THE DEVELOPMENT OF AN IMPROVED HUMAN CAPITAL INDEX FOR

ASSESSING AND FORECASTING NATIONAL CAPACITY AND

DEVELOPMENT

A Dissertation

by

OLHA VERKHOHLYAD

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2008

Major Subject: Educational Administration

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ABSTRACT

The Development of an Improved Human Capital Index for Assessing and

Forecasting National Capacity and Development. (December 2008)

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Human capital theory is accepted as one of the foundational theories of socio-economic development. Although, according to founding scholars, any acquired qualities and abilities that help individuals and groups be economically productive can be considered as individual or group human capital, the classical human capital model focuses on schooling and training as the major factors comprising human capital on individual, group, and national levels. Consequently, current human capital measurement tools generally assess only educational attainment on these levels.

Because of this overly simplified approach, the present manner in which human capital is commonly measured by national and international entities creates difficulty in accurately assessing the strengths and weaknesses of human capital within and between countries. A major challenge to improvement of human capital variables is identification and availability of data. The factors suggested to have significant impact on human capital are mostly intangible. Collecting such data is cost prohibitive for many developing countries. Consequently, national policy-makers, multinational corporations and international aid organizations use simplified estimates of human capital.

The purpose of this dissertation is to construct and validate a more comprehensive human capital index. Study research questions include: 1) What are the significant factors that affect national human capital as revealed in the literature? 2) Can an expanded measure of national human capital be developed to reflect adequate content of HC identified in the literature? 3) What is the preliminary evidence supporting the validity of the newly developed human capital index? This analysis resulted in the formation of a new human capital index, which is expanded due to the incorporation of new variables together with the routinely used education measures.

The sample panel data is from 163 countries for the years 2000-2005. Literature content analysis, factor analysis and regression analyses are used to support the exploration of the research questions. The results of the analyses suggest that a human capital model, which includes additional variables together with currently used education variables, predicts the level of national economic development significantly better than the model which includes only education measures. These results have implications for human resource development, corporate human capital management, national education, and international aid policies.

DEDICATION

In Honor of My Parents Nina Nikolaevna and Aleksandr Vasilievich

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CHAPTER I

INTRODUCTION

Problem Statement

Consistent with classical human capital (HC) theory (Becker, 1964; Mincer, 1958; Schultz, 1971), national HC is a combination of education and job experience in a country's population which is positively and strongly correlated with national economic development. Therefore, it can be used to predict national economic performance. If this theory holds, countries with similar educational attainment and years of employment in their population have similar levels of HC, and consequently, should display similar economic development (holding other variables constant). This paradigm (i.e., the more education people have, the higher is the level of HC in a country, and the better its economic prospects) is the one that governs financial and humanitarian aid to developing countries and emerging economies. It is also used to make cross-country performance comparisons, and assessments of economic prospects for individual countries. At the same time, there is often discrepancy between the predicted and actual socio-economic performance of countries. For example, the United Nations Conference on Trade and Development (UNCTAD) (2004, 2005, 2006) generally makes predictions of the level of foreign direct investments (FDI) in a country based on several variables, one of which is national human capital (as measured by tertiary education enrollment in

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This dissertation follows the style of *Human Resource Development Quarterly*.

the country). There is often a gap between the FDI's predicted and actual performance. Dean (2000) illustrated such a discrepancy in terms of an individual country: "the average Ukrainian is as poor as the average Bolivian, but better educated than the average American" (p. 95).

Currently used HC measures mainly assess educational attainment by relying heavily on unified education-attainment measures. Such measures assess neither quality of education, nor real skills that are empirically known to bring economic success. Literacy rate and school enrollment rate (the variables routinely used to measure national HC) may be similar for several countries, although the level of the countries' socio-economic development may be very different. For example, 2000-2005 average of the United Nations Human Capital Index (UNHCI) was 0.94 for Greece, Hungary, Italy, Japan, and Ukraine. At the same time, measures of socio-economic development were much higher for Greece, Hungary, Italy and Japan than for Ukraine (see Table 1).

Although many factors other than HC (availability of business infrastructure, openness of the market, accessibility of political/legal institutions, rule of law) are known to affect national socio-economic development, these factors are based on human factors (because they are created by human beings). Human capital is the intellectual power behind other factors.

Table 1. Comparison of Basic Socio-Economic Variables for Selected Countries					
2000-2005 Average	**Greece**	**Hungary**	**Italy**	**Japan**	**Ukraine**
GDP per capita (PPP)	$19,060	$13,060	$25,180	$27,500	$4,830
Life Expectancy at Birth	78.85	72.07	79.4	80.97	66.5
Infant Mortality Rate	5.98	8.71	5.96	3.51	20.92
UNHCI	**0.94**	**0.94**	**0.94**	**0.94**	**0.94**
Where					
	GDP per capita is measured in purchasing power parity *Life Expectancy at Birth is measured in years* *Infant Mortality Rate is measured as deaths/1, 0000 births* *UNHCI is United Nations Human Capital Index*				

The method by which HC is currently measured is not fully capable of predicting national economic performance, and there is a need to develop improved measures. Numerous factors other than education and experience have been suggested as additional key factors that affect HC (see Carneiro & Heckman, 2003; Fitz-Enz, 2000, Heckman, 2000; Psacharopoulos & Woodhall, 1985); however, by default, the HC of a country continues to be measured as a function of educational variables. Design and utilization of other measurement instruments involves other challenges which have resulted in the international community using education-based tools. The difficulties that present themselves when measuring HC by other than educational variables can be summarized as follows:

- the problem of identifying other significant factors that affect HC
- the problem of adequately measuring these factors

- the problem of accessibility and availability of the measures for most of the world countries

- the problem of assembling the suggested factors in one measurement tool

- the problem of validating this tool

As suggested, the need to address the aforementioned areas is evident in drastically different economic performance indicators across nations with similar HC, as assessed by unified measures of educational attainment of their populations (holding other variables constant, which is the common practice). Furthermore, this need is obvious in the failure of many attempts of international aid assistance to effect lasting positive economic improvement in poor and developing countries. The currently used HC measures are imprecise assessments of national economic performance. As such, there is a need to develop and validate a more comprehensive measure of national HC, which would more precisely estimate HC by including the multiple facets of this complex phenomenon. Such a measure would better represent and advance understanding of HC while contributing to effective national HC policies for individual countries.

The purpose of this dissertation is to construct and validate a more comprehensive HC index, which captures numerous aspects of the construct of human capital and better predicts the level of economic development of a country. Three research questions were identified to guide the study:

1. What are the significant factors that affect national HC as revealed in the literature?

2. Can an expanded measure of national HC be developed to adequately reflect the content of HC identified in the literature?

3. What is the preliminary validity evidence for a newly developed HC
index?

The remainder of this chapter contains the background of the problem, research methodology utilized, data used in the study, and limitations of the study.

Background of the Problem

Human capital theory originated approximately half a century ago under the leadership of Jacob Mincer, Theodore Schultz, and Gary Becker. Generally, the term *human capital* (HC) refers to productive skills and knowledge embodied in labor stock, which have the economic property of future services of some value. Specifically, HC is a measure of the economic value of people's skill sets, consisting of their knowledge, skills, abilities, attitudes and experiences (Becker, 1964; Heckman, 2000; Jaw, Yu PingWang & Chen, 2006; Mincer, 1958; Schultz, 1961, 1971; Smith, 1776/1937). Later, Schultz (1981) defined HC as "attributes of acquired population quality, which are valuable and can be augmented by appropriate investments" (Schultz, p. 21). The distinctive feature of human capital (compared to other forms of capital, for example, physical and financial capital)—is that it is a part of human beings. "It is *human* because it is embodied in man, and it is *capital* because it is a source of future satisfaction, or of future earnings, or of both" (Schultz, 1971, p. 48). Becker suggested that human capital includes qualities that raise future monetary and psychic income by increasing the resources in people, and activities that influence income are investments in human capital (Becker, 1964). In other words, any acquired qualities and abilities that help individuals

and groups be economically productive can be considered as individual/group human capital.

The economic importance of HC lies in its contribution to creation of national competitive advantage, and consequently, to national economic growth (Drucker, 1999; Nehru, Swanson, & Dubey, 1995; Porter, 1998). HC is the intelligence and knowledge behind other determinants of a country's economic development (for example, infrastructure, political/legal institutions, rule of law, business climate, etc.). Consequently, the quest for better understandings of the determinants of economic growth has stimulated strong interest in reliable estimates of HC (Baier, Dwyer & Tamura, 2006; Barro & Lee, 2000; Globerman & Shapiro, 2002; Haveman, Bershadker & Schwabish, 2003; Mankiw, Romer & Weil, 1992; Nehru, Swanson & Dubey, 1995; Schneider & Frey, 1985; Warner, 2002). Human capital theory has become accepted as one of the foundational theories of socio-economic development. It has gained increasing attention with the unfolding of the era of knowledge economy, with knowledge-intensive new technologies' design and utilization becoming an everyday reality.

Although the classical human capital model is well established (Becker, 1964; Mincer, 1958, Schultz, 1961, 1971), new discoveries are being made, and many questions still need to be answered. One issue under discussion for a considerable length of time has been the issue of factors that constitute HC. The classical HC model focused on schooling and training as the major investments responsible for producing the skills and abilities required for economic success. Mincer (1958, 1974) measured human capital as a function of average years of schooling using a macro-equation of the form:

$$H = e^{\,p(s)}$$

where *s* is average years of schooling, *p* is the rate of return on education, and *e* is an efficiency index. He estimated the rates of return on education by equating the present value of two earnings streams—with and without education. His model proposes that for every year in school, earnings are multiplicatively augmented by the discount rate (the discount rate on the resources invested during the period of education, generally equal to the average rate on business capital).

Similarly, Becker (1962, 1964) measured HC in terms of the rates of return on investments which were utilized to obtain it. He estimated the effects of investment in HC by estimating the value of activities that influenced future real income through "the imbedding of resources in people" (Becker, 1962, p. 9). He viewed education, on-the-job training, medical care, and acquiring information about the market (which he called "other knowledge") as activities that influence future real income. His classical formula for measuring return on on-the-job training is as follows:

$$MP+G=W+C$$

where *MP* is marginal product of labor, *G* is present value of return from training collected by the firm, *W* is wages and *C* is the cost of training for the firm.

His basic formula for measuring returns on education measures the difference between actual earnings and direct school costs, and is as follows:

$$W=MP\text{-}K$$

where *W* stands for net earnings, *MP* is marginal product of labor, and *K* is the direct costs of acquiring education. This formula can be expanded further to include potential earnings and indirect costs:

$$W=MP_o\text{-}G$$

where *MPo* is the marginal product that could have been received, and *G* is the sum of direct and indirect costs. Resources spent on acquiring information about the job market and the market as a whole, as well as relocation can significantly raise income by the function of increased opportunities and a better match between the individual's HC and the environment. These expenditures yield a return in the form of higher earnings than would otherwise have been received. Resources invested in improvement of the emotional and physical health of people are also a part of HC investment, from Becker's perspective (1964, 1993).

Schultz (1961, 1971, 1981) sought to clarify the investment process and the incentives to invest in HC by calculating return on educational investment for different social groups. He also calculated the share of national income as attributable to increases in the stock of HC. Originally, his studies evolved around formal education. As his research progressed, he pushed the theory by expanding HC to include a combination of schooling, learning on the job, advances in health, migration, family factors and the stock of information about the economy. His hypothesis was that the structure of wages was primarily determined by investment in education, health, on-the-job training, gaining information about the job market, and migration. He started with the proposition that people improved their capabilities as producers by investing in themselves:

> It implies that not all of the economic capabilities of a people are given at birth, or at age fourteen when some of them enter upon work, or at some later age when some complete their schooling; but that many of these capabilities are developed through activities that have the attributes of an investment. These investments in people turn out not to be trivial; on the contrary, they are of a magnitude to alter radically the usual measures of the amount of savings and capital formation. They also alter the structure of wages and salaries and the amount of earnings relative to income from property. (Schultz, 1971, p. 62)

Therefore, according to Schultz, economic abilities of people are predominantly a produced means of production and most of the differences in earnings originate in the differences in investments in people:

> …to the extent that the more equal distribution of investments in man equalizes earnings among human agents, the hypothesis here proposed is that these changes in the investment in human capital are the major factor reducing the inequality in the distribution of personal income (p. 63).

His approach was to calculate return on education by calculating the net income that different levels of education generated. By aggregating this on a national level, he calculated return on education for different levels of education, as differentiated by different social groups (e.g., a high school graduate female can earn an annual value of $X. There are Y number of high school female graduates in a country. Therefore, XY is a contribution of this social group with this kind of education toward GDP of this country). Taking this number as relative to net national product, he calculated the value of HC associated with different levels of education as relative to net domestic product. Comparing the total cost of education (with earnings forgone as the major investment) to the income obtained based on this level of education, he calculated return on investment in education.

Although all three original theorists acknowledged that other factors, not only education and training, influenced HC development, most of their work concentrated on education and training as the measures of HC. As such, although the HC theory that they created is strong, it would definitely benefit from strengthening the measurement instruments for HC (Hartog, 2001; Heckman, 1995, 2000; Heckman & Cunha, 2007).

Therefore, the purpose of this dissertation is developing and validating a new method of measuring HC.

Currently Used Measure of Human Capital

Current scholars build on classical HC theory, while suggesting different combinations and/or forms of education-training measures. More specifically, Baier, Dwyer, and Tamura (2006) computed HC as a sum of average education (measured in school years) and average experience (measured as average age minus average years of schooling) with assigned weights measured in increased earnings coefficients. Gemmell (1996) constructed an alternative measure of HC by distinguishing between stocks and flows of school enrollment rates. Cohen and Soto (2001) sought an improved measure of HC by employing direct country census data on school enrollment in a country. Mulligan and Sala-i-Martin (1997) measured HC for an economy as the sum of all workers weighted by the ratios of their wages to the wage of the zero-human-capital-worker.

Noorbakhsh, Paloni, and Youssef (2001) calculated HC as proxied by three measures: secondary school enrollment ratio, number of accumulated years of secondary education present in the working-age population, and number of accumulated years of tertiary education present in the working-age population. For them, the first measure reflects a flow of investment in HC. The other two measures reflect the education stock of a country. The authors did not attempt a combination of those three variables in any form but used all of them individually as "HC group." Warner (2002) suggested calculating an HC index as a simple average of standardized indices of the educational

attainment of population (i.e. primary, secondary, and tertiary) and a subjective measure of schooling quality.

Many international aid and development organizations calculate and utilize HC indices that do not measure the actual economic outcomes of HC in terms of return on investment, but instead, measure the intensity of factors contributing to it (e.g., *Human Development Reports* of United Nations Development Program (UNDP), United Nations (UN) *E-Government Readiness Assessments*, United Nations *World Public Sector Reports).* HC indices created this way are based on the degree of presence of specific factors. When national HC indices are compared, what is compared is not the actual amount of wealth that HC produces, but the degree of presence of variables that contribute to the HC measure. School enrollment and literacy rates are used by default as the contributing measures of HC. Generally, the combination formula is straightforward. For example, according to the UNDP, the HC index is based on UNDP Education Index and is a composite of the adult literacy rate and combined primary/secondary/tertiary gross enrollment ratio with two thirds of the weight given to adult literacy and one third to gross enrollment ratio (UN, 2008). For example, for country X, with an adult literacy rate of 96.3 per cent and a combined gross enrollment of 81.2 percent in 2002, the HC/Education Index would be (United Nations, 2008):

$$2/3 \ (0.963) + 1/3 \ (0.812) = 0.913$$

Overall, the following variables, in different combinations, have been included in HC measures by different researchers: a) enrollment in tertiary education; b) combined primary/secondary/tertiary gross enrollment ratio; c) adult literacy rate; d) job experience; e) expenditure on health; f) expenditure on education; g) mortality rate; h) GDP per

capita; i) growth rate of the labor force. Many of these indicators are education-related, a

consequence of availability of data and well-established meaning of education-related

measures. As Schultz (1981, p. 8) put it, "Meanwhile, … there have been important

advances in economic thinking with respect to investment in human capital…most of the

work thus far has concentrated on the first of the set (education)." Becker (1964)

concurred:

> the investment period of education can be measured by years of schooling, but the
> periods of on-the-job training, of the search for information, and of other
> investments are not readily available…Unfortunately, few empirical studies of
> rates of return on other (than education) human capital have been made (p. 44,
> 90).

Weisbrod (1961) explained the reason even more directly:

> We view the value of a person in terms of his worth as a productive asset, having
> some marginal productivity per period. A person's value as a companion to, and
> the leader of, his family is neglected—not because it is deemed insignificant or
> irrelevant, but because it seemed too difficult to measure, at least for the present
> (p. 426).

However, with the increase in the number of studies which failed to find strong support

for the basic HC theory hypothesis that the level of human capital as measured by the

level of educational attainment, was a strong predictor of economic success on individual

and national levels (Baier, Dwyer, & Tamura, 2006; Bowles, Gintis, & Osborne, 2001;

Graaf & Huinink, 1992; Hartog, 2001; Hauser & Sewell, 1986; Romer, 1989; Werner &

Smith, 1992), a need for more comprehensive measures of HC has become prominent.

Numerous authors (Ben-Porath, 1980; Griliches, 1997; Heckman, 1995, 2000; Heckman

& Cunha, 2007; Psacharopoulos & Woodhall, 1985) have suggested that in order to

increase accuracy in HC assessment, more comprehensive measures need to encompass

more characteristics than the basic school enrollments and literacy rates, and need to be

based on broader meanings of the phenomenon of HC. Specifically, Nehru et al. (1995) stated that though

> the measurement of HC should cover the range of investments that human beings make in themselves and in others, including formal and informal education, on-the-job training, health, nutrition, and social services….So far, no researchers have put together such a composite measure (p. 380).

Moreover, according to Heckman (2000):

> Current policies regarding education and job training around the world are based on fundamental misconceptions about the way …skills embodied in persons are produced…The preoccupation with cognition and academic "smarts" as measured by test scores to the exclusion of social adaptability and motivation causes a serious bias in the evaluation of human capital interventions (p. 4).

Numerous variables have been suggested as the ones that help shape HC. For example, Porter (1998) and Harrison (1992) stated that the human resources of a nation include not only skills, but work ethic as well. Schultz (1971) suggested that HC could be displayed in different forms: "If it were possible to aggregate all of the different forms of human capital, it would exceed by a wide margin all nonhuman capital" (p. vii). Other researchers (Prizel, 1998; Sadie, 1960; Sapford & Abbott, 2006; Shulman, 2005) spoke about the role of national identity awareness as a contributing factor toward the HC of a nation. Ben-Porath (1980) stressed importance of families in development of HC in a nation. Becker emphasized the role of emotional health and character qualities as contributing factors of HC. As a result of the ongoing discussion, additional variables that have the potential to affect HC have been suggested, such as:

- Character qualities of population
- Cultural values
- Ethical values
- Family factor

- Measure of trust in a country

- Morale of the population

- Emotional health

- National identity awareness in the population

- National unity

- Religion

- Social skills

- Variety of non-cognitive skills/Social Adaptability

However, existing literature provides little evidence that these variables have been structurally developed, validated or used to create a new HC index. Furthermore, there is no consensus regarding specific variables that may bring significant improvement to the HC index. Consequently, there is still a lack of agreement regarding the most robust measure of national HC; therefore, no consensus exists regarding the most appropriate HC measure for international comparison. Overall, human resource development (HRD) professionals, economists, and educators have made little progress in solving the tricky problem of how to measure HC within a single country over time, let alone for comparison between countries.

Research Methodology

The purpose of this dissertation is to construct and validate a more comprehensive human capital index, which captures more aspects of HC than conventional indices. Composite index creation methodology is used as an overall framework for achieving this purpose. A sizeable literature exists on the topic of composite index creation (Adelman &

Taft-Morris, 1972; Babbie, 2004; Baster, N, 1972; Booysen, 2002; Healy & Cote, 2001; Johnson & Reynolds, 2005; Kallman, 1997; Stapleton & Garrod, 2007). Overall, composite indices can be defined as "a synthesis of numerous factors into one given factor" (Booysen, 2002, p. 118, quoting Sainz, 1989). These are the measures arrived at via some empirical aggregation of a number of diverse variables, and are evaluated according to their content, method of creation, application, focus, clarity, availability and flexibility. In other words, good composite indices need to be sufficiently sensitive to differences in measurement constructs, reliable in terms of repeated measures yielding stable results, and accurate in being free from systematic error (Adelman & Morris, 1972).

Index creation involves four general flexible steps: selection of variables, weighting/scaling, aggregation, and validation (Babbie, 2004; Johnson & Reynolds, 2005; McGranahan, 1972). In terms of creating the new HC index, these steps are followed through the following process:

- *Determining what factors other than basic educational variables may affect development of HC in a nation.* Different researchers have suggested different additional factors as the ones that may affect HC in a country. The study's purpose is to collect and evaluate the suggested ideas by way of content analysis of the related literature.

- *Creating models of these factors.* After identifying additional factors, the study's purpose iss to explore and analyze their structure in order to suggest a potential set of measurable indicators of performance for each of these multidimensional factors. Broad meanings and definition of the factors serve

as the foundation of the analysis, which is carried out by way of a separate content analysis of the related literature for each separate factor. A hypothesis of the structure of each factor is formulated.

- *Determining what existing empirical measures may serve as proxies for construction of these factors.* Empirically observable and measurable proxies for every variable comprising each of the suggested latent factor constructs are searched for among the existing publicly available measures. The search is based on the hypothesized structure and the definition of the factor. The researcher seeks to include the aspects that are conceptually relevant to a particular factor, as well as available for all (or most of) the world's countries.

- *Testing each model of the factor against the data.* Factor analysis technique is used in this step as suggested by Pedhazur and Schmelkin (1991) and Field (2005). Factor analysis is generally used to uncover the latent structure of a set of variables. Confirmatory factor analysis (CFA) seeks to determine if the number of factors and the loadings of measured variables on them conform to what is expected on the basis of a pre-established theory or hypothesis. The hypotheses of the structure of factors are formulated in Step 2. The current step tests the hypotheses to see whether the collected data correspond to the hypothesized structures, and to create the final models of factors.

- *Creating a new HC Index including the newly developed factors together with the conventionally used factor.* Aggregation of the chosen variables into the index is the final step in the process of actual construction of the index. The factors can be aggregated at their face value or weights may be assigned to

them. In the area of composite index construction, aggregation and weights of components are always potential areas of methodological controversy. A group of researchers (Babbie, 2004; Johnson & Reynolds, 2005; Stapleton & Garrod, 2007) have suggested that equal weighting should be the norm. Another option is assigning weights based on an expert's opinion or policy aims (Harbison & Myers, 1964). Because weighting potentially hinders the meaning of the employed indicators, and because variables are automatically standardized during the process of factor analysis, no additional scaling/weights assignment is used in the study. Only factor scores created by the factor analyses are used. All further analysis is carried out on the extracted factor scores rather than the original data, as suggested by Field (2005). In order to obtain one score for every construct, additive aggregation technique is chosen as suggested by Field (2005). In other words, extracted factor scores for every construct are added together in order to arrive at one score for every construct. Finally, scores of every multidimensional construct are added together with the currently used United Nations Human Capital Index (UNHCI) in order to obtain a new expanded HC index (EHCI-1). This methodology is consistent with the way many indices, for example, Human Development Index (HDI) and UNHC, are created. As an extension of the process, EHCI-2 is created. Its difference with EHCI-1 is in the fact that UNHCI is treated as a part of one of the newly created constructs (Family Background construct) instead of being treated separately, as in EHCI-1. This

allows for reduction of uncertainty in the new index and improves its

predictive power toward economic measures.

- *Validating the newly created Index.* It has been suggested (Diamantopoulos &

  Winklhofer, 2001; Hauser & Goldberger, 1971; Jarvis, Mackenzie, &

  Podsakoff, 2003; Jöreskog & Goldberger, 1975) that estimation of the

  relationship between output indicators (the ones that represent effects of the

  construct) and the construct (as the input indicator) can serve as a means of

  validity testing. In addition, it is possible to assess the contribution and

  significance of the individual indicators by focusing on their particular

  relationship with the output indicator. Regression analysis is used in this step

  as a way of conducting the suggested examination. Regression analysis

  measures the degree of linear relationship between the predictor variable and

  the criterion variable (Wooldridge, 2006), and as such is deemed to be an

  appropriate tool here.

Analytical Techniques

HC can be understood as demonstrating itself twofold: through factors that

contribute to it (the input factors), and through factors which are indicative of its level

(the output factors). Representative consequential factors, through which HC is

theoretically known to be displayed (the output factors), include the export of high-value-

added goods (Dyker, Nagy, & Spilek, 2003; Krugman, 1991; Smith, 2005; Wolfmayr-

Schnitzer, 1998), export of services (Kalotay, 2008; United Nations Conference on Trade

and Development, 2004), amount of foreign investments in a country (Dunning &

Narula, 2004; Hanson, 1996; Noorbakhsh, Paloni & Youssef, 2001) the number of scientific discoveries, number of patents, etc. The degree of relationship between the input and output factors can be tested to determine how much of variation in the output factors can be explained by the new measure of HC. If the new Human Capital index (HCI) is a good measure of the real state of HC in a country, it must be highest in the countries that demonstrate the highest HC—intensive output (Veenhoven, 1993).

Univariate and multivariate statistical analyses are conducted to examine each variable as well as each hypothesized HC/economic variable relationship. Univariate statistics—means, medians, modes, standard deviations, ranges, range ratios, percentiles—are generated utilizing the Statistical Processing for Social Sciences (SPSS-16.0) software package, and used to provide general description of individual variables. Multivariate statistics—correlations, factor analyses, different types of ordinary least squares (OLS) regression analyses—are utilized to describe relationship between the variables, and make inferences regarding explanatory power of the newly developed EHCI as compared to UNHCI.

External validity of EHCI is determined based on its ability to predict another phenomenon better than UNHCI. Generally, in order to conduct this kind of validation, another variable, which is known to be correlated with the tested measure, must be examined in relation to this measure. The researcher suggests using three measures: export of high-value-added products, export of services, and foreign direct investments—as the outcome measures. Several steps of analyses are conducted. Initially, UNHCI is examined as the primary determinant of the outcome economic measures. Next, three newly suggested variables (separately) are examined as the primary determinants of these

measures. The difference between these analyses' results is formulated. Ultimately, the relationships between UNHCI and the outcome economic variables are compared with the relationships between both types of newly created HCIs (EHCI-1 and EHCI-2) and the outcome economic variables. EHCI-2 is chosen as the one that has the highest predictive power in terms of economic outcome. Therefore, it is concluded that expanding the currently used UNHCI via additional variables is beneficial. This index has demonstrated a certain level of validity, and may be used for future research in the field.

Collection and Description of Data

The data obtained and examined in this study spans six calendar years, 2000 through 2005. The data is cross-sectional time series data publicly available on websites of United States Agency for International Development (USAID), United Nations (UN), World Bank, Organization for Economic Cooperation and Development (OECD), International Labor Organization (ILO), World Health Organization (WHO), Encyclopedia Britannica, as well as statistical offices of individual countries. This study assesses the whole population of independent world countries with 100,000+ citizens. According to the US Department of State, the number of such countries is 163.

Summary and Discussion

The goal underlying this dissertation is to design and validate an expanded measure of national HC. Based on the review of the relevant literature and the evidence provided in this dissertation, a statement can be made that national HC is a

multidimensional construct, which includes diverse factors. Furthermore, a valid measurement instrument can be developed to assess the level of national HC development. The index developed in this study demonstrates a certain level of validity, and may be used for future research in the field.

Although a country's political situation, potential economic risk, rule of law, and available legal/business infrastructure have been named as the primary factors of economic development, it has also been argued that a country's HC is probably even more important. HC is a measure of the economic value of people's knowledge, skills, abilities, attitudes and experiences. HC is the "brain" behind all other determinants. The level of development and quality of HC are two of the most important factors that differentiate between countries with similar geographic and natural resources, but vary differently in terms of their socio-economic development. HC is a crucial input element in national politico-socio-economic development equations. Therefore, it is very important to correctly assess HC in a country. Accurately measuring HC will reduce "surprises" in national socio-economic development. Such unexpected results often lead to creation of a "potential/performance" dichotomy. More precise measures of HC can be instrumental in bridging the gap between national socio-economic potential and performance indicators.

A system of social reporting has two main functions: policy analysis and public information. As for the former, indicators are an instrument for policy analysis and serve as a foundation of policy creation by the central and local governments. As for the latter, they serve as a source of information to the general public and are supposed to inform citizens and give them perspective on national development by comparing their country

with other countries (Kallmann, 1997; Vogel, 1989). Overall, socio-economic indicators can serve as a tool to discover problems and develop alternative solutions. A newly created HCI could serve such a purpose as it helps to see national HC from a broader perspective. The new index can help direct national finances to the areas they are needed most of all and are most responsible, from a cost-benefit perspective. HRD professionals and educators may be particularly interested in this index.

As suggested by several HRD scholars and professionals (McLean, 2001, 2004; McLean, Bartlett, & Cho, 2003), national HRD should go beyond employment issues and include a host of other considerations that have not typically been considered as human capital investment, such as culture, community, health and many others. A view of labor force only in terms of unified "faceless" manpower greatly diminishes the diversity of ways training and development can be conducted. This dissertation provides evidence that human capital on a national level is formed by many factors. Specifically, this study assesses National Identity Awareness, Character Strength, and Family Background as factors contributing to HC development, and provides some evidence toward the significance of these factors. Therefore, these and other intangible factors need to be taken into consideration by HRD professionals and scholars in their pursuit of improving employee quality and increasing organizational effectiveness.

Furthermore, this dissertation provides support for the view expressed by a large group of educational scholars and economists (e.g., Hanushek, 1997; Heckman, 2000; Heckman & Cunha, 2007) about the importance of non-cognitive qualities in the economic success of individuals. It argues that other factors, for example, character qualities and social skills, play important roles in achieving personal welfare. Therefore,

educational institutions need to pay as close attention to providing opportunities for students to develop these traits as they do in providing opportunities to develop academic skills. National Educational ministries need to create policies which will raise this issue to the national level. This way, it will not depend on the initiative and willingness of individual schools, but will be required for all schools. The importance of the Family factor in increasing the level of national HC indicates the need to stream resources toward strengthening the institution of family in a given country.

The proposed dissertation is organized in the following format. Chapter II contains a review and critique of related research literature on HC conceptions and measurement. Chapter III focuses on research methodology, and development of the models of additional variables suggested to be added to the current HC measure. Chapter IV describes processes and results of the validation of the newly created index. Chapter V contains conclusions, policy recommendations, and implications for further study.

Implications for Education, HRD, and Development Research and Practice

This study contributes to Education, HRD, and Development research in several ways. First, it provides a new, valid instrument for broad cross-country assessment of the intangible factors of National Identity Awareness, Character, and Family Background developed by using quantitative measures. This offers opportunities for use by researchers and practitioners in future study and practice. Second, it provides evidence that a broad and diverse measure of national HC can be developed. The most effective measures of latent variables are those that contain as much information as possible about their essential attributes (Babbie, 2004; Globerman & Shapiro, 2002; Johnson &

Reynolds, 2005). Consequently, the newly created and expanded measure of HC can provide the academic community with a more reliable estimator of HC. This expanded index has the potential to better reflect the actual HC level in a country, and be more reliable in predicting a country's economic development. The approach used herein advances the work by HRD scholars including Harbison and Myers (1964) who have been identified as the earliest founders of the term human resource development (Wang & McLean, 2007). A major contribution of these scholars was the identification of economic indicators associated with national HRD. Use of this instrument can help Education/HRD professionals to assist in determination and development of a high level of HC in a country.

This study also has some implications for Education, HRD, and Development practice. With further validation evidence, the new index can serve as a useful tool for education and labor policy creators at central and local government levels. The new index can be used as a diagnostic tool in identifying HC development needs of individual countries. This index can help create policies, which will bring positive changes to development by addressing areas that are important to specific countries. A newly formed index may support directing resources to the areas that are most responsive from a cost-benefit and capacity development perspective. Based on preliminary validity evidence, the three suggested new variables in the index would likely attract attention of policymakers in order to achieve the desired level of HC development. Such a measure may be beneficial in the formation of individual policies for countries, which will bring positive changes to their socio-economic development by addressing the areas that are important for specific countries.

The proposed model of HC improves our understanding of how national HC can be developed. It suggests a holistic approach to HC as it is influenced by many national factors and it addresses the issue of access to valuable new data for use in HC assessment through the use of established indices. The evidence of positive correlation between the three newly suggested variables and economic development variables implies a need to maintain balance among these key factors and educational factors in order to achieve the desired level of national HC development. The model proposed in this study informs educational/HRD leaders and the general public that they need to balance the relationship among these key factors. Additionally, this new measure may have an impact on the way international help is organized and provided and G8 ministries are conducted.

Limitations of the Study

As with all research, there are several limitations in this study. One of the major purposes of this study is validation of the index construct. According to several researchers (Diamantopoulos & Winklhofer, 2001; Pedhazur & Schmelkin, 1991), construct validation is fraught with difficulties and inherent ambiguities. A given observed variable may reflect different constructs (e.g., the same behavior may reflect different motives), and the same construct may be manifested by different observed variables (e.g., the same motive may be reflected by different behaviors). Another problem is the fact that indicators may have different meanings in different places, cultures, subcultures, and the like. Moreover, even within a given place, the meanings of indicators may change over the course of time because of historical events and changes in norms, to name a few.

An important limitation is caused by availability and quality of data. Although some sources have data available for all the world's countries list-wise (for example, the World Bank, United Nations Development Program (UNDP), other sources (for example, International Labor Organization [ILO], World Health Organization [WHO]) have a limited number of countries. The researcher spent considerable time looking for comparable data across sources and making sure that only the data created by the same methodology was used in the study. Sometimes, the researcher had to estimate the data by herself, utilizing methodologies to calculate the available measures. Missing data in the data sources has been another major difficulty. A source may have all the world's countries list-wise, but have missing data for some. This necessitated the use of missing data substitutes such as regional averages and interpolation. Furthermore, data reporting is often inconsistent even as conducted and reported by the same agency.

Finally, another limitation comes from the chosen methodology itself. Factor Analysis (FA) was extensively employed in the study. The literature on Factor Analysis generally presents a wide variety of contrasting and contradictory views on almost every aspect of FA and often lacks uniformity in terminology and notation (Pedhazur & Schmelkin, 1991). Limitations such as the aforementioned are common for this type of undertaking and many of the limitations identified are consistent with limitations of currently utilized measures of HC. In spite of these limitations, the results of this study improve upon previous efforts and relevance for improved application of HC measurement in national and international contexts.

Definition of Key Terms

Composite index: a synthesis of several factors into one index, arrived at by way of empirical aggregation (Booysen, 2002).

Expanded Human Capital Index -1 (EHCI-1): a new HC index developed in this dissertation. It is a combination of United Nations Human Capital Index (UNHCI) and three additional factors: National Identity Awareness, Character, and Family Background.

Expanded Human Capital Index -2 (EHCI-2): a new HC index developed in this dissertation. It is a combination of United Nations Human Capital Index (UNHCI) and three additional factors: National Identity Awareness, Character, and Family Background. Its difference with EHCI-1 is in the fact that UNHCI is incorporated as a part of Family Background factor instead of being treated separately, as in EHCI-1.

Foreign Direct Investment (FDI): investment made by a foreign individual or a foreign company in the productive capacity of another country (Dunning, 1998).

Human capital: a measure of the economic value of people's skill sets, which consist of knowledge, skills, abilities, attitudes and experiences (Shultz, 1981).

Index: a method of accumulating scores on individual items to form a composite measure of a complex phenomenon (Babbie, 2004).

Human Resource Development: the process of increasing the knowledge, skills, and capacities of all people in a society with the goal of national economic development and development of politically and socially responsible citizens (Harbison & Myers, 1964).

International Human Resource Development: a field of study that focuses on cross-border cooperation between government, non-government, and business entities. The

purpose of this cooperation is systematic development of human potential (Wang and McLean, 2007).

International Labor Organization (ILO): one of the oldest components of the UN system of specialized agencies, which advances the cause of social justice and aims to improve conditions of the labor force throughout the world (it is based in Geneva).

Labor force: the group of people in a nation that have potential of being employed (Finz-Enz, 2000).

Latent variable: intangible variable that can be proxied by empirical measures (Jöreskog & Goldberger, 1975).

United Nations Human Capital Index (UNHCI): a measure of human capital calculated in an index form, which is used by the United Nations.

United Nations Development Program (UNDP): a body of the United Nations which promotes human development in developing countries.

United States Agency for International Development (USAID): an agency of the US government whose primary objective is to assist developing countries in their development while furthering US objectives.

*The International Bank of Reconstruction and Development (IBRD)***:** international financial institution cooperatively owned by 171 member countries providing financial and technical assistance to least developed countries.

*United Nations Conference on Trade and Development (UNCTAD)***:** permanent intergovernmental body, principal organ of the United Nations General Assembly dealing with trade, investments and development issues.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The Origin of Human Capital Theory

Human capital (HC) theory originated in the mid-twentieth century under the leadership of Jacob Mincer, Theodore Schultz, and Gary Becker. They formulated the theory based on their own research, as well as on ideas of several prominent economists before them—Adam Smith (1937/1776), Irving Fisher (1906), and Frank Knight (1944)—who broadly viewed acquired and useful human abilities as fixed capital, similar to machines, buildings, and land. For example, Adam Smith wrote:

> The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expense, which is a capital fixed and realized, as it were, in his person. These talents, as they made a part of his fortune, so do they likewise of that of the society to which he belongs. The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labor, and which, though it costs a certain expense, repays that expense with a profit. (Smith, 1776/1937, p. 265-266)

Since it was a new concept, HC theory encountered much criticism from the majority of economists who considered physical equipment as the only non-financial capital. As Becker (1993) acknowledged, "human capital is so uncontroversial nowadays that it may be difficult to appreciate the hostility in the 1950s and 1960s toward the approach that went with the term" (p. 392). Gradually, economists and other professionals accepted the concept of human capital as an invaluable tool in the analysis of different socio-economic issues. Since that time, HC theory has become one of the foundational theories of socio-economic development and has been gaining attention in the unfolding era of the

knowledge economy with knowledge-intensive technologies' design and utilization becoming an everyday reality.

