency Ratio because larger ratios imply less success at translating effort into outcome. The idea, therefore, is not simply to show that some nations are more (or less) developed than others or to present an approximation of these differences in living conditions (Hulme and Turner, 1990, pp. 15–23). The purpose, rather, is to develop descriptive measures of development for analytical purposes.

Measuring international disparities in human security: the HSIs and the Inefficiency Ratio

The methodology of measurement employed in devising the HSIs and Inefficiency Ratios is discussed in the following paragraphs. The discussion is arranged in terms of the different steps in composite indexing (i.e. selection, scaling, weighting, aggregation, and validation). During the original analysis, alternative indicators and different scaling and weighting methods were experimented with. Due to lack of space, the results cannot be reported for each of these different versions of the HSIs. Only those indexes that performed best on the tests for validation are discussed.

Selection of variables and components of HSIs

The specific components and variables included in each of the HSIs are presented in Table 1. The selection of components was here driven by *ad hoc* rather than empirical considerations (Baster, 1972, pp. 1–4). The seven components are those listed by the UNDP (United Nations Dvelopment Programme, 1994, p. 23) as the main dimensions of human security. These seven dimensions relate directly to a number of the specific challenges highlighted in the *Millennium Declaration* of the United Nations (2001); that is, sustained economic growth, improved education opportunities, promoting health and combating HIV/AIDS, freedom from conflict, the enforcement of international and human rights laws, and coping with climatic change and other environmental threats to sustainable development, which further enhances the conceptual validity of this selection of index components. Despite *ad hoc* selection being open to severe criticism, it remains the preferred method of selection where, as in this case, composite indices are cast in a specific context. The indices must ultimately reflect the underlying measurement construct (i.e. human security as defined by the UNDP).

Three specific guidelines are employed in indicator selection. First, indicators need to be valid. Differences in the selected indicator must reflect differences in the particular measurement construct. Discriminant ability is equally important when it comes to validity. In essence, improvements in indicators need to be equally relevant and achievable in all nations (Rao,

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Table 1. Human Security Indices of effort and outcome

Component	Indicator of effort	Indicator of outcome
1. Economic security	Combined gross enrolment ratio at primary, secondary and tertiary level (percentage) (1997)	Real GDP per-capita ($PPP) (1997)
2. Food security	Percentage of daily calorie requirements supplied (1990s)	Under-5 mortality per 1000 population (1997)
3. Health security	Doctors per 100,000 population (1993)	Maternal mortality rate per 100,000 live births (1990–1997)
4. Environmental security	Status of eight selected international environmental treaties (1994)	Protected areas as percentage of total land area (1997) CO_2 emissions (metric tons per capita) (1996) Emissions of organic water pollutants (kilograms per day per 1000 population) (1993–1996)
5. Personal security	Police officers per 100,000 population (1990s)	Reported homicides per 100,000 population (1990s)
6. Community security	Status of six selected international human rights treaties (1994)	Nondiscrimination index (1994)
7. Political security	Political freedom ratings (1994/1995)	Voter turnout (percentage) (1990s)

Data sources: Karatnycky (1995), Ul Haq (1995), Centre for International Earth Science Information Network (1997), Kurian (1997), United Nations Development Programme (1999), United Nations High Commissioner for Human Rights (1999), World Bank (1999a,b), World Resources Institute (1999).

1991, pp. 1453–1459). As a result, indicators exhibiting a significant plateau effect were excluded. Such indicators usually do not allow one to distinguish meaningfully between nations at the upper end of the development scale (Sen, 1993, pp. 62–66). Inconsistencies with regard to the desirability of indicator levels can also not be tolerated (Stewart, 1985, pp. 87–93). Calorie intake, for example, can be equally undesirable if extremely low or extremely high, thus comprising the variable's discriminant ability. Higher levels of indicators need always to reflect either improvement or deterioration.

Second, indicators need to be comparable in terms of the relative standardization of the concepts and methods employed in arriving at these indicator estimates (Morris, 1979; Estes, 1984). Since these indices are primarily employed in cross-section analysis, the indicators also need to be standardized for differences in population or country size so as to enhance their value in comparative analysis. Consequently, the indicators selected to represent each of the index components allow, where required, for differences in population and country size (e.g. being expressed in per-capita terms or as population ratios). Despite statistics being reported in certain standard formats, standardization can never be either entirely complete or perfect. Data reported in compendiums of international statistics are normally collected from different agencies, which employ different data sets and may use different methodologies. Hence development data are always susceptible to a certain degree of inaccuracy.

Finally, there is the matter of data availability. Recent statistics must be

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readily available for a relatively large sample of nations. HSIs and Inefficiency Ratios are compiled for the largest possible number of both developed and developing countries. The idea, therefore, is to maximize the sample size. Hence, indicators for which estimates were available only for either developing or developed countries were not considered for selection.

The main point of departure, therefore, in indicator selection was selecting from the wide variety of available indicators those indicators that conceptually best matched each of the particular index components and that performed adequately in terms of validity, comparability and availability. Where adequate grounds existed for selecting indicators other than those that were theoretically and intuitively the most appealing, these grounds are clearly stated to justify the particular choice. The following indicators were selected to quantify effort and outcome with regard to each of the seven dimensions of human security.

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Economic security. In terms of economic security, per-capita income is considered the main parameter of personal economic well-being. Differences in per-capita income are measured using the latest available estimates of real Gross Domestic Product (GDP) per capita ($PPP).[3] Equally important, however, is the extent to which people can find and keep the jobs that are required to afford them an income (United Nations Development Programme, 1994, p. 25). It therefore would have been ideal to combine per-capita income and unemployment in the Outcome Index of economic security. Recent data on unemployment rates, however, are neither meaningfully comparable nor available for a large sample of countries. The available estimates, furthermore, range from 1990 to 1997. As a result, unemployment rates were excluded from the Outcome Index since their inclusion compromised comparability and sample size.

Education and training represent the main determinants of differences in earning potential. The combined gross enrolment ratio at the primary, the secondary and the tertiary level is employed in monitoring efforts at economic security. To ensure adequate discriminant ability, combined enrolment ratios are preferred to individual ones. The combined enrolment ratio represents the total number of students enrolled at all three levels of education expressed as a percentage of the population aged 6–24 (World Bank, 1997, p. 255). Primary and secondary enrolment is particularly susceptible to the plateau effect. Many countries have already achieved close to maximum enrolment at these two levels of education. The addition, however, of tertiary enrolment to the combined ratio substantially improves discriminant ability.

Food security. Efforts at maintaining food security are measured in terms of the percentage of daily calorie requirements supplied. Daily calorie supply is calculated as the total calorie equivalent of net food supplies divided by the total population and related in daily averages. Daily calorie supply is then related to the calorie requirements set by the World Health Organization to determine the extent to which food supplies can meet these requirements.

Hence, it does not represent the actual calorie consumption of individuals, but the average calories for consumption provided to the total population.

In terms of outcomes, one needs to assess the extent to which this supply of calories is consumed in such a way as to limit malnutrition. Ideally, the best indicator would be estimates of the prevalence of malnutrition in children aged under 5. Recent estimates, however, are available only for a small number of developing countries. In fact, data were available only for seven of the 26 countries included in the original sample. To maximize the sample size and include both developed and developing countries in the sample, the under-5 mortality rate is employed as a proxy of malnutrition. Lack of nutrition, however, only partially explains child deaths. Of the 10 million children aged under 5 who died in 1997, 97% were from developing countries. Malnutrition in combination with infectious diseases such as pneumonia and diarrhea caused most of these deaths (World Health Organization, 1998, p. 3). It is estimated that under-nutrition contributes to at least one-half of child deaths (Department for International Development, 1999, p. 8). On this evidence, under-5 mortality can be considered a valid, although not ideal, proxy for nutritional outcomes.

Health security. The selection of indicators of health security remains problematic due to the varied ways in which health care is provided and health problems are manifested in different settings. Doctors per 100,000 population was selected as the indicator best reflecting the extent to which people have access to sufficient preventative and curative health care. It was preferred to the percentage of the population with access to health services, which in measurement is confined to curative treatment of disease and injury. It also lacks discriminant ability. In the case of developed countries, it is simply reported that more than 95% of the population have access to health services. No reference is made to specific levels of access. Thus, it does not represent an adequately discriminating indicator of efforts at maintaining health security.

The choice of an indicator was equally problematic in the case of the Outcome Index of health security. The maternal mortality rate was the eventual choice. The United Nations Development Programme (1994, p. 28) also recognizes it as the health indicator with the best discriminant ability. It was considered superior to total mortality rates and indicators of disease incidence. Mortality rates include causes of death not directly related to health care (e.g. homicide and old age). Furthermore, certain of the diseases (e.g. AIDS) that cause these deaths may not be curable. Disease incidence, on which the United Nations Development Programme (1994, p. 28) places particular emphasis, was considered inappropriate insofar as incidence is very much dependent on facilitating factors such as climate and lifestyle (e.g. malaria, tuberculosis and cancer). Thus, differences in disease incidence may be attributable to factors other than the delivery of appropriate health services.

Environmental security. The available indicators of environmental security are mostly confined to outcomes (e.g. de/reforestation, depletion of natural

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resources, and air pollution). Effort-based indicators are few and far between. Indicators of the extent to which national legislation and industrial regulation are sensitive to environmental issues are either non-existent or too complex for indexing purposes, and perform poorly when it comes to data availability. The only existing data that can realistically be related to national efforts at environmental protection are the extent to which nations are party to international environmental treaties. This pertains to certain treaties having entered into force in these states, or alternatively in terms of these states being signatories to certain treaties. This represents the best proxy of what Andersson (1992, pp. 237–238) calls disparities in international environmental awareness.

Eight international environmental treaties are employed in estimating national environmental awareness. The treaties were selected so as to represent environmental issues of relevance to all nations. Consequently, treaties like the Convention of the Law of the Sea, on Nuclear Weapon Tests in the Atmosphere, on Marine Pollution and on Pollution from Ships had to be excluded on the grounds that these environmental treaties were more at issue in some countries than in others. The eight selected treaties include the *Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal*, the *Convention on International Trade in Endangered Species of Wild Fauna and Flora*, the *Vienna Convention for the Protection of the Ozone Layer*, the *Convention on the Conservation of Migratory Species of Wild Animals*, the *Convention on Wetlands of International Importance*, the *Convention concerning the Protection of the World Cultural and Natural Heritage*, the *Convention on Biological Diversity*, and *the Montreal Protocol on Substances that Deplete the Ozone Layer*. For each of these treaties, the total number of days that the particular treaty has been in force in the particular country or that the particular country has been a signatory to the treaty, is determined. This is determined by subtracting the date the treaty entered into force or was signed by the particular country from a later date (i.e. 31 December 1994).[4] These totals are added up for each of the eight treaties for each of the countries to act as proxy for environmental awareness. The resulting indicator reflects the total number of days that the particular country has been party to the eight treaties, thus reflecting differences in the cumulative national effort over time at environmental security. Totals were not averaged out over the eight treaties since some countries are not party to all the treaties. The resulting averages would have distorted the proxy and compromised the discriminant ability of the indicator. This choice of methodology, furthermore, implies that older treaties carry a much greater weight than more recent ones. The main purpose here, however, is to find an aggregate proxy of countries' commitment to environmental issues of international importance.

When it comes to outcomes-based indicators, the multiplicity of environmental issues complicates selection. There are a multitude of environmental threats that are crucial to environmental sustainability. These concerns include air pollution, ozone depletion, climatic change (global warming), availability of fresh water, coastal and marine degradation, land degradation,

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deforestation and habitat loss, loss of biological diversity, environmental hazards and disasters (e.g. volcanoes and oil spills), and toxic chemicals and hazardous waste (Tolba and El-Kholy, 1992, pp. 1–276; Duraiappah, 1996, pp. 8–26). Hence, three environmental indicators are combined in an equally weighted Outcome Index of environmental security. The three selected indicators are: (i) protected land area as percentage of total land area (summary indicator of the extent to which land is valued and a culture of conservation is ascribed to); (ii) CO_2 emissions in metric tons per capita (summary indicator of ozone depletion and climatic change); and (iii) emissions of organic water pollutants in kilograms per day per 1000 population (summary indicator of the extent to which water resources are put under pressure). These indicators are universal insofar as they represent environmental impacts equally relevant in both developing and developed nations.

Personal security. In the case of personal security, the United Nations Development Programme (1994, p. 30), in addition to criminality, lists threats of violence emanating from the state (physical torture), from other states (war), and from other groups of people (ethnic tension) as elements of personal security. Comparable proxies of these three elements of personal security are not available for a sufficiently large sample of countries. These elements also overlap substantially with the components of community and political security already included in the index. Hence these three issues are excluded from this component index. The concern, rather, is with acts of violence committed by individuals and that affect individuals (i.e. crime). In terms of effort, the focus is on policing (i.e. police officers per 100,000 population). Assuming that policing is effective and efficient, relatively larger police forces represent greater efforts at policing. Outcomes with regard to personal security are monitored via the number of reported homicides per 100,000 population. Victimization rates, although superior to incidence rates in terms of allowing for the under-reporting of crime, were excluded since estimates were not readily available for large samples of countries, as were conviction rates. Incidence rates are preferred to indicators related to the judicial and correctional elements of the criminal justice system insofar as the incidence of crime, even where substantially under-reported, is the original manifestation of these threats to personal security. Arrest, conviction, sentencing and imprisonment can only follow once a crime has been committed and reported. The validity of this variety of statistic is also compromised insofar as the disparate efficiency of criminal and justice systems means that many criminals are neither arrested nor convicted.

Community security. This refers to the security people derive from group membership (e.g. families, racial and ethnic groups, and local communities). Group membership is also derived from gender and religious affiliation (United Nations Development Programme, 1994, pp. 31–32). The effort of governments at affording people community security is assessed in terms of the extent to which they are party to eight selected international human

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rights treaties. According to the United Nations High Commissioner for Human Rights (1999), nations, by being party to such treaties, "assume a legal obligation to submit periodic reports outlining the legislative, judicial, administrative, and other measures they have taken to ensure the enjoyment of the rights contained in the treaty". The selected treaties focus on the protection of the rights of some of the aforementioned membership groups. The six treaties included here are the *Convention on the Prevention and Punishment of the Crime of Genocide* (1948), that relating to the *Status of Refugees* (1954), that *on Economic, Social and Cultural Rights* (1966), that on the *Elimination of all forms of Racial Discrimination* (1969) and *Discrimination against Women* (1979), and that on the *Rights of the Child* (1989) (United Nations Development Programme, 1996, p. 214). The same method used in calculating the proxy of national environmental awareness employed in the Effort Index of environmental security is employed here. The total number of days that the particular treaty has been in force in the particular country or that the particular country has been a signatory to this treaty are determined for each of the six human rights treaties. This was achieved by subtracting the date on which the treaty entered into force or was signed by the particular country from a later date (i.e. 31 December 1994). These totals are added up across the six treaties for each of the countries. The resulting indicator reflects the total number of days that the particular country has been party to these six treaties, thus reflecting differences in the cumulative national effort over time at community security. As in the case of the proxy of environmental awareness, the totals were not averaged out over the six treaties so as to enhance the discriminant ability of the indicator. Similarly, this choice of methodology again implies that older treaties carry a much greater weight than more recent ones. For the same reason noted elsewhere, this is not considered problematic.