Schultz (1971), illustrating the crucial importance of HC, described the "mystery" of quick economic recovery after the WWII:

> The toll from bombing was all too visible in the factories that laid flat, the railroad yards, bridges, and harbors wrecked and the cities devastated. Structures, equipment, and inventories were all heaps of rubble. Economists were called upon to assess the implication of these wartime losses for recovery…It is clear that they overestimated the prospective retarding effects of these losses…The judgment that we formed soon after the war proved to be so far from the mark. The explanation that now is clear is that we gave altogether too much weight to nonhuman capital in making these assessments. We fell into this error … because we failed to take account of human capital and the important part that it plays in production in a modern economy (p. 34).

Human capital theory became especially prominent in the early 1990s, when it helped to illuminate the reason for the failure of the standard neoclassical growth model

$$Y = f(K, E, L)$$

(where Y is the output, E is an efficiency index signifying technological progress, K is financial capital stock and L is labor input) to explain non-convergence in per capita production level internationally, which the growth model predicted (Lucas, 1990). At that time, the standard neoclassical growth model was revised to include human capital, which improved the fit of the model.

Although the basic human capital model is well-established, many questions still need to be answered, and new discoveries are being made. HC theory and its practical application remain a growth industry just as they have been since its origin (Cohen & Soto, 2001; Hartog & Maassen van den Brink, 2007). This chapter reports on the literature which helps illuminate one such unanswered question. It investigates the content of HC, yet more specifically, it studies the question of what factors influence

development of HC in a country and therefore, need to be assessed while measuring national HC for cross-country comparisons.

Historical Perspective on HC

Generally, the term human capital (HC) refers to productive skills and knowledge embodied in labor stock, which have the economic property of future services of some value. According to the original HC theory (Becker, 1964; Mincer, 1958; Schultz, 1961), education is the major factor that enhances skill level in individuals and thereby human capital. A higher skill level in the workforce increases the overall production capacity. The classical HC model focused on education (and the measurement of it) because it was the major national investment and was associated with development of workforce skills and abilities required for economic success. Consequently, HC theory is a theory of joint distribution of education and earnings (Hartog, 2001; Psacharopoulos, 1988). This core model was developed during the period when academic education and on-the-job-training were considered the major, and probably the only, sources of economic success. Consequently, all three founders of the theory originally concentrated their attention on returns to education and training in their attempt to calculate growth of HC. Since that time, equating education (although measured in different ways) with human capital became the leading framework, which is still supported by the majority of economists, and is used by default. For example, speaking about the role of HC in economic development, Benhabib and Spiegel (1992) stated: "a standard economic approach is to treat human capital, or the average years of schooling of the labor force, as an ordinary input in the production function" (p.143).

Mincer (1958, 1974) estimated the rates of return on HC by equating the present value of two earnings streams (with and without education). His model proposed that with each school year, earnings are multiplied by the discount rate (i.e., the rate on the resources invested during the period of education, generally equal to the average rate on business capital). Thus, an increase in annual earnings is compensation for earnings postponed by education. Consequently, it is possible to say that one can estimate the rate of return as the coefficient of schooling years in a cross-section regression for individual earnings. The regression coefficient of earnings on education is interpreted as the return to education. Therefore, all that is necessary to calculate increase in HC as return on education is the information on earnings of individuals with different education and work experience (Hartog & Oosterbeek, 2007).

Research by Schultz (1961, 1962, 1971) sought to clarify the investment process and incentives to invest in human capital by calculating return on education for various groups using the investment approach. His early studies revolved around formal education and organized research. As his research progressed, he pushed the theory by expanding HC to include education, training, work experience, migration and health (1981, 1993), building on his earlier ideas:

> Much of what we call consumption constitutes investment in human capital.
> Direct expenditures on education, health, and internal migration to take advantage
> of better job opportunities are clear examples. Earnings forgone by mature
> students attending school and by workers acquiring on-the-job training are equally
> clear examples. Yet, nowhere do these enter our national accounts. The use of
> leisure time to improve skills and knowledge is widespread and it too is
> unrecorded. In these and similar ways the quality of human effort can be greatly
> improved and its productivity enhanced. I shall contend that such investments in
> human capital accounts for most of the impressive rise in real earnings per worker
> (1961, p.1).

Becker (1962) estimated the effects of investment in HC for the level and distribution of earnings by estimating the value of activities that influence future real income through "the imbedding of resources in people" (p. 9). These activities include education, on-the-job training, medical care, and acquiring information about the market (which he called "other knowledge").

Later, the hypothesis emerged that academic education (as measured in conventional enrollment rates, years of schooling, or literacy rates) was not the only factor which produced economic success. Numerous studies failed to support any hypothesis that attempted to prove that educational attainment alone was a strong predictor for individual occupational achievement or national economic welfare (Baier, Dwyer, & Tamura, 2006; Graaf & Huinink, 1992; Hartog, 2001; Howard, Dryden, & Johnson, 1999; Overstreet, 1954; Hauser & Sewell, 1986; Werner & Smith, 1992). Thus, a quest surfaced for further research on individuals' characteristics besides education that might be involved in the success of the individual in the marketplace.

Views on the Role of Human Capital in National Economics

As stated above, human capital refers to productive skills and knowledge embodied in labor stock, which have the economic property of future services of value. It is a measure of the economic value of the individual or group skill set, which includes areas of knowledge, as well as skills, abilities, attitudes and experiences (Becker, 1964; Coleman, 1988; Heckman, 2000; Heckman & Cunha, 2007; Jaw, Yu PingWang, & Chen, 2006; Smith, 1776/1937; Schultz, 1961, 1971). Schultz defined HC as "attributes of acquired population quality, which are valuable and can be augmented by appropriate

investment" (Schultz, 1981, p. 21). The distinctive mark of HC (in comparison with other forms of capital such as physical and financial) is that it is part of the human being, a part of the very essence of man and woman. As Schultz noted, "it is *human* because it is embodied in man, and it is *capital* because it is a source of future satisfaction, or of future earnings, or of both" (Schultz, 1971, p. 48).

Becker (1964) suggested that human capital includes qualities that raise future monetary and psychic income by increasing the resources in people. He found that any activities that influence income were investments in human capital—any kind of investment in human capital which increases earnings was legitimate and equally beneficial like formal education (Becker, 1964, p. 46). In Coleman's words:

> Just as physical capital is created in changes in materials to form tools that facilitate production, human capital is created by changes in persons that bring about skills and capabilities that make them able to act in new ways (Coleman, 1988, p. s100).

Thus any acquired qualities and abilities that help individuals and groups to be economically productive can be considered as individual/group human capital. Natural abilities are generally considered to be distributed equally between populations (Mincer, 1958; Pigou, 1950; Schultz, 1981). Simply stated, the difference in population quality stems from the difference in investment in HC (Ben-Porath, 1967, Schultz, 1981).

Human capital on an individual level causes variance of personal economic welfare, while aggregate human capital on a group level leads to variance of the market share. The importance of human capital on national level measures lies in its contribution to the creation of national competitive advantage, and consequently, to national economic growth and some level of the world market share (Drucker, 1997; Nehru, Swanson, & Dubey, 1995; Porter, 1998). Assessment of human capital on these three levels

(individual, group and national) constitutes separate fields of social science. For example, research on human capital at a group level is a part of the Human Resource Development/Human Resource Management field and has direct ramifications in that field (McLean, 2001; Nafukho, Hairston, & Brooks, 2004). This dissertation focuses on human capital evaluation on national and international levels, often connected to the science of economics.

Views Suggesting the Positive Effect of Human Capital on Economic Development

The importance of national and cross-national HC assessment lies in the well-accepted fact that economic development is a function not only of natural factor endowment (resource endowment, geographic location and size, etc) but created factors as well (culture, education, politics, etc.) (Adelman & Taft-Morris, 1967; Barro & Lee, 2001; Harrison, 1992; Kotkin, 1993; Lal, 1996; LaPorta, Lopez-de-Silanes, Shleifer, & Vishny, 1998; Schultz, 1971, 1981). Most observed economic growth cannot be explained by conventional labor and capital measures. According to Adelman and Taft-Morris (1967), 70 percent of inter-country variations in the level of economic development are associated with differences in non-economic characteristics.

Human knowledge, skills, attitudes and efforts make the decisive difference in just about every situation (Fitz-Enz, 2000). In Romer's (1990) analysis, for example, innovations are generated by HC stock. Romer modeled an endogenous growth process in which growth resulted directly from physical capital investment which in turn was driven by investment in research and development. He suggested that creation of goods (and consequent economic development) was a function of HC stock and growth. Nelson

and Phelps (1966) concluded that HC builds absorptive individual and national capacity and consequently increases the growth rate of total factor productivity. They created a model that attempted to show that the level of national HC affected the speed of technological upgrade. Therefore, the ability of a nation to adopt and implement new technology from abroad is a function of the domestic HC stock. Investment in population quality and in knowledge in large part determines the future prospects of mankind: "the decisive factors of production in improving the welfare of poor people are not space, energy, and cropland; the decisive factors are the improvement in population quality and advances in knowledge" (Shultz, 1981, p. 4).

A group of researchers argued that inclusion of an HC variable in growth models and numerous economic development equations improved their explanatory power (Mankiw, Romer, & Weil, 1992). For example, Mankiw et al. (1992) augmented the classic Solow's growth model (where output is produced from physical capital, labor and technology) by including in it accumulation of human capital. The classic Solow's model (Solow, 1956, 1988, 2000) predicted that the rates of savings and population growth determine the steady-state level of income per capita (the higher the rate of savings, the richer the country; the higher the rate of population growth, the poorer the country), although it does not correctly predict the magnitude. Inclusion of HC accumulation corrected the biases within the estimated coefficients on savings and population growth, which improved the explanatory power of the whole model (Lindahl & Canton, 2007).

Consequently, many social scientists and economists have suggested using measures of HC (as the changing quality of the labor force) to explain the growth, as well as differences, in economic performance among countries (Becker, 1964; Gemmell,

1996; Griliches, 1997; Haveman et al., 2003; Heckman, Stixrud, & Urzua, 2006;

Mankiw, Romer, & Weil, 1992; Kuznets, 1961; Mincer, 1958, 1962; Mulligan, & Sala-i-

Martin, 1997; Schultz, 1971). HC is the "brain" behind other determinants of a country's

economic development (infrastructure, political/legal institutions, rule of law, business

climate, business development). As early as the 1960s, it was noticed that though the

stock of physical capital was declining in value relative to income, the stock of human

capital was actually rising (Becker, 1964; Schultz, 1971). Early economists came upon

numerous signs pointing to improvements in the quality of human resources as one of the

major sources of economic growth. As Schultz (1981) put it, "Economic growth models

that treat changes in the labor force by counting the number of workers and that treat

changes in the stock of capital by counting physical structures, equipment, and

inventories are inadequate analytical tools because they omit critically important sources

of modern economic growth" (p. 3).

Views Suggesting That Human Capital Does Not Have Significant Effect on

Economic Development

Though many studies affirmed the applicability of the HC model, others abstained

from acknowledging HC importance or provided inconclusive results. For example, no

significant relationship between investment in HC and gross domestic product's (GDP)

growth was found for the Organization of Economic Cooperation and Development

(OECD) countries (Lindahl & Canton, 2007). At the same time, Baier, Dwyer and

Tamura (2006) found strong correlation between HC and GDP in developed countries

(including OECD), but no correlation in developing and poor countries. Benhabib and

Spiegel's (1992) study rejected the significance of HC in explaining per capita GDP growth rate, while finding support for the significance of national HC in explaining the growth rate of total factor productivity. Hartog (2001) stated that using education measures in a country as predictors of economic success could not lead to reliable results. Levin and Raut (1997) supported Levine and Renelt (1992) and concluded that "neither secondary school enrollment nor other measures of human capital have a robust influence on GDP growth" (p. 156). For them, "this result is difficult to reconcile with… broad international evidence for high private and social rates of return on education" (p.156). Cohen and Soto (2001) summed up the argument well by calling the discussion about the role of human capital in economic growth "an everlasting topic, which has changed course at least three times over the past two decades" (p. 2).

Causes for Divergence of Opinions on the Role of Human Capital

One potential explanation for such divergence of opinions is that it is caused by utilization of incomplete measures of HC. Up to date, there is no consensus between researchers and practitioners of exactly what factors constitute HC on the individual, group, and national levels. As Fitz-Enz (2000) noted, "No one has successfully taken on the challenge of detailing how to demonstrate the relative value of the human element in the profit equation" (p. xi). Cohen and Soto (2001) explained strong ongoing debates about the role of HC by difficulties in its measurement, "be it theoretically or empirically… it has not been very clear how human capital should be proxied" (p. 2). Various researchers and practitioners have suggested multiple variables that affect HC on the national level. Even in the case when authors agreed on some conceptual variables

designed to capture the essential characteristics of HC accumulation, such variables were not easily tested empirically (Gemmell, 1996).

As a result, empirical studies of the causes of economic growth often ignore complex measures of HC by using simple (and rather crude) empirical proxy variables of school enrollment and literacy rates. When the need to assess HC arises, educational measures are used by default and are called "human capital." Because of this ambiguity, some economists ignore the HC variable in their growth models. For example, in 41 studies using the cross-sectional "sources of growth" regression approach reviewed in 1992, only 13 included an HC measure (Gemmell, 1996, p. 9). Mankiw et al. (1992) pointed to potentially incorrect conclusions to which this can lead: "One might expect that ignoring human capital would lead to incorrect conclusions: Kendrick (1976) estimated that over half of the total US capital stock in 1969 was human capital" (p. 415).

In the empirical economic literature on individual earnings functions, the standard independent variables are education, experience, the square of experience, and gender. In some countries, race and region are added as well. Although individual abilities and skills are acknowledged to be important, they often leave their trace only in the concern over bias in the estimates of coefficients. The assumption that HC is equivalent to schooling (and a particular level of schooling is equivalent to the level of HC) undermines the usefulness of HC theory: "the failure of human capital theory as an articulate theory of the joint distribution of schooling and earnings remain" (Hartog, 2001, p. 519). Cohen and Soto (2001, p. 2) concurred:

> Years of schooling has long been thought of as the relevant proxy (of HC). Yet a simple glance at the data shows that the regions where the rate of growth of human capital has been the fastest are also those where it started from very low levels…It is hard to believe that a country that rose its average years of studies

from 1 to 2 years really doubled its stock of human capital and should correspondingly double its output as well.

Such an assumption leads to significant errors in assessment and prediction of the levels of economic and social development on national (and individual) levels. One example of which may be the obvious failure of most attempts of international assistance to affect lasting positive economic improvement in poor and developing countries. This is especially detrimental for such nations. As Schultz (1981) put it, "if half of the donor funds that are being allocated to increase the stock of physical capital in agriculture were allocated to enhance the abilities of rural people, it would increase the rate of agricultural development substantially compared to the prospects under the prevailing allocation of this capital" (p. 130). According to Schultz, the problem is of our own making because we have used estimates of capital and labor that had been "refined and narrowed in ways that excluded many of the improvements made in the quality of these resources" (p. 66). Measurement difficulty is the major reason for such a situation. Mankiw et al. (1992) admitted that "despite the narrowed focus (on only education) measurement of human capital presents great practical difficulties" (p. 418). As Fitz-Enz (2000) put it,

> The great irony is that the only economic component that can add value in and by itself is the one that is the most difficult to evaluate. This is the human component—clearly the most vexatious of assets to manage. The almost infinite variability and unpredictability of human beings make them enormously more complex to evaluate than one of the electro-mechanical components that comes with predetermined operating specifications. Nevertheless, people are the only element with the inherent power to generate value. All other variables—cash and its cousin credit, materials, plant and equipment, the energy—offer nothing but inert potentials (p. xii).

Hartog (2001) complained that with a small set of variables commonly used for assessing future economic success, "the researcher is a long shot away" from more precise assessment. He suggested following the example of business, occupational, and

educational psychology in their systematic investigation of individuals and expanding

"the economists' meager list of variables" (p. 515) that they routinely use for their

analysis.

Summary

The author can summarize the difficulties that present themselves in more precise

evaluation of HC as twofold:

1. There is no consensus about a list of indicators that together constitute HC.

2. Even those indicators which garner overall consensus as the ones that affect

    HC, are often not easily empirically measured.

Consequently, there is a need for:

1. Establishing a better consensus about what indicators may be included in

    cross-country assessment of HC.

2. Establishing empirical measures of these indicators which can be easily

    collected and available for all the world's countries.

Different Methods of Measuring of Human Capital

The researcher infers from the literature that two major methods of measurement

of a country's HC exist:

a) HC as measured in financial terms (Baier et al., 2006; Becker, 1964;

    Haveman, Bershadker, & Schwabish, 2003; Kendrick, 1976; Kuznets, 1961;

    Mankiw, Romer &Weil, 1992; Mincer, 1958, 1962, 1974; Mulligan & Sala-i-

    Martin, 2000; Schultz, 1971; Weisbrod, 1961).

b) Human capital as measured by the accumulation of contributing variables (Benhabib & Spiegel, 1994; Hanson, 1996; Globerman & Shapiro, 2002; Noorbakhsh, Paloni, & Youssef, 2001; Warner, 2002; United States Agency for International Development [USAID]; United Nations Development Program [UNDP]).

The first approach measures the value of national HC in financial terms and hard currency. Essentially, it answers a question: how much is a particular aggregate HC worth? This approach has two types of measurement of HC: in terms of return on investment in HC and in terms of the cost of resources invested in acquiring HC. The second approach does not measure the actual amount of wealth that a specific HC can produce, but instead, measures the degree of presence of variables that contribute to HC on the national level. The second approach, in contrast to the first one, potentially allows for incorporation of intangible variables into the HC measurement tool.

Human Capital as Measured in Financial Terms Method

Human Capital as Measured by Return on Investments—the Classical Approach

The first method is founded on the rate of return on investment and present value of expected earnings approach. This approach considers HC from a purely economic efficiency understanding, as financial value of labor qualities that are embodied in a country's population capable of producing national wealth. This definition reflects the analytics underlying the economist's concept of physical capital and is analogous to evaluation of physical capital in a country: "the value of the human capital stock is the discounted present value of the stream of outputs attributed to the potential productive

activities" (Haveman et al., 2003, p. 2). This method measures the flow of income from physical or human capital in a similar way in terms of their worth as productive assets. HC's worth is reflected in the earned wages: earning capacity (potential) and earning over lifetime are measures of this approach.

According to Becker (1964), the estimate of the value of HC can be based on the rule that the value of an asset equals the discounted sum of the income stream yielded. This means that "the value of the human wealth 'owned' at a particular age would equal the discounted sum of subsequent earnings" (p. 145). All earnings are generally discounted at an interest rate, which is about the average rate on business capital (p. 147). Mincer (1974) estimated the rates of return from cross-sections by equating the present value of two earnings streams (with and without education). His model proposed that for every year in school, earnings are multiplicatively augmented by the discount rate (i.e., the discount rate on the resources invested during the period of education, generally equal to the average rate on business capital).

HC estimates produced this way are often used together with physical capital stock estimates to calculate production functions used to derive total factor productivity growth for countries (Nehru, et al., 1995). Basically, this view is based on measurement of returns on investments toward HC, where economic importance is constituted as significant financial rates of return on every indicator included in HC structure.

In the framework of this view there have been several propositions of what constitutes national HC. As described earlier, Mincer (1958, 1974) measured human capital as a function of average years of schooling using a macro-equation of the form:

$$H = e^{p(s)}$$

where *s* is average years of schooling, *p* is the rate of return on education, and *e* is an efficiency index. He estimated the rates of return on education by equating the present value of two earnings streams—with and without education. Becker (1964) extended this original framework to reflect other types of HC investments among which individuals can choose: schooling, on-the-job training, medical care, migration, and information about the market. As indicators of a certain level of HC he spoke about levels of education, experience, health, morale, character qualities. He even admitted the role of luck (Becker & Tomes, 1976), although its role disappears with the second derivative.

Although Becker suggested all the above variables, he actually used only education and experience in his analysis. Becker (1962) created *Standard Competitive Theory*, where he differentiated between general training and firm-specific training. He used labor market experience as a proxy for general training and job tenure (seniority) as proxy for specific training. In the regression (wages regressed on experience), the coefficient on labor market experience was interpreted as return to general training and the coefficient of job tenure was interpreted as the return to specific human capital.

Becker (1962, 1964) measured HC in terms of rates of return on investments which were utilized to obtain it. He estimated the effects of investment in HC by estimating the value of activities that influenced future real income through "the imbedding of resources in people" (1962, p. 9). His classical formula for measuring return on on-the-job training is as follows:

$$MP+G=W+C$$

where *MP* is marginal product of labor, *G* is present value of return from training collected by the firm, *W* is the wages and *C* is the cost of training for the firm. His basic

formula for measuring returns on education measures the difference between actual earnings and direct school costs, and can be presented as

$$W=MP\text{-}K$$

where W stands for net earnings, MP is marginal product assumed equal to earnings, and K is the direct costs of acquiring education. This formula can be expanded further to include potential earnings and indirect costs:

$$W=MPo\text{-}G$$

where MPo is the marginal product that could have been received, and G is the sum of direct and indirect costs. Resources spent on acquiring information about the job market and the market as a whole, as well as relocation, can significantly raise income by the function of increased opportunities and a better match between an individual's HC and the new environment. These expenditures yield a return in the form of higher earnings than could have been received in the previous market. Resources invested in improvement of emotional and physical health of people are also a part of HC investment from Becker's perspective.

Schultz (1961, 1971) sought to clarify the investment process and the incentives to invest in human capital by calculating return on education for different groups of people, using the investment approach. Originally his studies revolved around formal education and organized research, yet as his research progressed, he pushed the theory by expanding HC to include a combination of schooling, learning on the job, advances in health, migration, family factors and the stock of information about the economy.

Human Capital as Measured by Return on Investments—Modern Approach

Contemporary scholars build on this foundation, while suggesting different combinations and/or forms of education-training measures. For example, Mankiw, Romer and Weil (1992) used secondary enrollment rates as proxies of human capital stock. They proposed a Cobb-Douglas production function of the form

$$Y = K^a \, H^{\,b} \, (EL)^{\,1-a-b}$$

where H is the human capital stock of the workforce, *a* is production elasticity of the physical capital, *b* is the production elasticity of human capital and *1-a-b* is the production elasticity of labor.

Lucas (1988) and Barro and Sala-i-Martin (1995) incorporated schooling and experience as the two well-known ways of building HC. They employed the formula:

$$Y = K^a \, (u\mathrm{H})^{\,1-a}$$

where *u* is the time devoted to production and *H* is human capital. They modeled human capital as:

$$QH = B \, (1\text{-}U) - R$$

where *QH* is the growth rate of human capital for an individual (which, if aggregated across all individuals in the economy, will signify the growth rate of HC in an economy), *(1-U)* is the time devoted to learning, *B* is transformational rate of learning into HC and *R* is depreciation of HC. Choice between education (or as Lucas, 1988 called it, *learning-or-doing)* and experience (*learning-by-doing)* depends on maximization of the utility functions of the consumer. (There is substantial literature for measuring experience, for example, Ford, 1997.)

Mulligan and Sala-i-Martin (1997) measured HC for an economy as the sum of all workers weighted by the ratios of their wages to the wage of the zero-human-capital-worker. Baier, Dwyer, and Tamura (2006) followed a similar path. They computed HC per worker from average education, and average experience, basing the transformation from educational attainment and experience to HC on estimated parameters of earnings regressions. They distinguished between primary (and intermediate), secondary and higher education because of substantial diminishing average returns to different levels of schooling (also assuming that primary school takes up to four years, as well as intermediate school, with secondary and higher education taking the rest of the years spent on education).They computed average years of work experience according to the following equation:

$$Yw = Age - Ys - 6$$

where *Ys* is average of years of schooling in a population, and *Age* is average age of population. Consequently, they define HC as:

$$H=H_0EXP\ (aP + bI + cS + dEX + eEX^2)$$

where *H* is human capital, *Ho* is the level of human capital with no schooling or experience, *a, b, c* are parameters on years of primary, intermediate and secondary education, and *d* and *e* are parameters on years of work experience and experience squared. They used the values of parameters as derived from regressions between wages and years of schooling and experience across countries in the world. Other researchers (Gemmel, 1996; Nehru at el., 1995) used a similar approach.

Even though the authors diverge slightly in what factors affect HC, they are unified in their view of how to measure it. In this approach, HC is assessed by the present

value of the stream of outputs attributable to human capital. Consequently, although several less tangible factors were suggested as important (family factor, informal education, character qualities of population, emotional health, social services, morale, migration), their measures have not been intensively studied. Neither have all these measures ever been put together in one unified measure of HC. As Becker put it, "unfortunately, few empirical studies of rates of return on other (than education) human capital have been made" (p. 90). Schultz conferred: "Meanwhile, … there have been important advances in economic thinking with respect to investment in human capital…most of the work thus far has concentrated on the first of the set (education)" (p. 8).

Overall, the variables in this approach that have been individually assessed as separate kinds of HC are as follows:

- Formal education (returns on education measured as net earnings for each education period—Becker, 1964; Shultz, 1971; Solow, 1988, 2000); (returns on education measured as years of schooling—Mincer, 1958; Shultz, 1971).

- Experience (measured by difference in wages; Becker, 1964).

- Information about the market and employment opportunities (measured in financial terms as the difference between the highest-paying employer and the lowest-paying employer, and the difference between the money spent on search; Becker, 1964; Stigler, 1962).

- Physical and emotional health (measured in financial terms as increase in wages that employees need to receive in order to make investments in factors

that improve health, such as medical examinations and improved nutrition; Becker, 1964).

- The effect of HC on health (in terms of the effect of education on health) was calculated using the value of a statistical life and a statistical life year. The value of the health gain due to one year of education (one-year increase in HC) is estimated to be in the range of 1.3-5.8% (Groot & Maassen, 2007).

- Abilities (as measured in earnings while holding quality of education, discrimination, nepotism, health, on-the-job-training as constant factors. Abilities can also be measured by the following factors: IQ score, father's occupation, rank in academic class, and earning differential related to them; Becker, 1964).

Although other variables were suggested as important determinants of the level of HC, they have not been measured. There is no practical place in this view for any intangible factors that may affect HC because it will be difficult to measure ROI of such factors. Benefits that are not manifested in earnings, and which are not directly captured in the earnings stream are hard to identify and measure, and thus cannot be considered seriously in this approach. Schultz summed up the issue very vividly by stating, "Although an investigation of many kinds of human capital would be illuminating, the absence of readily available data makes it necessary to concentrate primarily on formal education" (p. 69). Weisbrod (1961) conferred:

> We view the value of a person in terms of his worth as a productive asset, having some marginal productivity per period. A person's value as a companion to, and the leader of, his family is neglected—not because it is deemed insignificant or irrelevant, but because it seemed too difficult to measure, at least for the present. (p. 426)

Human Capital as Measured by the Financial Cost of Investments in Creation of HC

This method is based on the assumption that the measurement of HC should cover the range of investments that human beings make in themselves and in others (Nehru, 1995). It was pioneered by John Kendrick (1976) and measures the nation's HC stock as "cost-based," in that human assets are valued by the investment costs embodied in them, rather than the returns that they are capable of generating over their lifetime. Kendrick defined the nation's stock of HC to be the sum of rearing costs, plus the cost of education, training, healthcare and mobility. Basically, this view measures the cost of investment in HC. The variables that have been assessed by this method are:

- Education as measured in financial terms as the value of the resources that have been used, including opportunity costs foregone (on Elementary, Middle, High school and college levels; Schultz, 1971).
- Education in terms of the cost of services charged by schools (Kendrick, 1976).

Human Capital as Measured by the Method of Accumulating of Contributing Variables

This method considers HC from a developmental viewpoint, and potentially allows for more precise estimation of HC. This method does not measure the actual economic outcomes of HC or its contributing variables in terms of return on/cost of investments, but instead, measures the intensity of variables contributing to it. This is a method of accumulating scores on individual items to form a composite measure of a complex phenomenon. Consequently, HC indices created this way are based on the degree of

presence of specific factors. When HC indices are compared in countries, what is

compared is not the actual amount of wealth that HC produces, but the degree of

variables present that contribute to HC (and which are known to be positively correlated

with economic welfare). This method assembles the qualities which have been suggested

as those that can bring economic benefit for those who possess them. This approach is the

only method (out of the three) that allows for inclusion of intangible variables into the

HC index and estimating them. Indices created by this method potentially can integrate

various social, political, and economic variables into one measure. Booysen (2002)

argued that the increasing social, political, and economic heterogeneity of countries

makes combining of both synthetic and specialized indicators inevitable. This method is

widely used by international aid and development organizations and researchers working

in the area of international development (Hanson, 1996; Haveman et al., 2003; *Human

Development Report* of UNDP, Globerman & Shapiro, 2002; Noorbakhsh, Paloni, &

Youssef, 2001; UN *E-Government Readiness Assessment*, UN *World Public Sector

Report*; Warner, 2002).

Noorbakhsh et al. (2001) calculated HC as proxied by the three measures:

secondary school enrollment ratio, number of accumulated years of secondary education

present in the working-age population, and number of accumulated years of tertiary

education present in the working-age population. For them, the first measure reflected a

flow of investment in HC. The other two measures reflected the education stock of a

country. The authors did not attempt a combination of those three variables in any form

but used all of them individually as "HC group." Warner (2002) suggested calculating an

HC index as a simple average of standardized indices of educational attainment of

population (i.e. primary, secondary, and tertiary) and a subjective measure of schooling

quality (collected through surveying business managers). Globerman and Shapiro (2002)

used the measure of HC which they perceived to be the sum of the education and health

subindices of the Human Development Index (UN). Mankiw et al. (1992) used the

percentage of the working-age population that is in secondary school as the proxy for

HC. They used UNESCO Yearbook data on the fraction of the eligible population (aged

12 to 17) enrolled in secondary school, which they multiplied by the fraction of the

working-age population that is of school age (ages 15-19). Hanson (1996) employed the

measure of HC as the square of the adult literacy rate to represent the stock of education

and training. Squaring the rate utilizes the hypothesis of educational externalities. Some

national statistics describing the contribution of human capital to the economy are based

on demographics and are simply counts of people—for example, the number of people in

the labor force or the number of people employed (Haveman et al., 2003).

This method is potentially instrumental in helping countries improve, as it allows

for more specification of what factors need to be addressed in order for a country's labor

to be of a higher quality. What gets measured gets done. It has been generally accepted

that publishing cross-country comparative data inspires governments to reform.

Currently, the most used and accepted HC index in international comparisons is the index

developed by the United Nations. According to the UNDP, HC index is based on UNDP

Education Index and is a composite of adult literacy rate and combined

primary/secondary/tertiary gross enrollment ratio with two thirds of the weight given to

adult literacy and one third to gross enrollment ratio (UN, 2003). For a country X, with

an adult literacy rate of 96.3 per cent and a combined gross enrollment of 81.2 percent in

2002, the HC/Education Index would be:

$$2/3\ (0.963) + 1/3\ (0.812) = 0.913$$

(United Nations Department of Economics and Social Affairs, 2003). Other international

organizations use this method of HC measurement by default. For example, United

Nations Government E-Readiness Index (United Nations, 2008), which includes

Infrastructure, E-Participation, and HC indices, defines its HC exactly according to that

method:

> The data for the human capital index relies on the UNDP 'education index,'
> which is a composite of adult literacy rate and the combined primary, secondary,
> and tertiary gross enrollment ratio with two thirds weight given to adult literacy
> and one third to gross enrollment ratio.

Conclusion

The methods discussed above are valuable tools in the hands of researchers

attempting assessment of HC development on individual country level, or on the cross-

country level. Although both methods allow for some degree of assessment, the second

method can potentially be more precise, as it allows for incorporating not only empirical

but also intangible variables.

The Need for a More Precise Measure of Human Capital

All methods discussed above rely heavily on using different education measures

as proxies for HC. The strength of this approach is mainly in availability of data, as these

indicators can be relatively easily defined and empirically tested. Furthermore, there is

widespread agreement about the value of what is being measured. These social indicators

are "objective" in that they do not depend on individual perception (Diener & Suh, 1997). As Becker (1964) noted, "the investment period of education can be measured by years of schooling, but the periods of on-the-job training, of the search for information, and of other investments are not readily available" (p. 44). Using education as a proxy for HC is based on the assumption that formal education makes a fundamental contribution to HC accumulation, which can be complemented but not readily substituted by other forms of HC investment. It is assumed that formal education is the most important component of HC because it also increases the ability of people to live healthier lives and learn rapidly on the job once they enter the labor force (Nehru et al., 1995).

Another reason why simplistic education measures are often used as proxies for national HC is a lack of understanding of the true nature of the concept of this capital. "Failure to treat human resources explicitly as a form of capital, as a produced means of production, as the product of investment, has fostered the retention of the classical notion of labor as a capacity to do manual work requiring little knowledge and skill, a capacity with which, according to this notion, laborers are endowed about equally" (Schultz, 1971, p. 28).

Meanwhile, much criticism is aimed toward the use of education-related measures as the only kind of measures of HC. Welch (1965) remarked: "Frankly, I find it hard to conceive of a poorer measure of the marketable skills a person acquires in school than the number of years he has been able to endure a classroom environment. My own justification for using such a crude measure is that I can find nothing better" (p. 67). Following is a brief discussion of the weaknesses introduced into measures of HC when only education-related variables are used.

- *The average year of schooling per working person in economy.* This measure

used by itself as a proxy of HC (suggested, for example, by Nehru et al., though

understanding that the measure is "one-dimensional in nature and subject to weaknesses"

Nehru et al., 1995, p. 25), suffers from the basic evaluation problem. First, it assumes that

workers of each education category are perfect substitutes for workers of all other

categories. The second assumption is that the productivity differentials among workers

with different levels of education are proportional to their years of schooling. For

example, a worker with 16 years of schooling is 16 times more productive than a worker

with one year of schooling. The assumption here is that someone with X years of

education would have earned the same income as someone with 0 years of education if

s/he had also chosen 0 years of education. And it is assumed that someone who chose 0

years of education would have earned the same income as someone who chose X years if

s/he had chosen these number of years (Hartog & Oosterbeck, 2007). Third, one year of

schooling allegedly delivers the same increase in skill, regardless of the field of study,

quality of teachers and educational infrastructure.

- *Attained levels of education.* This measure may be used for intra-national

  analysis, yet it errs when applied to cross-country comparison. Nehru et al.

  (1995) suggested that years of schooling as a proxy for education is subject to

  error in cross-country analysis because the number of days and hours of

  schooling per year can vary substantially across countries. For example, the

  study by Blau and Kahn (1996) assumed that a year of education in the US

  had exactly the same meaning, in terms of produced skills, as a year of

  education in Germany. Using such an assumption, they came to a conclusion

that 50% of the German workforce belonged to the lowest 30% of US'

workforce in terms of skills. In addition, calculations of the average number

of years of schooling in the population often suffer from the inability of

researchers to exclude years of unemployment.

Furthermore, returns to education by itself are rather modest (Appleton &

Teal,1998; Freeman, 1986). Freeman (1986) noted that "every study finds that, by itself,

years of schooling explains a relatively small part of the variance of log earnings, say 3-5

percent at most" (p 377). Other researchers (Harmon, Walker, & Westergaard-Nielsen,

2001; Heckman, 1995; Krueger, 2002) estimated higher return of up to 10 percent as

return on educational investment. Another problem to consider here is that quality of

education tends to increase with time, which also leads to productivity differential

between young and old workers with the same education (Nehru, et al., 1995). Also,

since quality of education differs considerably between countries, calculating only this

measure can lead to an overestimation or underestimation of the level of the education

stock as well as the level of HC. Unfortunately, no good indicator of the quality of

education is easily available for developing countries (Nehru, et al., 1995). One popular

measure often used for this purpose, the teacher-student ratio, does not seem to be

strongly related to the value added of the school system (Barro, 1991; Hanushek, 1997;

Nehru et al., 1995).

- *Enrollment.* This access to education measure in quantitative terms does not

  tell us much about the product of education: the increase of cognitive and

  other skills (Dijkstra & Hanmer, 2000). Furthermore, it has been argued that

enrollment ratios are more of future rather than present indicators of the HC

level (Carneiro, & Heckman, 2003; Krueger, 2002).

- *Adult literacy rate.* This variable taken by itself is not a sufficient measure

   either, because it measures basic literacy, which can be a proxy for only low-

   cost, low value-added production, which has been losing its importance

   economically. According to UNDP (2003), "Adult literacy is the percentage

   of people aged 15 and above who can, with understanding both read and write

   a short simple statement on their everyday life." This hardly measures modern

   national dynamic competitive advantage.

- *Public expenditure on education.* This is also not a sufficient measure.

   Empirical results show that some countries which have high public

   expenditure on education, do not have a highly educated population

   (Hanushek, 1997). Public expenditure on health care is subject to the same

   problem, especially considering the problem of redistribution of limited

   resources in highly corrupt countries.

- *Head count.* Head count is a very unreliable proxy of HC as well.

As Fitz-Enz put it (2000), "If the key to wealth creation were only a head count, then the

dullest, lowest-level person would be as valuable as the brightest, highest-level person. In

actuality, it is the information that the person possesses and his or her ability and

willingness to share it that establish value potential" (p. 6).

Currently, an HC index can be as broad as to include all of the above mentioned

variables (combined primary/secondary/tertiary gross enrollment ratio, adult literacy rate,

job experience, expenditures on health, expenditure on education, mortality rate, GDP per

capita, growth rate of the labor force) or it can be as narrow as to include only one or two variables (mostly school enrollment or literacy rate). However, even including all the variables currently applied cannot give us an exhaustive and policy-useful HC measure, because they do not describe all the aspects of human capital.

Although education is a critical component of HC, other intangible factors also affect it, which leads to modification of the level of economic profit produced. To a great degree, education variables are affected and augmented by non-education intangible variables. Therefore, it is necessary to take into consideration these variables if we want to correctly assess the economic value of education, and HC altogether. It is necessary to give HC a more detailed and specific "face." More than two decades ago such a need was expressed by Ben-Porath (1980) as "a departure from impersonal economics" (p. 1).