Outcomes with regard to community security can be assessed in terms of indicators dealing with the various domains of community security (e.g. family life and ethnic and religious conflict). The United Nations Development Programme (1994, p. 32) lays particular emphasis on the latter aspect. The large number of indicators required to cover all these domains and the resultant questions as to the weighting of index components compromise the simplicity of the index. Data on these variables, furthermore, are not always readily available for large samples of countries. The choice, therefore, fell on a single proxy rather than a combination of indicators. The only appropriate proxy available was the non-discrimination index devised by Ul Haq (1995). This index reflects the extent to which nations are "free from discrimination based on gender, religion, ethnic group, national or social origin, language or income and wealth, whether by law, by government action or inaction or through actual practice" (Ul Haq, 1995, p. 70). Countries are rated on a scale of 0 to 100, where countries entirely free from discrimination score 100.

Political security. This need not be interpreted in terms of democratization (e.g. frequent elections, political participation, free media and human rights)

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(Handelman, 1996, pp. 7–9). Authoritarian states, in fact, need not be repressive and, in select cases, outperform more democratic ones in terms of socio-economic development (Crone, 1993). Taylor (1972, pp. 103–106) recognizes these anomalies in pointing out that political change cannot be located on a single continuum (i.e. where a change in one direction denotes progress and a change in the opposite direction denotes deterioration). This requirement, which is crucial for indexing purposes, can only be met when a specific political arrangement is ascribed to. The indices presented here are scaled relative to the ideal of democratic governance. Democracy refers to a "form of government organized in accordance with the principles of popular sovereignty, political equality, popular consultation, and majority rule" (Ranney, 1996, p. 94). When ascribing to this ideal, the exact meaning of democracy needs to be clearly stated. According to Taylor (1972), this task is fraught with difficulty. Democracy may be concerned with political freedom (civil and political rights), the provision of political goods (voting rights), or the maintenance of political order and stability (political violence) (Taylor, 1972, pp. 103–106). Democracy is here defined in an inclusive manner, referring to the extent to which the political climate necessary for the complete and equal development of people's capacities to participate in society exists (MacPherson, 1966, p. 58; Held, 1987, pp. 269–270). Differences in the ability of nations to actually instill democratic values are quantified using voter turnout. Higher voter turnout signifies higher levels of participation by people in the governance of their countries, and *vice versa*. The political freedom ratings annually reported by Freedom House are used as parameter of public efforts at establishing political security. These ratings cover the whole spectrum of political rights insofar as they measure elements of both positive and negative political rights. So, for example, these ratings take account of both the extent to which people are afforded the ability to exercise their freedom (e.g. regular elections), and also the extent to which unwanted interference with the rights of others is curbed (e.g. freedom of association) (Lloyd, 1938, p. 62; Berlin (1959) as quoted in Dasgupta, 1990, pp. 16–20; Dewey, 1970, pp. 15–16; McColm, 1993, pp. 78–79).

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Scaling of variables of HSIs, and composite HSIs and Inefficiency Ratios

The component indicators of the HSIs developed here are re-scaled with the aid of the conventional linear scaling transformation (LST) technique, which is here applied to the logs of the unadjusted indicator values. Variables are scaled from 0 to 100 with the aid of this technique. The index value is determined by subtracting the minimum value of the particular variable from its actual value and dividing it by the difference between the selected maximum and minimum values (Thiessen, 1997, p. 142). The LST technique is also employed in calculating the composite HSIs and the corresponding Inefficiency Ratios. These ratios are calculated by dividing the Effort Index by the Outcome Index. For the resulting ratios to be meaningful, the two sets of

indices need to be expressed in comparable terms. The Outcome Indices, however, fall into both a much higher and a much narrower range than the Effort Indices. Consequently, the LST technique is applied to each of the composite indices before calculating the Inefficiency Ratios. The HSIs are re-scaled relative to 0 and 100, based on the observed minimum and maximum values.

It may be argued that some of the indicators included in these indices require no re-scaling since they are already expressed in percentage terms. One example of such an indicator is the percentage of daily calorie requirements supplied, which is included in the Effort Index (Table 1). Yet, all the component indicators are re-scaled. There are two reasons for doing so. First, certain variables, such as the gross enrolment ratio included in the Effort Index, are expressed in percentage terms but have values exceeding the upper boundary of 100. This requires these variables to be re-scaled. Second, the relative performance of the countries included in the sample need not be close to either the lower or upper boundaries of the specific indicator. The main purpose here is to compare the relative performance of this specific sample of nations on the HSIs and Inefficiency Ratios. One therefore needs to express the performance of any one country relative to that of the others included in the sample. Hence, each of the indicators is re-scaled with the aid of the linear scaling transformation technique.

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Weighting of components of HSIs

One also needs to decide on the weighting system and method to be employed in aggregating component scores into one composite index. The composite scores on the Effort Indices and the Outcome Indices are calculated simply as averages of the corresponding component scores. Hence, the component indices of the HSIs are weighted equally. There are specific reasons why no explicit, differential weights are introduced. Equal weighting implies that one need not be concerned with the difficult task of determining the ideal balance between or priorities of these development objectives (Davis, 1945, pp. 7–10). These new indices are thus based on the implicit assumption that their components are equally important in assessing development. Babbie (1995, pp. 161–175), furthermore, argues that equal weighting should be the norm and the burden of proof should fall on differential weighting. Likewise, no empirically-based weighting techniques have been employed here. Such techniques would have seen different weights being allocated to the components of the Effort Indices and the Outcome Indices. This will, in turn, undermine the comparability of the two sets of indices. It will also obstruct the purpose of employing the HSIs to calculate Inefficiency Ratios that reflect the extent to which efforts are successfully translated into outcomes. The only weighting, therefore, to which these indices are exposed is the implicit weighting introduced during scaling.[5]

Aggregation of components of HSIs

Aggregation tends to be either of an additive or a functional nature. Whereas the former entails the mere addition of component scores to arrive at index

values, the latter is based on the estimated functional relationship between certain variables (Adelman and Morris, 1972, p. 111). The component indices employed here are aggregated additively in determining the respective composite index values of the HSIs. There are various reasons for employing additive rather than functional aggregation in calculating these index values. Additive aggregation allows the resulting indices to remain relatively simple in respect of construction and interpretation. Additive aggregation removes the empirical complexity introduced during the functional aggregation of indices. It also facilitates comparability insofar as the Effort Indices and the Outcome Indices need not have employed similar functions in the case of functional aggregation. Additive aggregation, furthermore, supports the stated claim that these components are valued equally and are each considered a necessary, although not sufficient, condition for development.

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Validation of HSIs and Inefficiency Ratios

Composite indices also need to be validated. The HSIs and Inefficiency Ratios are validated using external validation. During external validation, the association between these measures and existing development indicators is analyzed. The HSIs are validated externally with the aid of a range of indicators and indices of development that are prominent in the measurement debate or represent good proxies of the aggregate of development. Additional validators are employed in externally validating the Inefficiency Ratio. Countries that have been relatively more successful in translating effort into outcomes can be expected to have made better progress over time in development. These measures of progress include the average annual rate of growth in GDP and Gross National Product, both in aggregate and per-capita terms. In the case of other validators, the percentage improvement in the indicators and indices is also employed as validator. Estimates were obtained for as many countries as possible of the sample of 57 countries for which HSIs and Inefficiency Ratios were calculated. In the majority of cases, recent estimates were available for 40 or more of the 57 countries. The only exceptions are those indicators or indices that are reported for select groups of countries (e.g. developed and developing countries).