The Need for HC Measures to Expand Their Variable-Base

Despite the vast array of literature on HC, researchers have emphasized that existing HC measures lack precision, and are in fact reductionist measures, incorporating only subsets of possible indicators. As discussed in the Introduction, with an increasing number of studies which failed to support the classical assumption that educational attainment (measured in basic enrollment and literacy figures) was a strong predictor of individual's occupational achievement or national economic welfare, the search for other influential factors became important. Researchers in different countries have made multiple attempts to build an expanded HC index. However, there is considerable difference of opinion regarding how to establish more robust and specific measures of HC.

Nehru et al. (1995) stated that though "the measurement of HC should cover the range of investments that human beings make in themselves and in others, including formal and informal education, on-the-job training, health, nutrition, and social services…. So far, no researchers have put together such a composite measure" (p. 380).

According to Heckman (2000),

> Current policies regarding education and job training around the world are based on fundamental misconceptions about the way …skills embodied in persons are produced…The preoccupation with cognition and academic "smarts" as measured by test scores to the exclusion of social adaptability and motivation causes a serious bias in the evaluation of human capital interventions. (p.4)

Becker (1964) concurred :

> Economists have long been aware that conventional measures of ability—intelligence tests or aptitude scores, school grades, and personality tests… do not reliably measure the talents required to succeed in economic sphere. The latter consists of particular kind of personality, persistence, and intelligence. (p. 61).

Porter (1998) stated that the human resources of a nation include not only skills, but work ethic. Schultz (1971) suggested that HC can be displayed in various forms beyond the conventional: "If it were possible to aggregate all of the different forms of human capital, it would exceed by a wide margin all nonhuman capital" (p. vii). He proposed that HC consists of differentiated forms of capital and is "exceedingly heterogeneous" (p. 48).

Knight (1996) also supported this idea and said that not all human capital is produced by education, and not all education produces human capital. Godfrey (1997), Heckman and Cunha (2007) stressed that non-cognitive abilities (perseverance, motivation, ability to deal well with other people, risk aversion, etc.) have direct affects on wages. Carneiro and Heckman (2003) conducted an analysis which challenged the conventional point of view that equated skill with intelligence, thereby demonstrated the importance of both cognitive and non-cognitive skills in socioeconomic success. Hanson

(1996) found evidence that qualities of labor besides education and training seem to deter investments in some countries. Specifically, he referred to "personal qualities of workers" (p. 86). Kluckhohn's (1954) earlier study supportes this idea as well. As Adelman and Taft-Morris (1967) put it, "key economic functions used in analyzing advanced economies may take quite different form in less-developed countries for reasons that are largely political, social, and institutional" (p.3).

HRD scholars recognize the importance of intangible assets and their impact on corporate productivity and growth. At the same time, the endeavor of measuring the impact of developing such assets in the HRD field has been undertaken by just few scholars (Cho & McLean, 2000; Nafukho, et al., 2004). Overall, HR professionals, economists, and educators have made little progress in solving the tricky problem of how to measure human capital within a single country over time, let alone for comparisons between countries. As Schultz (1971) put it, " [investments in human capital] seem amorphous compared to brick and mortar, and hard to get at compared to the investment accounts of corporations, but they assuredly are not a fragment; they are rather like the contents of Pandora's box, full of difficulties and hope" (p. 35).

At the same time, the urgent importance of knowing what constitutes HC can be illustrated by the almost constant failure of the international donor community to receive sufficient return on their humanitarian investments in poor countries, in the form of enhanced economic productivity and improved social relationships in these countries. Schultz (1981) raised the question by comparing ROI on the Marshall Plan and several other programs instituted by the US. The Marshall Plan, although available for only few years, significantly enhanced the economic recovery of Japan and West Germany. In

contrast, the Point Four Latin American Aid program, similar to the Marshall Plan US foreign aid program administered during the 1950s, contributed very little to the productivity of Latin American countries. Schultz suggested (1981) that while the war destroyed physical capital of Japan and West Germany, their human capital was relatively intact. By providing funds for physical capital, the Plan simply added physical means of production to high-level HC. In contrast, Latin American countries' low level of HC did not allow for similar success.

This example illustrates the importance of HC, but does not really address the need to knowing exactly what factors contribute to HC. This need can be illustrated by comparing politico-socio-economic success of the former socialist countries after the collapse of the socialist system. Some countries progressed significantly while others stagnated, although general education, training, and research levels among those countries were similar due to specificities of a planned socialist economy (a comparison of Ukraine and Poland over the period from 1991-2007 may be helpful in this regard).

Variables Suggested for Inclusion in Human Capital Measure

As a prophetic voice in economics, Adam Smith included all acquired and useful abilities of the inhabitants of a country as part of capital. For him, HC included psychological, intellectual, physical qualities of people (Smith, 1776/1937). Becker (1964) spoke about classical HC components like on-the-job training and schooling, as well as other economically useful knowledge, such as information about the job market. He also stressed the importance of intangible components of HC such as morale, character, emotional and physical health, as well as even luck (Becker & Tomes, 1986).

He noted, "I am going to talk about a different kind of capital. Schooling, a computer training course, expenditures on medical care, lectures on the virtues of punctuality and honesty are capital too, in the sense that they improve health, raise earnings, or add to a person's appreciation of literature over much of his or her lifetime" (Becker, 1964, p. 39). For Becker, "one way to invest in human capital is to improve emotional and physical health. Emotional health increasingly is considered an important determinant of earnings in all parts of the world" (Becker, 1964, p. 33).

Schultz (1971) said that the "unsatisfactory state of economic theory in solving the mystery of modern abundance has turned some economists to an array of explanatory factors that are predominantly cultural, social and political" (p. 3). He suggested considering the following categories as investments in HC: investment in schooling, on-the-job training, health, job information, and migration. The category of individual health includes all expenditures that affected vigor, vitality, and life expectancy of people (any health facilities and services); migration includes movements of individuals and families to adjust to changing job opportunities. Later (1981), he expanded his view by adding other variables: "the principal activities that contribute to the acquisition of human capital are child care, home and work experience, schooling and health. The value of such added human capital depends on the additional well-being that people derive from it" (p.23). He also considered entrepreneurial abilities as a part of HC (Schultz, 1981).

Heckman (2000) viewed human capital as a combination of cognitive and non-cognitive skills, both of which were equally important. He suggested that focusing on only education as human capital to the exclusion of social skills, self-discipline and a variety of non-cognitive skills that were known to determine success in life, would lead

to fundamental misconceptions about the way socially useful skills embodied in persons were produced. According to Heckman " popular discussions of skill formation almost always focus on expenditures in schools or on educational reforms and neglect important non-institutional sources of skill formation , which are equally important, if not more important, producers of the varieties of skills that are useful in a modern economy" (p.4.). Both kinds of skills—cognitive and noncognitive—are affected by families and schools, but they differ in their malleability over the life cycle, with noncognitive skills being more malleable later in life (Carneiro & Heckman, 2003).

Non-cognitive abilities are important for schooling and labor market success. This finding is supported by studies of early childhood interventions (*The Perry Program, Head Start*) that improve primarily non-cognitive skills with a much weaker effect on cognitive ability. These longitudinal studies showed substantial positive effect on future schooling and labor market outcomes (Krueger, 2002). Mentoring programs during childhood through teenage years can significantly affect these skills as well (Werner & Smith, 1992). Becker (1964) also suggested that any kind of learning, not just formal education or on-the-job training, invests in human capital (p. 46). Therefore, according to Becker, there is no conflict between interpretations of the shape of earning profiles based on learning theory and those based on investment in human capital since the former is a special case of the latter.

Becker (1993) also saw great importance in the individual character as it shapes HC. He suggested that behavior is rooted in character and is interrelated with HC:

> The various kinds of behavior included under the rubric of human capital help explain why the concept is so powerful and useful. It also means that the process of investing or disinvesting in human capital often alters the very nature of a person: training may change a lifestyle from one with perennial unemployment to

one with stable and good earnings, or accumulated drinking may destroy a career, health, and even the capacity to think straight (p. 392).

Consequently, social adaptability, motivation, and other similar character traits need to be considered as a part of the human capital variable. Other writers (Fitz-Enz, 2000; Psacharopoulos & Woodhall, 1985) supported this idea and noted that attitudes, motivations, character traits are a part of HC and are necessary for economic and social development. Goleman's (1995) classic study attests to this view as well.

A group of researchers (Almond & Verba, 1963; Boettke & Subrick, 2003; Denzau & North, 1994; Franke, Hofstede, & Bond, 1991; Guiso et al., 2006; Hofstede, 1980, 2001; Harrison, 1992; Lal, 1996, 1998; Lim, 2002; Mason,1995; Reisinger, W., Miller, A., Hesli, & Maher, K.,1994; Shulman, 2005) have suggested that culture has a strong economic effect. They documented that countries more skewed in favor of autonomy and egalitarianism, exhibited higher rule of law, less corruption, and more democratic accountability. For example, Lal (1996, 1998) strongly supported that culture, which is historically formed under the influence of many socio-geopolitical factors, influences the way people behave economically. For example, he quoted Frankfort (1948) in his example of two ancient nations—Mesopotamia and Egypt. Their worldviews were different, which affected social and economic spheres:

> This contrast in outlook is curiously in keeping with the physiographical differences between the two countries. The rich Nile Valley lies isolated and protected between the almost empty desert on either side, while Mesopotamia lacks clear boundaries and was periodically robbed and disrupted by the mountaineers on its east or the nomads on its west. Egypt derived its prosperity from the annual inundation of the Nile, which never fails to rise, even if the floods differ greatly in effectiveness. But Mesopotamia is for much of its grazing, dependent on an uncertain rainfall and possesses in the Tigris an unaccountable, turbulent, and most dangerous river (p. 24).

At the same time, Shultz (1981) did not see culture as a relevant variable in the economic

development equation, calling research on the effect of culture "at best intellectual

curiosities" (p. 4).

McCleary & Barro (2006) researched the relationship between religion and

economy and finds fairly strong correlation between them. Shulman (2005) spoke about

the role of national identity in the success of economic reforms, and also found support

for positive correlation between those variables. In strong tandem with him, Prizel (1998)

provided evidence for strong correlation between the national identity and foreign policy

of a country, which affects economic development:

> National identity remains the main, if not the sole, glue of all societies… All
> polities, whether or not they are aware of it, have an identity that helps define
> their values and serves as the basis of ranking their priorities. These values and
> priorities, along with a host of objective factors, shape foreign as well as domestic
> policy (p. 2, 413).

The cultural and socio-political situation of a country has important effects on the

quality of HC (Hanson, 1996). The role of culture, though hard to measure, is attracting

more and more research attention. Overall, sociologists and anthropologists interested in

the problems of developing countries consistently stress the close interaction between

sociocultural and economic aspects of change (Granovetter & Swedberg, 2001; Hoselitz,

1960, Mingione & Goodrick 1991). Hoselitz (1960) examined the process of economic

growth in terms of sociological pattern variables, summarizing patterns of change that

can be described by change in cultural values (i.e., transformation from communally-

oriented values to individualistic achievement-oriented values).

The role of family affiliation is very important, though often neglected in the

assessment of HC (Ben-Porath, 1980; Griliches, 1997). Strong families contribute to the

overall national human capital by increasing the traits that lead to high HC. The value of a strong family affiliation manifests itself in personal individual traits, including honesty, various skills, and ingenuity. Moreover, "the degree to which the family takes responsibility for actions of its members correlates with the degree of trust between the outsiders and the family members" (Ben, Porath, 1980, p.12). It has been argued that ascribed status has greater practical significance than achieved status for those outsiders who deal with family members. A caring head of the family (i.e. who has the utility of members in his own utility function) can generate socially optimal behavior by family members (Becker & Tomes 1986). Heckman, 2000, and Heckman et al., 2006, postulated that a family's role lies in fostering skills and a variety of abilities required to succeed in the modern economy. Families who lack the above qualities produce members with low ability and thus poorly motivated students who do not succeed. Policies directed toward families may be a more effective means for improving the performance of schools than direct expenditure on teacher salaries or technical resources.

Other researchers have noticed other qualities that affect HC. For example, Richards and Amjad (1994) mentioned ethical values, responsible citizenry, and a healthy attitude toward work. They emphasized that both attitude to work and cognitive skills matter in determining the efficacy of workers. Sjaastad (1962) treated migration as an activity that develops HC. The main reason for this is that a misplaced resource is equivalent to a less productive resource properly located. Stigler (1962) suggested using availability of labor market information as a variable affecting HC for similar reason, as well.

Conclusion

As a result of the literature review, there follows a list of variables that are perceived to be instrumental in composing the HC of a national population:

- Character qualities of the population

- Cultural values

- Educational attainment

- Work experience

- Ethical values

- Family background and values

- Physical health

- Market Information available

- Measure of trust between citizens

- Morale

- Emotional health

- Migration opportunities available within the country

- Awareness of national identity

- Unity among citizens

- Religion in the country

- Social skills and quality of interaction

- Variety of non-cognitive skills

- Work Ethics

Out of the list of indicators, *educational attainment, work experience*, *physical health, migration* and *information about the market* are not new measures. They were mentioned

by classical HC theory although not extensively developed. The author of this study decided to concentrate only on the variables that have never been developed or included in HC measurement tools before. Out of the remaining list, the researcher chose three variables: (1) *National identity awareness,* (2) *Families, and* (3) *Character qualities most common in the population*. The choice of these variables is based on the parsimonious requirement of a dissertation. Consequently, the three chosen variables to be studied further are as follows:

- National identity awareness in the population (*abbr*. National Identity Awareness)

- Families in a country (*abbr*. Family factor)

- Character qualities most common in the population (*abbr*. Character Qualities factor)

Summary of the Reviewed Literature on Human Capital

The list of additional variables that constitute national HC, and may potentially improve the fit of HC models, indicates that the way HC is currently measured produces incomplete results by neglecting important variables. HC theory may be changed from the theory of joint distribution of education and economic welfare to the theory of joint distribution of productive skills, qualities and knowledge and economic welfare. Therefore, HC measurement tools will greatly benefit from incorporating intangible/latent measures which describe diverse qualities and skills of a country's population, not only the overall level of its education.

After identifying additional factors as ones that affect HC, there was a need to operationalize them by conducting analyses of their structures and suggesting a potential set of measurable indicators of performance for these multidimensional constructs. In the following section, the three newly suggested HC factors were examined and the initial models of these factors were developed. Complex measures, reflecting different aspects of each new factor were created, combining interrelated aspects of the relevant feature within each single factor. The author sought to include the aspects that were conceptually relevant to a particular factor, as well as easily empirically measurable and available for all (or at least most) countries.

National Identity Awareness Factor

National Identity Awareness as a Formative Component of National Human Capital

Though National Identity Awareness has been noted as an important contributor toward the level of national HC, it has yet to be measured. This section explores and establishes the relationship between national consciousness of people in a country and HC of this people. It is followed by the section which identifies specific channels of the process of citizens' national identity awareness influencing their HC.

As a family provides its members with a sense of belonging (Ben-Porath, 1980), a nation provides its members with a sense of national identity, which is a powerful means of defining and locating individual selves in the world (Smith, 1991). National identity may be defined as citizens' conception of the factors that do or should unite the population of a nation-state into a single community and that differentiate that community from others (Shulman, 2005). A polity cannot exist in a state of prolonged

anomie; it needs an identity to provide a psychological frame of reference in which to function. All polities have an identity that helps define their values and serves as an instrument by which to rank their priorities (Prizel, 1998). Therefore, it can be stated that each country has its unique national identity.

Is there a relationship between HC in a nation and its national identity awareness, and can a theory of this relationship be established? A group of researchers (Eke & Kuzio, 2000; Harrison, 1992; Kevane, 1997; Kuzio, 2000; Prizel, 1998; Shulman, 2005; Smith, 1991) have emphasized the relationship between national identity awareness and the success of economic and democratic reforms of this nation. The overall hypothesis that inclusion of identity substantively changes conclusions of economic analysis seems to be strongly supported (Akerlof & Canton, 2000; Kevane, 1997; Landa, 1994; Sen, 1986; Thomas, 1996). One reason identity matters in economics is that individuals, groups and corporate actors in an economy have equilibrium strategies predicated on their identities (Kevane, 1997). According to Ben-Porath (1980, p. 1-4):

> Recent works in economics deal with many issues in which the identity of the agents and the mechanics of their interaction matter (because) the identity of the people engaged in a transaction is a major determinant of the mode of transaction.

The organization of activity is determined by the implicit attempt of participating actors to benefit from the returns to scale on both—the personal and the impersonal— dimensions of transactions, as well as the interaction between them. Identity can either dominate or be subsumed under the impersonal dimensions of a transaction and the degree to which this happens shapes the actual type of transaction. In other words, organization of activity depends on: 1) whether identity dominates or 2) whether impersonal dimensions of transactions dominate. This affects the level of welfare derived

from an activity and its major recipient(s). This array of research on the role of group

identity in the nature of the group's economic interactions comes to similar conclusions

as research on the relationship between the sense of personal identity (a person's sense of

self) and personal level of welfare (economic success). Akerlof and Kranton (2000)

suggested that identity could account for many phenomena on individual and group levels

that current economics cannot explain well.

> (Many) problems such as ethnic and racial conflict, discrimination, intractable labor disputes, and separatist politics all invite an identity-based analysis. Because of its explanatory power, numerous scholars in psychology, sociology, political science, anthropology, and history have adopted identity as a central concept. …Identity can be brought to economic analysis, allowing a new view of many economic problems…Identity is likely to affect economic outcomes, for example, in areas of political economy, organizational behavior, demography, the economics of language, violence, education, consumption and saving behavior, and labor relations (Akerlof & Kranton, 2000, p. 716, 745).

According to the earlier definition, HC can be defined as a characteristic of a country's

populace which includes any acquired human qualities and abilities that help individuals

become economically productive and which affect the nation's economic welfare. Since

identity awareness is a human quality and seems to be correlated with national economic

development, a deduction can be made that national identity awareness is a part of

national HC. (Note: it is not a *specific national identity*, given by birth, but rather

national identity awareness/national consciousness of people.)

The Basic Model of National Identity Awareness Factor

The previous section provided theoretical evidence for relationships between

national identity awareness of people in the country and development of national HC.

This section explores the actual model of the variable of national identity awareness.

Moreover, it identifies the channels through which the national consciousness of population affects HC of this people. It explores how consciousness of national identity creates value.

As noted earlier, national identity may be defined as citizens' conception of the factors that do or should unite the population of a nation-state into a single community and that differentiate that community from others (Shulman, 2005). Jenkins and Sofos (1996) note:

> the potential ingredients (of collective national identity) are diverse - a common language, a shared history or culture, religious particularism, a sense of territorial, ethnic or 'racial' distinctiveness and /or assertion of opposition to other communities, or indeed the existence either in the past or in the present of some political identity - a state or subordinate administrative unit (p. 11).

According to Webster's dictionary, a nation is a community of people composed of one or more nationalities and possessing a more or less defined territory and government. According to other definitions, a nation can be described as a community of people obeying the same laws and institutions within a given territory (Smith, 1991). This implies some common institutions and a single code of rights and duties for all members of the community. It also suggests a definite social place, a fairly well bounded territory, with which the members identify and to which they feel they belong. This presupposes a measure of common values and traditions among the population (Smith, 1991)—"In other words, nations must have a measure of common culture and a civic ideology, a set of common understandings and aspirations, sentiments and ideas, that bind the population together in their homeland" (p. 11). Divided nations (for example, West and East Germany, North and South Korea) serve as good examples for this definition. Although East and West Germans obeyed different laws and were governed by different institution,

all of them viewed themselves as Germans based on earlier history, culture and overall identity as Germans.

Historic territory, common institutions, legal-political equality of members, and common civic culture and ideology comprise the standard model of a nation (Smith, 1991). Consequently, national identity is awareness of these features and their functions. It is awareness of these commonly held (and often unspoken) rules and norms, and the appreciation and support of them. Therefore, national identity is a function of:

- Common culture, norms and values shared by a country's population
- Perception of collective destiny (goals) among the people in the country
- Common institutions/rights and duties for all members of a society
- Common myths and historic memories among citizens of a country

Shulman (2005) suggested that national identity was formed around the following factors: basic unifying and distinguishing features, compatibility of multiple ethnic or national identities, domestic policy, and foreign policy. In its approach, Smith's concept of national identity formation corresponds to Schulman's concept. Smith's *common culture, norms and values,* and *common goals* correspond to Shulman's *basic unifying* and *distinguishing features,* and Shulman's *domestic policy* corresponds to Smith's *common institutions and legal rights and duties for all members.* As far as foreign policy, it is suggested that this policy is based on national identity awareness of the leaders who make international decisions (Smith, 1991)—"The selection of political personnel, the regulation of political conduct and the election of governments are grounded in criteria of

national interest, which is presumed to reflect the national will and national identity of the inclusive population" (p.16).

Decisions by the leadership most closely reflect the will and interests of the population when there is a strong national identity awareness in the population. When the sense of national identity is strong, the nation becomes "a faith-achievement group, able to surmount obstacles and hardships" (Smith, 1991, p. 17). Strong national identity unites a nation and strengthens the fiber of the country, individually and collectively. For Rustow (1970), national unity means that the vast majority of citizens have no doubt or mental reservations as to which political community they belong. Harrison (1992) called national identity awareness *the radius of identification.* He stated that in countries with relatively high degrees of identification, the politically and economically powerful are more likely to concern themselves with the well-being of the masses. One area which concerns this reflection is government decisions aimed at the increased welfare of the nation, budget allocations, high levels of literacy and public health, and other areas of social stability and welfare. An indication of a strong perception of national identity is when belonging to a particular social class does not overshadow an individual's economic actions to the degree that national interests are neglected or abused. Strong national identity is also displayed when individuals possessing above average power and authority make important national economic decisions, not based on their personal association with a particular social class or on their desire to increase their personal resources, but based on the economic interests of the nation (when applicable). Such an attitude can be called country-responsible self-interest. Smith (1991) described such an attitude as "a consciousness of belonging to the nation, together with sentiments and

aspirations for its security and prosperity" (p. 72). Velychenko (1993) supported this idea and said that national identity usually appears as a means to attain social or economic goals, and is "essential to group survival" (p. 18). In such situation, citizens see the nation as existing perpetually, and this belief serves as a framework for political-socio-economic decisions the country's leaders make. National identity plays an important role in the politico-economic development of a nation. It legitimates common legal rights and duties of legal institutions, which define specific values of the nation and reflect the customs of its people.

Other researchers working in the area of national identity support this framework. For example, Canovan (1996), Duijker and Frijda (1960) emphasized the role of national institutions (organizations that regulate the habits of people) and norms and values in the formation of national identity. Prizel (1998) wrote that abiding institutions and collective memories are the major foundations of national identity. Harrison (1992) pointed to the level of ethical behavior, trust, and cultural norms, as well as institutions that support their perpetuation. Jenkins and Sofos (1996) underlined the importance of territorial distinction and opposition to (distinction from) other communities. They suggested that creation of an "us" and "them" attitude facilitates awareness of citizens of a nation as those belonging to a particular nation.

The earlier discussion established the existence of a relationship between national HC and national identity awareness. Consequently, national HC is also affected by the variables which influence national identity development. More specifically, national HC may be said to be affected by the following factors, and is a function of them:

- Common norms, values, and culture shared by a country's population

- Perception of collective destiny (goals) among people in a country

- Common institutions/rights and duties for all members of a society

- Perpetuation of common myths and historic memories among citizens of a country

This section has established a basic model of the factor of national identity awareness. It has specified the major variables through which national identity is formed. Following is description of the process of operationalization of each of these variables.

Operationalization of Common Norms, Values, and Culture Variable

The variable of common norms, values and culture can be assessed by the degree a society is cohesive in norms, values, and culture. Because cultural and normative values are generally grounded in ethnicity, religion, and language, this variable essentially measures the degree of linguistic/ethnic/religious homogeneity of a nation. The degree of homogeneity will be a pattern for the degree of communality in values, culture and norms. This study suggests evaluating homogeneity by simultaneous assessment of the strength of forces that increase and decrease it.

Factors that Decrease Homogeneity in a Society

The presence of unorganized diversity in language, culture, religion, and race generally results in a lack of social and economic integration, which consequently negatively affects the process of nation-building. Attachments to different customs, religions, languages and races conflicts with the requirements for political integration, and in particular, with the need for more generalized commitment to a nation-wide civil order.

Adelman and Morris (1967) suggested using the proportion of people belonging to the same ethnic/religious/language group as an indicator of the extent of linguistic, religious and racial homogeneity of a country. A trend in research (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003; Annett, 2000; Bossert, D'Ambrosio, & LaFerrara, 2006) has suggested assessing the level of group homogeneity/heterogeneity by calculating the *fractionalization index.* This index serves as a proxy for the number of competing groups in a society. *Fractionalization index* measures the probability that two randomly selected persons from a given country will not belong to the same group (Alesina et al., 2003). A group may be defined according to different qualities. In this dissertation, the *fractionalization index* measures the probability that two randomly selected persons from a given country do not belong to the same ethnic/religious/language groups, and thus, do not share common norms, values and culture.

Annett (2000) suggested that societies are composed of multiple self-interested groups who act non-cooperatively. With an increase in the number of such groups in a society, a possibility of cultural/norm/value conflict increases. The bigger the diversity in languages, religions and ethnicities, the smaller the degree of common culture, norms and values that they share. Annett (2000) cited Canning and Fay (1993), who argued that a more fractionalized population displays lower productivity growth (Annett, 2000, p. 572). Vigdor (2002), Alesina and La Ferrara (2000, 2005) concluded that an individual's willingness to invest resources in local public goods, as well as participate in heterogeneous communities depends on how many members of the community share the same ethnicity of that individual. The greater the initial cultural and ethnic heterogeneity

of a society, the less likely it is that modern integrative mechanisms such as education

and mass communication will be effective in promoting a unified population.

Factors That Increase Homogeneity in a Society

It has been suggested (Alesina et al., 2003; Bossert et al., 2006; La Porta, Lopez-

de-Silans, Shleifer, & Vishny, 1999; Smith, 1991) that a high level of fractionalization in

a country can be offset by a strong government and strong national institutions. If a

country is comprised of many nationalities, but has strong national institutions to

organize them, such a country displays stronger integration, and the population more

strongly adheres to common norms and values than a country with many nationalities, but

no force to organize them together in a unified nation. In fact, a country with strong

institutions or government is capable of building and supporting an "umbrella" culture

that welcome diverse cultures. In spite of forces which tend to result in disruption of

national cohesion (such as major wars, occupation, deportation, influx of immigrants),

some nations still preserve it, while others dissolve and assimilate. There must be some

strong institutions that keep people together. It can be either strong and effective

government or any other nationally-recognized institution that is equally effective (for

example, the Catholic Church in Poland and Judaism in Israel). The historical experience

of countries with opposite political systems, which were able to reach significant

economic growth, reveals the fact that often it is not the content of the institutions that is

important but their strength and ability to keep the society together, effectively utilizing

the human and material resources of the population (the USSR and USA can serve as a

good comparison here). Rationally organized administrative services can help establish

and strengthen the public services necessary for social integration and economic growth. Effective institutional bureaucracy can display the responsibility, rationality, and high professionalism necessary to achieve this goal (La Palombara, 1963).

It has been suggested that the quality of a government's work in building a cohesive and homogeneous society may be measured in terms of the amount of financial resources it consumes (Annett, 2000). This suggestion is based on the nature of government consumption. One major component of government consumption is the wage bill of the bureaucracy, which is responsible for establishing and running national institutions capable of strengthening social cohesion. Another major component is transfer of fiscal resources to the various groups of society. This transfer usually takes form of public provision of goods (either of public goods or publicly provided private goods). As Annett (2000) succinctly put it, "the most natural interpretation of government consumption is to think of it as the quantity of publicly provided goods provided by the government at any point it time" (p. 564). Examples of such goods are schools, health care, recreation facilities, etc. It has been shown that ethnic fractionalization is strongly negatively correlated with good schooling, well-developed financial institutions, and institutional quality (Easterly & Levine, 1997). Government consumption may be viewed as a measure of the degree to which the government is capable of placating high social fractionalization (Annett, 2000; Rodrik, 1997). This can appease competing groups and reduce the level of conflict in a society divided by ethnic, religious, and language lines.

Conversely, high fractionalization of society is associated with low schooling, underdeveloped financial institutions, high government deficit and poor institutional quality. In a related work, Alesina, Baqir, and Easterly (1999) studied the relationship

between fractionalization and the provision of local public goods in the US. They found

that an increase in the level of ethnical diversity in a region is associated with higher

spending and deficits per capita, but with lower spending on basic public goods like

education. Therefore, cohesion in a society can be measured by both variables—the

overall level of government consumption or government spending on basic public goods,

such as education and healthcare. Because the former potentially covers a broader range

of public services than the latter, this study will utilize the measure of overall government

consumption.

It has been suggested (Alesina, Baqir, Easterly, 1999; Annett, 200o),that

government consumption needs to be measured as the share of government consumption

in GDP minus the ratio of government expenditure on defense. The reason for excluding

military spending is the different nature of military spending, and the correlation between

military expenditure and instability in countries.

Final Operationalization of the Variable of Common Norms, Values, and Culture

Utilizing discussion of the previous two sections, the following indicators are

suggested to measure the variable of common norms, values, and culture:

- Language cohesion

- Ethnic cohesion

- Religious cohesion

- Level of total government consumption minus military expenditure as percent

   of GDP

Operationalization of Perception of Collective Destiny Variable

This variable assumes the existence of collective goals in a nation and perception of collective destiny by the major groups in a nation. Such an understanding is based on a framework that assumes perpetual existence of a country, and views personal welfare as nested in the context of the welfare of the country. Politico-socio-economic decisions by leadership are affected by the degree to which such an understanding exists in the country. The author of this study suggests assessing this variable by measuring 1) the degree to which people in the country view themselves as "sailing together in one boat;" 2) the proportion of people in a country who see their personal welfare in the context of the welfare of the country; 3) the degree to which the actions of the leadership are affected by a wider sense of identity.

The Degree People in the Country View Themselves as "Sailing Together In One Boat"

As a proxy for this measure, the researcher suggests using Corruption Perception Index compiled by Transparency International. The reasoning of using this variable is grounded in the fact that any corruption hurts the national economy through artificial market distortions (Hellman, Klich, & Kaufman, 2000; Shleifer & Vishny, 1993). A competitive market is known to deliver the most economically efficient results. Influencing the market through corruption reduces its competitiveness, and consequently hurts national interests. A high level of corruption is known to reduce the strength of a country in terms of its territory and independence of its interior and exterior decisions. At the same time, corruption creates personal economic rent, which may be attractive for some individuals. Businesspersons and politicians often encounter situations when they

can make either choice: seeking their personal rent at national expense hurts national interests, while seeking national interests may obliterate chances for (unlawful) personal gain. Countries with a high level of corruption have politicians and business leaders who are willing to choose personal economic rent at the expense of national market distortions. This means that they do not identify their financial welfare with that of their country. They do not see themselves as "sailing together in one boat" with the rest of people in the country, and, consequently, are not interested in improving the conditions of this "boat." They do not see themselves as agents in perpetuating the existence and welfare of the country into future generations. Therefore, they do not have strong national identification with their country. As suggested earlier, behavior of national leaders generally can be viewed as a typical behavior of the rest of population. Therefore, a high level of corruption may be said to be a characteristic of a country whose population, by their own choice or under the pressure of circumstances, does not see itself as one nation "sailing together in one boat."

The Proportion of People in a Country Who See Their Personal Welfare as Nested in the Context of the Welfare of the Country

  Gini coefficient (as a proxy for the size of the middle class in a country) can serve as a measure of the number of people who see their personal welfare as nested in the context of the welfare of the country. Gini coefficient is a well-accepted measure of inequality in a country (as measured by income distribution). It has been suggested (Aghion, Caroli, & Garcia-Penalosa, 1999; Berkowitz & Jackson, 2005; Glaeser, Scheinkman, Shleifer, 2003) that equitable income distribution is conducive to economic

growth of a country through being instrumental toward the creation of a powerful middle class. Historically, the middle class is known as the group of people whose economic interests are concentrated inside the country and who are therefore interested in the country's healthy politico-socio-economic development. In comparison with the upper class (who is predominantly cosmopolitan in its economic interests) and the lower class (who does not have a strong voice in national decisions), the middle class sees improvements in the country as the foundation of improvements in their own lives, and possesses enough power to initiate national actions based on this understanding (Fidrmuc, 2000; Romanenko, 2007). Anthony Smith has recommended that nations must have a set of common aspirations to be successful in their pursuit of affluence. Adelman and Taft-Morris (1967) added that the presence of active indigenous groups in the middle class is considerably more conducive to the initiation of the growth process than is the presence of expatriate groups in that class. The middle class is the group of people who most logically possess such common aspirations.

The middle class can be defined in both economic terms, meaning a relatively flat income distribution, and in political terms, meaning a bloc of centrist voters (Berkowitz & Jackson, 2005). The difficulty with this measure is that direct measures of classes in a society do not exist. As Fuller and Clarke (1994) put it (cited in Buchmann, 2002, p. 167), "the greatest weakness… is the lack of social class measures that are culturally relevant to the particular society or community being studied." Because of this, some researchers use such ethnomethodological measures as types of livestock and modern items in possession (Buchmann, 2002, p. 167) to validly discriminate families' levels of wealth and social class. It has also been suggested (studies at the University of

Pennsylvania, mentioned by Buchmann, 2000), that home possessions data can prove a more comparable measure of SES than parental education and occupation.

At the same time, both—sensitivity to local context and concern for comparability across multiple contexts—are important. Although researchers need to be careful in applying Western measures in non-Western contexts, the use of broadly divergent measures may lead to not reliable results (Buchmann, 2002). Therefore, this study suggests using *Gini Coefficient* measure as a proxy for the size of the middle class in a country (with an understanding that this measurement has its weaknesses).

The Degree a Country's Leaders' Actions Are Affected by a Wider Sense of Identity

An array of literature suggests that there is strong relationship between the core values of a nation and its elite (Duijker & Frijda, 1960; Hofstede, 2001; Kotkin, 1993; Smith, 1991). Dujker and Frijda (1960) stated that "national character is determined by the character of the elite" (p. 28). They suggested that elites represent most clearly those psychological features which distinguish one nation from another. "The very fact that they are national elites might make it probable that they represent and embody the values current in their nation more clearly, more completely… than the other strata of the population" (p. 29). Kotkin (1993) concurred that national decline and rise are connected with the quality of national elites. Hofstede (2001) saw the reason for strong correlation between characteristics of national elites and characteristics of the whole nation in the fact that "elites were more likely than non-elites to shape the institutions that perpetuate a culture" (p.14). Prizel (1998) described evolution in a country's national identity as transfer of that identity from the elite to the popular level. Generally, the ideas, attitudes

and practices of the elite serve as models to other members of a society. The question is whether elites and the general strata have national development in their utility function, or if they perceive their socio-economic success as independent from the wellbeing of the country in which they are located. The question is whether the elite identify with success of the country or whether they see no correlation between their personal economic and social wellbeing (as measured in personal income and socio-political voice), and those of their country.

Kevane (1997) and Cremer (1986) suggested thinking of national identity in terms of membership in an ongoing organization (a nation). They state that if individuals fully realize that they were born into an infinitely lived social organization, which covers a much longer period than their personal lives, they will adjust their socio-economic behavior to include this fact into their utility function even if they as individuals have finite life spans. Sen (1986) supported this idea by explaining how identity becomes important in the socio-economic development of a country: "…the choice of actions may be seen as a group choice and 'self-interest' in that context may involve a correspondingly wider sense of 'identity.' 'We' may be the natural unit of first-person decision" (p. 351). Such a conclusion is grounded in basic economic way of looking at behavior, which assumes that "individuals maximize welfare as *they conceive it,* whether they be selfish, altruistic (or) loyal (Becker, 1993, p. 386). In other words, if individuals in a nation conceive perpetuation of welfare of this nation as a part of their utility function, they will maximize their welfare by aiming for a goal of increased welfare for the nation. Jenkins and Sofos (1996) concurred: "national identity articulates demands for

expression of the national/popular general will, without however linking them to the representation of particular social identities and interests" (p.14).

Smith (1991) said that strong national identity awareness signifies strong social and political movements to achieve the goals of the nation. He proposed that it was "a consciousness of belonging to the nation, together with sentiments and aspirations for its security and prosperity" (p.72). Consequently, having national goals, and actually pursuing them on a national level with all strata of society, as well as being aware of them and participating in them, is a consequence of strong national identity awareness in the nation.

The question that becomes very important is how many people in society view their experiences in these terms. As a possible proxy for such a belief, the researcher suggests using the measure of time a country has been independent. The reasoning for the use of this variable is grounded in the fact that the time factor improves the chances of citizens developing a strong national awareness.

Final Operationalization of the Variable of Perception of Collective Destiny/Common Goals

Utilizing discussion of the previous three sections, the following indicators are suggested to measure Collective Destiny/Common Goals variable:

- Period of national independence

- Corruption Perception Index

- Gini Coefficient

Operationalization of Common Institutions/Rights and Duties for All Members

Variable

It has been suggested that institutions reflect national character and support the perpetuation of national culture. It has also been suggested that the economic conditions of a country to some degree are a function of its socio-cultural customs and institutions (Adelman & Taft-Morris, 1967; Duijker & Frijda, 1960; Fukuyama & Avineri, 1994; Harrison, 1992; Sen, 1985, 1986). As Harrison put it, "it is impossible to answer (economic) questions without examining the impact of culture on human progress - the values and attitudes of a nation, and the institutions that both reflect and reinforce those values and attitudes" (p. 6). Duijker & Frijda (1960) agreed that the national system of norms and values, the general pattern of characteristics specific for a nation, were evident in the nation's institutions. Hofstede (2001) stated that institutions, once established, reinforced societal norms and the ecological conditions that had led to their establishment. Societal norms lead to the development and pattern maintenance of institutions in society with particular structures and ways of functioning. Generally, the major institutions of the country are those which uphold the overall livelihood of the country, such as the institution of government, the institution of education, legal institution, and media institution. To assess these institutions, it is necessary to assess the quality of service they provide to the country. The World Bank is an organization which consistently assesses the quality of national institutions of all countries. Therefore, this study uses their measures for the discussed factor. (The institution of education is not included in the current discussion in order to avoid multicollinearity problems during the statistical analysis).

Final Operationalization of the Variable of Common Institutions/Rights and Duties for

All Members

This study suggests operationalizing this variable by selected measures of the

World Bank's *Governance Indicators:*

- *Government Effectiveness* measure: a composite measure for the

  quality of public services, civil services, and the quality of policy

  formulation and implementation (Kaufmann, Kraay, & Mastruzzi,

  2007).

- *Voice and Accountability* measure: a composite measure which

  evaluates the extent to which a country's citizens are able to

  participate in selecting their government, as well as freedom of

  expression and media (Kaufmann, Kraay, & Mastruzzi, 2007).

Operationalization of Common Myths and Historic Memories Variable

This variable measures the degree to which national identity awareness in the

population is developed via citizens' being reminded about the uniqueness of their

country by stories about its history or its current successes. The researcher suggests

operationalizing this measure by the indicators which measure how often citizens in a

country are reminded about the uniqueness of their country by their direct and indirect

participation in cultural and sport activities and institutions that set aside their country as

different from others.

Citizens' Active Participation in Perpetuation of Common Myth and Historic Memories

This study suggests the following indictors to measure this variable: school life expectancy and the number of national holidays that are celebrated in a country.

School life expectancy (in years). Generally, children and youth learn their national history in school. School is the major institution responsible for perpetuating citizen awareness in national memory and culture. Education is the major tool for reproducing the existing structure of the society, including the myths and legends that support that national culture (Bourdieu, 1977). Generally, learning national history is strengthened with every academic year in accordance with the gradation of historical complexity. Consequently, the more years in school a child has completed, the more chances he/she has had to learn more about his/her country and internalize the national identity.

Number of holidays that the country celebrates. The reason for inclusion of this variable is that holidays are generally a time when family/national history and traditions are remembered and practiced.

Citizen Non-Active Participation in Perpetuation of Common Myths and Historic Memories

This dissertation suggests the following indicators to measure the variable of citizens' non-active participation in perpetuation of common myths and historic memories: number of Nobel Prize laureates in a country and number of Olympic medals. The honor of a country's citizen winning the Nobel Prize or a country's team winning a medal in Olympic Games increases national pride, forces citizens to be united as a nation

and remind them in which country they live. An occasion of winning the Nobel Prize or a country winning Olympic medal can be used by the government as a good opportunity for further developing national pride.

Conclusion

The preceding sections analyzed the structure of the construct of national identity awareness by way of literature content analysis. Four factors which constitute this variable were analyzed, and empirically measurable proxies for every factor were suggested as a result of the analysis. Overall, the variable of *national identity awareness* may be presented as a function of the following indicators:

- ❖ Common norms, values, and culture
  - Ethnic cohesion
  - Linguistic cohesion
  - Religious cohesion
  - Total government consumption minus Military expenditure as percent of GDP
- ❖ Perception of collective destiny
  - Corruption Perception Index
  - Gini Coefficient
  - Time of Independence
- ❖ Common institutions/Rights and duties for all members
  - Government Effectiveness measure
  - Voice and Accountability measure

❖ Perpetuation of common myths and historic memories

- Number of Nobel Prize laureates in a country (1901-2005)

- Number of Olympic medals (1998-2005)

- School life expectancy

- Number of holidays that the country celebrates

Family Background Factor

As previously discussed in this chapter, the role of the family is an important factor in the formation of HC in its members. On an aggregate level, families in a country contribute to development of national HC. This chapter establishes specific mechanisms of this process, develops a model of the Family factor construct, and suggests empirical measures for this construct.

Family Background Factor as a Formative Component of National Human Capital

This section explores and establishes the relationship between families within a country and the level of HC that the country attains. It identifies specific channels for the process of the Family factor's influence on national HC.

A sizable group of HC authors have argued (Heckman & Cunha, 2007; Heckman et al., 2006; Mincer & Polachek, 1974; Schultz, 1971) that the major function of the family as a social institution is the building of human capital of children, as Schultz (1971) called it, "child capital." In his words, "A particular class of human capital consisting of 'child capital' may hold the key to the economic theory of population. The

formation of 'child capital' by the household, man and wife, would begin with the bearing of children and proceed through their rearing through childhood" (p. vii).

Family background is one of the major contributing factors in the process of formation of children's HC by their families. It plays a crucial role in shaping the educational experiences and achievement of children and the generational transmission of status. Three interrelated processes explain the process of family background's affect on children: 1) transmission of financial capital; 2) transmission of cultural resources; 3) transmission of social capital from parents to children (Ben-Porath, 1980; Bourdieu, 1990; Buchmann, 2002; Nash, 1990).

Much has been written in academic literature on the models and processes of transmission of financial capital as a type of non-market transaction (Becker, 1993; Becker & Tomes, 1976; 1986; Ben-Porath, 1980; Schultz, 1986). Bourdieu's ideas (1977, 1986) are very prominent in any discussion of the transmission of cultural and social capital. He noted that cultural capital could exist in three forms: embodied as a disposition of the mind and body; objectified as cultural goods; and in its institutionalized state, for example, education (Bourdieu, 1986). Bourdieu recognized social capital as "the aggregate of the actual or potential resources which are linked to the possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (p. 248). Ascribed status as a member of a certain family has a greater operational significance for others outside the family than the actual achieved status of the individual. Family creates a collective identity that affects the transactions of each member with people outside the family (Becker, 1993; Ben-Porath, 1980; Buchmann, 2002; Van Zanted, 2005). The role of family affiliation vis-à-vis others is based to a

significant degree on its value as a signal of personal traits and the degree to which the family is responsible for its members' actions. All three sources of capital—financial, cultural, and social—are distinctive resources that can be mobilized through the family in support of its children. These avenues are used by families to affect their children's development and, together, act toward development of HC of children in the family.

Specific Channels of the Family Background Factor's Influence of Human Capital Development

Transmission of Cultural Capital

Education. One major mechanism in the transmission of cultural and social capital takes place through the formal and non-formal education of a child. Since education is an essential HC variable, it has been suggested that families affect HC in a country through affecting the education potential of children (Heckman, & Cunha 2007; Heckman, Layne-Farrar, & Todd, 1996).

Conventional wisdom, which places educational institutions in the center of producing skills and knowledge necessary to succeed in modern economy, neglects the crucial role of families in fostering these skills and a variety of other abilities crucial for economic and social success (Heckman, 2000; Heckman, Layne-Farrar, & Todd, 1996). It has long been recognized that parental influences are key factors governing child development, as abilities are created, not solely inherited, and are multiple in variety. Heckman (2000) suggested that the family's effects on the educational achievement of children are twofold: a) families engage in skills, character, and abilities formation from the moment a child is born, much earlier than any educational institution, and b) families

are the prime places where socially and economically valuable non-cognitive skills and

motivations are formed, which are variables in economic success.

> Children's tastes for education and their expectations about their life chances are
> shaped by those of their parents. The influence of family factors that are present
> from birth through adolescence accumulate over many years to produce ability
> and college readiness (Heckman, 2000, p. 15).

It has been argued that the disincentive affects of college tuition on college

attendance are dramatically weakened when ability is entered into the analysis of college

attendance (Cameron & Heckman, 1998). Since Schultz (1981) stated that natural

abilities are normally spread between and among nations, and that the major difference in

the quality of HC among nations comes from acquired abilities, it is possible to say that it

is family which constitutes an important influence in abilities acquisition (along with

school, which steps into the process considerably later in a child's life).

Supporting this view is a group of researchers who argue that the role of the

family in shaping children's social and academic readiness is evident in the fact that

ability gaps between individuals and across socioeconomic group become noticeable at

an early age for cognitive, as well as non-cognitive skills, while school quality and

resources have relatively small effects on these gaps (Hanushek, 1997). At the same time,

other researchers (Krueger, 2002; Mosteller, 1995) found strong support for the opposite

view, arguing that "the literature exhibits systematic evidence of a positive relationship

between class size and achievement, and between expenditures and achievement"

(Krueger, 2002, p. 35), as measured in gains and losses on test scores during the school

year. However, the same group of researchers acknowledged that this gain's effect

disappears when school is not in session, because children from poor families receive

little academic enrichment during that time. Consequently, their argument once again points to the importance of families in children's academic success.

It has been stated that for many skills and abilities, later remediation for disadvantage is possible, but is much less efficient and effective than if given to children at early age (Heckman & Cunha, 2007). A study by Hopkins and Bracht (1975) showed that IQ scores become stable only by the time a child is 10 years old. Goleman (1995) provided evidence that the neocortex of the brain, which is responsible for reasoning and thinking processes, completes its development late into the teenage years. Early childhood is when children spend most of their time with parents. This means that families are in large part responsible for the level of IQ their children will have as adults. An opposite view is represented by Herrnstein and Murray (1994), who claimed that a general ability factor is mostly determined by heredity and is of utmost importance as it overrides the importance of family background and of any other factor. However, these claims are not shared by economists (Daniels, Devlin, & Roeder, 1997; Fienburg & Resnick, 1997; Korenman & Winship, 2000).

Disposition of mind. Families play a crucial role, not only in developing children's academic skills and knowledge, but also in the development of the child's emotional and social skills. Development of emotional skills is achieved through the channels of social-psychological factors that the family provides—parental involvement with children, psychologically safe and nurturing environment, and family social and cultural capital (Buchmann, 2002; Goleman, 1995; Gerber & Hout, 1995; Haller & Portes, 1973; Sewell, Haller & Portes, 1969). According to Emotional Intelligence theory (Bar-On & Parker, 2000; Goleman, 1995), people's emotional well-being is the key to

their economic and social success. By families' active participation in emotional development of children and their help in assisting children to develop into emotionally mature adults, families strongly contribute to formation of a high level of HC in a country.

Cultural goods. Family background affects development of children's HC through providing cultural goods, which include various cultural events, works of classic and contemporary art, history and science. More affluent families are in a better financial position to do this. At the same time, a similar effect can be achieved by less wealthy families who realize importance of children's exposure to classical and contemporary culture and art and act consistently upon this understanding.

Transmission of Social Capital

Social capital can be broadly defined as a supportive network that furthers an individual's goals. In the words of James Coleman (1988):

> Social capital is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors—whether persons or corporate actors—within the structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that in its absence would not be possible (p. S 98).

Social capital exists in relations among persons, through goodwill and fellowship between individuals. The amount of resources individuals in a network possess, as well as the sheer number of individuals involved in the network, affects efficacy of social capital derived from such a network. Family background is a factor which generally causes these variables. Consequently, HC of family members is affected by the family's social capital, which, in its turn, is influenced by the family's background.

Family's Role in Meeting Psychological Needs of Family Members

Emotional Intelligence theory can also been applied to argue that families affect HC of not only children, but their adult members as well. According to Maslow's needs theory, a psychologically safe, nurturing and comfortable environment is a basic psychological need not only of children but also of adults. Therefore, another possible way family affects national HC is through affecting the psychological/emotional health of all its members by meeting/not meeting all family members' needs in this area. As Becker (1964) noted more than forty years ago, "emotional health increasingly is considered an important determinant of earnings in all parts of the world… One way to invest in human capital is to improve emotional (and physical) health" (p. 33). Consequently, the researcher suggests that *family background* factor affects HC through:

- Family's role in governing development of children
  - Family affecting children's cognitive abilities
  - Family affecting children's emotional abilities
- Family's role in meeting psychological needs of all family members

Family's Role as Governing Development of Children

According to Hartog (2001), in the simplest possible framework, individuals are characterized by an ability vector *a,* which is transferred into skill vector *s* through an educational production matrix *E.* Skills are transferred into outputs *q* by a productivity matrix *Q.* Earnings are determined by output prices *p* and productivity.

$$s = Ea$$

$$q = Qs$$

$$y = pq$$

Therefore earnings *y* can be presented as:

$$Y = pQEa$$

Ability is an indication of the potential of an individual, while skill is the actual proficiency in an activity. Affecting the *ability* and *skill* vectors by affecting the *E* production function, family influences the future economic welfare of an individual. *Abilities* and *skills* vectors signify both—cognitive and non-cognitive—characteristics.

Family Affecting a Child's Cognitive Abilities

Children's cognitive abilities are affected by two major sources—their parents' genes and the family environment. In fact, the positive influence of parents' schooling on their children's schooling is driven to a great extent by the family environment and not ultimately by genes. Although heritability of cognitive abilities in childhood is well-established (McGue, Bouchard, Iacono & Lykken, 1993; Plomin, 1999), its magnitude and mechanisms remain unresolved (Turkheimer, Haley, Waldron, & D'Onofrio, 2003). Research shows that although about 50% of all ability transfers relevant for educational attainment measured in years "run through genes" (Plug, 2007, p. 88) there is still sizable transfer through nurture, not nature (Plug & Vijverberg, 2003). Measured abilities are influenced by both—genetics and environment, and "gene expression is governed by environmental conditions (Heckman & Cunha 2007, p.3) to a considerable extent. Turkheimer et al. (2003) study showed that proportions of IQ variance attributable to genes and environment depend non-linearly on SES. In impoverished families, 60 percent

of the variance in IQ is accounted for by the environment and the contribution of genes is close to zero; in affluent families, the result is almost exactly the reverse (p. 623). This is true to a considerable extent even for adopted children. (Additional strong support for the importance of social environment may be found in the well-known results of the social experiment conducted in 1968 by Jane Elliott, a third-grade teacher in Iowa.)

Social environment is determined by socio-economic status (SES)/family background to a big extent. An array of research (Plug, 2007) speaks about family's SES in determining student achievement. With or without ability controls, parental schooling and income retain their positive influence on the schooling of children (Plug, 2007). Although SES is a complex variable, it can be defined as measuring the quality of the environment in which children are born and raised (Hartog, 2001; Turkheimer et al., 2003).

Family Affecting a Child's Emotional/Psychological Abilities

Becker (1993) stated that parental attitudes and behavior have an enormous influence on children in the family:

> Parents who are alcoholic or are addicted to crack create a bizarre atmosphere for impressionable youngsters, whereas parents with stable values who transmit knowledge and inspire their children favorably influence both what the children are capable of and what they want to do (p. 399).

The "Big Five" personality attributes that are routinely used as robust factors of predicting a child's academic success are as follows: emotional stability, agreeableness, conscientiousness/dependability, openness to experience, and extraversion (Hartog, 2001). The foundations of these qualities are formed early. Children learn them in families much earlier than they get a chance to develop them at school. A family that

provides for the development of such qualities gives a child a great springboard in life. Furthermore, skills are self-reinforcing and cross-fertilizing, which means that skills produce new skills, while also increasing their complexity and quality (Heckman & Cunha 2007). Moreover, better developed emotional skills lead to improvement in cognitive skills, in terms of learning promotion allowed by good emotional skills. Surely influenced by early development experiences, these Big Five personality dimensions have been attributed to work performance in adults (Barrick & Mount, 1991).

Family as Providing for Psychological Needs of All Family Members

As previously stated, one major role of the family is meeting the need for belonging, a safe and nurturing environment of all member of the family—not only children but adults as well. According to Maslow's needs theory, a safe, loving and nurturing environment is a basic need that must be met for a person to fully devote him/herself to pursuing higher goals. Family is the major social institution where this need is met. A group of economists (Becker, 1993; Schultz, 1974) proposed that people's decision to marry is an attempt to raise their welfare by comparing benefits and costs. The notion of welfare includes both economic and emotional aspects, as people maximize welfare as they perceive it. For example, Becker (1993) discussed "warm atmosphere," the feeling of love, duty and inspiration residing in some families, and not in others. It has been discussed earlier that emotional/psychological stability is considered an important quality contributing to human capital on the individual and group level (Becker, 1964). Consequently, the family's role in taking care of the emotional needs of its members is an important contribution for the development of HC in the family members. Aggregated

across a nation, a country's families play an important role in formation of the country's

HC by affecting the emotional aspect of life.

Conclusion

The ability of a family to provide for the cognitive and emotional development of

a child depends on the education of parents and the environmental conditions which the

family is capable of creating, which, in turn, depends on the family's background.

Therefore, assessment of family background is an important part of assessment of the

degree to which conditions in a family are conducive for child development. As discussed

in previous sections, cognitive and emotional development of children affects the level of

national HC development. Consequently, measures of family background need to be

assessed while evaluating national HC. A family's ability to meet the emotional needs of

its members is a crucially important factor which also needs to be taken into

consideration in this regard.

The Basic Model of Family Background Factor

The previous sections have established the importance of assessing family

background in order to evaluate the relationship between the Family factor and national

HC. Furthermore, in standard economic analysis, households and firms exist as collective

identities that completely replace the identity of the individuals affiliated with them. That

is why "family background is one of the most important social conditions to consider

when comparing populations cross-nationally" (Buchmann, 2002, p. 152).

Family background has been suggested to be measured by the following variables:

- Parents' income

- Parents' IQ

- Mother's IQ

- Father's IQ

- Mother's schooling

- Father's schooling

  (Plug, 2007)

- Number of siblings

- Highest grade of father

- Highest grade of mother

- Broken home

  (Heckman, 2000)

- Father's education

- Mother's education

- Father's occupation

- Mother's occupation

- Number of siblings

  (Graaf & Huinink (1992)

- Parental education

- Family structure

- Place of residence

  (Carneiro & Heckman (2003)

Data search for availability of these variables showed that most of them were not available as panel data for many countries. In fact, they were not available for most countries. One major difference of this study as compared with similar studies is the fact that this study uses available and empirical data for all of the world's countries (not just a few countries as most studies use). Consequently, there was a need to create a more parsimonious model of the family background factor that would incorporate measures that were available and easily empirically tested for all (or most of) the 163 countries in the sample. Therefore, the researcher analyzed the four models of family background mentioned above in order to create the model which would incorporate as many variables as possible from the models, according to their frequency of use and providing for cross-country availability.

Number of Children in the Family

Number of children in the family is an important factor in three out of four examined models. This factor is also the one that is available as cross-country panel data. Therefore, this factor was investigated.

Number of children in the family has a unique effect on the way child human capital is developed. Research suggests (Buchmann, 2002; Mincer, 1974) that number of children is negatively correlated with educational achievement. Becker (1995) used the

term *quality of children* and stated that it was connected with the home time of parents

that each child received as well as with shared resources: "Quality of children has to be

bought with time as well as money" (p. 263). Therefore, "increase in the quantity of

children raises the cost of the quality of children, and vice versa. This explains why the

observed income elasticity of demand for quality of children is high at the same time that

the observed quantity elasticity is low and often even negative" (Becker & Tomes, 1976,

p.143). An increase in the number of children increases the cost of raising the quality of

children since higher quality applies to more children (Becker, 1993; Schultz, 1986).

Number of siblings (relative to other background variables) is found to have an important

detrimental impact on child quality even for socially and economically advantageous

countries (Blake, 1981). Becker's insight in explaining this fact is that the expenditure

per child, which the parents consider necessary, rises with family income (Becker, 1993;

1995). This necessary level of expenditure depends on the social class a family belongs

to, which also establishes certain standards of quality (which varies with social class).

Ben-Porath (1980) agreed with this and stresses that the parental decision to have

children and how to behave toward them during their childhood are affected by

expectations concerning future mutual relationships. That is why in standard economic

analysis the number of children is added into the utility function of parents.

Becker suggested that from a pure economics approach, an increase in child

ability-endowments should reduce the investment by parents in children, which in turn

will reduce the cost of children and consequently will lead to increase in the number of

children (Becker & Tomes, 1976). The picture, however, changes when the issue of

quality comes into view. Two opposing forces are at work: a "wealth" effect that

motivates parents to compensate less to well-ability-endowed children, and an "efficiency" effect that induces them to reinforce better-ability-endowed children. There is a strong presumption that "efficiency" effect dominates for investments in human capital and the "wealth" effect for investments in nonhuman capital (Becker & Tomes, 1976). Given time constraints, parents may choose to invest more human capital in their better-endowed children. Taking into consideration the above discussion about the importance of time with parents for the future of the children, we can say that such behavior may further increase the quality gap between children, and their consequent economic success.

Family Size

Family size is an important factor in one out of four examined models. This factor is also the one that is available as cross-country panel data, thus, this factor was investigated. Family size, particularly extended family (additional adults living in the family, for example, grandparents, or other members of an extended family), may affect the process of HC development by increasing adult attention to children. In a large household there is greater flexibility—older children can help take care of younger ones, and older relatives can help as well. Another channel of how family size can affect HC of family members is through risk-mitigation. Additional adults in a family may reduce the risk of lowering welfare as well as increase family-structure security in emergency and a greater likelihood that larger numbers of adult family members will contribute to aggregate household income.

Broken home and *place of residence*

    Broken home and *place of residence* are important factors in one out of four examined models. These factors are also the ones that are available as cross-country panel data. Therefore, these factors were investigated.

    Ultimately, this study suggests using the following indicators of family background:

- Average number of children in a household

- Family size

- Urban/Rural population distribution in the country

- Existence of at least one social security program oriented toward families

- Divorce rate

Final Operationalization of the Family Background Variable

    The ability of a family to provide for cognitive and emotional development of all its members depends on the environmental conditions the family is capable of creating, which, in turn, depends on its background to a big extent. Therefore, appraisal of family background is an important part of assessment of the degree to which conditions in a family are conducive for development of all family members. As previously discussed, the cognitive and emotional state of family members affects the level of national HC development. Consequently, measures of family background need to be assessed while evaluating national HC. Overall, the variable of *family background* may be presented as the function of the following indicators:

❖ Family as governing development of children

- Average number of children in a household

- Family size (number of occupants per a household)

- Urban/Rural population distribution

- Existence of at least one social security program oriented toward supporting families

❖ Family as meeting psychological needs of all family members

- Divorce rate

Character Factor

As discussed earlier in this chapter, character qualities of people in a country are important contributing factors toward national HC. This section establishes specific mechanisms of the relationship between these variables, develops a model of the Character factor construct, and suggests empirical measures for this construct. The specificity of this chapter is that it relies on a more flexible approach in search for the variables' proxies because of a lack of applicable theories other than overall theories of moral development.

Brief Overview of the Framework Utilized in Development of the Character Factor

Importance of character qualities in human capital have long been recognized. Writing at the end of the 18th century, Adam Smith (1776/1937) believed that development and use of human capital was closely associated with the degree to which the system of democracy (natural liberty) and moral doctrines were allowed to prevail in

a society. Smith spoke about the need for education to not only teach basic literacy skills, but also to develop character qualities, "to prevent cowardice, and stupidity" (Spengler, 1977, p. 34). Many current researchers follow this approach in giving credit to the importance of character qualities of a population as an important factor in shaping national HC. For example, Becker (1993) suggested that "various kinds of behavior (are) included under the rubric of human capital" (p. 392). He established the concept of human capital as including different work habits,

> even including harmful addictions such as smoking and drug use. Human capital in the form of good work habits or addictions to heavy drinking has major positive or negative effects on productivity in both market and nonmarket sectors (p. 392).

Consequently, some behavior which is a part of HC, can improve economic outcomes, while other behavior, which is also a part of HC, may inhibit it. Psacharopoulos and Woodhall (1985) underlined the importance of character qualities in student achievement. They spoke about "individual personality" of students, which is a decisive factor in schooling output (p. 217). Fitz-Enz (2000) emphasized such character qualities as openness, cooperative spirit and trust. He underlined the importance of these qualities in the corporate world, where willingness to share information (information symmetry) for mutual benefit separates successful and unsuccessful companies. Bar-On and Parker (2000) and Goleman (1995) proposed that character development is the foundation of democratic societies. This proposition, together with Adam Smith's proposition about the association between democracy and human capital emphasizes the importance of character as a part of human capital.

This chapter utilizes the framework of the moral development theories (Durkheim, 2002; Kohlberg, 1981; Piaget, 1997; Turiel, 1983), and attempts to build the

model of the Character factor. The founders of the theories believed that morality and character development resulted from social interaction or immersion in a group. Kohlberg (1981), as well as many other researchers, believed in the importance of experience as a moral agent within a community. He suggested that full participation of community members in decision-making significantly enhances individual character development. Turiel (1983) underlined character development as grounded in universal concerns for fairness and human welfare. Therefore, people's consistent actions grounded in the understanding of these issues provide for gradual development of their character. Consequently, one way the Character factor is viewed in this study is as one which is built within a society and the one that manifests itself in social context. Concomitantly, some researchers (DeVries & Zan, 1994; Kohlberg, 1973) have viewed character development and morality as also dependent upon personal reflections. During the process of personal reflection, a readjustment of an individual's views take place, which then is manifested in his/her public and private life. Thus, this is the second way the Character factor may be viewed and is viewed in this study. Overall, this dissertation uses these two major avenues of character development as two factors of the Character construct: Character as manifested in public life, and Character as manifested in private life.

Another important area of assessment is how the environment influences people's character and moral decisions. Extensive research on the role of the environment indicates that a good environment is positively correlated with positive character qualities, and actually causes them, while bad environment brings out bad traits even in decent people (Fullan, 2003; Hofstede, 2001; Veenhoven, 1993). Therefore, the third

factor –environment where specific population is located—was added to account for the importance of environmental influences on individual moral decisions and character development.

Overall, this study suggests that the Character construct can be modeled as a combination of three factors: character as manifested in the private life of individuals, character as manifested in public life of individuals and specific environment where the population is located. Consequently, this study considers these avenues to assess Character construct.

Character as Manifested in Private Llife

This section examines the issue of how character manifested in private life can be measured. It suggests a number of indicators that can be used to measure this factor. The variables that this study suggests as the ones capable of addressing the issue of evaluating character of citizens in private life stem from the moral theory assumption that private life is one of the avenues where character is developed and manifested. The variables suggested are as follows: a measure of trust in a country, suicide rate, prison population rate, and attitude toward women in a society.

Measure of Trust in a Country

A line of research (Coleman, 1988; Fukuyama, 1995; Glaeser, Laibson, Scheinkman, & Soutter, 2000; La Porta et al., 1997; Putnam, 1995; Sapford & Abbott, 2006; Sztompka, 1999, 2002) has argued that trust in a nation determines the performance of the society's institutions, and consequently, the whole society. It is an

essential foundation for the exercise of agency in societies and is essential for the working of the market economy and democratic political institutions. Although the *trust* factor is generally considered as a part of social capital (access to social networks, status), it has been suggested that it is appropriate to consider it as a part of human capital as well (Glaeser et al., 2000; Goldin & Katz, 1999). In fact, social capital may be viewed as "a subcomponent of human capital that reflects an ability to earn returns from social situations" (Glaeser et al., 2000, p. 841). Furthermore, its presence or absence affects the degree of utilization of people's education and skills (Goleman, 1995). Trust may be defined as "a cognitive state: a feeling of confidence in those around you and/or in things unseen; the perception of socioeconomic systems and relations as regularities on which one may depend" (Sapford & Abbott, 2006, p. 60). Trust is cultural, normative, and deeply embedded in socially shared understandings. Sztompka (2002) calls a breakdown of social trust and confidence a cultural drama.

Fukuyama (1995) argued that high trust among citizens accounts for the superior performance of all institutions in a society, including business. This happens because higher trust between people in a population is associated with greater cooperation (La Porta et al., 1997, Sapford & Abbott, 2006), which reduces transaction cost in business and increases return on investments. As La Porta et al. put it (1997), trust is an input in the production of wealth, and its relationship with economic and social indicators is statistically significant and quantitatively large. For example, the effect of trust on large firms' share of the economy is large: a one standard deviation increase in trust raises that share by half of a standard deviation. A one standard deviation increase in trust raises the percentage of high school graduates in a population by one-half SD, and school adequacy

by one-third of a standard deviation (La Porta et al., 1997). Trust is not a truly exogenous variable. It increases with good past performance of a society's institutions. According to Putnam (1995), trust is a habit formed historically by horizontal networks of association between people, covering commercial and civic activities.

As a proxy for this variable, the researcher suggests using an indicator of public trust in police. This indicator can come from the cross-country data on appeals to police for help (as measured in annual reported offenses to police per 100,000 of population). The degree people appeal to police for help indicates their trust in their effectiveness and trustworthiness. This premise can be supported by comparing the number of reported appeals to police across countries. For example, in 2000, Switzerland reported 22,500 appeals to police per 100,000 population, while Burkina Faso reported only 700, and Romania reported only 3,000 (Encyclopedia Britannica, 2006).

Emotional Stability of Citizens

Becker (1964) underlined the importance of emotional stability for the economic welfare of people. Generally, emotional stability refers to emotional health and social adaptability and is measured by scales of confidence-anxiety in the broad range of everyday life circumstances (Lester & Bishop, 2000). The evidence supporting the importance of emotional stability in determining success at work and private life is impressive (Badaracco, 1997; Druskat & Wolff, 2001; Goleman, Boyatsis & McKee, 2002). Generally, measurement tools, which aim to assess individuals' emotional stability, address such issues as social integration, social adjustment, friendship, social activity, self-esteem and psychological well-being (Bar-On, Brown, Kirkcaldy, & Thome,

2000; Beck, Steer, & Garbin, 1988; Hills & Argyle, 2001; Lester & Bishop, 2000; Vitterso, 2001). Based on the meaning of these factors, the current study suggests using the following empirical indicators for evaluation of emotional stability of citizens for cross-country comparison:

- Suicide rate

- Prison population rate

- Attitude toward women in a society (in the family, at the job)

Character as Manifested in Public Life

This section examines the issue of how character manifested in public life can be measured, and suggests a number of indicators that can be used to measure this factor. Goleman (1995) stated that character development is the foundation of democratic societies. In his famous Fulton Speech, Winston Churchill (1946) announced freedom of speech, open and free elections and an independent court system as the foundations of democracy. Since then, these institutions have been considered as the ones that develop people as agents of democracy. Therefore, the level of development of democratic institutions in a country and the degree of citizens' participation in them can serve as a proxy for the level of character development of people. Social participation in democratic institutions in a country can serve as a good indicator of this variable, as it has been suggested that institutions reflect national character and support perpetuation of national culture. It has also been suggested that economic conditions of a country to some degree are a function of its socio-cultural customs and institutions (Adelman & Taft-Morris, 1967; Duijker & Frijda, 1960; Harrison, 1992). As Harrison put it, "it is impossible to answer (economic) questions without examining the impact of culture on human

progress—the values and attitudes of a nation, and the institutions that both reflect and reinforce those values and attitudes" (p.6). Duijker and Frijda (1960) agreed that a national system of norms and values, general pattern of characteristics specific for a nation are evident in the nation's institutions. Hofstede (2001) stated that institutions, once established, reinforce societal norms and the ecological conditions that led to their establishment.

To operationalize this variable, the researcher suggests using measures of people's participation in organizations and institutions in a country, as well as the democratic level of these institutions. The following variables are used in the study:

- Eligible voters participating in national elections

- International NGOs membership density

- Independence of Judicial System

- Level of Political Rights

- Level of Civil Liberties

Environment Where Human Capital Is Located/Level of Happiness of Citizens

This section examines the issue of how environment affects HC, and how this effect can be measured. It suggests a number of indicators that can be used to measure this factor.

Just as being a part of a certain family affects human capital development of an individual, being a particular nation ("a super-family") affects overall HC of a nation. Belonging to a particular nation, similar to belonging to a particular family, provides an individual/ citizen with certain experiences, and causes development of particular

abilities and attitudes. Classic comparative studies of the cognitive/social development of children in different countries have shown that the abilities developed depended on the task. Children become good at things that are important in a society and that they have occasion to develop and practice often—what Hofstede (2001) referred to as *collective mental software.*

One trend in research emphasized the importance of location qualities in terms of their effect on productivity of people. If there is a mismatch between individual or group HC resources and the environment where they are located, the economic value of these resources will not be completely utilized. Becker (1964) noted that higher economic benefits (as measured in earnings) might be a result of either better abilities or better social environment. This research trend is based on an assumption that some societal conditions better correspond to human needs and capacities than others. An international organization, Freedom House, uses the term "enabling environment" to describe this phenomenon.

There is an array of literature which concentrates on studying happiness in societies (Hills & Argyle, 2001; Veenhoven, 1993). Its main emphasis is on the factors that are perceived to be the ones which contribute to a feeling of psychological well-being (or happiness) in a population. One of the most influential of these studies is the study of happiness conducted by Veenhoven (1993). Veenhoven (1993) conducted a survey-based comparative study of "goodness" of human societies. He differentiated several criteria that indicated the level of quality of life in a society: their stability over time, their productivity in goods and services, the degree to which they realize particular ideas, and their livability. According to Veenhoven, the livability of a society is the

degree to which its provisions and requirements fit with the needs and capacities of its members.

Because of the lack of theory from which to deduct the necessary living conditions, Veenhoven (1993) used an empirical approach, and came up with two (output) factors that best indicate such conditions: the indicator of health in a society (as measured by life expectancy) and the indicator of overall personal satisfaction with life among people in society (as measured by self-reported measures of life appreciation in "quality-of-life" surveys). A basic assumption in these studies is that a good fit between societal provisions and demands and individual needs and capacities results in high appreciation of life by individuals. A nation can be more or less livable, which is likely to be manifest in the happiness of its citizens. According to Veenhoven, these two indicators explain 37% of the variance in happiness.

The choice of this measure comes from the subjective well-being tradition in the behavioral sciences. Overall, there are three major philosophical approaches to determining quality of life (Diener & Suh, 1997). The first approach describes characteristics of the good life as they are dictated by normative ideas (based on a religious, philosophical or other system). This approach has nothing to do with the subjective experiences of people. It is based on rational thought of what is good. This approach is related to the social indicators tradition. The second approach to defining the good life is based on the satisfaction of preferences, and is based on whether citizens can obtain the things they desire while being constrained by their limited resources. This is the economic approach of utility maximization. The third definition of quality of life is in terms of the experience of individuals. In this approach, there is a strong correlation

between an individual's life satisfaction and feelings of joy and contentment s/he experiences in life (Campbell, Converse, & Rodgers, 1976).

The input factors toward the level of happiness in a nation have been named as: the material comfort the economy provides; social equality in the country; freedom society provides; and access to knowledge (according to the study, they explain 77% of the variance in average happiness; Veenhoven, p. 79). The author conducted several external validity tests to establish the validity of survey assessed happiness for measuring livability of nations. One objection is that happiness cannot be compared across borders because of inevitable cultural bias in its measurement. Several commonly mentioned claims of cultural measurement distortion were checked empirically: language, desirability distortion, response style and familiarity with the concept. None of these distortions appeared to be involved. Furthermore, subjective well-being measures possess adequate validity (Diener & Suh, 1997). For example, "temporal stabilities in the range of 0.5 to 0.7 have been found over a period of several years" (p. 205) and response artifacts appear not to be strong. This suggests that the survey data on average happiness used in the study (similar to the World Values Survey) provide a good estimate of true happiness in countries.

The Economist Intelligence Unit (EIU) developed its Quality-of-Life Index (2005) separately from Veenhoven's Index. They used multivariate regression analyses between life-satisfaction surveys and various factors that have been shown to be associated with life satisfaction in previous studies. According to EIU, nine important factors (in order of importance) that influence life satisfaction in countries are: health, material well-being, political stability and security, family life, community life, climate

and geography, job security, political freedom and gender equality. The values of the life-satisfaction scores that are predicted by these nine indicators represent a country's quality-of-life index, which is based on objective cross-country determinants.

Diener and Suh (1997) investigated the construction of several types of Quality-of-Life indicators. They emphasized that subjective well-being is concerned with the respondents' own internal judgment of well-being, rather than what policy makers or academics consider important. Their research also showed strong correlation between subjective measures of well-being and income, human rights and societal equality (Diener & Diener, 1995). They agreed with Veenhoven and the EIU that the degree to which a society fulfills the basic needs of individuals and provides opportunities for them to achieve their goals, is an important determinant of national subjective well-being (Diener & Suh, 1997). Income allows for meeting individual needs and aims; human rights and equity give individuals opportunities to pursue their goals and needs within a society.

Although social indicators and subjective well-being correlate across societies, each type of measure yields additional information about quality of life of societies (Diener & Diener, 1995; Diener & Suh, 1997; Diener, Sandvik, Seidlitz, & Diener, 1993). Subjective well-being and objective quality of life indicators cannot be considered synonymous. This is attested to by countries that have similar social indicators, but different understanding of their well-being.

To operationalize this measure, the researcher suggests using the construct for assessing the degree of happiness in a country that Veenhoven (1993) suggested: material

comfort, social equality, freedom, and access to knowledge. The researcher proposes

using the following indicators:

- Expenditure on leisure as percent of the total family consumption

- Population above income poverty rate

- Parliamentary seats held by women

 (The measure of access to education is intentionally not used to avoid the problem of

multicolleniarity in the later analysis.)

Conclusion

Overall, the variable of *character* may be presented as the function of the

following existing measures:

❖ Character as manifested in private life

- Reported police offenses rate

- Suicide rate

- Prison population

- Attitude toward women in a society (in the family, at the job)

❖ Character as manifested in public life

- Eligible voters participating in national elections

- International NGOs membership density

- Independence of Judicial System

- Political Rights

- Civil Liberties

❖ Environment where specific population is located

- Expenditure on leisure as percent of the total family consumption

- Population above income poverty rate

- Parliamentary seats held by women

Conclusion

This chapter has reported on examined literature in four directions. The first part of the chapter reported on the literature related specifically to national HC, covering such topics as history of the theory of HC, historical and current measurement tools of HC, and the need to expand these tools. It also suggested several factors as the ones that affected HC, and therefore, might be added to currently used HC measures. The second part of the chapter dealt specifically with development of models and measurements of these newly suggested variables. Models of three variables (national identity awareness, family background, and character qualities) were created. Creation of these models utilized applicable theories and empirical research.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this dissertation is to construct and validate a more comprehensive human capital index, which captures more aspects of HC than conventionally used indices. Such an expanded HC index includes both—tangible and intangible—qualities of a population in a country. As such, composite index creation methodology must be employed as an overall framework for achieving this purpose. Therefore, the first section of the methodology chapter discusses methodology basics for composite index creation. The next section applies this methodology to the actual creation of EHCI. It includes the issues of the choice of variables, factor construction and aggregation of factors into the index. Finally, methods of validation are discussed and their application to the newly created index is presented.

Methodology of Composite Index Creation

This section addresses theoretical issues of latent composite index creation. It discusses two types of composite indices and makes a conclusion on the type to which EHCI belongs. Moreover, it explains the main rules of construction of latent composite indices, and presents an example of construction of an existing composite index: Human Development Index (United Nations).