The inclusion of per-capita income as an external validator is contrary to common practice. External validators are normally variables not included in the particular index, but real GDP per-capita is included in the Outcome Index (Table 1). Since it is the indicator that best quantifies the extent to which people are afforded economic security, excluding it from the index would have introduced ambiguity in the process of indicator selection. Yet, per-capita income to date remains the single most important yardstick of economic development. On these grounds alone, it could not be excluded from the list of selected validators. The Human Development Index and Gender-related Development Index, which each include one individual indicator respectively included in the two HSIs, were also not excluded from the list of validators insofar as the HSIs represent much richer measurement constructs than these two composite indices. Again, it was also of interest

to see how well these new indices correlate with these two prominent composite indices of human development.

The association between the Effort Indices and the Outcome Indices and each of the external validators is reported in Table 2. Rank order rather than linear correlation is employed in the validation of these indices. Country data on development indicators are subject to methodological inconsistency insofar as data on the same variable are often obtained from different sources. Hence, the data employed in calculating the HSIs and Inefficiency Ratios are neither fully accurate nor directly comparable. According to Koutsoyiannis (1977, p. 40), linear correlation should be used where data are accurate, whereas rank order correlation should be applied to data that are relatively imprecise.

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TABLE 2. Rank order correlation between HSIs, the Inefficiency Ratio and selected development indicators and indices

Development indicator or index	*n*	Effort Index	Outcome Index	Inefficiency Ratio
1. Real GDP per-capita ($PPP) (1997)	57	0.796**	0.859**	0.128
2. Average annual growth in GDP (1990–1998)	54			−0.097
3. Average annual growth in GDP per-capita (1987 US$) (1975–1997)	54			−0.028
4. Average annual growth in GNP (1975–1995)	54			−0.163
5. Average annual growth in GNP per-capita (1975–1995)	54			0.029
6. Unemployment (1997)	40	−0.005	−0.104	0.214
7. Life expectancy (1997)	57	0.850**	0.872**	0.201
8. Percentage improvement in life expectancy (1970–1997)	57			−0.067
9. Human Development Index (1997)	57	0.882**	0.891**	0.198
10. Percentage improvement in HDI shortfall (1−HDI) (1975–1997)	44			0.211
11. Percentage improvement in HDI shortfall (1−HDI) (1990–1997)	45			0.326*
12. Index of Economic Freedom (1999)	57	−0.699**	−0.814**	0.020
13. Percentage improvement in Index of Economic Freedom (1995–1999)	57			−0.031
14. Global Competitiveness Index (1999)	38	0.567**	0.709**	−0.257
15. Percentage improvement in Global Competitiveness Index (1996–1999)	36			0.017
16. Gender-related Development Index (1997)	55	0.877**	0.896**	0.253
17. Gender Empowerment Measure (1990s)	50	0.731**	0.700**	0.160
18. Developing country Human Poverty Index (1997)	31	−0.740**	−0.598**	−0.469*
19. Developed country Human Poverty Index (1997)	16	0.177	−0.155	0.178
20. Human Suffering Index (1990s)	57	−0.891**	−0.897**	−0.220
21. Status of Women Index (1990s)	55	0.861**	0.793**	0.270*

Data sources: Kurian (1997), Heritage Foundation (1999), United Nations Development Programme (1999), World Bank (1999a,b), World Economic Forum (1999).

Note: The Spearman's correlation coefficients with two asterisks are significant at the 0.01 level using a two-tailed test. The coefficients with one asterisk are significant at the 0.05 level using a two-tailed test. Coefficients without asterisks are not statistically significant.

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Validation also entails an analysis of the association between component indices and a selected external validator. According to Babbie (1995, pp. 161–175), this type of analysis is useful for distinguishing between 'good' as opposed to 'bad' indices. If the index is a 'good' one, the composite and component scores will correlate well with the validator. If, on the contrary, the index is a 'bad' one, the composite and/or some of the component scores will fail to correlate with the validator. This type of analysis requires a validator that is not included in either of the two indices, that is prominent in the measurement debate, and that represents a good proxy of the aggregate of development (i.e. the economic, social, political and environmental elements of development). Life expectancy is the indicator that best meets these criteria. Table 3 reports on the association between life expectancy and each of the component indices of the Effort Index and the Outcome Index, and the Inefficiency Ratio.

In light of Babbie's (1995) criterion for a good index, one may conclude that the Effort Indices and the Outcome Indices are 'good' indices. The Effort Indices and the Outcome Indices, and their component indices, correlated relatively well with life expectancy. So, for example, simple linear regression shows that differences in the Effort Index and the Outcome Index respectively explains 62.8% and 58% of differences in life expectancy. The two indices also correlated fairly well with most of the external validators. The association between the HSIs was also assessed. One would expect differences in effort to explain a large proportion of differences in outcomes. The results underscore this. Differences in the Effort Index explain 74.7% of the differences in the Outcome Index. This to a certain extent justifies the methodology of dividing the Effort Index by the Outcome Index to obtain an Inefficiency ratio that reflects the extent to which effort is actually translated into outcomes.

According to Babbie's (1995) criteria, the Inefficiency Ratios are 'bad' indicators. The ratio failed to correlate meaningfully with most of the external validators. Although as many as six of the nine validators indicative of

TABLE 3. Rank order correlation between life expectancy and components of the HSIs and the Inefficiency Ratio ($n = 57$)

Component	Effort Indices	Outcome Indices	Inefficiency Ratio
1. Economic security	0.731**	0.854**	−0.302*
2. Food security	0.600**	0.926**	−0.516**
3. Health security	0.821**	0.901**	−0.477**
4. Environmental security	0.423**	−0.687**	0.704**
5. Personal security	0.350**	0.091	0.014
6. Community security	0.502**	0.605**	−0.375**
7. Political security	0.757**	0.210	0.744**

Note: The Spearman's correlation coefficients with two asterisks are significant at the 0.01 level using a two-tailed test. The coefficients with one asterisk are significant only at the 0.05 level. Coefficients without asterisks are not statistically significant.

progress in development are correctly associated with the ratios, the results are mostly statistically insignificant. In addition, only some of the components of the ratios correlated meaningfully with life expectancy. Ultimately, however, this may simply imply that countries at different levels of development differ substantially and eratically in terms of the extent to which they have succeeded in translating effort into actual achievement. The UNDP similarly emphasizes the fact that countries with similar scores on the Human Development Index differ widely in terms of their performance on other indicators of development (United Nations Development Programme, 1999, p. 129). In addition, the ratios also compound the measurement errors in all the constituent indicators. In this context, it would not be uncommon for the ratios to fail the test for internal and external validity. Consequently, these measures are employed in further analysis aimed at attempting to identify those development characteristics generally associated with higher levels of effort and outcome and greater success in translating effort into actual achievement.

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General methodological remarks on HSIs and Inefficiency Ratios

This measurement effort complies with most of the general guidelines for composite indexing put forward by the likes of Estes (1984) and Ul Haq (1995). It recognizes the multi-dimensional nature of development in that it takes cognizance of the economic, social, environmental and political aspects of development. These measures reflect development objectives that are shared internationally and nationally, thus enhancing the universality of the resulting measurement constructs. Yet, these measures remain conceptually and methodologically manageable. Validity, comparability and data availability are employed as guidelines in indicator selection to enhance their relative objectivity and comparative value. These measures are also relatively flexible. Future changes in content and coverage can be accommodated, albeit at the cost of comparability.