Two Kinds of Composite Indices: Formative and Reflective

A sizeable amount of literature exists on the topic of composite index creation (Adelman & Taft-Morris, 1972; Babbie, 2004; Booysen, 2002; Diamantopoulos & Winklhofer, 2001; Healy & Cote, 2001; Jarvis, Mackenzie & Podsakoff, 2003; Johnson & Reynolds, 2005; Kallman, 1997; McGranahan, 1995; Stapleton & Garrod, 2007). Overall, composite index can be defined as "a synthesis of numerous factors into one given factor" (Booysen, 2002, p. 118, quoting Sainz, 1989). Composite indices are the measures arrived at via some empirical aggregation of a number of diverse variables, and are evaluated according to their content, method of creation, application, focus, clarity, availability and flexibility. In other words, good composite indices need to be sufficiently sensitive to differences in measurement constructs, reliable in terms of repeated measures yielding stable results, and accurate in being free from systematic error (Adelman & Taft-Morris, 1972).

Two major measurement models, which use multiple indicators to assess latent constructs, have been developed—the Principal Factor (Reflective) model and the Composite Latent Variable (Formative) model (Jarvis, Mackenzie, & Podsakoff, 2003). The main distinction between the two models is in the direction of causality between the latent variable and its composite measures: it can be either latent variable –> its empirical measures or empirical measures –> latent variable (Bagozzi, 1981; Fornell & Bookstein, 1982; Jarvis, Mackenzie, & Podsakoff, 2003). Fornell and Bookstein (1982) noted, "the unobserved constructs can be viewed either as underlying factors or as indices produced by the observable variables. That is, the observed indicators can be treated as reflective or

formative" (p. 441). The major importance of this question lies in the different methods of reliability and validity testing for both models.

The Principal Factor (Reflective) model is a model where covariation among the measures is caused by variation in the latent construct. The direction of causality is from construct to the measures. If the construct changes, the measures will change as well and therefore are called reflective measures (Bollen & Lennox, 1991; Fornell & Bookstein, 1982). In this model, the latent variable affects its measures, being responsible for their intercorrelation, and the indicators are manifestations of the construct. Such constructs meet all criteria of classical reliability testing. For example, internal consistency reliability is an appropriate standard for evaluating the adequacy of such a measure. An example of this model can be self-esteem measure, verbal intelligence measure, or quality of product measure (as someone's self-esteem increases, all of its measures inevitably increase as well).

The Composite Latent Variables (Formative) model assumes that changes in the measures cause changes in the underlying construct (Jarvis, Mackenzie, & Podsakoff, 2003). Consequently, this model is referred to as a causal or formative model and the measures that construct the model are called formative measures. Diamantopoulos and Winklhofer (2001) suggested that the origins of the formative perspective can be traced to the Operational Definition model. According to that model, a concept becomes its measure. In contrast with the reflective model, the formative model assumes that all measures have impact on the construct, and the indicators are defining characteristics of the construct. "That is, the direction of causality flows from the indicators to the latent construct, and the indicators, as a group, jointly determine the conceptual and empirical

meaning of the construct" (Jarvis, Mackenzie, & Podsakoff, 2003, p. 201). Formative

indicators "are observed variables that are assumed to cause a latent variable"

(Diamantopoulos & Winklhofer, 2001). Different from reflective measures, where

observed variables are perceived as reflective (effect) indicators of an underlying

construct of a latent variable, formative index measures view formative indicators as

variables that cause a latent variable, where formative indicators are exogenous measured

variables (Bollen, 1984; Diamantopoulos & Winklhofer, 2001; MacCallum & Browne,

1993). A formative approach characterizes several composite measures, which are widely

used in international economics. Examples include the Human Development Index

(United Nations Development Program), Level of Corruption Index (the World Bank),

Quality-of-Life Index (Economist Intelligence Unit), and others.

Jarvis et al. (2003) suggests the following guidelines to assist in deciding whether

a construct is formative:

- The indicators are viewed as defining characteristics of the construct

- Changes in the indicators are expected to cause changes in the construct

- Changes in the construct are not expected to cause changes in the indicators

- The indicators do not necessarily share a common theme

- Eliminating an indicator may alter the conceptual domain of the construct

- Change in the value of one of the indicators does not necessarily associate
  with a change in all other indicators

- The indicators are not expected to have the same antecedents and
  consequences

- Internal consistency is not implied (indicators are not expected to co-vary with each other)

Jarvis et al. (2003, p. 205) specified four possible combinations of formative and effective indicators (Figure 1).
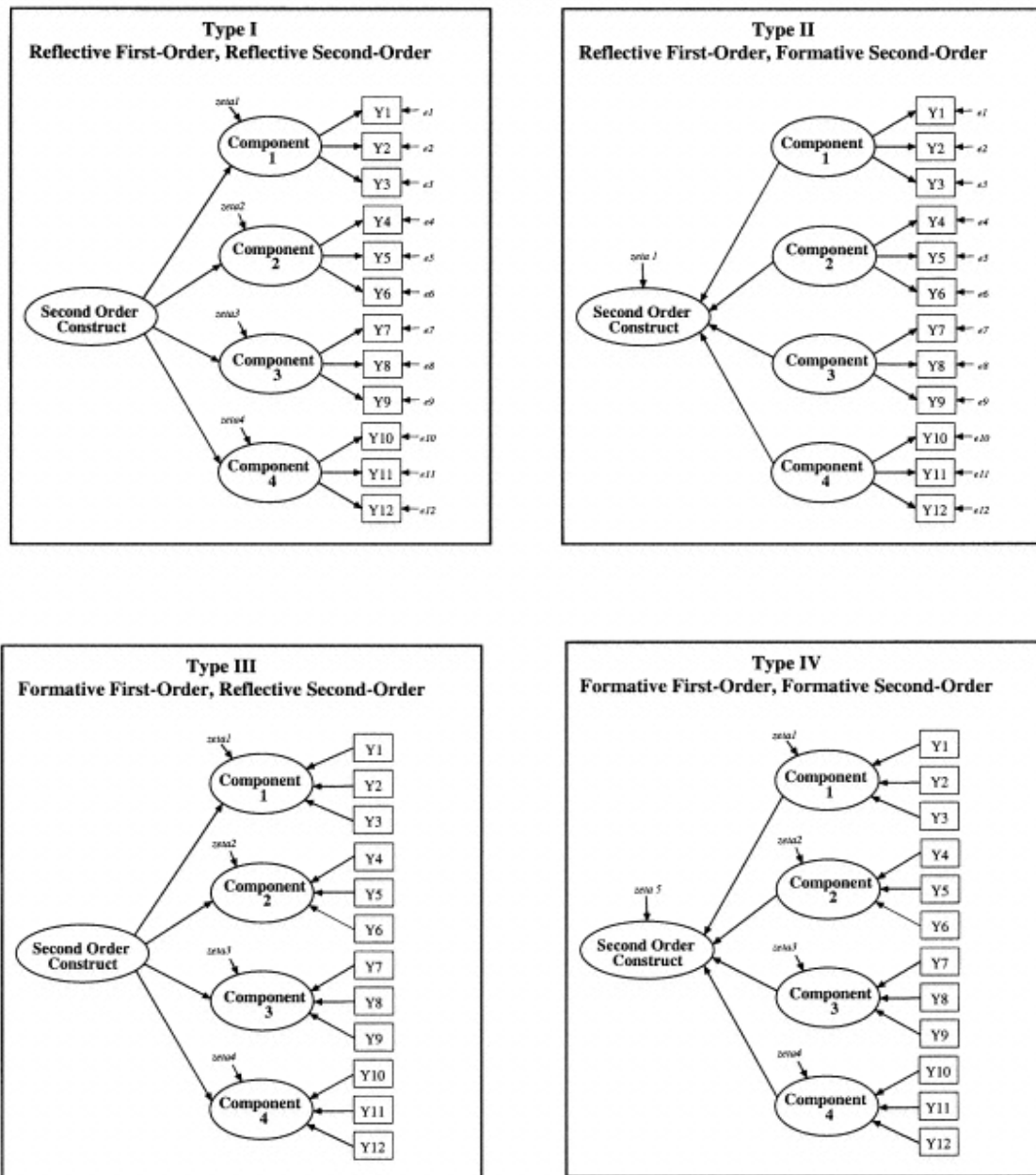
FIGURE 1. Four Possible Combinations of Formative and Effective Indicators

Based on this discussion, the new Expanded Human Capital Index (EHCI) is an example of the Formative model. More specifically, it belongs to Type IV (although some components represent formative component's characteristics more strongly than others), where Components 1-4 are the factors that compose EHCI. They are formed by their respective empirical measures (Y1, Y2, Y3… Yn). The Second-Order Construct is the actual final EHCI, which consists of these Components. Bagozzi and Fornell (1982) specify a Formative model in the following equation:

$$A = Y1\mathrm{X}1 + Y2\mathrm{X}2 + …Yn\mathrm{Xn}$$

where *Yn* is a parameter reflecting the contribution of Xn to the latent variable *A*. Another model, including a disturbance term, can be specified as:

$$A = Y1\mathrm{X}1 + Y2\mathrm{X}2 + … Yn\mathrm{Xn} + b$$

where b characterizes disturbance (Bollen & Lennox, 1991). The difference between them is that the first equation posits that the construct is a perfect linear combination of its measures, while the second one adds an error term to the equation.

Distinctive Properties of the Formative Indices

Formative indicators have several distinctive properties. One of their most essential features is that traditionally used methods of assessing construct reliability and validity are not appropriate for them (Bollen & Lennox, 1991). Because formative measures influence—rather than are influenced by—the latent construct, there is no requirement of correlation between the formative measures. Correlation may or may not be present. Indeed, it would be entirely consistent for formative indicators to be completely uncorrelated (Diamantopoulos & Winklhofer, 2001; Jarvis, Mackenzie, &

Podsakoff, 2003). The formative indicators may measure and reflect different areas of the construct, and may capture its different aspects, and different themes. That is why they are not necessarily interchangeable. Therefore, internal consistency reliability is not an appropriate standard for evaluating this model, and another way of assessing its reliability need to be devised. As Bollen and Lennox (1991) put it, "causal indicators are not invalidated by low internal consistency so to assess validity we need to examine other variables that are effects of the latent construct" (p. 312).

The second distinctive property of formative indicators is the possible serious consequence of a mis-specified model (omitting an indicator or adding a wrong one). While reflective indicators are not affected by removing or adding an item, with formative indicators, "omitting an indicator is omitting a part of the construct" (Bollen & Lennox, 1991, p. 308). Therefore, for formative indicator models, following the standard scale development procedures of eliminating items with low correlation with other items may remove precisely those items that would alter the empirical meaning of the composite latent construct. This is another reason why classical measures of internal consistency reliability cannot be used here.

The third property is that unlike reflective indicators, error variance in formative indicators is represented only in the disturbance term, *b,* which is not correlated with variables (xs). This means that covariance between them is 0:

$$\text{cov } [X_i, \text{b}] = 0$$

These characteristics are important issues to consider for successful index creation.

Methodology of Creation of Formative Indices

Methodology of composite index creation involves four general flexible steps: selection of variables, weighting/scaling, aggregation, and validation (Babbie, 2004; Booysen, 2002; Johnson & Reynolds, 2005; McGranahan, 1972, 1995). The following subsections discuss each of these steps individually.

Selection of Variables

Three issues are important in selecting variables: 1) content specification of the latent variable that needs to be assessed via observed indicators; 2) specification of the measures that correspond to this content, and therefore may be used to valuate it; 3) empirical indicators (proxies) for each of these specified measures (Booysen, 2002). The first step of the process is specification of the overall content the index as a whole is intended to capture. Diamantopoulos and Winklhofer (2001) stressed the fact that failure to consider all content sides of the construct may lead to exclusion of relevant aspects (which will negatively affect the whole measure). Therefore, a thorough review of literature is very important at this step. It allows for illuminating all sides of the complex multidimensional construct.

Referring to the second step, Bollen and Lennox (1991) suggested that a census of indicators is required for formative measures. More specifically, factors that comprise a formative index must cover all aspects of the specified index according to its content specification. This means that indicators need to be selected to capture the entire scope of the measure. Such selection is generally based on theory, empirical analysis, intuitive appeal, or some combination of them (Adelman & Taft-Morris, 1972; Diener & Suh,

1997). Diamantopoulos and Winklhofer (2001) noted that an extensive review of literature becomes especially important at this step as well. Searching for empirical proxies for all of these measures comprises step 3. Such proxies need to reasonably correspond with the specified measures.

After the initial process of collecting applicable proxies has been completed, both bivariate and multivariate statistical techniques can be employed to choose the best-fit proxies out of a bigger number of potentially applicable ones. Bivariate analysis measures the strength of association between all pairs of variables, and multivariate analysis measures the ability of any collection of variables to measure any other variable (Booysen, 2002). Factor analysis (FA) is one of the most widely used methods in multivariate analysis (Field, 2006; Kallmann, 1997). Pedhazur and Schmelkin (1991) cited factor analysis as the most useful and valuable tool to study the internal structure of a set of items. According to them, factor analysis is:

> a family of analytical techniques designed to identify factors, or dimensions, that underlie the relations among a set of observed variables…that are the indicators presumed to reflect the construct (p. 66).

Two major types of FA exist: confirmatory and exploratory. Confirmatory factor analysis (CFA) differs from exploratory factor analysis (EFA) in that EFA seeks to uncover the underlying structure of a large set of variables with no *a priori* theory, while CFA allows researchers to test a hypothesis about a structure of latent variables based on well-established theory. In other words, EFA is generally thought of as more of a theory-generating procedure, while CFA is a theory-testing procedure. In CFA, indicator variables are selected based on theory and the method is used to see if they load as predicted on the expected factor (Pedhazur & Schmelkin, 1991).

Weighting/Scaling of Factors

Scaling means "ordering of things in some meaningful way" with a purpose of pointing out the relationships among them (Booysen 2002). Weighting is the process of assigning weights according to the relative importance of each of the components for the whole construct. There is an option of scaling/not scaling and weighting/not weighting the factors, and many efforts in composite index construction have employed non-modified variables in their original form. Although Booysen (2002) suggested scaling, seven out of twenty composite indices that he studied did not use scaling. Weights may be assigned to the components in order to reflect the relative importance of each indicator (Stapleton & Garrod, 2007). A group of researchers (Babbie, 2004; Johnson & Reynolds, 2005; Stapleton & Garrod, 2007) suggested that equal weighting should be the norm. They base their argument on the fact that different weighting systems imply different results and are inevitably subjective. Other researchers routinely assign weights according to the factor analysis extraction sums of squared loadings (Booysen, 2002; Diener & Suh, 1997; Field, 2005), or based on an expert's professional (although subjective) opinion. For example, experts may be asked to assign a total of 100 points between all index components (Booysen, 2002), after which each component is weighted with the average percentage points it scored in the expert survey.

Weights may also be based on the researcher's perceptions. For example, Harbison and Myers (1964) created their Human Resource Development Index (HRDI), assigning heavier weights to tertiary education than to secondary education, under the belief that tertiary education was more important than secondary education when

explaining differences between countries in the quality of their human capital. They

multiplied the tertiary enrollment rate by five, and then added it to the secondary

enrollment rate to obtain their index. Weights also can be assigned according to a policy

maker's purposes of stressing some variables due to implementation of specific policies.

Out of twenty composite indices studied in Booysen (2002), four used principal

component analysis' or correlation coefficients' weighting, thirteen used equal averages,

and five used experts' opinions and mixed approach.

Aggregation of Variables

In the area of composite index construction, aggregation of components is always

a potential area of methodological controversy. Aggregation of components into a

composite score tends to be either additive or functional in nature. Additive aggregation

entails the mere addition of component scores (Field, 2005), while functional aggregation

is based on the estimated functional relationships between variables (Adelman & Taft-

Morris, 1972), which many researchers perceive to be empirically biased in terms of

being wholly dependent on the number of observations and the selected variables

(Booysen, 2002). Out of twenty indices studied by Booysen (2002), sixteen were created

by additive aggregative format, and four by functional format.

Booysen (2002) advised that ideally, composite indices need to be relatively

simple in their construction and interpretation, with the choice of weighting and

aggregation method depending on the purpose of a study. Studies whose purpose is

exploring theoretical concepts of indexing should generally utilize complex techniques.

At the same time, studies aiming to present an informative view tend to use simpler

methods and be easier for understanding. The purpose of developmental indicators is usually presenting broad information for policy makers and the general public, therefore, they tend to utilize less complicated approach of variables' aggregation.

For example, Human Development Index (HDI) is a simple average of three sub-indices: life expectancy index, education index, and GDP index (Human Development Report, 2007-2008):

HDI = 1/3 (life expectancy index) + 1/3 (education index) + 1/3 (GDP index)

where indices are calculated out of the raw data according to the general formula of a dimension index:

$$\text{Dimension Index} = \frac{\text{the actual value - Min value}}{\text{Max value - Min value}}$$

Consequently, the Life Expectancy Index (LEI) is calculated as follows:

$$\text{LEI} = \frac{\text{Life expectancy in years - Min expectancy}}{\text{Max expectancy - Min expectancy}}$$

The GDP Index is calculated as follows:

$$\text{GDP Index} = \frac{\text{Log (GDP per capita) - Log (Min Goalpost)}}{\text{Log (Max Goalpost) - Log (Min Goalpost)}}$$

The Education Index (EI) is calculated as follows:

EI = 2/3 (% of adult literacy) + 1/3 (% of gross enrollment)

Validation of the Composite Index

As mentioned previously, the nature of formative indicators renders classical internal consistency tests (for example, Cronbach's *a*) inappropriate. Therefore, other methods of validation should be used. A widely used approach (Diamantopoulos & Winklhofer, 2001; Jarvis et al., 2003) is utilization of reflective indicators (the ones that

represent effects of the construct) as a validity test. External validation includes evaluation of the relationship between the index and the outside variables that should theoretically correlate. Two types of external validation exist: external concurrent validation (assessing correspondence with indicators of another kind) (Diamantopoulos & Winklhofer, 2001; Jarvis et al., 2003) and external congruent validation (assessing correspondence with other indicators in the same class) (Hauser & Goldberger, 1971; Jöreskog & Goldberger, 1975). It has been suggested that inclusion of reflective indicators (the ones that represent effects of the construct) in the model and estimation of the relationship between them and the construct not only serves as a validity test (concurrent validation), but allows for assessing the contribution and significance of the individual indicators of the index in terms of their relationship with the reflective indicator. In its turn, external congruent validity is based on the assumption that if the index really measures a phenomenon, it should correlate with other indicators of this phenomenon (Babbie, 2004).

Summary

This section contained a brief discussion of the methodology of composite index construction. It described two kinds of composite indices—formative and reflective—and suggested that the EHCI Index is a formative index, based on the definitions of these two kinds of indices. Consequently, it is subject to the rules governing operations with formative indicators.

Application of the Methodology of Composite Index Creation to the Expanded

Human Capital Index

This section builds on the information on methodology of composite index

creation presented above to create an EHCI. It includes a discussion of procedures used

for data collection as pertaining to the EHCI, description of the data, explanation of

techniques used for aggregation of data and creation of the expanded index, and methods

utilized for validation of the new index.

Data Collection Procedures

The data used in the study spans 6 calendar years (2000-2005) and was available

for most of the163 countries of the specified population of all countries with 100,000

citizens or more. Overall, 30 variables were identified for the subsequent study. The data

were cross-sectional time series data publicly available on websites of United States

Agency for International Development (USAID), United Nations (UN), World Bank,

Organization for Economic Cooperation and Development (OECD), International Labor

Organization (ILO), World Health Organization (WHO), and Encyclopedia Britannica, as

well as statistical offices of individual countries. The rules followed in the process of data

collection were as follows:

- If several sources of data were available for the same country, with some

  divergence in the actual data, the source with the most disaggregated data (i.e.

  the greatest number of reported factors) and the most recent date was used.

- Interpolation was used for missing data (within an observation). Wherever interpolation was not applicable, the missing values were considered equal to the most recent available data.

- Wherever data on a country was not available even after the researcher invested significant efforts to find it, regional averages were used.

- Overall, missing data for each of the suggested 30 variables (for 163 countries) did not exceed the conventionally accepted 20 percent boundary, with most variables having significantly less than 20 percent of missing data.

- All scores smaller or bigger than 3 standard deviations were omitted in order to have a normal distribution of data.

For the purpose of comparability of data across countries within each indicator, most initial (raw) variables were standardized by turning them into percentages, rates, or scores if they were not collected in one of these forms. More specifically, the raw data on the number of Nobel Prize laureates in every country was turned into Nobel Prize laureates in a country as a percent of the total number of laureates in the world; the raw data on the number of Olympic medals won by every country was turned into Olympic medals won by a country as a percent of the total number of medals won by all countries during a specified period. Several variables (school life expectancy in years, number of holidays that a country celebrates, average number of children in a household, and average number of occupants per a household) were kept in their original form because of inappropriateness of their standardization.

For all individual variables to be consistent in their measurement with the original UNHC index (which measure increases with the increase of availability of a measured

product), the scoring for some variables have been reversed (Field, 2006). For example, Level of political rights and civil liberties was originally measured by Transparency International on a scale of 7-1 (with 7 representing the min of rights and liberties and 1 representing maximum of available rights and liberties). For this measure to be consistent with other measures (for example, Enrollment rate is measured on continuum 0-1, with 0 representing min of enrollment and 1 representing max of enrollment), the Level of political rights and civil liberties variable was reversed so that 7 represents max of rights and liberties and 1 represents min of rights and liberties.

The variables collected and examined initially included:

- *Ethnic cohesion measure*

- *Linguistic cohesion measure*

- *Religious cohesion measure*

- *Level of total central government consumption* minus *military expenditure as percent of GDP*

- *Corruption Perception Index*

- *Gini Coefficient*

- *Length of a country's Independence (in years)*

- *Government Effectiveness indicator*

- *Voice and Accountability indicator*

- *Nobel Prize laureates in a country (1901-2005) as percent of the total number of Nobel Prize laureates in the world (1901-2005)*

- *Olympic medals won by a country (1998-2005) as percent of the total number of Olympic medals won by all countries (1998-2005)*

- *School life expectancy (in years)*

- *Number of national holidays that a country celebrates*

- *Reported police offenses rate*

- *Election participation rate*

- *Independence of Judicial System measure*

- *Percent of people in a country who are not in prison (reverse of prison population rate)*

- *Percent of deaths in a country as calculated without suicide mortality (reverse of suicide rate measure)*

- *Expenditure on leisure as percent of the total family consumption*

- *Population above income poverty line*

- *Parliamentary seats held by women*

- *Political Rights measure*

- *Civil Liberties measure*

- *Attitude toward women in a society (in the family, at the job)*

- *Average number of children in a household*

- *Average family size (number of occupants per a household)*

- *Urban population distribution*

- *Divorce rate*

- *Existence of at least one social security program oriented toward supporting families*

- *International NGOs membership density*

This subsection provides information on the data used in the study. Following is brief description of every variable with its definition, calculation and the data sources.

Data Description

The data listed above form the basis for the operationalization of the formative multidimensional indicators examined in this research. This section presents an overview of every participating variable. Their definitions, calculations, and sources are described in Tables 2-28.

Table 2 presents information on the variable on Ethnic/Linguistic/Religious Cohesion in a Country.

Table 2. Ethnic/Linguistic/Religious Cohesion in a Country

Definition	Calculation	Source
Ethnic/Linguistic/Religious cohesion variables measure probability that two randomly selected individuals from a population belong to the same ethnic/linguistic/religious group. (Alesina et al., 2003)	These variables are constructed based on group fractionalization approach. *Group fractionalization* measures probability that two randomly selected individuals from the population belong to two different groups (Elesina et al., 2003, p 156). Consequently, ethnic/linguistic/religious fractionalization measures probability that two randomly selected individuals from a population belong to two different ethnic/linguistic/religious groups. The measure of cohesion was calculated as one minus Fractionalization Index. Group Fractionalization Index is generally computed as one minus the Herfindahl index of market concentration and can be interpreted as one minus a weighted sum of population shares, where the weights are these shares themselves (Bossert, D'Ambrosion, LaFerrara, 2006). Mathematically, it can be presented in the following way: FRACTIONALIZATION $(i) = 1 - \Sigma (S (ij)^2)$ Where S (ij) is the share of group (i) in the population, $(i = 1…N)$ in a country j.	Mainly, Encyclopedia Britannica (EB) Book of the Year (2000-2006) was used to calculate the fractionalization index, and ultimately, the measure of cohesion. Encyclopedia Britannica provides raw data on language, ethnic and religious groups in each country (measured in thousands or millions). Percentage share of each group was calculated based on this data and the total country population, which is also available in EB. However, since EB does not have data for all countries, it was necessary to compliment that data with additional resources. Alesina et al.'s (2003) study showed close correlation between fractionalization measures calculated based on CIA World Factbook data and Encyclopedia Britannica census data (p. 159). Researchers explained it by the fact that both publications use similar country data source. Therefore, in this dissertation, both sources to calculate fractionalization measures (with EB being the primary source) were used. World data sections in EBs which were used are as follows: Neher (2004, 2005, 2006); Neher, PeBenito, & Sturgis (2000, 2001, 2002).

Table 2. Continued

Definition	Calculation	Source
	According to the researcher's knowledge current (2000-2007) measures of fractionalization for the required 163 countries do not exist. Furthermore, the majority of studies that employ measures of fractionalization still use fractionalization indices based on the 1960 Soviet *Atlas Narodov Mira* (Atlas of the World People) (Alesina et al., 2003). The most recent study which provides more up-to-date fractionalization indices for 190 countries (Alesina et al., 2003) used different dates for different countries. Some countries have their indices calculated for as late as 2001, while others have them for only 1979, with the majority of countries' indices dating 1980s-1990s. Group shares stability and time persistence (at the 30-year horizon) was the assumption that underlay using such time-divergent data (Alesina, 2003; Fearon, 2003). At the same time, it seems that the issue of endogeneity (change in the index through time) may be a problem in such assumption. The whole period of 1990s witnessed tremendous change in countries' populations caused largely by the collapse of the Soviet block and consequent heavy migration. Consequently, population structures in place in late 1980s-early 1990s cannot be used as proxies for the 2000s structure. Therefore, there was a need to recalculate the indices for the 163 countries examined in this study for the period of 2002-2005.	Ethnic and linguistic differences were previously lumped together as part of an "ethnolinguistic" fractionalization variable, however it was suggested that ethnic and linguistic fractionalizations need to be used separately as they measure different forms of distinctions (Easterly & Levine, 1997).

Data Limitations

The potential limitation in development of this measure (which may cause some measurement error) is that data on ethnic differences is fraught with conceptual problems, such as the definition of physiological characteristics that distinguish races (Alesina et al., 2003). Furthermore, the definition of ethnicity involves a combination of racial and linguistic characteristics. That is why ethnic percentage country data (which may reflect both racial and language distinctions) may be different from percentage country data on linguistic distinction. These classifications are based on anthropologists' and ethnologists' classifications, which are not defined precisely, even on an academic level.

Therefore, to minimize potential error, this study used the exact published data classified

as "ethnicities in the country," "religions in the country," and "languages in the country."

Table 3 presents information on the variable of theLevel of Total Central

Government Consumption Minus Military Expenditure as Percent of GDP.

Table 3. Level of Total Central Government Consumption Minus Military

Expenditure as Percent of GDP

Definition	Calculation	Sources
Central Government consumption refers to Central Government expenditure in terms of its size relative to a national economy. It includes cash payments for operating activities of the government in providing goods and services, such as compensation of employees (in the form of wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rent and dividends (World Bank 2006, p. 233).	Level of total Central Government consumption minus military expenditure as percent of GDP was calculated as a simple subtraction between total government consumption as percent of GDP and its military expenditure as percent of GDP.	o World Development Indicators (World Bank, 2004, 2005, 2006, 2007) o Government Finance Statistics Yearbooks (IMF, 2002, 2003, 2004, 2005) o CIA World Factbook (CIA, 2000-20006) o Human Development Reports (UN, 2002, 2004, 2006) o UNESCAP Statistics Division (UN, Countries of the East Region section, 2000-2006) o UNECLAC (UN, Latin America and the Caribbean section, 2000-2006)

Limitations of the Data

A limitation with the use of this variable is the different financial data reported by

different sources, or from the same sources across time. Before 2005, the World Bank

reported data derived on the basis of the 1986 International Monetary Fund (IMF)

Manual. In 2005, World Bank started using the 2001 IMF manual. The 2001 Manual

does not distinguish between current and capital expenditure, unlike the 1986 Manual

(which means that since 2005 they do not distinguish between them). This means that

until the 2001 Manual, expenditures were reported altogether (current + capital outlays).

Most countries still follow the previous manual however. Because of this, in order to

minimize potential error, this study used only one source for the variable (and did not use

several sources to put together a measure for a particular country).

Table 4 gives information about Corruption Perception Index variable.

Table 4. Corruption Perception Index

Definition	Calculation	Sources
Corruption Perception Index relates to perceptions of the degree of corruption as seen by business people, academics, risk analysts, non residents and residents (Transparency International, 2000). It measures the overall extent of corruption (frequency and/or size of bribes) in the public and political sectors (http://www.transparency.org/).	This index is calculated using survey data from 14 sources originating from 12 independent institutions, and is measured by the frequency and/or size of bribes in the public and political sectors. An essential condition for inclusion is that the source must provide a ranking of nations on the overall extent of corruption. In other words, each of these sources surveyed different groups of people on their perception of the extent of corruption in a country using different survey questions. Afterwards, an average of the mean values of all sources is determined, which becomes the Transparency International index. Originally, the Index ranges between 10 (highly clean of corruption) and 0 (highly corrupted) countries. In order to make this measure consistent with the other measures and to measure the degree a society is free of corruption, the researcher reversed the score. The results obtained are as follows: 0=min corruption /// 9= max corruption	o This Index is created by *Transparency International*: http://www.transparency.org/

Table 5 describes definition, calculations, and sources of Gini Coefficient

variable.

Table 5. Gini Coefficient

Definition	Calculation	Sources
Gini Coefficient is a measure of income inequality (inequality in a country's wealth distribution) defined as the area between the Lorenz curve and the perfect equality line divided by the total area underneath the perfect equality line. The range of this index is 0 (perfect equality)—1 (perfect inequality).	In this study, Gini Coefficient was used in its original form without any changes.	o Human Development Report (2006, 2005, 2004, 2002) o World Development Indicators (2007, 2006, 2005, 2004, 2000) o CIA World Factbook (2004, 2005, 2006) o ECLAC (Economic Commission for Latin America and the Caribbean) statistical database: http://www.eclac.org/ o ESCAP (Economic and Social Commission for Asia and the Pacific) statistical database: http://www.unescap.org/ o ESCWA (Economic and Social Commission for Western Asia): http://www.escwa.un.org/ o UNECE (UN Economic Commission for Europe): http://www.unece.org/ o World Income Inequality Database: www.wider.unu.edu

Table 6 presents information about Length of Countries' Independence variable.

Table 6. Length of Countries' Independence (in years)

Definition	Calculation	Sources
The date of independence refers to the date "when the country, within its present borders, attained full sovereignty over both its internal and external affairs" (Encyclopedia Britannica, 2004, p. 740)	Length of countries' independence is calculated as the period from their respective years of independence until each year of the 2000-2005 period	o Encyclopedia Britannica, 2000-2006 (Government and International Organizations sections)

Table 7 describes definition, information, and sources for the Government

Effectiveness Indicators variable.

Table 7. Government Effectiveness Indicators

Definition	Calculation	Sources
Government Effectiveness measures the quality of public services, the quality of the civil service and the quality of policy formulation and implementation (Kaufmann, Kraay, Mastruzzi, 2007).	The indicator is constructed using an unobserved components methodology. It relies on a large number of individual data sources that provide information on perceptions of governance of a wide range of stakeholders. These data sources consist of surveys of firms and individuals, assessments of commercial risk agencies, NGOs and international aid agencies (http://info.worldbank.org/governance/wgi2007/). These data sources reflect the perceptions of a diverse group of respondents. 　The indicator is measured in units ranging from -2.5 to 2.5 with higher values corresponding to better governance outcomes. The units in which governance is measured follow a normal distribution with a mean of zero and a standard deviation of one in each period. 　For calculation purposes of this study, 2.5 was added to each value to eliminate negative values.	o The "Governance Indicators" developed by the World Bank for 1996-2006: http://info.worldbank.org

Table 8 presents information about Voice and Accountability Measure variable.

Table 8. Voice and Accountability Measure

Definition	Calculation	Sources
Voice and Accountability measures the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, association and free media (Kaufmann, Kraay, Mastruzzi, 2007).	The indicator is constructed using an unobserved components methodology. The indicator is measured in units ranging from -2.5 to 2.5 with higher values corresponding to better governance outcomes. The units in which governance is measured follow a normal distribution with a mean of zero and a standard deviation of one in each period. For calculation purposes of this study, 2.5 was added to each value to eliminate negative values.	o The "Governance Indicators" developed by the World Bank for 1996-2006: http://info.worldbank.org

Information about Nobel Prize Laureats in a Country variable can be obtained in

Table 9.

Table 9. Nobel Prize Laureates in a Country (1901-2005) as a Percent of the Total Number of Nobel Prize Laureates in the World

Definition	Calculation	Sources
Nobel Prize laureate is an individual who won a Nobel Prize. The Nobel Prize is an award for outstanding contributions in physics, chemistry, medicine, literature, economics, and for the promotion of peace, given by the Nobel Foundation established in 1900 in the will of Alfred Nobel (http://nobelprize.org).	As the first step, the number of NP laureates (individuals and organizations) in every country beginning with 1901—the first year when NP was awarded—until 2005 was calculated. The next step included calculating the percentage of the awards won by every country in relation to the total number of Nobel Prize awards won by all countries during the period of 1901 until each year of the examined period of 2000-2005. By 2000 (including 2000), 712 awards were given: 695 individuals and 17 international organizations. By 2005 (including 2005), 776 awards were given: 757 individuals and 19 international organizations.	o Official website of the Nobel Prize: http://nobelprize.org

Limitations of the Data Utilized for the Variable

Some laureates are listed as representing more than one country. Some laureates were born in one country, but moved to another one (mostly USA), where they worked. They are listed according to the later country on the website. The reason for this is that generally it is the country where they work that gets the majority of recognition, not the country where they were born (and which they may have had to leave because conditions there were not conducive for their work).

Table 10 provides information on the number of Olympic Medals.

Table 10. Number of Olympic Medals Won by a Country (1998-2005) as a Percent of the Total Number of Olympic Medals Won by All Countries (1998-2005)

Definition	Calculation	Sources
Silver, bronze, and gold medals won in Winter and Summer Olympic Games. The Olympic Games is an international multi-sport event subdivided into summer and winter sporting events (http://www.olympic.org).	The 1998-2005 period, with 1998 as the beginning year of the period, was chosen because 1998 was the first year when the former USSR countries started presenting themselves individually. As the first step, the number of medals won by every country during the specified period was calculated. The next step included calculating the percentage of medals won by every country in relation to the total number of medals won by all countries during the specified period.	o The official site of the International Olympic Committee: http://www.olympic.org

Table 11 provides information on the variable of Schools Life Expectancy.

Table 11. School Life Expectancy in Years

Definition	Calculation	Sources
School life expectancy is the total number of years of schooling which a child can expect to receive, assuming that the probability of his or her being enrolled in school at any particular future age is equal to the current enrolment ratio at that age (UN, Statistics Division)	This measure is available only for one year per country (out of the 2000-2005 examined period). Because this measure cannot drastically change within such a short period, this study used the value for one year as the proxy for the rest of the years in the 2000-2005 examined period.	o United Nations Statistics Division—Demographic and Social Statistics: http://unstats.un.org/unsd/demographic/products/socind/education.htm

Information about definition, calculations, and sources of Number of National

Holidays that a Country Celebrates variable can be obtained in Table 12. Dickey &

Runchock (2001), Gall (2004), and Gall & Hobby (2007) publication were the major

sources for this variable.

Table 12. Number of National Holidays That a Country Celebrates

Definition	Calculation	Sources
The total number of all celebrated national holidays as listed by the Worldmark Encyclopedia of the Nations (2001, 2004, 2007)	The total number of all celebrated national holidays as listed by the Worldmark Encyclopedia of the Nations (2001)	o Worldmark Encyclopedia of the Nations, 2001, 2004, 2007

Table 13 provides information on the Reported Police Offenses Rate variable.

Table 13. Reported Police Offenses Rate

Definition	Calculation	Sources
Offenses reported to the police is the number of total reports (excluding minor traffic violations), not the number of offenders apprehended or tried in courts (EB, 2004, p.842). It is measured per 100,000 population in a country.	In this study, this measure was used as reported in Encyclopedia Britannica in its original form without any changes.	o Encyclopedia Britannica (2000-2006), "Social Protection" section.

Table 14 provides information on Election Participation Rate variable.

Table 14. Elections Participation Rate

Definition	Calculation	Sources
This measure is generally accepted as a measure of citizens' participation in politics. In this study, it is expressed as the percentage of voters who participated in casting a vote in elections (Legislative or Presidential) in relation to those voters who were of eligible age to do so.	Elections (Legislative or Presidential) participation rate was calculated as the relation of the number of people who voted in the elections (reported as raw data) to the number of citizens over the age of 20 years old (reported as raw data). If a country underwent both—Presidential and Legislative elections in the same year, this study used an average of both elections to form one score per year.	o International Institute for Democracy and Electoral Assistance (IDEA): http://www.idea.int/ o United Nations Statistics Division: http://unstats.un.org/

Limitations of the Data Utilized for the Elections Participation Rate Variable

There are several factors that introduce potential error into the calculation of this

variable. Although the use of voting-age population as relative to actual voters allows for

more precise evaluation of political activity of the population than the use of the number

of registered voters as relative to the number of actual voters, this approach has several

weaknesses. One of its weaknesses is that the voting-age population measure is not able

to exclude those within the population who may not be eligible for voting due to legal or

systematic barriers (factors such as mental competence or imprisonment.) Furthermore,

although most of the countries in the world have 18 years old as the suffrage age, 20

countries deviate from this age across a period of 16-21 years old (Rose, 2000). For

example, voting age in Austria, Cuba, and Nicaragua is 16; voting age in Indonesia,

North Korea, and Sudan is 17; voting age in Cameroon, Japan, and Tunisia is 20. At the

same time, standard age distribution statistics are reported in periods of 0-19 years of age

and 20+ years of age (United Nations Statistics Division). Following the International

Encyclopedia of Elections (2000), this study used 20+ age as the voting age, although

with understanding that this will inevitably introduce some error into calculations.

Another data limitation is in the fact that in spite of the 1979 United Nations

General Assembly's resolution emphasizing the importance of equal participation of

women and men in public life, laws restricting women's right to vote still persist in

several countries: Kuwait, Qatar, Saudi Arabia, Oman, United Arab Emirates. This fact

needs to be taken into consideration in order to achieve very precise estimates of voting

participation rates. One more way error may be introduced into calculations is through

difficulty to precisely assess consequences for voting participation in the countries which

have compulsory voting system. This system may artificially skew the elections

participation results in favor of showing high political activity of the population. Overall,

there are 25 countries in the world with laws which provide for compulsory voting. At the

same time, this requirement is not strictly enforced in many countries (IDEA).

The variable of Independence of Judicial System is described in Table 15. Bonk

(2000), as well as Worldmark Encyclopedia of the Nations (2004, 2007) were used as the

sources for this variable.

Table 15. Independence of Judicial System

Definition	Calculation	Sources
Ability of the Judicial System to make decisions independently from the Government	Based on the description of countries provided in the volumes of the Worldmark Encyclopedia of the Nations, the countries were grouped according to the following characteristics: 0 = Not independent from the Government 1 = Partly independent from the Government 2 = Independent from the Government	o Worldmark Encyclopedia of the Nations (2004, 2007) o Worldmark Yearbook 2000

Table 16 reports on definition, calculation, and sources for the reverse of Prison

Population Rate variable.

Table 16. Percent of People in a Country Who Are Not in Prison (Reverse of Prison Population Rate)

Definition	Calculation	Sources
In this study, this is the measure of percent of people in a country who are not incarcerated (Human Development Reports 2000-2006). Prison population is the number of incarcerated people in a country as measured by the number of people in prison per 100,000 of population (Human Development Reports 2000-2006). Percent of people who are not in the prison is the total number of people in the country (100%) minus the percent of people who are incarcerated.	Prison population rate is the number of incarcerated people per 100,000 of citizens in a country (Human Development Reports). Dividing the total country population by 100,000 and multiplying it by prison population rate produces the total number of people in prison in a particular country. Dividing this number by the total country population and multiplying it by 100% produces the measure of percent of people in a country who are in prison. Subtracting this number from 100% produces the measure of percent of people in the country who are not in prison.	o Human Development Reports (2000-2006) o International Center for Prison Studies: www.prisonstudies.org

Information about reversed variable of Suicide Rate Measure is presented in

Table 17.

Table 17. Percent of Deaths in a Country as Calculated without Suicide Mortality (Reverse of Suicide Rate Measure)

Definition	Calculation	Sources
Suicide is a conscious act of terminating ones' own life. Suicide rate is measured as the number of suicide deaths per 100,000 of population (World Health Organization, 2000-2007). The inverse of this measure is the annual number of deaths in a country minus the number of deaths caused by suicide.	Suicide rate is measured as the number of suicide deaths per 100,000 of population (World Health Organization, 2000-2007). Dividing the total country population by 100,000 and multiplying it by the suicide rate produces the total number of deaths caused by suicide in a particular country in a particular year. Dividing this number by the total country population and multiplying it by 100% produces the measure of percent of deaths in a country caused by suicide in a particular year. Subtracting this number from 100% produces the measure of percent of deaths in a country without deaths caused by suicide (in a particular year).	o World Health Organization (WHO): http://www.who.int/mental_health/prevention/suicide/country_reports/ o World Health Organization, Department of Measurement and Health Information: http://www.who.int/healthinfo/statistics/bodgbddeathdalyestimates.xls o Statistical Yearbook for Asia and the Pacific (2003) o Ruzicka, L. (1998). Suicide in countries and areas of the ESCAP region. *Asia-Pacific Population Journal, 13*(4). o Darnay, B. (Ed.) (1997). *Gale country and world rankings reporter.* Detroit: Gale Research.

Description of the Data Limitations

Generally, cross-country data on suicide rates needs to be used with caution.

Limited data are available documenting suicide rates in Africa and the Middle East. Even

in countries where cause-of-death data is collected systematically, societal attitude

toward suicide may impact the recorded figures. Furthermore, in highly corrupt countries

suicide cause-of-death may be used as a cover-up for criminal causes of death

(information retrieved from the World Health Organization's website on November 12, 2007: http://www.who.int/).

The variable of Expenditure on leisure as Percent of the Total Family Consumption is described in Table 18.

Table 18. Expenditure on Leisure as Percent of the Total Family Consumption

Definition	Calculation	Sources
Leisure and recreation expenditure is defined as consumption expenditure on cultural activities other than education (Encyclopedia Britannica, 2004, p. 831; International Labor Organization: http://laborsta.ilo.org/). It is measured as percent of household income. *Household* (an economic unit and the primary basis of analysis) can be as small as a single person and as large as an extended family (Encyclopedia Britannica, 2004, p. 830). Household income consists of "all receipts whether monetary or in kind (goods and services) that are received by households and their individual members at annual or more frequent intervals. These receipts are available for current consumption and do not reduce net worth of the household through reduction of its cash, disposal of its other financial or non-financial assets or an increase in its liabilities" (http://laborsta.ilo.org/)	Several sources (Encyclopedia Britannica and United Nations Statistics Division) report data on percent of household income used on leisure and recreation, which may be directly utilized. For the missing data, the following sources were used: International Marketing Data and Statistics and European Marketing Data and Statistics. They provide data on total expenditure on leisure and recreation per country. Dividing that measure by the total number of households in a country (Encyclopedia Britannica, 2000-2006, Vital Statistics, Marriage and Family section) provides the measure of leisure and recreation expenditure per household. International Labor Organization (ILO) Bureau of Statistics provides data on average monthly household income, which is available on LABORSTA on-line database (http://laborsta.ilo.org/) for selected countries. Finding the relationship between the measure of leisure and recreation expenditure per household and average household income and multiplying it by 100% provides this study with the measure of family income used for leisure and recreation	o International Labor Organization (ILO) Bureau of Statistics, LABORSTA on-line database: http://laborsta.ilo.org/ o Encyclopedia Britannica Book of the Year (1999-2006) o United Nations Statistics Division Common Database: http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract.asp?srID=30256 o International Marketing Data and Statistics, 2006 (Euromonitor International) o European Marketing Data and Statistics, 2005 (Euromonitor International)

Population above Income Poverty Line variable is described in Table 19.

Table 19. Population above Income Poverty Line

Definition	Calculation	Sources
Income poverty line is defined as national poverty line for developing countries, and as 50 percent of median income as specified on OECD level (Human Development Reports, 2000-2006).	Percent of population below income poverty line measure available through Human Development Reports (UN) was utilized. Percent of population above income poverty line was calculated as 100% of total population minus percent of population below income poverty line.	o Human Development Reports, 1999-2007 (UN).

Tables 20-22 present information on national liberties, such as political rights and civil liberties, and rights and liberties that women injoy.

Table 20. Parliamentary Seats Held by Women

Definition	Calculation	Sources
Seats in Parliament held by women measure refers to seats held by women in a lower or single house or an upper house or senate, where relevant (Human Development Report, 2005, p. 360). This measure is reported as percent of total Parliamentary seats.	In this study, this measure was used as reported in Human Development Reports (2000—2006) in its original form without any changes.	o Human Development Report (2000—2006)

Table 21. Political Rights and Civil Liberties Measures

Definition	Calculation	Sources
These measures are based on Freedom in the World annual surveys which have been conducted by the Freedom House since 1973 (http://www.freedomhouse.org/). These surveys assess state of political rights and civil liberties in 192 countries in the world. Data is collected from professional contacts, international visitors, human rights organizations, specialists in geographic and geopolitical areas, the reports of governments and multilateral bodies, and a variety of domestic and international media.	Level of political rights and civil liberties variable is measured on a scale 7-1 (with 7 representing the min of rights and liberties and 1 representing maximum of available rights and liberties). For this measure to be consistent with other measures, it was converted so that 7 represented max of rights and liberties and 1 represented min of rights and liberties.	o Freedom House website: http://www.freedomhouse.org/

Table 22. Attitude Toward Women in a Society

Definition	Calculation	Sources
This variable includes: women's legal rights and their actual life application, domestic violence, attitude toward women on the job.	For this variable, the researcher used qualitative information on women's legal rights and their actual life application, domestic violence, attitude toward women on the job available in *Social Development section* of every country's profile as presented by the Worldmark Encyclopedia of the Nations (Gale Group). Based on this information, countries were ranked according to three categories: 0—poor 1—moderate 2—good	o Worldmark Encyclopedia of the Nations (2004, 2007)

Tables 23-27 pertain to the Family construct, and describe structural composition of families, availability of aid for families, and population distribution.

Table 23. Average Number of Children in a Household

Definition	Calculation	Sources
This variable assesses the number of children (under age 15) per household. A threshold for child-age is set at 15 to provide a consistent measure of social minority internationally, though legal minority depends on the law of each country (Encyclopedia Britannica, 2004, p. 771).	Encyclopedia Britannica provides ready-to-use data for 100 countries. For the rest of the countries in the specified population, this study used Encyclopedia Britannica's data on marriage and family (*Total Number of Households in a Country* and *Total Number of Children Under 15* measures in *Vital Statistics, Marriage and Family* and *Area and Population sections*). The researcher assumed that all children 0-14 were in households (and ignored street children and children in orphanages). Dividing number of children (0-14) by the number of households provided the study with a rough estimate of number of children of this age per household.	o Encyclopedia Britannica Book of the Year (1999-2006)

Table 24. Family Size

Definition	Calculation	Sources
A family unit is comprised of individuals related by blood or civil register (Encyclopedia Britannica, 2004, p.771). Household/family unit can be as small as a single person and as large as an extended family (Encyclopedia Britannica, 2004, p. 830).	In this study, the measure of average family size was used as reported in Encyclopedia Britannica in its original form without any changes.	o Encyclopedia Britannica Book of the Year (1999-2006)

Table 25. Urban Population Distribution

Definition	Calculation	Sources
The urban-rural classification of population in international statistics follows the national census definitions that are usually based on criteria that may include one of the following: size of population in a locality, predominant type of economic activity, legal or administrative boundaries and urban characteristics (United Nations Statistics Division). This measure is reported as percent of urban population in the total country population.	In this study, the measure of urban population distribution was used as reported by United Nations Statistics Division and Encyclopedia Britannica in its original form without any changes. This measure is reported as percent of urban population in the total country population.	o United Nations Statistics Division: http://unstats.un.org/ o Encyclopedia Britannica Book of the Year (2000-2006)

Table 26. Divorce Rate

Definition	Calculation	Sources
A final legal dissolution of a marriage, that is, that separation of husband and wife which confers on the parties the right to remarriage under civil, religious and/or other provisions, according to the law of each country. The number of annual final divorce decrees granted under civil law is presented as per 1000 mid-year population (UN Demographic Yearbook, 2001, p. 641).	In this study, the measure of divorce rate was used as reported in the described sources without any changes.	o UN Demographic Yearbook (1990, 1996, 2000, 2001, 2002, 2003, 2004) o International Marketing Data and Statistics, 2006 (Euromonitor International) o European Marketing Data and Statistics, 2005 (Euromonitor International) o NationMaster online Statistics: http://wwwnationmaster.com o Eurostat metadata: http://www.epp.eurostat.ec.europa/ o United Nations Statistics Division Common Database: http://unstats.un.org/unsd/cdb/cdb_advanced_data_extract.asp?srID=30256

Limitations of the Data Utilized for the Divorce Rate Variable

This variable has higher proportion of missing data than other variables. Divorce has not been considered culturally appropriate in many African countries. Therefore, even if a divorce occurred, it may not be registered. In some Catholic countries divorce is illegal (for example, Chile, Philippines, Malta). As a result, people in these locations may travel to other areas to get divorced. In countries where divorce is illegal, an annulment (announcement that the marriage never existed) is allowed. For the countries where divorce is allowed, but the data is missing, regional variables were utilized.

Table 27. Existence of at Least One Social Security Program Oriented Toward Families

Definition	Calculation	Sources
This measure is presented in terms of existence or non-existence of the program Because of great complexity of national programs, a social security program oriented toward families refers to any programs providing financial assistance to families or mothers to help with the cost of raising children (Encyclopedia Britannica, 2004, p.843). Because of great complexity of national programs, this measure is presented in terms of existence or non-existence of the program.	In this study, this measure was used as reported in Encyclopedia Britannica in its original form without any changes.	o Source: Encyclopedia Britannica Book of the Year (1999-2006)

Table 28 describes definition, calculation, and sources for the variable of International NGOs Membership Density.

Table 28. International NGOs Membership Density

Definition	Calculation	Sources
Membership density is expressed as the number of memberships in NGOs per 1 million population.	In this study, this measure was used as reported in the *Yearbook of International Organizations 2006/2007* in its original form without any changes.	o Union of International Associations (Ed.). (2006). *Yearbook of International Organizations 2006/2007.* Germany: Union of International Associations

Operationalization of Data

The data reviewed above forms the basis for the operationalization of the three factors examined in this research (*National Identity, Family,* and *Character*). This section contains a detailed discussion of the process of creating the factors out of the collected data.

Analyses of the Structure of Factors

The data described above was generated based on the results of a content analysis of literature as described in Chapter II. The next step needed to determine whether the collected data fit the three hypothesized factors, develop these factors, and determine reliability. Generally, Cronbach's alpha is used as the overall reliability estimate of complex instruments, and factor analysis is used to determine the appropriate assignment of individual items to factors to see the structure of a factor emerge out of many potentially applicable variables (Field, 2005; McLean, Yang, Kuo, Tolbert, Larkin, 2005). However, as discussed in the previous section on specificity of formative indices, internal reliability analysis is not appropriate for such indices. Therefore, only factor analysis tests were conducted to test the hypothesized structure of the factors and ultimately develop these factors. Variables hypothesized to represent each of the three examined factors were factor analyzed. Specifically, thirteen variables hypothesized to form the National Identity Awareness construct were factor analyzed, as well as twelve variables hypothesized to represent the Character construct, and five variables hypothesized to represent the Family construct.

Out of two kinds of factor analysis—exploratory and confirmatory— confirmatory factor analysis was chosen for use in the study. Pedhazur and Schmelkin (1991), Field (2005), and Jöreskog & Goldberger (1975) identified confirmatory factor analysis as a theory-testing technique, which gives a researcher a viable method for evaluating construct validity. Compared with exploratory factor analysis which explores data, confirmatory factor analysis tests data for its fit with the theory. More specifically, in confirmatory factor analysis, a researcher is able to test hypotheses concerning the

factor structure of the data due to having a prior model that specifies the number and

composition of the factors. This technique allows a researcher to determine whether

measures created to represent a latent variable really belong together. The model is

expected to specify the number of variables within the model. It may also specify the

degree of correlation between individual variables, and the loadings of variables on

particular factors. The theory-based model is then tested to assess its fit with the data.

The fit statistics are then evaluated to determine whether the predetermined model

explains the relationships between the observed and latent variables. Bentler (1980)

explained the process of confirmatory factor analysis,

> The primary statistical problem is one of optimally estimating the parameters of
> the model and determining the goodness-of-fit of the model to sample data on the
> measured variables. If the model does not acceptably fit the data, the proposed
> model is rejected as a possible candidate for the causal structure underlying the
> observed variables. If the model cannot be rejected statistically, it is a plausible
> representation of the causal structure (p. 420).

Therefore, the instances of the most effective use of confirmatory factor analysis (CFA)

are as follows:

- If a researcher begins with a hypothesis prior to the analysis

- If a well-established theory exists, that is the foundation for the hypothesis

- There is a need to test a theory, not to generate a theory

There are two approaches to conducting CFA: by using any general-purpose

statistical package, which supports FA, or by using a structural equation modeling (SEM)

package such as AMOS or LISREL. While SEM is typically used to model causal

relationships among factors, it may also be used to explore CFA measurement models. In

this dissertation, SPSS-16.0 package was used to run this analysis.

Choice of Eigenvalues

The *Principal Component Analysis (PCA)* method was used for extraction of factors. According to Pedhazur and Schmelkin (1991) PCA is a data reduction technique that is applied to "arrive at a relatively small number of components that will extract most of the variance of a relatively large set of indicators… Principal components extract both variance that is unique to an indicator as well as error variance" (p. 598).

Based on the definition of FA, not all factors are retained in the analysis, and there is a debate over the criterion employed to determine whether a factor is statistically important (Field, 2005). Kaiser has recommended retaining all factors with eigenvalues greater than 1 with eigenvalues defined as representing the amount of variation explained by a factor (Field, 2006). This criterion is based on the idea that an eigenvalue of 1 indicates a substantial amount of variation. Joliffe (1972) suggests retaining all factors with eigenvalues more than 0.7 because Kaiser's criterion is too strict. Field (2006, p. 634) suggests using the Kaiser method (which is also a default method in SPSS) because the closer the communalities are to one, the better the factors are at explaining the original data. Therefore, in this dissertation, a communality of one is used as a criterion.

Choice of the Loading Level That Is Significant

Loading of variables on factors is the main step in the process of factor extraction. Rotation (a technique that improves loading of variables) can be used in order to improve the loading. Two types of rotation exist—orthogonal rotation (used when factors are independent) and oblique (used when the underlying actors are allowed to correlate).

Since there is no good theoretical and empirical reason to suppose that the factors in this study could correlate, orthogonal rotation (*varimax method)* was used.

The next step of the analysis was determining the degree of loading that would be considered significant. As mentioned earlier, factor loading is an indicator of the substantive importance of a given variable to a given factor. According to Field (2005), typically, researchers view a loading of 0.3 to be important. At the same time, the significance of a factor loading depends on the sample size. Stevens (1992) recommends considering a loading of 0.722 as significant for a sample size of 50, a loading of 0.512+ for a sample size of 100, and a loading greater than 0.364 for a sample size of 200 (pp. 382-384). Because the degree of substantive importance of a variable to a factor is determined by the amount of variance in a factor accounted for by the variable (like R^2 it is calculated by squaring the factor loading), Stevens recommends interpreting only the factor loading with an absolute value greater than 0.4 (it explains 16% of the variance). Choosing conservatively, with N=163 in this dissertation, factor loading of 0.5 and greater is considered significant.

Other Considerations

Another central consideration during selection of variables is the purpose of measurement. Since the goal is international comparison, the components need to be available for all countries, as well as be universally significant and cross-culturally applicable (Booysen, 2002). Other important selection criteria include distinction between variables focused on ends, means or both. Different authors argue for the use of either variables focused on ends (Adelman & Taft-Morris, 1972), or those focusing on

means (McGranaham, 1972), or both (Morris, 1979 UNDP's Human Development Index). The argument for the latter is that some variables represent both—ends and means (for example, literacy). Therefore, in this study both kinds of indicators have been employed.

Factor Analysis Results

Results of Factor Analysis of the National Identity Awareness Factor

Two tests, the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Barlett's test of sphericity, were conducted in order to determine whether the data meets the requirements for factor analysis (Field, 2006). According to the results of the tests, the data set for the *National Identity Awareness (ID)* factor meets the adequacy criteria for factor analysis (see Appendix A-1).

Factor analysis was conducted for the *National Identity Awareness* (ID) factor for each year of the 2000-2005 period (total of 6 years). The 13 items suggested as the ones comprising this factor were factor analyzed. The percentage of variance explained in the *National Identity Awareness* factor (2000-2005) is provided in Appendix B (Tables B1-B6). According to Pedhazur and Schmelkin (1991), the first two or three components are supposed to extract at least 50% of the variance. Results presented in Tables B1-B6 show the extracted eigenvalues for every year and indicate that this requirement was met. In 2000, four components explained 69.09 percent of variance. In 2001, four components explained 68.73 percent of variance. In 2002, four components explained 68.21 percent of variance. In 2003, four components explained 69.01 percent of variance. In 2004, three components explained 62.10 percent of variance. And in 2005, four components

explained 70.12 percent of variance. On average, the extracted eigenvalues explained 67.87 percent of variance. In five out of six years (2000-2003 and 2005) these results were achieved by four components, and in one year (2004), it was achieved by three components.

The factor loadings for the *National Identity Awareness* factor (2000-2005) are provided in Appendix B (Tables B7-B12). Only items with factor loadings of 0.5 and above were considered. For five out of six years (2000-2003 and 2005), four components were extracted, and for one year (2004), three components were extracted. Results of the Rotated Component Matrix and the Total Variance Explained matrix indicate that components were extracted similar to the hypothesized structure of the ID factor, although some variables loaded on a different factor that the author hypothesized.

Extracted Factor 1. Four variables that appear in each of the first extracted factor (for 2000-2005) are *Government Effectiveness*, *Corruption Perception*, *Voice and Accountability*, and *School Life Expectancy*. Additionally, *Government Expenditure* appears in three years; *Medals Won in Olympics* variable appears in two years; and *The Number of the Nobel Prize Winners* appears in one year. This factor is similar to the hypothesized Common Institutions/Rights and Duties for all Members factor. Therefore, based on the results of the tests, the hypothesized model of Common Institutions/Rights and Duties for All Members factor can be adjusted to:

- ❖ Common Institutions/Rights and Duties for All Members
    - Government Effectiveness measure
    - Voice and Accountability measure
    - Corruption Perception Index

- School life expectancy (in years)

- Level of total government consumption minus Military expenditure as percent of GDP

Extracted Factor 2. Three variables that appear in each of the second extracted factor (for 2000-2005) are *Language cohesion, Ethnic cohesion,* and *Religious cohesion.* No additional variables appear. This factor is similar to the hypothesized Common Norms, Values, and Culture factor. Therefore, based on the results of the tests, the hypothesized model of Common Norms, Values, and Culture factor can be adjusted to:

- ❖ Common norms, values, and culture

  - Linguistic cohesion

  - Ethnic cohesion

  - Religious cohesion

Extracted Factor 3. Two variables that appear in each of the third extracted factor (for each of the 2000-2005 years) are *Gini Coefficient* and the *Number of National Holidays that a Country Celebrates.* Additionally, the variables of *Number of Medals Won in Olympic Games* and *Years of a Country's Independence* appear once. This factor is similar to the hypothesized Awareness of Collective Destiny (Collective Goals) factor. Therefore, based on the results of the tests, the hypothesized model of Awareness of Collective Destiny (Collective Goals) factor can be adjusted to:

- ❖ Collective Goals (Awareness of Collective Destiny)

  - Number of holidays that the country celebrates

  - Gini Coefficient

- Number of Olympic medals (1998-2005)

Extracted Factor 4. Two variables that appear in each of the fourth extracted factor (for each of the 2000-2003 and 2005 years) are *Years of Independence* and *The Number of Nobel Prize Winners*. No additional variables appear. This factor is similar to the hypothesized Perpetuation of Common Myths and Historic Memories factor. Therefore, based on the results of the tests, the hypothesized model of Perpetuation of Common Myths and Historic Memories factor can be adjusted to:

- ❖ Perpetuation of common myths and historic memories

  - Time of Independence

  - Number of Nobel Prize laureates in a country (1901-2005)

Based on these results, the researcher can adjust the model of National Identity Awareness construct. The new adjusted model is as follows:

- ❖ Common norms, values, and culture

  - Linguistic cohesion

  - Ethnic cohesion

  - Religious cohesion

- ❖ Collective Goals (Awareness of Collective Destiny)

  - Number of holidays that the country celebrates

  - Gini Coefficient

  - Number of Olympic medals (1998-2005)

- ❖ Common Institutions/Rights and Duties for All Members

  - Government Effectiveness measure

- Voice and Accountability measure

- Corruption Perception Index

- School life expectancy (in years)

- Level of total government consumption minus Military expenditure as percent of GDP

❖ Perpetuation of common myths and historic memories

- Time of Independence

- Number of Nobel Prize laureates in a country (1901-2005)

Therefore, for future studies this model can be considered as the model of the *National Identity Awareness* factor.

Results of Factor Analysis of the Character Factor

Two tests, the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Barlett's test of sphericity, were conducted in order to determine whether the data meets the requirements for factor analysis (Field, 2006). According to the results of the tests, the data set for the *Character of Citizens in a Country (Character)* factor meets the adequacy criteria for factor analysis (see Appendix A-2).

Factor analysis was conducted for the *Character of Citizens in a Country (Character)* factor for each year of the 2000-2005 period (6 years). The 12 items suggested as the ones comprising this factor were factor analyzed. The percentage of variance explained in the *Character of Citizens in a Country (Character)* factor (2000-2005) is provided in Appendix C (Tables C1-C6). According to Pedhazur and Schmelkin (1991), the first two or three components are supposed to extract at least 50% of the

variance. Results presented in Tables 1-6 show the extracted eigenvalues for every year and indicate that this requirement was met. In 2000, three components explained 60.40 percent of variance. In 2001, two components explained 52.36 percent of variance. In 2002, three components explained 61.34 percent of variance. In 2003, three components explained 60.63 percent of variance. In 2004, three components explained 60.80 percent of variance. And in 2005, three components explained 60.53 percent of variance. On average, the extracted eigenvalues explained 59.34 percent of variance. In five out of six years (2000 and 2002-2005) the results were achieved by three components, and in one year (2001), it was achieved by two components.

The factor loadings for the *Character* factor (2000-2005) are provided in Appendix C (Tables C7-C12). Only items with factor loadings of 0.5 and above were considered. For five out of six years (2000, and 2002 - 2005), three components were extracted, and for one year (2001), two components were extracted.

Extracted Factor 1. Six factors that appear in each of the first extracted factor (2000-2005) are *Civil Liberties in a Country*, *Political Rights in a Country*, *Independence of Judicial System from the Government*, *Percent of Population Above Income Poverty Line*, *Attitude toward Women and Treatment of Women in a Society (in the family, at work place),* and *Expenditure on Leisure and Recreation (as percent of a household budget).* Additionally, *Number of Reported Criminal Offenses, INGO Membership Density* and *Suicide Rate* appear in three years, and *Parliamentary Seats Held by Women* in one year.

This factor is similar to the hypothesized *Environment Where Specific Population is Located* factor. Therefore, based on the results of the tests, the hypothesized model of *Environment Where Specific Population is Located* factor can be adjusted to:

❖ Environment where specific population is located

- Level of Civil Liberties in a Country

- Level of Political Rights in a country

- Independence of Judicial System

- Population above income poverty rate

- Attitude toward women and treatment of women in a society (in the family, at the job)

- Expenditure on leisure as percent of the total family consumption

- International NGOs membership density

- Suicide rate

Extracted Factor 2. One factor that appears in each of the second extracted factor in five out of six years (except 2001) is *Seats in the Parliament Held by Women. Election Participation Rates* factor appears four times (except 2001 and 2005). Additionally, *Reported Police Offenses* variable appears three times, and *Prison Population* and *INGO Density* appear once each.

This factor is similar to the *Character as Manifested in Public Life* variable. Therefore, based on the results of the tests, the hypothesized model of *Character as Manifested in Public Life* factor can be adjusted to:

❖ Character as manifested in public life

- Election Participation Rates

- Parliamentary seats held by women

- Reported police offenses (per 100,000 of population)

Extracted Factor 3. One factor that appears in each of the third extracted factor in five out of six years (except 2001) is *Prison Population (per 100,000 population in the country).* No additional variables are present. This factor is similar to the *Character as Manifested in Private Life* variable. Therefore, based on the results of the tests, the hypothesized model of *Character as Manifested in Private Life* factor can be adjusted to:

❖ Character as manifested in private life

- Prison population (per 100,000 of population)

Based on the results of these tests, the researcher can adjust the model of *Character of Citizens in a Country (Character)* construct. The new adjusted model is as follows:

❖ Character as manifested in private life

- Prison population (per 100,000 of population)

❖ Character as manifested in public life

- Election Participation Rates

- Parliamentary seats held by women

- Reported police offenses (per 100,000 of population)

❖ Environment where specific population is located

- Level of Civil Liberties in a Country

- Level of Political Rights in a country

- Independence of Judicial System

- Population above income poverty rate

- Attitude toward women and treatment of women in a society (in the family, at the job)

- Expenditure on leisure as percent of the total family consumption

- International NGOs membership density

- Suicide rate

Therefore, for future studies this model can be considered as the model of the Character factor.

Results of Factor Analysis of the Family Background (Family) Factor

Two tests, the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Barlett's test of sphericity, were conducted in order to determine whether the data meets the requirements for factor analysis (Field, 2006). According to the results of the tests, the data set for the *Family Background (Family)* factor meets the adequacy criteria for factor analysis (see Appendix A-3).

Factor analysis was conducted for the *Family Background (Family)* factor for each year of the 2000-2005 period (6 years). The five items which had been suggested as the ones comprising this factor were factor analyzed. The percentage of variance explained in the *Family Background* factor (2000-2005) is provided in Appendix D (Tables D1-D6). According to Pedhazur and Schmelkin (1991), the first two or three components are supposed to extract at least 50% of the variance. Results presented in Tables D1-D6 show that the first component explained the required majority of variance in this factor. All five of the suggested *Family* variables loaded as one factor.

The factor loadings for the *Family* factor (2000-2005) are provided in Appendix D (Tables D7-D12). Only items with factor loadings of 0.5 and above were considered. In each of the 2000-2005 years only one component was extracted.

Results of the tests indicate that components were extracted somewhat differently than the hypothesized structure of the Family factor. Although it was hypothesized that the *Family* factor consists of two constructs, only one was formed in reality. All components loaded on one variable that can be identified as Family Background factor. Such loading is consistent with Becker's ideas about the economic importance of the number of children in the family (as discussed in the Literature Review section). Based on the results of this test, the researcher can adjust the model of Family construct. The new adjusted model is as follows:

- ❖ Family Status
    - Average number of children in a household
    - Family size (number of occupants per household)
    - Share of total population living in urban areas
    - Availability of family services
    - Divorce rate

Therefore, for future studies this model can be considered as the model for the Family factor.

Conclusion

The factor analysis tests discussed above condensed a large number of variables into distinctly different factors, for which shared characteristics describe the examined population. Thirteen variables chosen to represent the National Identity Awareness construct were condensed into four factors; twelve variables chosen to represent Character construct were condensed into three factors; and five variables chosen to represent Family construct were condensed into one factor.

Weighting/Scaling and Aggregation of Variables

Based on the discussion presented in the beginning of this chapter, no additional weighting or scaling was assigned to the extracted factors. Because scaling potentially hinders the meaning of the employed indicators, and because variables are automatically standardized during the process of FA, no scaling has been used in this study. No additional weights have been assigned either. Only factor scores created by the FA have been used. All further analyses have been carried out on the extracted factors' scores rather than the original data, as suggested by Field, 2006 (p. 628).

Based on the theoretical discussion on formative index creation presented in the beginning of this chapter, the additive aggregation technique was chosen as the method of factor aggregation into one final score. No theoretical or expert reasoning for functional method of aggregation has been found. Moreover, this approach is consistent with the basic formula of formative indicators, which is

$$A = Y_1 X_1 + Y_2 X_2 + \dots Y_n X_n$$

where *Yn* is a parameter reflecting the contribution of Xn to the latent variable *A*.

Final Results of Formation of the Expanded Index

EHCI (called EHCI-1) is the result of the summative aggregation of four major

variables: UNHCI, National Identity Awareness factor, Character factor, and Family

factor. Appendix E (Table E-1) presents EHCI-1 in non-standardized form. For

standardization, a simple score formula (United Nations Conference on Trade and

Development , 2002) was used:

$$\text{Score} = \frac{X\,i - X\,min}{X\,max - X\,min}$$

Appendix E (Table E-2) presents the standardized EHCI-1 (with scores ranging between

0 and 1).

Validation of the Expanded Human Capital Index

This section addresses the issue of validation of EHCI. It presents the rationale for

the choice of the use of regression analysis as the best method of validation. Moreover, it

presents a rationale on the choice of the dependent variables utilized.

Theoretical Approach to Validation

As already discussed in this chapter, the nature of formative indicators renders

classical internal consistency tests (for example, item analysis) inappropriate. Therefore,

other methods of validation need to be used. It has been suggested (Diamantopoulos &

Winklhofer, 2001; Jarvis et al., 2003) that utilization of reflective indicators (the ones that

represent effects of the construct) can serve as a means of validity testing. External validation includes evaluation of the relationship between the index and the outside variables that should theoretically correlate. This is generally done via regression analysis. Another approach to validation, suggested by the same researchers, links the index to other constructs with which it would be expected to correlate. In this study, validation has been conducted by regression analysis between the created index and several indicators theoretically known to correlate with human capital (percent of high-value-added products in total country export, amount of a country's foreign investments, and export of services by a country).

Validation Method Utilized for EHCI

As discussed earlier, composite indices can be validated by testing their relationship with the outside variables with which they are theoretically supposed to correlate. Human Capital can be shown as demonstrating itself twofold: through factors that contribute to it (input factors), and through factors which are indicative if its level (output factors). Discussion about contributing factors is one of the major parts of this dissertation. Representative consequential factors, through which HC is displayed (output factors), are such factors as export of high-value-added goods (Smith, 2005), export of services (Kalotay, 2008; United Nations Conference on Trade and Development, 2004), the number of scientific discoveries, number of patents, and the level of foreign investments in a country (Dunning & Narula, 2004; Hanson, 1996; Noorbakhsh, Paloni & Youssef, 2001; United Nations Conference on Trade and Development, 2002). The degree of relationships between these factors and the HC Index can be tested to determine

how much variation in the output factors can be explained by the new measure of HC. If the new HCI is a good measure of the real state of HC in a country, it must be highest in the countries that demonstrate the best output (Veenhoven, 1993).

Predictive validity has been determined based on the ability of the new index to predict another phenomenon better than the original HC index. Generally, in order to conduct this kind of validation, another variable, which is known to be correlated with the tested measure, must be examined in relation to this measure. The researcher used the above mentioned economic variables (export of services, high-value-added export and foreign investments), as they are theoretically known to be correlated with HC. Regression analysis was used in the study to examine whether the independent variable predicted the dependent variables. Regression analysis was chosen as the most appropriate way of analysis because a regression equation describes the nature of the relationships between the variables (Field, 2005; Pedhazur & Schmelkin, 1991). Regression analysis can also be described as prediction analysis because it measures the degree of linear relationships between the independent predictor variable and the dependent criterion variable. This study hypothesized a significant correlation between a new HC index (as the predictor variable) and several outcome variables that are theoretically known to correlate with HC in a country: the Percent of High-Value-Added products in national export, export of services as percent of the world total by a country, and the amount of foreign investments a country attracts.

The Procedure of Validation of EHCI

Simple and multiple regression analyses were conducted to examine predictability of the EHCIs as the predictor variables of the outcome variables (Field, 2005). Simple regression seeks to predict an outcome variable from a single predictor variable, while multiple regression aims to predict an outcome variable by several predictors. The outcome variables that have been used are the variables that are theoretically known to be positively correlated with the level of HC in a country: inward foreign direct investments (IFDI/FDI) in a country, the level of high-value-added export, and the level of services that a country exports. Simple regressions were conducted between these variables (used separately), and both types of EHCIs as a whole, as well as between these variables (used separately) and the separate components of EHCIs. Multiple regressions were conducted by employing all of the components of the new HC index and the outcome variables. Results of these analyses were compared with the results obtained from the similar tests with UNHCI and the outcome variables.

In multiple regressions, several methods of entry of explanatory variables can be utilized: hierarchical entry, forced entry, and stepwise entries. In hierarchical regression, predictors are chosen based on previous research, and the researcher uses it to decide the order of entering them into the model. As a general rule, well-established predictors are entered into the model first, and new predictors are entered next (Field, 2006). In forced entry regressions, all predictors are entered into the model simultaneously. Similar to hierarchical, this method utilizes well-established theoretical reasons for including the chosen predictors. However, unlike hierarchical, the researcher does not make decisions on the order of entry (Field, 2005). Stepwise methods rely on significance of variables

(via mathematical criterion) in entering variables. It has been suggested that Stepwise methods need to be avoided except for exploratory model building (because it takes many important methodological decisions out of the hands of a researcher) (Field, 2005; Wright, 1997). In this dissertation, both hierarchical and forced entry methods were used.

The following test results are considered to be the most important in statistical assessments: adjusted R^2, F-test and its significance, *B* coefficient, and significance of corresponding with it *t*-test. They are the measures this study used to evaluate the new HCI. Generally, R^2 and adjusted R^2 are the test results that are instrumental in assessing the goodness of fit of a model. R^2 represents the amount of variance in the outcome explained by the model relative to how much variation there was to explain in the first place. Therefore, as a percentage, it represents the percentage of variation in the outcome that is explained by the model (Field, 2005). Adjusted R^2 indicates how much variance in the outcome would be accounted for if the sample were generalized to the whole population.

Another step of assessing the model is through the F-test. This test is based on the ratio of the improvement due to the model, and the difference between the model and the observed data. In other words, F-ratio is a measure of how much the model has improved the prediction of the outcome compared to the level of inaccuracy of the model. Therefore, a good model needs to have a large F-ratio (Field, 2005).

The value of the *B* coefficient represents the change in the outcome resulting from a unit change in the predictor. Consequently, if a variable significantly predicts an outcome, than its *B* value is significantly different from 0. A hypothesis is tested using t-test statistic, which tests the null hypothesis that the value of *B* is 0. Failure to support the

null suggests the hypothesized model will predict the outcome variable. In SPSS, *Sig.*

measures the exact probability that the observed value of t would occur if the value of B

was really 0 (Field, 2006). When the observed value is less than .05, than B is considered

significantly different from zero and, therefore, contributes to the outcome.

Summary

Applying a general methodology of composite index construction, this researcher

sought to 1) create models of latent factors that may be included in HCI; 2) create an

EHCI; and 3) validate the index established herein. As such, this dissertation critiques,

refines, and re-examines widely used approaches to HC measurement. The predictive

power of the currently used UNHCI is examined, followed by an examination of the

predictive power of the two newly formed HCIs. Finally, the index which has the

strongest predictive power, and consequently, the one best indicator in economic

prediction equations, is determined.