This measurement effort also deals with the main criticisms leveled at composite indexing. Composite indices are often criticized for excluding some essential component(s) of development and/or for being biased where component selection is performed in an *ad hoc* fashion. These two common criticisms are dealt with by drawing very specific conceptual boundaries within which these measures are devised and interpreted (i.e. the specific meaning ascribed to human security by the UNDP). The criticism that indicators other than those selected may be better presentations of some components is addressed by employing very specific guidelines during indicator selection. The preference for equal weighting and additive aggregation is sufficiently justified in terms of allowing the direct comparison of the Effort Indices and the Outcome Indices while maintaining the need for clarity and simplicity. With regard to the criticism that composite indices lack practical value, let it be pointed out, the indices are developed with two specific aims in mind. The HSIs are used to calculate Inefficiency Ratios that reflect the extent to which efforts at human security are not translated

into actual achievement. These measures are also employed to identify possible causes and consequences of higher levels of effort, outcome and inefficiency.

Explaining international disparities in human security

Appendices A–C report the component and composite values for the HSIs and Inefficiency Ratio for each of the 57 countries for which these measures were calculated. Evident from these Appendices is the considerable range of experiences. So, for example, Bangladesh performed worst on the Effort Index, while Iraq performed worst on the Outcome Index and the Inefficiency Ratio. Portugal and Finland, respectively, performed the best on the Effort Index and the Outcome Index, while Bangladesh had the most favorable Inefficiency Ratio, with its relative performance on the Outcome Index considerably exceeding that on the Effort Index. The experiences, furthermore, of individual countries are even more diverse when it comes to the different component scores of these indices. So, for example, Bangladesh, which performed worst on the Effort Index, obtained relatively high scores on the environmental and community security components of this index. Iraq, which performed worst on the Outcome Index, achieved a very high score on the political security component of the Outcome Index. Portugal and Finland, in turn, respectively scored low on the personal and environmental components of the Effort Index and the Outcome Index, despite respectively outperforming other countries on these two indices. However, the main purpose of this paper is not to elaborate on specific country experiences with regard to human security. Indices such as those presented here, moreover, only reflect the performance of one nation relative to that of all other countries included in the sample, which means that it presents a rather crude measure with which to judge individual countries.

Further value can be added to efforts at composite indexing by attempting to identify the characteristics with which higher levels of effort and outcome and lower Inefficiency Ratios are generally associated. As a result of the lack of adequate data to allow indices to be devised for different time periods, the focus here is on cross-section analysis. The relationship between human security and four broad development issues is explored with the aid of multiple regression analysis. The analysis is confined to the following prominent issues in development studies.

There are a number of reasons why the relation between human security and *demographic dynamics* is of particular interest. On the one hand, increasing population pressure is associated with diminishing prospects for human security (e.g. deteriorating rates of economic growth, rising inequality, and increasing environmental degradation) (Birdsall, 1980, pp. 21–42, 1994, pp. 175–182). Increasing populations also place an increasing burden on socio-economic infrastructure and on the planning capacity of governments. These pressures result from growing populations being increasingly youthful and dependent on the government for their livelihood, particularly in urban communities (Solimano and Chapin, 1981, pp. 1–3; Leonard, 1989, pp. 5–9;

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United Nations Population Fund, 1991, pp. 3–16). On the other hand, improved prospects for human security are crucial in reducing population pressure (i.e. reducing fertility and mortality rates) (or negotiating the demographic transition). The main factors in reducing fertility rates include improvements in education, reductions in the cost of and improvements in the availability of family planning services and contraceptive devices, and reductions in infant mortality (Birdsall, 1980, pp. 21–42, 1994, pp. 182–191). Improvements in health care are also crucial in curbing mortality rates (Bengtsson and Gunnarsson, 1994, pp. 1–3).

Thus, the relationship between human security and population pressure is postulated to be a negative one. To establish the nature of this relationship, the association between the HSIs and the Inefficiency Ratio and the population dependency burden (i.e. the percentage of the population aged younger than 15 and older than 65 years) is assessed. Fertility is employed as an alternative indicator of differences in population pressure. This choice of indicators supports Lipton's (1988, pp. 53–56) recognition of the importance of age (population dependency burden) and household size (fertility) in studies of underdevelopment. Average annual population growth is employed as an additional indicator of the demographic dynamics of development.

The relationship between human security and *urbanization* is of a dual nature. Many of the elements of human insecurity (e.g. criminality and environmental insecurity) are symptomatic of urbanization (Campbell, 1989, pp. 165–166). Other aspects of human security (e.g. educational opportunities and health care services) are normally better developed in urbanized societies. People living in rural areas are also relatively more susceptible to certain symptoms of human insecurity than are city dwellers (e.g. malnutrition and famine) (Spitz, 1978, p. 867; Oodit and Simonis, 1993, pp. 14–15). Urbanization, furthermore, is indicative of increasing pressure on development resources and service delivery systems (Sandbrook, 1982, pp. 18–28). Yet, one can also argue that delivery in concentrated, urbanized communities is relatively easier to manage and achieve than in more geographically dispersed localities. At issue, as far as statistics go, are the level of urbanization (i.e. percentage of total population living in urban areas) and the average annual rate of growth in urban and rural populations.

Disparities in human security cannot be assessed without taking into account differences in *infrastructure* (Boserup, 1984, pp. 20–32). Infrastructure such as roads and railways stand central in the delivery of persons, goods and services required in meeting development objectives. Other infrastructure, such as sanitation and delivery of safe water, directly fulfill certain human security needs. Communication is also of particular importance in this regard. According to Campbell (1989, pp. 165–166), communication indicators represent good proxies of the general capacity of societies to avert economic, social, environmental and political crises. Garnier and Majeres (1992) reiterate this. They argue that access to information is as crucial an aspect of development as is access to basic services (Garnier and Majeres, 1992, p. 68). The ability to convey information is particularly crucial in enabling governments to plan and manage the development process

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efficiently. This is becoming of increasing importance as the interdependence between nations with regard to communication, travel, trade and finance increases (Rose, 1995, p. 114). Infrastructure development is measured with the aid of indicators reflecting differences in the dispersion of railways, roads, and airfields, and access to sanitary services. Indicators pertaining to the relative availability of transport and communication means such as motor vehicles, telephones, radio and television receivers, newspapers, fax machines and the Internet are employed in assessing differences in communications capacity.

Ethnic tension and the resulting conflict remain a big threat to human security, particularly in African countries, which are characterized by a relatively high degree of ethnic fractionalization (Scholte, 1999, p. 76). According to the United Nations Development Programme (1994, p. 32) "about 40% of the world's states have more than five sizable ethnic populations, one or more of which faces discrimination". The Ethnic Homogeneity Index, which is calculated as the largest percentage of the total population that belongs to the same ethnic group, is employed as a general proxy of the threat of ethnic tension to human security.

Analyses are affected with the aid of multiple regression analysis. Stepwise multiple regression analysis was used to estimate the models elaborated on in the subsequent discussion. The selected models are those with the highest possible adjusted R^2, and for which the coefficients and F and t statistics are acceptable (Table 4). To ensure the statistical significance of the results, only those independent variables available for more than 50 of the 57 countries for which index values were calculated are used. This is to maximize the sample size. As a result, the independent variables are confined to a total of 21 variables.

TABLE 4. Multiple regression models for the HSIs and the Inefficiency Ratio and selected parameters of social and economic development

	Dependent variables		
Independent variables	Effort index	Outcome index	Inefficiency ratio
1. Ethnic homogeneity	0.175 (4.676)	0.087 (8.465)	
2. Growth rate of urban population	−2.266 (3.597)		
3. Access to telephones	0.036 (5.664)	0.034 (3.049)	
4. Percentage population urbanized	0.128 (2.527)		0.0035 (3.887)
5. Access to sanitation		0.156 (2.643)	
6. Daily newspaper circulation			−0.0002 (2.085)
7. Constant	47.251 (9.984)	38.389 (11.507)	0.864 (17.272)
Summary statistics			
n	44	44	44
R^2	0.880	0.878	0.339
Adjusted R^2	0.867	0.869	0.290
F	71.330	96.207	7.555

Note: R^2 is significant at the 0.01 level using the F test. The t-statistics, which are presented in parentheses with the coefficients of the independent variables, are significant at the 0.05 level using a two-tailed test.