CHAPTER IV

DATA ANALYSIS

Introduction

The currently used instruments for measuring HC are based on approaches developed during the period of mid-18th century—mid-20th century. These approaches view HC as a combination of the education and experience of a country's population. Consequently, they utilize education-related measures in their attempt to assess a level of national HC development. However, with the increased number of studies providing evidence for limited capacity of education-related variables to adequately measure national HC, the need for expanding currently used measures has become apparent. Intangible qualities of populations have been consistently suggested as the ones that contribute to the formation of national HC, and, therefore, need to be taken into consideration when measuring national HC.

The United Nations HC Index was used in this analysis, as the tool that is widely used internationally for national HC assessment. Although other HC measures exist (as discussed in the Literature Review section), they are used mostly in academic circles, and are similar to UNHCI in their approach of using education-related measures for HC assessment. Therefore, UNHCI can be considered as a good representative of this approach of measuring HC. The availability of UNHCI data for broad cross-country comparison, as well as its wide use in international statistical reporting, makes it a good measure for the use in this study.

In order to test empirically the adequacy of the UNHCI, and whether additionally suggested variables can be significant contributors toward an improved HC measure, a

series of regression equations were modeled. Economic performance measures, theoretically known to be correlated with HC, were used as the predicted variables. The rest of the chapter presents results of the analyses in the following format:

- Effect of UNHCI on economic development variables (export of services, high-value-added export, and foreign investments in a country) was examined. Effect of the individual newly suggested variables (ID, Family, and Character) on the economic development variables was examined. Results of these analyses were compared.

- The effect of the Expanded HC Index—EHCI-I—(the combination of the three newly suggested variables plus UNHCI as individual variables) was analyzed in terms of its relationship with the outcome variables (export of services, high-value-added export, and foreign investments in a country). These results were compared with the results of the analysis of the effect of UNHCI as an individual measure on economic variables in order to determine which measure had more explanatory power in relation to the predicted outcome economic measures.

- The effect of expanding the HC Index in a different way (the combination of ID and Character factors plus modified Family factor which incorporated UNHCI) was analyzed in terms of its relationship with the outcome variables. Incorporating UNHCI as a part of one of the newly suggested variables allowed for preserving this factor in the newly created index without adding uncertainty affiliated with it. The effect of the new index created this way—

EHCI-II—was tested against the outcome variables. The results produced by EHCI-I and EHCI-II were compared.

Comparison of the Effect of UNHCI and Individual Variables (ID, Family, and Character) on the Economic Development Variables

As suggested, education-based HC measures are not fully adequate measures of national HC. Three additional latent variables (National Identity Awareness, Family Background, and Character) have been suggested as ones that may affect national HC, and therefore, their roles need to be examined. The following three subsections report the results of examination and compare the effects of these individual variables as separate factors and UNHCI on the outcome economic variables.

Comparison of the Effect of UNHCI and ID Factor on the Outcome Economic Development Variables (Export of Services, High-Value-Added Export, and Foreign Investments)

UNHCI and ID as Tested Against the Export of Services Measure

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because this study's goal was assessing the relative effect of independent variables on dependent (economic) variables, rather than actual effect sizes caused by independent variables. Based on the results reported in Table 29, both UNCHI and the ID factor had a statistically significant effect on economic measures.

Table 29. Comparison Between Effects of National Identity Awareness Factor and UNCHI on the Outcome Variables: 2000 - 2005

Dependent outcome variables: outcome variables separately (Export of Services, High-Value-Added Export, Foreign Investments)

	ID and Export of Services		ID Factor and High-Value Export						ID Factor and Foreign Investments					
	2002-04	2003-05	2000	2001	2002	2003	2004	2005	2000	2001	2002	2003	2004	2005
Bstd	0.585***	0.692***	0.470***	0.493***	0.473***	0.480***	0.452***	0.424***	-0.209 *	-0.242 **	-0.230 *	-0.236 *	0.044	-0.082
AdjR²	0.337	0.467	0.215	0.237	0.218	0.225	0.199	0.174	0.035	0.05	0.045	0.045	-0.009	-0.004
F-Stat	57.865***	39.559***	36.780***	42.052***	38.863***	39.321***	34.233***	29.352***	5.276*	7.216**	6.541*	5.152*	0.172	0.613

	UNHCI and Export of Services		UNHCI and High-Value-Added Export						UNHCI and Foreign Investments					
	2002-04	2003-05	2000	2001	2002	2003	2004	2005	2000	2001	2002	2003	2004	2005
Bstd	0.299***	0.363**	0.441***	0.474***	0.469***	0.434***	0.407***	0.385***	-0.365 ***	-0.367 ***	-0.314 **	-0.266 **	-0.186	-0.140
AdjR²	0.083	0.114	0.189	0.219	0.215	0.183	0.16	0.142	0.124	0.126	0.089	0.061	0.025	0.011
F-Stat	12.802***	7.418**	34.608***	41.375***	41.209***	33.864***	29.420***	25.420***	15.060***	15.579***	10.584**	7.437**	3.535	2.103

where

Bstd = standardized coefficient

AdjR² = amount of variation in dependent variable explained by variation in independent variable

F-Stat = the fit of the model

* Significant at 0.05 level; ** Significant at 0.01 level; *** Significant at 0.001 level

ID = National Identity Awareness factor

UNHCI = United Nations Human Capital Index

However, the National Identity factor had more explanatory power than the UNHCI. Variation in national identity awareness in a country's population could account for 33.7 percent of variation in the country's export of services for the period 2002-2004, and for 46.7 percent for 2003-2005 period. For UNHCI these measures were 8.3 percent and 11.4 percent respectively.

Linear regression coefficients (statistically significant for both of the examined time periods) indicate that one SD increase in the level of a country's citizens identification with their country increased the country's export of services by 0.585 SD in 2002-2004, and by 0.692 SD in 2003-2005. For UNHCI these measures were 0.299 SD and 0.363 SD respectively. According to F-test results, improvement in prediction of the level of export of services that resulted from fitting the model with the ID factor, relative to the inaccuracy that existed in the model was 57.865 in 2002-2004 and 39.559 in 2003-2005. When UNHCI was utilized in the model, F-test results were 12.802 and 7.418 for the respective periods.

UNHCI and ID as Tested Against High-Value-Added Export Measure

Based on the results reported in Table 29, both UNCHI and the ID factor were significant in predicting proportion of high-value-added export (as a share of the total country export) in national export. However, the National Identity factor had more explanatory power than the UNHCI. According to the results of regression analysis, variation in ID factor accounted for 21.5 percent of variation in a country's high-value-added export in 2000, 23.7 percent in 2001, 21.8 percent in 2002, and 22.5, 19.9, 17.4 percents in 2003-2005 respectively. The results of this analysis for UNHCI were 18.9,

21.9, 21.5, 18.3, 16, and 14.2 percent respectively. On average, variation in ID factor accounted for 21.13 percent in national high-value-added export in 2000-2005. Variation in UNHCI accounted for 18.47 percent on average. One standard deviation increase in ID factor led to 0.470 SD increase in high-value-added export in 2000, 0.493 SD increase in 2001, 0.473 SD, 0.480 SD, 0.452 SD, and 0.424 SD increase in 2002-2005 respectively (all six regression coefficients are statistically significant at *p<0.001*). One SD increase in UNHCI led to 0.441 SD increase in 2000, 0.474 SD increase in 2001, 0.469 SD, 0.434 SD, 0.407 SD and 0.385 SD increase in 2002-2005 respectively (all six regression coefficients are statistically significant at *p<0.001*). On average, one SD increase in ID factor accounted for 0.47 increase in high-value-added export in 2000-2005. On average, one SD increase in UNHCI accounted for 0.44 increase. According to F-test results, improvement in prediction of the proportion of high-value-added export in the total country export that resulted from fitting the model with the ID factor, relative to the inaccuracy that existed in the model, was 36.78 in 2000, 42.05 in 2001, 38.86, 39.32, 34.23, and 29.35 in 2002-2005 respectively. F-test results for the model with UNHCI in it were: 34.61, 41.38, 41.21, 33.86, 29.42, and 25.42 respectively. On average, the F-test result was 36.77 for the ID factor and 34.32 for UNHCI for the examined period of 2000-2005.

UNHCI and ID as Tested Against Foreign Direct Investments Measure

National identity awareness of population in a country and UNHCI in a country were shown to be statistically significant predictors of foreign direct investments in a country for four out of six years, holding other variables constant. Four out of six

regression coefficients were statistically significant at (*p<0.05 or better*), with the sign being negative for each of the four years. At the same time, UNHCI was a better predictor of FDI in a country than ID factor. According to the results of regression analysis (Table 29), variation in the ID factor could account for 3.1 percent of variation in FDI in a country on average for the 2000-2005 period. Variation in UNHCI could account for 7.3 percent for the same period. One SD change in ID factor led to 0.23 SD change in FDI variable, while one SD change in UNHCI led to 0.33 SD change.

Conclusion

Overall, the results reported above provide evidence for the ID factor possessing more explanatory power in relation to the selected economic variables than the UNHCI, holding other variables constant. ID factor is more effective in predicting the level of national export of services and high-value-added export. UNHCI is shown to be more effective in predicting the amount of foreign investments that a country attracts.

Comparison of the Effect of UNHCI and Family Factor on the Outcome Economic

Development Variables (Export of Services, High-Value-Added Export, and Foreign

Investments)

UNHCI and Family Factor as Tested Against the Export of Services Measure

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because this study's goal was assessing the relative effect of independent variables on dependent (economic) variables, rather than actual effect sizes caused by independent variables. Based on the test results reported in Table 30, both Family factor and UNHCI had a statistically significant effect on economic measures. At the same time, Family factor seemed to be a stronger predictor of those measures. Variation in the Family factor could account for 23 percent in a country's export of services in 2002-2004 period, and for 27.1 percent in 2003-2005 period. Variation in UNHCI could account for 8.3 percent and 11.3 percent respectively. Linear regression coefficients (statistically significant for both of the examined time periods at *p<0.01 or better*) indicated that one SD increase in the measure of a country's Family factor increased the country's export of services by 0.486 SD in 2002-2004 and by 0.536 SD in 2003-2005. For UNHCI these measures were 0.299 SD and 0.362 SD respectively. According to F-test results, improvement in prediction of the level of export of services that resulted from fitting the model, relative to the inaccuracy that existed in the model was 36.527 in 2002-2004 and 17.704 in 2003-2005. When UNHCI was utilized in the model, F-test results were 12.793 and 7.396 for the respective periods.

Table 30. Comparison Between Effects of Family Factor and UNHCI on the Outcome Variables: 2000 – 2005

Dependent variables: Export of Services, High-Value-Added Export, Foreign Investments

	Family and Exp of Services		Family Factor and High-Value Export						Family Factor and Foreign Investments					
	2002-04	2003-05	2000	2001	2002	2003	2004	2005	2000	2001	2002	2003	2004	2005
Bstd	0.486***	0.536***	0.573***	0.557***	0.551***	0.574***	-0.564 ***	0.564***	-0.411 ***	-0.462 ***	-0.397 ***	-0.374 ***	0.254*	-0.179
AdjR²	0.230	0.271	0.324	0.306	0.299	0.324	0.313	0.314	0.160	0.205	0.149	0.131	0.055	0.022
F-Stat	36.527***	17.704***	70.487***	63.563***	62.865***	68.194***	64.242***	64.955***	19.721***	24.659***	17.223***	15.463***	6.644*	3.134

	UNHCI and Exp of Services		UNHCI and High-Value-Added Export						UNHCI and Foreign Investments					
	2002-04	2003-05	2000	2001	2002	2003	2004	2005	2000	2001	2002	2003	2004	2005
Bstd	0.299***	0.363**	0.441***	0.474***	0.469***	0.434***	0.407***	0.385***	-0.365 ***	-0.367 ***	-0.314 **	-0.266 **	-0.186	-0.140
AdjR²	0.083	0.114	0.189	0.219	0.215	0.183	0.160	0.142	0.124	0.126	0.089	0.061	0.025	0.011
F-Stat	12.802***	7.418**	34.608***	41.375***	41.209***	33.864***	29.420***	25.420***	15.060***	15.579***	10.584**	7.437**	3.535	2.103

where

Bstd = standardized coefficient

AdjR² = amount of variation in dependent variable explained by variation in independent variable

F-Stat = the fit of the model

* Significant at 0.05 level; ** Significant at 0.01 level; *** Significant at 0.001 level

Family = Family factor

UNCHI = United Nations Human Capital Index

UNHCI and Family Factor as Tested Against High-Value-Added Export Measure

Based on the reported results (Table 30), Family factor and UNHCI were strong predictors of the proportion of high-value-added products in a country's export. At the same time, Family factor possessed more explanatory power in predicting this economic measure than UNHCI did. According to the results of the regression analysis, variation in measures of the Family factor accounted for 32.4 percent of variation in a country's high-value-added export in 2000, 30.6 percent in 2001, 29.9 percent in 2002, 32.4, 31.3, and 31.4 percent in 2003-2005 respectively. The results of this analysis for UNHCI were 18.9, 21.9, 21.5, 18.3, 16, and 14.2 percent respectively. On average, variation in Family factor accounted for 31.3 percent in the measure of high-value-added export in a country in 2000-2005. Variation in UNHCI accounted for 18.47 percent during this period.

One SD increase in the measures of Family factor led to 0.573 SD increase in high-value-export in 2000, 0.557 SD increase in 2001, 0.551 SD, 0.574 SD, and 0.564 SD increase in 2002, 2003 and 2005 respectively (all six regression coefficients were statistically significant at *p<0.001*). One SD increase in UNHCI led to 0.44 SD increase in 2000, 0.474 SD increase in 2001, 0.469 SD, 0.434 SD, 0.407 SD and 0.385 SD increase in 2002-2005 respectively (all six regression coefficients were statistically significant at *p<0.05* or better). On average, one SD increase in Family factor accounted for 0.56 increase in high-value-added export during the period of 2000-2005. On average, one SD increase in UNHCI accounted for 0.44 increase. In 2004, the regression coefficient had a negative sign, which implied reduction by 0.564 of SD in a country's high-value export with one SD increase in the measures of Family factor.

According to F-test results, improvement in prediction of the proportion of high-value-added export in the total country export that resulted from fitting the model, relative to the inaccuracy that existed in the model was 70 in 2000, 63.563 in 2001, 62.865, 68.194, 64.242, and 64.955 in 2002-2005 respectively. F-test results for the model with UNHCI in it were: 34.61, 41.38, 41.21, 33.86, 29.42, and 25.42 respectively. On average, F-test result was 65.72 for the Family factor and 34.32 for UNHCI.

UNHCI and Family Factor as Tested Against Foreign Direct Investments Measure

Family factor and UNHCI were shown as being statistically significant predictors for FDI in a country. At the same time, Family factor had more explanatory power than the UNHCI. According to the results reported in Table 30, variation in Family factor could account for 16 percent in FDI in a country in 2000, 20.5 percent in 2001, 14.9 percent in 2002, 13.1 and 5.5 percent in 2003-2004 respectfully. On average, Family factor could explain 12 percent of variation in variation of national FDI measure. UNHCI could explain on average 7.3 percent of variation.

The standardized regression coefficient of the Family factor was statistically significant for five out of six years (except 2005), and *Bstd* of UNHCI was statistically significant for four out of six years (except 2004 and 2005) ($p<0.05$ or better). One SD change in Family factor led to 0.41 SD change in FDI factor in 2000, 0.46 SD change in 2001, 0.397 SD, 0.374 SD, and 0.254 SD change in 2002-2004. Results for 2005 were not significant. One SD change in UNHCI led to 0.36 SD change in FDI measure in 2000, 0.36 SD change in 2001, 0.31 SD and 0.27 SD change in 2002-2003. Results for 2004-2005 were not significant. According to the F-test results, improvement in

prediction of the amount of FDI in a country that resulted from fitting the model with the Family factor, relative to the inaccuracy that existed in the model, was on average 16.74 for 2000-2004 (2005 year was not significant). That measure was 12.17 for UNHCI for 2000-2003 (2004-2005 were not significant).

Conclusion

These results provide evidence that the Family factor possesses more explanatory power in relation to the three outcome economic variables than the UNHCI, holding other variables constant.

Comparison of the Effect of UNHCI and Character Factor on the Outcome Economic Development Variables (Export of Services, High-Value-Added Export, and Foreign Investments)

UNHCI and Character Factor as Tested Against the Export of Services Measure

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because this study's goal was assessing the relative effect of independent variables on dependent (economic) variables, rather than actual effect sizes caused by independent variables. Based on the test results reported in Table 31, both Character factor and UNHCI had a significant effect on economic measures. At the same time, the Character factor seemed to be a stronger predictor of these measures. Variation in the Character factor could account for 41.2 percent in a country's export of services in 2002-2004 period, and for 51.2 percent in 2003-2005 period. Variation in UNHCI could account for 8.3 percent and 11.3 percent respectively.

Linear regression coefficients (statistically significant for both of the examined time periods at *p<0.01 or better*) indicated that one SD increase in the measure of a country's Character factor increased the country's export of services by 0.646 SD in 2002-2004 and by 0.724 SD in 2003-2005.

For UNHCI those measures were 0.299 SD and 0.362 SD respectfully. According to F-test results, improvement in prediction of the level of export of services that resulted from fitting the model, relative to the inaccuracy that existed in the model was 68.166 in 2002-2004 and 41.882 in 2003-2005. When UNHCI was used in the model, F-test results were 12.793 and 7.396 for the respective periods.

UNHCI and Character Factor as Tested Against High-Value-Added Export Measure

Based on the reported results (Table 31), the Character factor and UNHCI were significant predictors of the proportion of high-value-added products in a country's total exports. According to the results of regression analysis, variation in measures of the Character accounted for 16.2 percent of variation in a country's high-value-added export in 2000, 15 percent in 2001, 16.4 percent in 2002, 30.9, 18.3, 17.6 percent in 2003-2005 respectively. The results of this analysis for UNHCI were 18.9, 21.9, 21.5, 183, 16, and 14.2 percent respectively. On average, variation in the Character factor accounted for 19.1 percent in the measure of high-value-added export in a country in 2000-2005.

Table 31. Comparison Between Effects of Character Factor and UNHCI on the Outcome Variables: 2000 – 2005

Outcome dependent variables: Export of Services, High-Value-Added Export, Foreign Investments

	Character and Exp of Services		Character and High-Value-Added Export						Character and Foreign Investments					
	2002-04	2003-05	2000	2001	2002	2003	2004	2005	2000	2001	2002	2003	2004	2005
Bstd	0.646***	0.724***	0.411***	0.396***	0.413***	0.561***	0.436***	0.427***	-0.400 ***	-0.494 ***	-0.124	-0.07	-0.015	-0.168
AdjR²	0.412	0.512	0.162	0.150	0.164	0.309	0.183	0.176	0.150	0.234	0.002	-0.006	-0.011	0.017
F-Stat	68.166***	41.882***	24.253***	21.971***	24.459***	57.380***	30.197***	28.485***	15.827***	25.482***	1.165	0.433	0.02	2.58

	UNHCI and Exp of Services		UNHCI and High-Value-Added Export						UNHCI and Foreign Investments					
	2002-04	2003-05	2000	2001	2002	2003	2004	2005	2000	2001	2002	2003	2004	2005
Bstd	0.299***	0.363**	0.441***	0.474***	0.469***	0.434***	0.407***	0.385***	-0.365 ***	-0.367 ***	-0.314 **	-0.266 **	-0.186	-0.140
AdjR²	0.083	0.114	0.189	0.219	0.215	0.183	0.160	0.142	0.124	0.126	0.089	0.061	0.025	0.011
F-Stat	12.802***	7.418**	34.608***	41.375***	41.209***	33.864**	29.420***	25.420***	15.060***	15.579***	10.584**	7.437**	3.535	2.103

where

Bstd = standardized coefficient

AdjR² = amount of variation in dependent variable explained by variation in independent variable

F-Stat = the fit of the model

* Significant at 0.05 level

** Significant at 0.01 level

*** Significant at 0.001 level

ID = National Identity Awareness factor

Character = Character factor

UNCHI = United Nations Human Capital Index

Variation in UNHCI accounted for 18.47 percent during this period.

Standardized linear regression coefficients had a positive sign and were statistically significant for both Character factor and UNHCI (*p<0.01 or better*). The values of *Bstd* were bigger for Character factor than for UNHCI for three years (2003-2005), but they were bigger for UNHCI for three other years (2000-2002). One SD increase in the measure of Character factor led to 0.411 SD increase in high-value-export in 2000, 0.396 SD increase in 2001, 0.413 SD, 0.561 SD, 0.436 SD, and 0.427 SD increase in 2002-2005 respectively. One SD increase in UNHCI led to 0.44 SD increase in 2000, 0.474 SD increase in 2001, 0.469 SD, 0.434 SD, 0.407 SD and 0.385 SD increase in 2002-2005 respectively. On average, one SD increase in the Character factor accounted for 0.441 SD increase in high-value-added export during the period of 2000-2005. On average, one SD increase in UNHCI accounted for 0.435 increase.

According to F-test results, improvement in prediction of the intensity of high-value-added export in the total country export that resulted from fitting the model with the Character factor, relative to the inaccuracy that existed in the model, was 24.253 in 2000, 21.971 in 2001, 24.459, 57.380, 30.197, and 28.485 in 2002-2005 respectively. The numbers for the model with UNHCI were as follows: 34.608 in 2000, 41.375 in 2001, 41.209, 33.864, 29.420, and 25.420 in 2002-2005 respectively.

UNHCI and Character Factor as Tested Against Foreign Direct Investments Measure

The Character factor for a country and UNHCI were also shown as being statistically significant predictors of foreign direct investments in a country, holding other variables constant. According to the results of regression analysis (Table 31), on average,

variation in the Character factor could account for 7 percent of variation in FDI in a country for the period of 2000-2005; and variation in UNHCI could account for 7.3 percent on average.

Standardized regression coefficients of the Character factor were statistically significant for two out of six examined years (2000 and 2001), with a sign being negative. Standardized coefficients of UNHCI were statistically significant for four out of six years (except 2004 and 2005), with the sign being negative. On average, one SD change in the Character factor led to 0.45 SD change in FDI measure, and one SD change in UNHCI led to 0.33 SD change in FDI measure. According to the F-test results, improvement in prediction of the amount of FDI in a country that resulted from fitting the model with the Character factor, relative to the inaccuracy that existed in the model, was on average 20.65 for the period of 2000-2001 (results for 2002-2005 were not significant). This measure was 12.17 for UNHCI for 2000-2003 (results for 2004-2005 were not significant).

Conclusion

These results provide evidence that the Character factor possesses slightly more explanatory power in relation to the three outcome economic variables than the UNHCI, holding other variables constant. It has more explanatory power in terms of the export of services measure, and is similar to UNHCI in terms of high-value-added export and foreign investments measures.

These test results provided some evidence for significance of the three newly suggested variables in terms of their ability to predict selected economic development

variables as compared with UNCHI. The factor that appeared consistently better than UNHCI was the Family factor. It outperformed UNHCI on its ability to predict each of the three selected economic variables. The National Identity Awareness factor outperformed the UNHCI on two out of three selected economic variables (export of services and high-value-added export). The Character factor strongly outperformed UNHCI on the Export of Services factor. Its predictive power was somewhat similar to UNHCI in terms of predicting high-value-added export and FDI in a country. For three out of six examined years it was superior to UNHCI's predictive power for both variables.

Attention needs to be drawn to the predicted outcome variables themselves. The Export of services factor was consistently and strongly predicted by ID, Family, and Character factors. UNHCI displayed significantly less power for predicting that economic variable. High-value-added export was similarly consistently predicted by ID, family, and Character factors. UNHCI displayed significantly less power for predicting this variable. Foreign direct investments factor, on the contrary, was predicted with similar strength and consistency by both UNHCI and each of the variables (ID, Family, and Character). Potential explanation of less significant results between the newly suggested variables and FDI variables may lie in the nature of the predicted variables themselves.

Export of Services Measure

Literature suggests that currently, countries with better developed human resources produce higher level of professional services. Therefore, such countries are positioned to export more of such services than countries with a lower level of human

resource development (United Nations Conference on Trade and Development, 2004).

Export of services continues to be dominated by developed countries with USA, Japan,

and the EU being the major participants. The share of the world's export of services stock

increased for developing countries from 1 percent in 1990 to 10 percent in 2002 (WIR,

2004, p. xxi). By 2001, the service sector accounted for 72 percent of GDP in developed

countries and 52 percent in developing countries (United Nations Conference on Trade

and Development, 2004, p.xxi). Currently, about 60 percent of global investment stock is

in services (United Nations Conference on Trade and Development, 2004, p. xx).

Traditionally, export of services was in banking, insurance and transportation, and was

undertaken by companies investing internationally to support overseas production by

their manufacturing clients. Although this pattern is still fully in place, new trends have

been added, such as exporting services on their own account (i.e., without the need to

support own production) (WIR, 2004). For example, the "Big Four" accounting firms

have global operations and export accounting and management consulting services

around the world with revenues running into billions of dollars. Currently, the Big Four

audit the majority of publicly listed companies in most countries.

Availability of the export of services data as well as its nature makes this measure

a valid measure for assessing national HC level.

High-Value-Added Export Measure

According to the literature reviewed as part of this study, the intensity of high-

value-added exports by a country is one of the indications of the quality of its labor force.

In fact, high-value-added production is often a synonym of human-capital-intensive

production (Dyker, Nagy, & Spilek, 2003; Krugman, 1991; Smith, 2005; Wolfmayr-Schnitzer, 1998). Countries with better developed human resources export significantly more high-value-added products than do countries with a lower level of HC, which specialize mostly in export of natural resources. For example, currently, 75 % of intra-EU trade growth is accounted for high-value-added (human capital intensive) products. Levin and Raut (1997) point out that export and adoption of modern technologies correlate. They point to the fact that the productivity differential associated with the export sector is concentrated in the manufactured export sector rather than the raw materials export sector. This happens because the export sector utilizes human capital more efficiently than the rest of the economy (Levin & Raut, 1997). Educated workers can quickly adapt to advanced and rapidly changing technology, which is crucially important for competitiveness in the world market.

Availability of the high-value-added export data as well as its nature makes this measure a valid measure for assessing national HC level.

Foreign Direct Investments Measure

Practical comparison of FDI data (for example, FDI stocks as a percentage of GDP or FDI flows as a percentage of GDP) shows that this outcome variable has some practical weaknesses if used as a variable predicted by the degree of national HC development. Foreign investments are generally divided into four major groups: market-seeking FDI, resource-seeking FDI, efficiency-seeking FDI, and created-assets-seeking FDI (United Nations Conference on Trade and Development, 2006, p.158). Market-seeking FDI generally aims at expanding the customer base, often by investing in

middle-income developing economies. Efficiency-seeking FDI targets lower and middle

income developing countries and transition economies in an attempt to reduce the cost of

production. Resource-seeking FDI constitute investments in countries with abundant raw

materials desiring to access key factor inputs and secure their supplies for their home

markets. Created-assets-seeking FDI looks for new technologies to improve productivity

by mainly investing in developed economies.

Although there is evidence that a more highly educated populace attracts FDI

(Kogut & Chang, 1996; Mody & Srinivasan, 1998), this fact is probably more associated

with efficiency-seeking and created-asset-seeking investments. At the same time, data on

FDI grouping on a cross-country level for all countries is generally not reported. In fact,

all attempts by the author (in consultation with experts in the field) to locate such data did

not bring the desired results. One consequence of such data reporting is that the data are

artificially skewed because of poor oil-producing countries as well as tax havens. In both

of these groups of countries, GDP can actually be small, and even a moderate amount of

FDI can show as high in terms of its percentage of GDP. Furthermore, FDI can be the

major driver of the economy specifically because of a country being a tax-haven or an

oil-producer. For example, in Liberia FDI values are 599.5% and 832.6% for 2000 and

2005 (United Nations Conference on Trade and Development, 2006, p. 309); Brunei

displays 89.6% in 2000 and 145.2% in 2005. Luxemburg's FDI in 2005 is 203% of GDP,

and Bermuda's—2,419.4% (United Nations Conference on Trade and Development,

2006, p. 312)!

Furthermore, in the modern resource-lacking world, rich countries would go a

long way to insure access to resources, which means that they heavily invest in the

locations that are not attractive except for the availability of natural resources. The United Nations Conference on Trade and Development (2002) suggested that a high (greater than one) index value might be the result of many factors, such as exceptionally welcoming regulatory regimes, good macroeconomic environment, efficient business environment, good growth prospects, ample and economical skilled labor, natural resources, good R&D capabilities, advanced infrastructure, efficient services support, favorable location for exporting to large markets, tax-havens and so on. FDI which is a result of created politico-socio-economic factors, is related to drastically different features of a country, than FDI which is a result of the availability of natural resources. Consequently, although raw FDI scores may be similar between these two groups of countries, FDI in former countries point to a different level of national HC development than FDI in later countries. Although in this study, oil-producing countries (OPEC states and former USSR oil-rich states) and tax-havens (as defined by OECD), which artificially skew FDI distribution toward resource-seeking FDI, were removed, there still are multiple unaccounted factors, which introduce error into these results.

It appears that the currently available measures of FDI in a country may not be very good measures from which to make a judgment about the country's level of HC development, if national HC is viewed in terms of not only school enrollment and basic literacy, but in broad terms of nation-wide availability of economically-valuable skills (which EHCI implies). Resource-seeking and market-seeking FDI requires only availability of basic skills in the population of the host country, such as literacy. UNHCI measures exactly these kinds of skills. Consequently, there is stronger relationship between UNHCI and FDI than the relationship between EHCI and FDI. Potential

evidence for this proposition may be the fact that most *Bstd* coefficients in regressions between FDI measures and independent variables (different combinations of HC-related measures) have a negative sign. A negative sign indicates that FDI level decreases with increased level of human capital. This fact, together with the fact that FDI has been rising, provides evidence that most reported FDI is, in fact, resource-seeking or market-seeking, and is not created-assets-seeking FDI, which requires a high level of HC (R&D may serve an example of such kind of FDI).

Comparison of the Effect of UNHCI and EHCI-1 on the Economic Development Variables (Simple Case)

The previous section provided some preliminary evidence for the significance of ID, Family, and Character factors in terms of their ability to predict economic variables. Therefore, these variables may be used as contributing variables to a new HC measure. The benefit of expanding UNHCI by adding these variables to it was examined. This section reports on the results of a simple case aggregation of the above mentioned variables (ID, Family, and Character) with the currently used UNHCI to form an expanded measure of HC (called EHCI-I). The effect of EHCI on economic measures was then compared with effect of UNHCI on economic measures.

Results of Regression Analysis:

Export of Services (as Percent of the World Total) and HC Indices (UNHCI and EHCI-1)

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because the goal of this study was to

assess the relative effects of independent variables (UNHCI and EHCI-1) on dependent (economic) variables, rather than actual effect sizes caused by independent variables. Regression analyses between a country's export of services and 1) UNHCI; and 2) EHCI-I were conducted. The export of services data was only available as an average for 2002-2004 (United Nations Conference on Trade and Development, 2006) and 2003-2005 (United Nations Conference on Trade and Development, 2007). Therefore, all variables employed in the study were used as 2002-2004 and 2003-2005 averages. Results of two sets of regressions were compared:

1. Export of services as predicted by the UNHCI (average for 2002-2004) and Export of services as predicted by the EHCI-I (average for 2002-2004).

2. Export of services as predicted by the UNHC index (average for 2003-2005) and Export of services as predicted by the EHCI-I (average for 2003-2005).

The results indicate (Table 32) that UNHCI had significantly less explanatory power in terms of predicting the level of a country's export of services than EHCI-1. For 2002-2004, UNHCI could explain 8.3 percent of the variation in the export of services, while the EHCI-1 could explain 60 percent. For 2003-2005, UNHCI accounts for 11.3% of variation in this variable, while the EHCI-1 explains 53.2%.

Table 32. Regression Results for Export of Services by Countries and Their HC Index: 2002-2004 and 2003-2005 Averages

Years	1. Results for the United Nations HC Index									2. Results for the Expanded HC Index -I								
	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
2002-2004	0.299***	0.000	0.083	12.802***	0.000	-0.096	1.665	1.000	1.000	0.778***	0.000	0.600	126.873***	0.000	0.013	1.989	1.000	1.000
2003-2005	0.363**	0.009	0.114	7.418**	0.009	-1.124	2.364	1.000	1.000	0.738***	0.000	0.532	40.753***	0.000	0.166	2.117	1.000	1.000

where

Bstd = standardized regression coefficient for HC Index
P-Value = significance
* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level
Adj R² = Amount of variation in the Export of Services variable explained by variation in HC Index variable
F-Stat = the overall fit of the model
D-W = homoscedasticity diagnostics
VIF = collinearity diagnostics
b = constant

1. Dependent variable = export of services by countries
Independent variable = United Nations HC Index (UNHCI)

2. Dependent variable = export of services by countries
Independent variable = Expanded HC Index-I

The standardized coefficients for the linear term (*Bstd*) of UNHCI and for EHCI-1 were statistically significant predictors of export of services for both time periods examined. However, EHCI-1 indicated a greater effect on the export of services by a country than UNHCI. Specifically, one standard deviation change in UNHCI led to 0.299 standard deviation change in export of services, while EHCI-1 led to 0.778 change in export of services (for 2002-2004 period). For 2003-2005, one SD change in UNHCI led to 0.362 standard deviation change in export of services, and 0.738 SD change if EHCI-1 was used.

When compared to the currently utilized UNHCI, results of the F-statistics indicated that utilizing EHCI-I significantly improves the regression model's ability to predict the level of services exported by a country. For 2002-2004, F-stat was 12.793 for UNHCI and 126.873 for EHCI-1. For 2003-2005, those numbers were 7.396 and 40.753 respectively (tests were significant at *p<0.01* or better). (Multicollinearity and homoscedasticity statistics for this test were well within the norm.)

Therefore, for the time periods examined, EHCI-1 was a strong predictor of the level of services that a country exports. It was a significantly stronger predictor than UNHCI.

Results of Regression Analysis:

High-Value-Added Export (As the Percent of the Total Country Export) and HC Indices

(UNHCI and EHCI-I)

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because the goal of the study was

assessing relative effects of independent variables (UNHCI and EHCI-1) on dependent (economic) variables, rather than actual effect sizes caused by independent variables.

Regression analyses comparing high-value-added export as the percent of total national exports and 1) UNHCI; and 2) EHCI-I were conducted. The high-value-added export data were available for each year of the period of 2000-2005. Therefore, regression tests were conducted for each year, and results of two sets of regressions were compared: high-value-added export as predicted by UNHCI and high-value-added export as predicted by EHCI-1.

The results indicate (Table 33) that UNHCI had less explanatory power toward the level of a country's export of high-value-added goods than EHCI-I. For each year of the examined period (2000-2005), Adjusted R^2 statistics for EHCI-1 were comparatively higher than for the UNHCI. For six years of the examined period on average, 18.5% of the variation in the proportion of high-value-added export could be explained by variation in UNHCI, while variation in EHCI-1 explained on average 25.4% of this variation (Table 33). The standard coefficients for the linear term (*Bstd)* of UNHCI and EHCI-1 were positive for each of the six years, while also being statistically significant predictors of the amount of high-value-added export for each year of the examined period.

Table 33. Regression Results for Countries' High-Value-Added Export and Their HC Indices: 2000-2005

Years	1 Results for the United Nations HC Index									2 Results for the Expanded HC Index -I								
	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
2000	0.441***	0.000	0.189	34.608***	0.000	-6.803	1.977	1.000	1.000	0.515***	0.000	0.258	36.102***	0.000	4.821	1.998	1.000	1.000
2001	0.474***	0.000	0.219	41.375***	0.000	-8.149	2.025	1.000	1.000	0.551***	0.000	0.296	43.119***	0.000	4.943	1.947	1.000	1.000
2002	0.469***	0.000	0.215	41.209***	0.000	-8.542	1.952	1.000	1.000	0.497***	0.000	0.239	33.416***	0.000	5.438	1.882	1.000	1.000
2003	0.434***	0.000	0.183	33.864***	0.000	-5.997	1.860	1.000	1.000	0.536***	0.000	0.281	43.598***	0.000	5.065	1.765	1.000	1.000
2004	0.407***	0.000	0.160	29.42***	0.000	-4.445	1.918	1.000	1.000	0.410***	0.000	0.160	22.385***	0.000	4.982	2.009	1.000	1.000
2005	0.385***	0.000	0.142	25.42**	0.000	-3.798	1.774	1.000	1.000	0.542***	0.000	0.288	47.462***	0.000	5.457	1.677	1.000	1.000

where

Bstd = standardized regression coefficient for HC Index

P-Value = significance

* Significant at 0.05 level

** Significant at 0.01 level

*** Significant at 0.001 level

Adj R² = Amount of variation in the High-Value-Added Export variable explained by variation in HC Index variable

F-Stat = the overall fit of the model

D-W = homoscedasticity diagnostics

VIF = collinearity diagnostics

TOL = collinearity diagnostics

b = constant

1. Dependent variable = High-Value-Added Products in Export of Countries

Independent variable = United Nations HC Index (UNHCI)

2. Dependent variable = High-Value-Added Products in Export of Countries

Independent variable = Expanded HC Index –I (EHCI – 1)

At the same time, the values of the coefficients associated with EHCI-1 were higher than the values of coefficients associated with the UNHCI for every year of the examined 2000-2005 period. On average, one standard deviation change in UNHCI led to 0.44 SD change in high-value-added export, while a one SD change in EHCI-1 was associated with 0.51 SD change in high-value-added export.

F-statistics is a measure of how much the model has improved the prediction of the outcome compared to the level of inaccuracy of the model. Based on the F-statistics results, a model with EHCI-1 is stronger than the model with UNHCI. For four of the six years covering the 2000-2005 period, F-statistics were higher when EHCI-1 was used, and for two years (2002 and 2004), they were higher when UNHCI was used. On average, EHCI-1 improved the fit of the model by 37.68, while UNHCI improved the quality of the model by 34.32 (all tests were significant at $p<0.001$). Multicollinearity and homoscedasticity statistics for the test are well within the norm.

These results provide evidence that for the time periods examined, EHCI-1 was a stronger predictor of the proportion of high-value-added products in a country's total exports than UNHCI.