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Certain conditions appear to be especially conducive to improved efforts at human security. First, the urbanization process needs to be completed (i.e. urbanization needs to taper off at high levels of urbanization). Efforts at human security are more successful in countries where urban populations grow at a slower rate (i.e. where migration is less) and where larger proportions of the populace already live in urban settlements. In such circumstances, planning and delivery are less constrained by changing patterns in human settlement and migration. Second, more people require access to telephones. Planning and delivery are understandably also dependent on an improved capacity for communication. Finally, efforts at human security are also dependent on the ethnic make-up of society. Countries in which a larger proportion of the population belongs to the same ethnic group have been able to make greater efforts at human security, possibly due to the lower risk of conflict in these countries.

There are also conditions conducive to actual outcomes with regard to human security. Communications capacity and infrastructure are especially important. In countries where a greater proportion of the population have access to telephones and sanitation, higher levels of human security were achieved. Better infrastructure and communications capacity can be argued to enhance the ability of people to actually exercise the capabilities afforded them via the delivery of certain means. Ethnic homogeneity again impacts on human security. Like with effort, ethnic homogeneity enhances the prospects for human security. Here, however, it is actual achievement rather than effort that is dependent on the ethnic make-up of society. This may be because the greater efforts at human security to which ethnic homogeneity are conducive are indeed translated into actual achievement.

In the case of the regression model looking at those conditions conducive to the relatively more efficient translation of effort into actual achievement, the results also yield some valuable insights, although this model does not have as great an explanatory power as those for the Effort Indices and the Outcome Indices. The lack of efficiency is dependent on the spatial characteristics of development. A greater centralization of people in urban settlements causes inefficiency to increase. This is possibly the result of the greater pressures that concentration brings to bear on planning and delivery networks. Furthermore, improved efficiency requires enhanced communication. Access to communication can be argued to enhance the possibility of delivering the right means in the right localities at the right time, thereby enhancing the efficiency of efforts at development.

Conclusion

Achieving human security is about much more than political intent. Neither is it simply a case of making available to people certain public goods and services. There rather are a variety of conditions that determine whether human security is actually delivered on and how efficiently these efforts are translated into achievement. The balance of these forces determines the ultimate success or failure of the efforts of national governments at human

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security. The majority of these forces fall into the realm of the policy-maker's influence, which is primarily exercised at the national level. Thus, policy-makers need to take cognizance of the extent to which certain policy interventions can be instrumental in making greater strides in achieving human security in a more efficient manner.

The results suggest that nations that are ethnically more homogeneous (i.e. where a larger percentage of the population belongs to the same ethnic group) are more likely to make better efforts at and to achieve higher levels of human security. Hence, the international community needs to intensify its efforts to address those discriminatory inequalities between ethnic and religious groups that has entrenched conflict in communities and societies, and in the process threatens the attainment of human security for all. The expansion of infrastructure and communications capacity, and the pro-active management of urban and population dynamics appear to be particularly important in this respect. The UN, for example, in its *Millennium Declaration* has paid particular attention to this need to build "digital bridges" to improve access to new information networks in developing countries (United Nations, 2001). The Declaration also emphasizes the need to improve the lives of the 100 million slum dwellers by the year 2020, which is related directly to the need for improved management of urban societies. Achieving human security will also require increased levels of development coordination between rich and poor nations to ensure that progress toward these objectives become a reality.

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Notes

1 The 1994 *Human Development Report* represented the core recommendations of the UNDP's address to the World Summit on Social Development in Copenhagen in 1995 (Kaul, 1995, p. 56). Hadingham (2000, pp. 115–116) argues that the original scope of this definition was too ambitious and that advocates of this ideal in time recognized that the definition was "too unwieldy and all-inclusive to be effective". Hadingham then proceeds to point out that the concept has, over time, evolved into something more realistic, with a specific focus on the cost of human conflict and underdevelopment. Yet, these two broad issues in essence still encompass the aspects of human security included in the UNDP's definition.

2 This network originated from a bilateral agreement between Canada and Norway, the so-called 'Lysoen' partnership (Axworthy, 2001, p. 21).

3 Purchasing Power Parity ($PPP) represents the amount of "goods and services (that) can be purchased with the recorded income per capita of different countries (in this case the US) depending on the relative prices of similar products (and services)" in different countries (Todaro, 1994, p. 698). Purchasing Power Parities are the 'currency converters' or 'price deflators' employed in converting broad aggregates such as GDP to a comparative basis across countries (Hill, 1984, pp. 128, 132), rather than using current exchange rates.

4 The indicators used to measure outcomes with regard to human security range from 1994 to 1997 (Table 1). These outcomes are the result of the corresponding efforts at human security. The indicators used to measure effort can therefore not post-date those used to measure outcomes. As a result, 31 December 1994 is used to calculate the proxies of efforts at environmental and community security.

5 The literature on composite indexing draws a distinction between the implicit and explicit weighting of index components. Implicit weighting is introduced during the scaling of variables. The wider the minimum and maximum values are apart, the higher the implicit

weighting (Morris, 1979, pp. 41–56). Assume, for example, that the minimum and maximum observed average life expectancy is 40 and 80, respectively. A difference of 10 percentage points between two index scores now reflects a greater improvement in life expectancy than if the observed minimum and maximum had, respectively, been 50 and 70. The scaling methods employed here to calculate the different index values cannot be employed to address this implicit weighting of index components.

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Appendix A: Human Security Effort Indices

Country	Economic security Effort Index	Food security Effort Index	Health security Effort Index	Environmental security Effort index	Personal security Effort Index	Community security Effort Index	Political security Effort Index	Composite Effort Index
Argentina	77.55	66.87	88.15	80.97	40.96	97.89	52.90	66.66
Australia	100.00	63.13	85.01	97.72	63.12	99.38	100.00	97.17
Austria	85.64	77.55	91.73	75.36	62.19	98.95	100.00	92.16
Bangladesh	0.01	14.47	39.55	71.47	26.00	85.20	43.53	0.01
Belgium	100.00	85.37	93.71	72.27	55.60	98.79	100.00	96.40
Botswana	66.03	32.48	41.44	55.41	52.21	89.31	52.90	32.45
Canada	99.04	58.00	84.68	93.63	0.02	98.62	100.00	75.15
Chile	75.11	44.36	71.80	92.79	62.19	98.04	64.37	67.65
China	64.66	58.00	72.93	72.85	39.50	94.97	−0.02	36.33
Colombia	67.38	56.69	71.29	64.86	64.59	99.21	35.61	53.13
Costa Rica	60.43	74.07	74.57	78.02	61.74	97.86	79.16	72.74
Denmark	88.90	82.07	89.13	97.47	56.97	99.72	100.00	98.93
Egypt	68.71	78.69	83.06	93.76	57.70	97.63	7.91	61.38
Finland	99.04	51.33	88.22	93.33	55.60	97.66	100.00	90.31
France	92.06	90.72	88.94	91.65	55.93	99.42	79.16	94.07
Ghana	17.38	29.36	12.48	90.88	56.27	96.90	22.69	13.55
Greece	77.55	89.66	94.77	80.59	66.73	99.00	64.37	86.61
Guatemala	28.09	40.01	68.51	80.52	54.62	95.48	22.69	32.49
Hungary	71.32	78.69	92.28	89.97	53.38	99.18	79.16	84.03
India	43.06	47.19	57.20	94.26	50.30	95.30	28.75	40.23
Indonesia	57.50	71.71	32.25	64.40	39.82	78.55	3.79	20.08
Iraq	35.87	16.20	58.29	49.45	88.05	95.17	−0.02	18.60
Ireland	87.83	99.89	79.64	72.55	71.07	93.34	79.16	89.81
Italy	81.10	87.53	100.01	96.97	54.30	98.87	79.16	94.09
Jamaica	56.00	58.00	60.29	35.46	64.09	97.38	52.90	42.62
Japan	84.52	68.09	80.69	79.50	61.74	87.55	64.37	72.92
Jordan	60.43	66.87	78.64	93.64	55.93	95.33	28.75	59.04
Kenya	33.98	17.91	36.27	66.75	37.41	92.00	7.91	3.56
Korea Republic	89.97	86.46	74.71	36.16	64.59	94.20	64.37	68.18
Kuwait	46.46	41.48	80.79	−0.00	100.00	85.04	17.28	26.90
Malawi	72.60	−0.13	0.00	70.02	35.12	81.28	52.90	9.35
Malaysia	58.97	75.24	55.22	70.11	51.93	21.97	22.69	22.49
Morocco	32.06	66.87	50.99	85.70	49.79	97.74	17.28	35.60
Nepal	49.75	17.91	16.49	78.67	46.07	91.75	35.61	16.59
Netherlands	98.08	63.13	87.33	84.65	60.44	97.49	100.00	92.07
New Zealand	95.11	85.37	83.76	80.98	55.93	98.61	100.00	94.63
Norway	95.11	64.39	92.22	100.03	49.29	99.99	100.00	95.01
Panama	70.03	30.93	73.54	87.95	82.68	98.18	52.90	63.97
Paraguay	57.50	58.00	63.20	63.79	71.07	94.78	35.61	48.49
Philippines	81.10	35.54	30.68	67.30	42.90	98.11	35.61	32.88
Poland	75.11	70.51	85.16	84.06	67.30	96.96	64.37	77.96
Portugal	91.02	94.86	89.64	93.34	54.94	94.12	100.00	100.00
Senegal	0.01	27.78	22.55	92.38	52.79	95.95	22.69	10.05
South Africa	93.09	49.96	60.91	84.90	49.04	—	52.90	32.75
Spain	92.06	97.90	95.36	87.70	57.70	96.37	79.16	96.55
Sri Lanka	60.43	38.54	43.96	84.28	49.29	95.09	22.69	33.78
Sweden	100.00	49.96	90.12	97.83	69.74	99.87	100.00	96.93
Switzerland	77.55	70.51	90.24	96.39	55.60	89.10	100.00	88.60

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Appendix A: Continued

Country	Economic security Effort Index	Food security Effort Index	Health security Effort Index	Environmental security Effort index	Personal security Effort Index	Community security Effort Index	Political security Effort Index	Composite Effort Index
Thailand	49.75	49.96	44.72	64.54	59.62	76.84	28.75	27.83
Trinidad & Tobago	60.43	45.78	68.51	56.43	73.25	88.93	79.16	56.94
Tunisia	66.03	85.37	63.20	95.82	69.10	98.84	12.38	62.35
Turkey	52.92	82.07	70.94	47.51	36.44	95.97	17.28	36.40
United Kingdom	100.00	77.55	79.31	95.17	64.59	98.25	79.16	92.94
United States	94.11	87.53	86.54	89.03	68.79	89.19	100.00	99.20
Uruguay	75.11	40.01	90.72	85.47	83.90	98.86	64.37	76.47
Zambia	32.06	9.16	27.07	73.41	59.22	93.14	35.61	14.65
Zimbabwe	63.27	7.34	35.02	64.66	52.21	85.15	17.28	13.25

Appendix B: Human Security Outcome Indices

Country	Economic security Outcome Index	Food security Outcome Index	Health security Outcome Index	Environmental security Outcome Index	Personal security Outcome Index	Community security Outcome Index	Political security Outcome Index	Composite Outcome Index
Argentina	72.07	55.02	47.48	40.40	62.43	88.42	97.12	60.14
Australia	90.23	89.82	89.70	33.58	65.31	80.45	99.99	85.68
Austria	92.61	94.39	87.85	46.46	75.31	93.45	98.54	97.40
Bangladesh	10.56	17.03	9.95	66.99	75.31	68.26	96.35	25.02
Belgium	93.42	85.95	87.85	29.17	62.97	94.82	99.36	87.00
Botswana	64.20	37.10	31.41	65.79	33.10	50.39	96.93	35.24
Canada	93.10	85.95	96.80	36.60	57.19	82.13	95.33	85.10
Chile	77.78	70.41	55.03	54.49	62.97	77.84	98.54	70.26
China	39.98	38.14	48.38	46.55	78.47	79.59	—	21.07
Colombia	60.93	49.41	47.48	59.92	0.01	76.04	89.09	36.41
Costa Rica	60.29	68.55	57.96	54.16	46.44	95.49	95.54	64.73
Denmark	94.51	89.82	89.70	39.34	90.25	93.45	98.54	99.48
Egypt	39.29	27.09	38.17	45.20	86.65	73.24	90.03	41.39
Finland	90.15	100.00	86.18	32.03	97.12	96.81	95.11	100.01
France	92.56	94.39	80.74	42.12	60.37	86.14	95.74	86.57
Ghana	22.57	17.49	12.38	82.61	77.37	66.16	94.46	33.50
Greece	77.86	82.60	87.85	37.13	70.12	73.24	96.74	78.70
Guatemala	47.26	34.20	36.22	75.63	18.93	73.24	86.24	33.10
Hungary	62.43	74.60	81.95	36.20	62.43	82.13	92.28	68.76
India	23.06	17.26	21.50	64.60	48.88	62.86	93.77	21.31
Indonesia	42.92	28.87	23.61	60.54	97.12	56.93	99.04	44.17
Iraq	40.55	14.20	27.64	41.13	36.70	0.00	99.84	0.00
Ireland	90.89	85.95	87.85	25.21	80.87	89.90	94.68	87.54
Italy	90.34	89.82	84.65	43.33	58.05	89.90	98.02	87.17
Jamaica	42.53	74.60	44.28	20.67	18.16	89.90	94.46	36.92

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Appendix B: Continued

Country	Economic security Outcome Index	Food security Outcome Index	Health security Outcome Index	Environmental security Outcome Index	Personal security Outcome Index	Community security Outcome Index	Political security Outcome Index	Composite Outcome Index
Japan	94.94	89.82	77.54	34.94	92.31	68.26	93.04	86.21
Jordan	42.61	55.02	40.37	50.77	49.76	68.26	89.73	40.45
Kenya	13.93	22.69	14.66	73.97	61.38	73.24	94.46	27.95
Korea Republic	79.54	89.82	68.59	39.31	83.57	89.90	94.23	84.46
Kuwait	96.30	70.41	75.70	29.56	40.82	62.86	97.48	63.17
Malawi	0.02	−0.03	15.49	90.83	71.71	73.24	97.48	26.29
Malaysia	65.73	74.60	66.39	39.60	77.37	86.14	95.95	72.84
Morocco	41.49	27.44	24.54	48.52	90.25	50.39	92.79	34.20
Nepal	11.56	18.21	−0.00	83.72	72.56	68.26	93.77	26.10
Netherlands	91.41	89.82	84.65	38.06	30.50	96.81	96.15	79.25
NewZealand	86.22	85.95	71.78	42.05	67.92	89.90	98.87	83.79
Norway	95.36	100.00	96.80	32.39	75.31	93.45	97.12	97.94
Panama	62.31	59.59	57.96	57.50	32.42	82.13	96.35	55.79
Paraguay	46.46	47.02	36.22	75.47	32.42	62.86	97.48	40.87
Philippines	43.15	41.57	34.47	62.17	18.93	73.24	97.30	32.84
Poland	59.75	74.60	100.00	38.91	67.92	86.14	90.03	76.28
Portugal	80.86	82.60	80.74	36.23	62.43	93.45	94.90	80.38
Senegal	24.01	13.79	18.91	81.29	92.31	82.95	87.74	41.78
South Africa	63.09	30.01	32.87	42.59	2.47	68.26	98.71	23.11
Spain	83.82	94.39	94.10	42.17	73.44	93.45	96.93	94.35
Sri Lanka	33.82	60.88	68.59	72.13	45.19	77.84	96.74	57.85
Sweden	89.67	100.00	94.10	40.22	44.95	100.00	97.67	90.88
Switzerland	96.22	94.39	96.80	38.55	74.36	93.45	88.09	95.40
Thailand	60.45	43.48	35.32	54.52	48.31	77.84	93.77	45.55
Trinidad & Tobago	61.05	63.67	49.32	29.03	50.99	77.84	94.00	49.17
Tunisia	54.17	47.02	38.17	35.64	100.00	82.13	99.99	58.42
Turkey	59.04	39.24	37.17	47.20	80.87	68.26	98.37	50.43
United Kingdom	90.92	85.95	89.70	41.11	74.36	89.90	95.95	91.26
United States	99.97	82.60	84.65	36.29	46.96	89.90	85.84	78.90
Uruguay	69.03	58.37	50.33	28.63	54.42	86.14	99.36	55.21
Zambia	8.14	1.54	14.66	79.43	40.82	82.13	87.38	16.02
Zimbabwe	32.26	24.79	29.42	60.64	50.37	89.90	92.54	35.54

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Appendix C: Human Security Inefficiency Ratios

Country	Economic security Inefficiency Ratio	Food security Inefficiency Ratio	Health security Inefficiency Ratio	Environmental security Inefficiency Ratio	Personal security Inefficiency Ratio	Community security Inefficiency Ratio	Political security Inefficiency Ratio	Composite Inefficiency Ratio
Argentina	1.08	1.22	1.86	2.00	0.66	1.11	0.54	1.11
Australia	1.11	0.70	0.95	2.91	0.97	1.24	1.00	1.13
Austria	0.92	0.82	1.04	1.62	0.83	1.06	1.01	0.95
Bangladesh	0.00	0.85	3.97	1.07	0.35	1.25	0.45	0.00
Belgium	1.07	0.99	1.07	2.48	0.88	1.04	1.01	1.11
Botswana	1.03	0.88	1.32	0.84	1.58	1.77	0.55	0.92
Canada	1.06	0.67	0.87	2.56	0.00	1.20	1.05	0.88
Chile	0.97	0.63	1.30	1.70	0.99	1.26	0.65	0.96
China	1.62	1.52	1.51	1.56	0.50	1.19	1.00	1.72
Colombia	1.11	1.15	1.50	1.08	4 978.23	1.30	0.40	1.46
Costa Rica	1.00	1.08	1.29	1.44	1.33	1.02	0.83	1.12
Denmark	0.94	0.91	0.99	2.48	0.63	1.07	1.01	0.99
Egypt	1.75	2.90	2.18	2.07	0.67	1.33	0.09	1.48
Finland	1.10	0.51	1.02	2.91	0.57	1.01	1.05	0.90
France	0.99	0.96	1.10	2.18	0.93	1.15	0.83	1.09
Ghana	0.77	1.68	1.01	1.10	0.73	1.46	0.24	0.40
Greece	1.00	1.09	1.08	2.17	0.95	1.35	0.67	1.10
Guatemala	0.59	1.17	1.89	1.06	2.89	1.30	0.26	0.98
Hungary	1.14	1.05	1.13	2.49	0.86	1.21	0.86	1.22
India	1.87	2.73	2.66	1.46	1.03	1.52	0.31	1.89
Indonesia	1.34	2.48	1.37	1.06	0.41	1.38	0.04	0.45
Iraq	0.88	1.14	2.11	1.20	2.40	22 176.94	−0.00	6 784.40
Ireland	0.97	1.16	0.91	2.88	0.88	1.04	0.84	1.03
Italy	0.90	0.97	1.18	2.24	0.94	1.10	0.81	1.08
Jamaica	1.32	0.78	1.36	1.72	3.53	1.08	0.56	1.15
Japan	0.89	0.76	1.04	2.28	0.67	1.28	0.69	0.85
Jordan	1.42	1.22	1.95	1.84	1.12	1.40	0.32	1.46
Kenya	2.44	0.79	2.47	0.90	0.61	1.26	0.08	0.13
Korea Republic	1.13	0.96	1.09	0.92	0.77	1.05	0.68	0.81
Kuwait	0.48	0.59	1.07	−0.00	2.45	1.35	0.18	0.43
Malawi	4 530.04	5.13	0.00	0.77	0.49	1.11	0.54	0.36
Malaysia	0.90	1.01	0.83	1.77	0.67	0.26	0.24	0.31
Morocco	0.77	2.44	2.08	1.77	0.55	1.94	0.19	1.04
Nepal	4.30	0.98	−4 476.55	0.94	0.63	1.34	0.38	0.64
Netherlands	1.07	0.70	1.03	2.22	1.98	1.01	1.04	1.16
New Zealand	1.10	0.99	1.17	1.93	0.82	1.10	1.01	1.13
Norway	1.00	0.64	0.95	3.09	0.65	1.07	1.03	0.97
Panama	1.12	0.52	1.27	1.53	2.55	1.20	0.55	1.15
Paraguay	1.24	1.23	1.74	0.85	2.19	1.51	0.37	1.19
Philippines	1.88	0.85	0.89	1.08	2.27	1.34	0.37	1.00
Poland	1.26	0.95	0.85	2.16	0.99	1.13	0.71	1.02
Portugal	1.13	1.15	1.11	2.58	0.88	1.01	1.05	1.24
Senegal	0.00	2.01	1.19	1.14	0.57	1.16	0.26	0.24
South Africa	1.48	1.67	1.85	1.99	19.86	—	0.54	1.42
Spain	1.10	1.04	1.01	2.08	0.79	1.03	0.82	1.02
Sri Lanka	1.79	0.63	0.64	1.17	1.09	1.22	0.23	0.58
Sweden	1.12	0.50	0.96	2.43	1.55	1.00	1.02	1.07

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Appendix C: Continued

Country	Economic security Inefficiency Ratio	Food security Inefficiency Ratio	Health security Inefficiency Ratio	Environmental security Inefficiency Ratio	Personal security Inefficiency Ratio	Community security Inefficiency Ratio	Political security Inefficiency Ratio	Composite Inefficiency Ratio
Switzerland	0.81	0.75	0.93	2.50	0.75	0.95	1.14	0.93
Thailand	0.82	1.15	1.27	1.18	1.23	0.99	0.31	0.61
Trinidad & Tobago	0.99	0.72	1.39	1.94	1.44	1.14	0.84	1.16
Tunisia	1.22	1.82	1.66	2.69	0.69	1.20	0.12	1.07
Turkey	0.90	2.09	1.91	1.01	0.45	1.41	0.18	0.72
United Kingdom	1.10	0.90	0.88	2.31	0.87	1.09	0.83	1.02
United States	0.94	1.06	1.02	2.45	1.46	0.99	1.16	1.26
Uruguay	1.09	0.69	1.80	2.98	1.54	1.15	0.65	1.39
Zantia	3.94	5.94	1.85	0.92	1.45	1.13	0.41	0.91
Zimbabwe	1.96	0.30	1.19	1.07	1.04	0.95	0.19	0.37

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