Results of Regression Analysis:

Foreign Direct Investments and HC Indices (UNHCI and EHCI-I)

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because this study's goal was assessing the relative effects of independent variables (UNHCI and EHCI-1) on dependent (economic) variables, rather than actual effect sizes caused by independent variables. Regression

analyses between a country's foreign direct investment (FDI) performance indices and 1) UNHCI; and 2) EHCI-I were conducted. The FDI performance data were available for each year of the 2000-2005 period. Therefore, regression tests were conducted for each of the years, and results of two sets of regressions were compared: FDI performance as predicted by the UNHCI and FDI performance as predicted by EHCI-1.

The results indicate (Table 34) that UNHCI and EHCI-1 were somewhat similar in their abilities to predict investments in a country. UNHCI was significant four out of six times (2000-2003 years), and EHCI-1 was significant three out of six times (2000-2002) ($p<0.01$ or better). Out of the three years that EHCI-1 was significant, its adjusted R^2 statistics were higher than this statistic for UNHCI for two years (0.128 vs. 0.126 in 2001 and 0.103 vs. 0.089 in 2002). UNHCI's R^2 statistics were higher than this statistic for EHCI-1 for two years as well (0.124 vs. 0.120 in 2000 and 0.061 vs. 0.033 (not *sig*) in 2003).

The standard coefficients for the linear term (*Bstd)* of UNHCI and EHCI-1 were negative for each of the six examined years for UNHCI and for five years for EHCI-1. *Bstd* associated with UNHCI was a statistically significant predictor of the amount of FDI for four out of six examined years (2000-2003). It was a statistically significant predictor of FDI for three out of six examined years for EHCI-1. At the same time, the values of the coefficients associated with EHCI-1 were higher than the values of coefficients associated with UNHCI. On average, a one SD change in UNHCI led to 0.34 SD change in FDI, while a one SD change in EHCI-1 led to 0.36 SD change in FDI.

Table 34. Regression Results for Countries' FDI Performance Indices and Their HC Indices: 2000-2005

Years	1 Results for the United Nations HC Index									2 Results for the Expanded HC Index-I								
	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
2000	-.365 ***	0.000	0.124	15.060***	0.000	123.460	2.123	1.000	1.000	-.366 **	0.003	0.120	9.893**	0.003	96.193	1.892	1.000	1.000
2001	-.367 ***	0.000	0.126	15.579***	0.000	124.068	2.051	1.000	1.000	-.375 **	0.002	0.128	10.666**	0.002	91.977	1.921	1.000	1.000
2002	-.314 **	0.002	0.089	10.584**	0.002	119.337	2.027	1.000	1.000	-.342 **	0.005	0.103	8.318**	0.005	92.597	2.049	1.000	1.000
2003	-.266 **	0.008	0.061	7.437**	0.008	112.071	1.939	1.000	1.000	-0.216	0.071	0.033	3.362	0.071	86.197	2.055	1.000	1.000
2004	-0.186	0.063	0.025	3.535	0.063	103.356	2.179	1.000	1.000	0.098	0.408	-0.004	0.693	0.408	61.190	2.091	1.000	1.000
2005	-0.14	0.150	0.011	2.103	0.15	95.555	2.202	1.000	1.000	-0.173	0.142	0.016	2.203	0.142	83.318	2.346	1.000	1.000

where

Bstd = standardized regression coefficient for HC Index

P-Value = significance

Adj R² = Amount of variation in the High-Value-Added Export variable explained by variation in HC Index variable

F-Stat = the overall fit of the model

D-W = homoscedasticity diagnostics

VIF = collinearity diagnostics

TOL = collinearity diagnostics

b = constant
* Significant at 0.05 level
** Significant at 0.01 level
*** Significant at 0.001 level

1. Dependent variable = Foreign Direct Investments (FDI) Performance Index

Independent variable = United Nations HC Index (UNHCI)

2. Dependent variable = Foreign Direct Investments (FDI) Performance Index

Independent variable = Expanded HC Index –I (EHCI-1) (EHCI-1 = ID factor + Character factor + Family factor + UNHCI)

F-statistics is a measure of how much the model has improved the prediction of the outcome compared to the level of inaccuracy of the model. Based on the F-statistics results, EHCI-I did not improve the regression model's ability to predict the amount of FDI in a country better than the model with UNHCI. (Multicollinearity and homoscedasticity statistics for the test were within the norm.)

Therefore, for the time periods examined, evidence was not provided to suggest that EHCI-I was a stronger predictor of the FDI in a country than the UNHCI. There is support for this finding in the examined literature, as discussed in the previous section.

Discussion

As the results reported in Tables 32-34 illustrate, adding the three components (ID, Family, and Character) to UNHCI has made it more adequate to fulfill the role of predicting the level of national economic development. EHCI-I had more explanatory power than UNHCI in predicting national export of services and high-value-added exports, while UNHCI and EHCI-1 had approximately similar explanatory power in predicting the level of foreign investments in a country. Improved fit of the Expanded Index model called for the need to examine significance of the contributing variables inside the new index. The previous results need to be examined while controlling for the influences of individual EHCI-1 composite variables on the outcome variables.

Examination of Significance of Composite Variables of EHCI-1 in Relation to Export of

Services Variable

Effect of the EHCI-I was examined while controlling for the influences of individual EHCI-1 composite variables on the Export of Services variable. In order to determine the statistical significance of variables comprising EHCI-I, a hierarchical regression analysis between a country's export of services and two variables comprising EHCI-1 (UNHCI and the sum of ID, Character and Family factors) was conducted (Table 35). In hierarchical regression, predictors are selected based on past research and the experimenter decides in which order to enter predictors into the model. As a general rule (Field, 2006), predictors should be entered into the model based on their importance in predicting the outcome. Because of the results of the previous test, three new variables of the HCI (ID, Family, and Character) were added into the model first, and were followed by adding UNHCI in the second step. The obtained results were compared with the forced entry results, when all predictors were forced into the model simultaneously. The results were identical.

Table 35. Regression Results for Export of Services and Composite Variables of the Expanded HC Index-1: 2002-2004 and 2003-2005 Averages

2002-2004	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
Step 1									
Sum of ID, Character, and Family factors	0.779***	0.000	0.602	127.938***	0.000		1.964	1.000	1.000
Constant						0.022			
Step 2									
Sum of ID, Character, and Family factors	0.785***	0.000						1.354	0.738
UNHCI	-0.012	0.884						1.354	0.738
			0.597	127.938***	0.000		1.964		
Constant						0.024			
2003-2005	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
Step 1									
Sum of ID, Character, and Family factors	0.745***	0.000	0.542	42.454***	0.000	0.268	2.286	1.000	1.000
Constant									
Step 2									
Sum of ID, Character, and Family factors	0.932***	0.000						2.26	0.443
UNHCI	-0.25	0.149						2.26	0.443
			0.558	23.055***	0.000		2.286		
Constant						0.888			

where

Bstd = standardized regression coefficient for independent variables
P-Value = significance
AdjR² = amount in variation in the Export of Services variable explained by variation in the dependent variables
F-Stat = the overall fit of the model
D-W = homoscedasticity diagnostics
VIF = collinearity diagnostics
TOL = collinearity diagnostics
b = constant

The results indicated that UNHCI became insignificant in the presence of the three additional factors (ID, Character, and Family). For 2002-2004, the standardized coefficient of the linear term (*Bstd)* was much higher for the sum of ID, Character and Family factors that for UNHCI (0.785 and -0.012 respectively). For 2003-2005, the coefficients were 0.932 and -0.25 respectively. Furthermore, while the sum of the three variables was significant (*p<0.001)* all the time, UNHCI was consistently insignificant (although the whole EHCI-1 was significant). Ability of the model containing only the sum of ID, Family, and Character factors to predict export of services variable, as assessed by the AdjR² statistics, was higher than the ability of the model containing both the sum of ID, Family, and Character factors and UNHCI for the period of 2002-2004. AdjR² was 0.602 and 0.597 respectfully. Ability of the model containing both the sum of ID, Family, and Character factors and UNHCI for the period of 2003-2005 was higher than the ability of the model containing only the sum of ID, Family, and Character factors. AdjR² was 0.542 and 0.558 respectfully. At the same time, adding UNHCI to the sum of ID, Family, and Character factors reduced F-statistics from 42.454 to 23.055 (for the period of 2003-2005) and did not change it for the period of 2002-2004. (Multicollinearity and homoscedasticity statistics for this test were within the norm).

Therefore, for the time period examined, adding UNHCI as a separate factor to the sum of ID, Family, and Character factors did not consistently improve the predictive capacity of the model and added uncertainty to it.

Examination of Significance of Composite Variables of EHCI-1 in Relations to High-

Value-Added Export Variable

Effect of the EHCI-I was examined while controlling for the influences of

individual EHCI-1 composite variables on the High-Value-Added Export variable. In the

process, a hierarchical regression analysis between a country's high-value-added export

and two variables comprising EHCI-1 (the sum of ID, Character, and Family variables

and the UNHCI) was conducted. In hierarchical regression, predictors are selected based

on past research and the experimenter decides in which order to enter predictors into the

model. As a general rule (Field, 2005), predictors should be entered into the model based

on their importance in predicting the outcome. Because of the results of the previous test,

three new variables of EHCI-1 (ID, Family, and Character) were added into the model

first, and were followed by adding UNHCI in the second step. The obtained results were

compared with the forced entry results, when all predictors were forced into the model

simultaneously. The results were identical.

The tests' results indicated that UNHCI generally became insignificant in the

presence of the three additional factors (ID, Character, and Family). For four of the six

years covering the 2000-2005 period, UNHCI was insignificant, and it was significant for

two years (2002 and 2004) (Table 36). The standardized coefficient of the linear term

(*Bstd)* was much higher for the variable which is the sum of ID, Character and Family

factors than for UNHCI. It was 0.495, 0.521, 0.387, 0.485, 0.300, 0.654 for the sum of

the three factors for each of the consecutive year of the examined period; and it was

0.037, 0.052, 0.215, 0.074, 0.317, -0.141 for UNHCI for the same period. On average,

Table 36. Regression Results for High-Value-Added Export and Composite Variables of the Expanded HC Index-1: 2000-2005

Dependent variable: High-Value-Added Export

2000	*Bstd*	*P-Value*	*AdjR²*	*F-Stat*	*P-Value*	*b*	*D-W*	*VIF*	*TOL*
Step 1									
Sum of ID, Character, and Family factors	**0.523*****	0.000	0.269	**37.316*****	0.000		1.997	1.000	1.000
Constant						5.339			
Step 2									
Sum of ID, Character, and Family factors	**0.495*****	0.000						2.307	0.433
UNHCI	0.037	0.777						2.307	0.433
			0.260	**18.525*****	0.000		1.997		
Constant						4.443			
2001	*Bstd*	*P-Value*	*AdjR²*	*F-Stat*	*P-Value*	*b*	*D-W*	*VIF*	*TOL*
Step 1									
Sum of ID, Character, and Family factors	**0.559*****	0.000	0.305	**44.485*****	0.000		1.950	1.000	1.000
Constant						5.614			
Step 2									
Sum of ID, Character, and Family factors	**0.521*****	0.000						2.135	0.468
UNHCI	0.052	0.675						2.135	0.468
			0.299	**22.144*****	0.000		1.950		
Constant						4.181			

where

Bstd = standardized regression coefficient for independent variables
P-Value = significance
AdjR² = amount of variation in the High-Value-Added Export variable explained by the variation in the dependent variables
F-Stat = the overall fit of the model
D-W = homoscedasticity diagnostics
VIF = collinearity diagnostics
TOL = collinearity diagnostics
b = constant

Table 36. Continued

Dependent variable: High-Value-Added Export

2002		Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
Step 1										
	Sum of ID, Character, and Family factors	**0.499***	0.000	0.242	**33.174***	0.000		1.848	1.000	1.000
	Constant						6.020			
Step 2										
	Sum of ID, Character, and Family factors	**0.387***	0.000						1.371	0.729
	UNHCI	**0.215***	0.03						1.371	0.729
				0.268	**19.507***	0.000		1.848		
	Constant						-0.334			

2003		Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
Step 1										
	Sum of ID, Character, and Family factors	**0.527***	0.000	0.271	**41.494***	0.000		1.930	1.000	1.000
	Constant						5.631			
Step 2										
	Sum of ID, Character, and Family factors	**0.485***	0.000						1.470	0.680
	UNHCI	0.074	0.458						1.470	0.680
				0.271	**41.494***	0.000		1.930		
	Constant						3.882			

where

Bstd = standardized regression coefficient for independent variables

P-Value = significance

AdjR² = amount of variation in the High-Value-Added Export variable explained by the variation in the dependent variables

F-Stat = the overall fit of the model

D-W = homoscedasticity diagnostics

VIF = collinearity diagnostics

TOL = collinearity diagnostics

b = constant

Table 36. Continued

Dependent variable: High-Value-Added Export

2004	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
Step 1									
Sum of ID, Character, and Family factors	0.379***	0.000	0.136	18.812***	0.000		1.947	1.000	1.000
Constant						5.723			
Step 2									
Sum of ID, Character, and Family factors	0.300***	0.001						1.068	0.937
UNHCI	0.317***	0.000						1.068	0.937
			0.224	17.320***	0.000		1.947		
Constant						-2.169			

2005	Bstd	P-Value	AdjR²	F-Stat	P-Value	b	D-W	VIF	TOL
Step 1									
Sum of ID, Character, and Family factors	0.545***	0.000	0.291	48.173***	0.000		1.695	1.000	1.000
Constant						6.093			
Step 2									
Sum of ID, Character, and Family factors	0.654***	0.000						2.494	0.401
UNHCI	-0.141	0.257						2.494	0.401
			0.293	24.797***	0.000		1.695		
Constant						9.663			

where

Bstd = standardized regression coefficient for independent variables

P-Value = significance

AdjR² = amount of variation in the High-Value-Added Export variable explained by the variation in the dependent variables

F-Stat = the overall fit of the model

D-W = homoscedasticity diagnostics

VIF = collinearity diagnostics

TOL = collinearity diagnostics

b = constant

Bstd was 0.474 for the sum of the three factors, and it was 0.139 for UNHCI. In 2000 and 2001, the presence of UNHCI in EHCI slightly decreased explained variation in the high-value-added export variable (from 26.9% to 26% and from 30.5% to 29.9%. In 2005, the presence of UNHCI in EHCI did not change explained variation in the outcome factors, and in 2002, 2004, and 2005 it increased it (from 24.2% to 26.8%, from 13.6% to 22.4% and from 29.1% to 29.3% respectively). At the same time, the fit of the model (as measured by F-statistics) decreased with the presence of UNHCI. For five years of the examined period (except for 2003), it dropped from 37.316 to 18.525 (2000), from 44.485 to 22.144 (2001), from 33.174 to 19.507 (2002), from 18.812 to 17.320 (2004), and from 48.173 to 24.797 (2005). In 2003, F-statistics didn't change. (Multicollinearity and homoscedasticity statistics for these tests were within the norm.)

Therefore, for the time period examined, adding UNHCI as a separate factor to the sum of ID, Family, and Character factors did not consistently improve predictive capacity of the model and added uncertainty.

Conclusion

The above discussion indicates that adding UNHCI as an individual variable into the index reduced explained variation of the new index to some degree. Although the earlier analyses provided evidence for less than full adequacy of UNHCI, this measure was still important and needed to be kept. However, instead of adding certainty, the use of UNHCI as an individual variable decreased explained variation in several examined years. In order to keep UNHCI without a negative effect of reduced explained variation, it was necessary to incorporate it into one of the newly suggested variables.

Comparison of the Effect of UNHCI and EHCI-II on the Economic Development

Variables (General Case)

The preceding section provides evidence for the need to create the new HCI model not as a sum of UNHCI, ID, Family, and Character factors, but to incorporate UNHCI into one of the three new variables. Keeping UNHCI as an individual variable in the model added some uncertainty into the model. Concomitantly, UNHCI was still important and needed to be retained. Incorporating UNHCI as part of one of the newly suggested variables allowed for preserving this factor in the new HC measure without adding the uncertainty connected to it. The "host" variable for UNHCI was chosen based on the results of two statistical tests: factor analysis and correlation analysis. This section reports on the results of the analyses, the choice of the "host" variable for UNHCI, and the consequent creation of a new version of HCI (EHCI-II). The new HCI's (EHCI-II) effect on economic measures was then compared with the earlier version of EHCI (EHCI-1), and with UNHCI's effect on economic measures.

Results of Correlation Analysis: the Choice of the Variable to Include UNHCI

Three participating variables (ID, Family, and Character) were examined in order to determine the variable where UNHCI would be added. Because this search was ultimately a search for the highest association between UNHCI and another variable, two statistical tests' results appropriate for this task—factor loading in factor analysis and coefficient in correlation analysis—were considered in the decision process.

Factor loading in factor analysis is a correlation between a particular variable and the extracted factor where it is loaded. Squared factor loading is a variation in the factor, which is explained by that particular variable (without holding other variables constant). Therefore, squared factor loading is the amount of variation in the extracted factor that can be explained by that particular variable (without holding other variables constant in the extracted factor constant). Consequently, the variable with the highest loading (and consequent highest squared loading) explains the biggest amount of variation in the extracted factor (not holding other variables constant).

Correlation is the measure of linear relationship between variables. Correlation coefficient signifies the degree of linear relationship between the two variables. Consequently, the highest correlation coefficient between two variables signifies the biggest degree of relationship between the two variables.

Factor analyses of the ID factor's contributing variables plus UNHCI, the Family factor's contributing variables plus UNHCI, and the Character factor's contributing variables plus UNHCI were conducted in order to determine which variable had the highest factor loading (and consequently explains the biggest amount of variation in the extracted factor). Results reported in Table 37 indicate that UNHCI had the highest factor loading in the Family variable.

Table 37. Comparison of Factor Loadings for ID + UNHCI, Family + UNHCI, and Character + UNHCI: 2000-2005			
	ID factor + UNHCI	*Family factor + UNHCI*	*Character factor + UNHCI*
2000	0.711	0.835	0.508
2001	0.633	0.831	0.543
2002	0.728	0.834	0.548
2003	0.623	0.843	0.590
2004	0.658	0.832	0.632
2005	0.662	0.851	0.562

A series of correlation tests between ID factor and UNHCI, Family factor and UNHCI, and Character factor and UNHCI was conducted in order to determine which of the three variables has the strongest relationship with UNHCI. Based on the results reported in Table 38, the highest correlation coefficient between UNHCI and ID, Family and Character factors was displayed by UNHCI-Family.

Table 38. Comparison of Correlation Coefficients Between National Identity Awareness Factor with UNHCI, Family Factor with UNHCI, and Character Factor with UNHCI: 2000-2005			
	ID factor and UNHCI	*Family factor and UNHCI*	*Character factor and UNHCI*
2000	0.596*	0.723*	0.717*
2001	0.540*	0.718*	0.707*
2002	0.548*	0.725*	0.308*
2003	0.610*	0.737*	0.325*

Table 38. Continued

2004	0.427*	-0.716	0.341*
2005	0.609*	0.742*	0.710*
Average	0.555	0.727	0.518

Note: * denotes significance at 0.05 level or better.

Therefore, it was determined that UNHCI would be viewed as a part of the Family factor. The new factor coefficient of the Family factor was consequently the product of the original Family variables and UNHCI. Thus, the new measure of HC (EHCI-II) consisted of the original ID factor, original Character factor and the modified Family factor. Appendix E (Table E-3) presents EHCI-II in non-standardized form. For standardization, a simple score formula (United Nations Conference on Trade and Development, 2002) was used:

$$\text{Score} = \frac{X\,i - X\,\min}{X\,\max - X\,\min}$$

Appendix E (Table E-4) presents standardized EHCI-II (with scores ranging between 0 and 1).

Results of Regression Analysis:

Comparison Between Effects of UNHCI, EHCI-I, and EHCI-II on the Export of Services

Variable

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because this study's goal was assessing the

relative effect of independent variables on dependent (economic) variables, rather than actual effect sizes caused by independent variables.

Regression analyses between the measure of Export of Services and 1) UNHCI; 2) EHCI-I; and 3) EHCI-II were conducted. The export of services data was only available as an average for 2002-2004 (United Nations Conference on Trade and Development, 2006) and 2003-2005 (United Nations Conference on Trade and Development, 2007). Therefore, all variables in the study were used as 2002-2004 and 2003-2005 averages. Results of two sets of regressions were compared:

1. Export of services as predicted by the UNHCI (average for 2002-2004)

   Export of services as predicted by the EHCI-I (average for 2002-2004)

   Export of services as predicted by the EHCI-II (average for 2002-2004)

2. Export of services as predicted by the UNHCI (average for 2003-2005)

   Export of services as predicted by the EHCI-I (average for 2003-2005)

   Export of services as predicted by the EHCI-II (average for 2003-2005)

The results indicate (Table 39) that UNHCI possessed significantly less explanatory power than EHCI-I or EHCI-II in terms of predicting the level of a country's export of services. Comparison between EHCI-I and EHCI-II indicated that for both periods examined, EHCI-I and EHCI-II displayed strong explanatory power, although EHCI-I displayed slightly stronger explanatory power than EHCI-II. For the 2002-2004 period, EHCI-I could explain 60 percent of the variation in the export of services, while EHCI-II could explain 45.8 percent.

Table 39. Comparison Between Effects of UNCHI, EHCI-I (Simple Case), and EHCI-II (General Case) on the Outcome Variables: 2000 - 2005

Dependent outcome variables: Export of Services, High-Value-Added Export, Foreign Investments

	2002-04	2003-05	2000	2001	2002	2003	2004	2005	2000	2001	2002	2003	2004	2005
	UNHCI and Export of Services			*UNHCI and High-Value-Added Export*						*UNHCI and Foreign Investments*				
Bstd	0.299***	0.363**	0.441***	0.474***	0.469***	0.434***	0.407***	0.385***	-0.365 ***	-0.367 ***	-0.314 **	-0.266 **	-0.186	-0.140
AdjR²	0.083	0.114	0.189	0.219	0.215	0.183	0.16	0.142	0.124	0.126	0.089	0.061	0.025	0.011
F-Stat	12.802***	7.418**	34.608***	41.375***	41.209***	33.864***	29.420***	25.420***	15.060**	15.579***	10.584**	7.437**	3.535	2.103
	EHCI-I and Export of Services			*EHCI-I and High-Value-Added Export*						*EHCI-I and Foreign Investments*				
Bstd	0.778***	0.738***	0.515***	0.551***	0.497***	0.536***	0.410***	0.542***	-0.366 **	-0.375 **	-0.342 **	-0.216	0.098	-0.173
AdjR²	0.600	0.532	0.258	0.296	0.239	0.281	0.160	0.288	0.120	0.128	0.103	0.033	-0.004	0.016
F-Stat	127.079***	40.753***	36.102***	43.119***	33.416***	43.598***	22.385***	47.462***	9.893**	10.666**	8.318**	3.362	0.693	2.203
	EHCI-II and Export of Services			*EHCI-II and High-Value-Added Export*						*EHCI-II and Foreign Investments*				
Bstd	0.681***	0.735***	0.519***	0.534***	0.486***	0.589***	0.592***	0.531***	-0.363 **	-0.450 ***	-0.375 **	-0.296 *	-0.116	-0.202
AdjR²	0.458	0.526	0.262	0.278	0.229	0.340	0.344	0.275	0.119	0.190	0.126	0.074	-0.001	0.027
F-Stat	80.304***	38.709***	36.592***	38.269***	30.063***	56.204***	59.752***	43.579***	9.740**	16.009***	9.968**	6.453*	0.962	2.964

where

Bstd = standardized coefficient

AdjR² = amount of variation in dependent variable explained by variation in independent variable

F-Stat = the fit of the model

* Significant at 0.05 level

** Significant at 0.01 level

*** Significant at 0.001 level

UNHCI = United Nations Human Capital Index

EHCI - I (Simple case) = Expanded Human Capital Index-1, which is an aggregation of original ID, Family, Character factors, and UNHCI

EHCI-II (General Case) = Expanded Human Capital Index-II , which is an aggregation of original ID and Character factors, and a composite of Family factor and UNHCI

For 2003-2005, variation in EHCI-I could account for 53.2 percent of variation in the export of services, while variation in the EHCI-II could account for 52.6 percent. On average, as reported in Table 39, variation in UNHCI could explain 9.9 percent of variation in export of services; variation in EHCI-I explained 56.6 percent, and variation in EHCI-II explained 49.2 percent of variation in this economic measure.

The standardized coefficients of the linear term (*Bstd*) of both EHCI-I and EHCI-II were statistically significant predictors of export of services for both periods examined. However, EHCI-I had a stronger effect on the export of services by a country than EHCI-II. Specifically, one standard deviation change in the EHCI-I led to 0.778 DS change in the export of services, while the EHCI-II led to 0.681 SD change (for the 2002-2004 period). For 2003-2005 period, one SD change in EHCI-I led to 0.738 SD change in export of services, and 0.735 SD when the EHCI-II was used. On average, as reported in Table 40, one SD increase in UNHCI indicated 0.331 SD increase in export of services; one SD increase in EHCI-I indicated 0.758 SD increase, and one SD increase in EHCI-II indicated 0.708 SD increase in this measure.

Table 40. Comparison Between Average Effects of UNCHI, EHCI-I and EHCI-II on the Outcome Variables: Average of 2000-2005 Period

Dependent outcome variables: Export of Services, High-Value-Added Export, Foreign Investments

	2002-04 and 2003-05 average	2000-2005 average	2000-2005 average *Only significant years are used*
	UNHCI and Export of Services	*INHCI and High-Value-Added Export*	*UNHCI and Foreign Direct Investments*
Bstd	0.331	0.435	0.328
AdjR²	0.099	0.185	0.073
F-Stat	10.110	34.316	12.165
	EHCI-I and Export of Services	*EHCI-I and High-Value-Added Export*	*EHCI-I and Foreign Direct Investments*
Bstd	0.758	0.507	0.361
AdjR²	0.566	0.254	0.066
F-Stat	83.916	37.680	9.626
	EHCI-II and Export of Services	*EHCI-II and High-Value-Added Export*	*EHCI-II and Foreign Direct Investments*
Bstd	0.708	0.542	0.371
AdjR²	0.492	0.288	0.089
F-Stat	59.507	44.077	10.543

where

Bstd = standardized coefficient

AdjR² = amount of variation in dependent variable explained by variation in independent variable

F-Stat = the fit of the model

UNHCI = United Nations Human Capital Index

EHCI - I (Simple case) = Expanded Human Capital Index, which is an aggregation of original ID, Family, Character factors, and UNHCI

EHCI-II (General Case) = Expanded Human Capital Index , which is an aggregation of original ID and Character factors, and a composite of Family factor and UNHCI

The result of the F-statistics indicated that utilizing EHCI-I improved the ability of the regression model to predict the level of export of services in a country relative to the existing inaccuracy in the model better than when EHCI-II was employed. For 2002-2004, F-statistics results were 127.079 for the EHCI-I and 80.304 for the EHCI-II. For 2003-2005, these numbers are 40.753 and 38.709 respectfully (*p<.001*). (Multicollinearity and homoscdedasticity statistics for this test were within the norm.) On average (Table 40), F-stat associated with UNHCI was 10.110, F-stat associated with EHCI-I was 83.916, and F-stat associated with EHCI-II was 59.507.

Therefore, for the time periods examined, EHCI-I was the strongest predictor of the level of services that a country exports. EHCI-II had slightly less explanatory power. UNHCI revealed weak explanatory power as compared with the Expanded HC measures.

Results of Regression Analysis:

Comparison Between Effects of UNHCI, EHCI-I, and EHCI-II on the

High-Value-Added Export (as Percent of the Total Country Export) Variable

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because this study's goal was assessing the relative effect of independent variables on dependent (economic) variables, rather than actual effect sizes caused by independent variables.

Regression analyses between a country's high-value-added export as percent of the total country export and 1) UNHCI; 2) EHCI-I; and 3) EHCI-II were conducted. The high-value-added export data were available for each year of the period 2000-2005.

Therefore, regression tests were conducted for each year, and results of three sets of regressions were compared between:

High-value-Added Export as predicted by UNHCI

High-value-Added Export as predicted by the EHCI-I

High-value-Added Export as predicted by the EHCI-II

The results indicate (Table 39) that UNHCI had less explanatory power in terms of explaining the proportion of high-value-added exports in total country exports than EHCI-I and EHCI-II. For each year of the examined period (2000-2005), Adjusted R^2 statistics in EHCI-I and EHCI-II were higher than this statistic for the UNHCI. For the six years of the examined period, on average 18.5 percent of the variation in the proportion of high-value-added export could be explained by variation in UNHCI, while variation in EHCI-I explained on average 25.4 percent, and variation in EHCI-II could account for 28.8 percent of variation (Table 39).

The standard coefficients for the linear term (*Bstd)* of each of the three variables (UNHCI, EHCI-I, and EHCI-II) were positive for each of the six years, while being statistically significant predictors of amount of high-value-added export for each year of the examined period as well (*p<0.001*). At the same time, the values of coefficients associated with UNHCI were lower than the values of coefficients associated with EHCI-I and EHCI-II for every year of the examined 2000-2005 period. On average, one standard deviation increase in UNHCI signified 0.435 SD increase in high-value-added export (Table 41). On average, one SD increase in EHCI-I signified 0.507 SD increase in this variable, and one SD increase in EHCI-II was associated with 0.542 SD increase in this economic measure.

Based on the F-statistics results, on average, UNHCI improved the regression model's ability to predict the amount of high-value-added products in total country exports by 34.32. For EHCI-I this number was 37.68, and for EHCI-II it was 44.077 (all tests are significant at *p<0.001* level). (Mutlicollinearity and homoscedasticity statistics for the test were within the norm.) The results provide evidence that for the time period examined, EHCI-II was the strongest predictor of the proportion of high-value-added products in total country exports. UNHCI was the weaker predictor.

Results of Regression Analysis:

Comparison Between Effects of UNHCI, EHCI-I, and EHCI-II on the

Foreign Direct Investments Variable

In the analyses that follow, standardized parameter estimates were examined instead of unstandardized parameter estimates because this study's goal was assessing the relative effect of independent variables on dependent (economic) variables, rather than actual effect sizes caused by independent variables. Regression analyses between countries' foreign direct investments (FDI) performance indices and 1) UNHCI; 2) EHCI-I; and 3) EHCI-II were conducted. The FDI performance data were available for each year of the 2000-2005 period. Therefore, regression tests were conducted for each year, and results of three sets of regressions were compared between:

FDI performance as predicted by UNHCI

FDI performance as predicted by the EHCI-I

FDI performance as predicted by the EHCI-II

The results indicate (Tables 39 and 40) that UNHCI had less explanatory power in terms of explaining the level of foreign direct investments in the country than did EHCI-II. Adjusted R² statistics as related to EHCI-II were higher than R² associated with UNHCI. For the six years of the examined period, on average 7.3 percent of variation in FDI could be explained by variation in UNHCI, while 8.9 percent could be explained by variation in EHCI-II. Variation in EHCI-I could account for 6.6 percent in a country's FDI variation.

The standard coefficients of the linear term (*Bstd)* for each of the three variables were negative for each of the six years (except for one year for EHCI-I). *Bstd* as associated with UNHCI was statistically significant for four out of six examined years. For EHCI-I, it was significant for three years, and for EHCI-II it was significant for four out of six examined years. At the same time, the values of coefficients associated with UNHCI were lower that the values of coefficients associated with EHCI-I and EHCI-II. On average, one standard deviation change in UNHCI signified 0.328 SD change in the amount of foreign direct investments in a country (Table 39). On average, one SD change in EHCI-I led to 0.361 SD change in FDI, and one SD change in EHCI-II led to 0.371 SD change. F-statistics results were higher for UNHCI, than for EHCI-I and EHCI-II and were 12.165, 9.626 and 10.543 respectfully (all tests were statistically significant at *p<0.01* or better). (Mutlicollinearity and homoscedasticity statistics for the test were within the norm.)

The results provide evidence that for the time period examined, EHCI-II was the strongest predictor of the amount of foreign investments that a country attracts.

Discussion

Based on the results reported and discussed above, EHCI-II, which consists of the original ID and Character factors and the modified Family factor (which includes original Family factor together with UNHCI), is the strongest predictor of the selected economic variables. UNHCI is the weakest predictor. These results indicate the usefulness of incorporating UNHCI into EHCI-II not as a separate variable, but as part of another (Family) variable. This way, UNHCI does not diminish the results, but instead, increases the strength of the component.

Summary

This chapter attempted to fulfill several goals:

- Examine the claim suggested by the literature that the currently used measures of HC are not adequate, and are too narrow measures of the level of national HC.

- Examine the claim suggested by the current study that the three latent factors—National Identity Awareness, Character, and Family factors—may be used as additional variables in a measure of national HC.

- Examine two types of HC Index. The first type (EHCI-I) was composed of four individual variables: UNHCI, ID, Family, and Character. The second type (EHCI-II) was composed of three variables: ID, Character, and a modified Family factor, which was a combination of Family factor and UNHCI.

These goals were reached via a series of regression analyses with economic performance measures, theoretically known to be correlated with HC, as the predicted variable, and the three types of HC indices, as well as their individual components as the predictor variables. The analyses provided some evidence for ID, Family, and Character factors to be significant predictors of economic performance variables. It also provided evidence for the benefit of expanding the currently used UNHCI via these additional variables. The newly created EHCI-II showed the most significant results as a predictor of the output economic variables. Therefore, it is suggested that this HC measure is more effective for measuring national HC.

CHAPTER V

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Introduction

There are seven major sections in this chapter. In the second section, the factor analysis tests results are discussed and their summary is presented. These tests were instrumental in the creation of the models of the three latent constructs, which were used to create an expanded HC index. The third section presents analytical results of regression tests. These tests helped compare newly created Expanded HC index with United Nations HC index. The fourth section studies the implication of the current study for academic research. The fifth section contains discussion of the implication of the current study for practice. The sixth section presents recommendations and directions for future research. In the final section, strengths and limitations of the study are provided.

This dissertation intended to cover the gap in knowledge about HC. More specifically, it attempted to create a more complex HC index then the one currently used. The study was based on the following facts:

1. There is no consensus in the research community about an exhaustive list of specific indicators that are robust determinants of HC.

2. Even those indicators, which garner overall consensus as the ones that affect HC, are often not easily empirically measured.

Therefore, there was a need for:

1. Establishing better consensus about what variables may be included as a part of HC measurement tool.

2. Determining how these variables may be measured.

The study suggested three additional variables (National identity awareness in population, Character qualities of population, and Family background) as the ones that affect HC on national level, and therefore, may be employed in assessment of the level of HC. The significance of each of these factors, as well as the whole new HCI which incorporates them, were studied in relationship to the outcome economic variables.

General Summary

This section summarizes the results of the factor analysis statistical tests conducted in the study. The result of these tests was the creation of preliminary models of three latent constructs: National identity awareness in population, Character qualities of population, and Family background. Literature-based explanation of loadings divergent from the hypothesized loadings is also provided in this section.

National Identity Awareness Construct as Created by Factor Analysis

Based on the literature review, it was hypothesized that the national identity awareness construct consisted of four factors: common norms, values and culture, perception of collective destiny, common institutions, and perpetuation of common myths and historic memories. Loading of variables on these four factors is discussed in the following subsections.

Common Norms, Values and Culture Factor

Level of Government Consumption variable, although originally hypothesized to be a part of *Common Norms, Values, and Culture* factor, did not load as hypothesized. Instead, three out of six times it loaded on *Common institutions/rights and duties for all members* factor. The literature search provided several possible reasons for this. Government finances include cash payments for operating activities of the government in providing goods and services, such as compensation of employees, interest and subsidies, social benefits (World Development Indicators, 2006, p. 233). Through these channels, a national government fulfills its responsibility to sustain and develop national institutions (Alesina et al.,1999; Annett, 2001). Therefore, the relationship between central government finances and institutions in a country appears as a key to the health of the nation. At the same time, it is hard to generalize this relationship into a causal relationship in a cross-country comparison. There are two major reasons for this: first, the very nature of government bureaucrats who, as a group, are responsible for practical implementation of a government's role by overseeing and controlling national institutions and responsible for practical provision of public goods. However, according to Niskanen's (1971) theory, bureaucrats maximize budgets beyond efficiency requirements because a bureaucrat's utility function does not necessarily include outcome efficiency (Rolle, 2000). Therefore, quality of institutions in a country does not necessarily directly and positively correlate with government consumption, as they produce outcomes in a manner that is often economically ineffective. The second reason is corruption--the reality that resources are intentionally misallocated to provide personal resources (Kaufmann, 1998).

Ethnic, Linguistic, and *Religious Cohesion* variables consistently loaded together and were named *Common norms, values and culture* variable, as hypothesized.

(ii) Perception of collective destiny

Number of Holidays that a Country Celebrates variable was hypothesized to be a part of the *Perpetuation of Common Myths and Historic Memories* factor. However, it loaded together with the *Gini Coefficient* variable and was identified as the *Perception of Collective Destiny* factor. Logical support for such an outcome can be found by broadly equating the meaning of two variables: *Time of independence* and *Number of national holidays in a country.* The meaning of both is in strengthening citizens' association with the country.

The Number of Medals Won in Olympic Games variable was originally hypothesized to be a part of *Perpetuation of Common Myths and Historic Memories* factor. However, it did not load on this factor, but instead loaded (although only once) on *Perception of Collective Destiny* factor. Such an outcome can be based on the broad meaning of a sport game, which implies a drive toward a certain goal (victory) by a team and its fans. Symbolically, populations can be viewed as fans of the respective countries' Olympic teams. Cheering for a country's team by a country during big international competitions (such as the Olympic Games) creates the perception of a collective goal among citizens (the country winning medals) and thus strengthens the nation-wide perception of politico-socio-economic collective destiny and goals.

Common Institutions/Rights and Duties for All Members

School life expectancy variable was originally hypothesized to be a part of *Perpetuation of common myths and historic memories* factor. As a result of factor analysis, it loaded with the variables which were grouped together into the *Common institutions/Rights and duties for all members* factor. Support for such loading was found in the literature. This is consistent with the view of school as one of the strongest national institutions, which serves as a channel of socializing people into citizens and perpetuation of the existing socio-economic structure (Bernstein, 1975; Bourdieu, 1977, 1978; Bourdieu & Passeron, 1990; Hofstede, 2001).

According to the theory of social and cultural reproduction (Bernstein, 1975; Bourdieu, 1977, 1978; Bourdieu & Passeron, 1990), school is a conservative force that helps students develop "master patterns" of thinking and behavior. School, theorized as an institution responsive to an arbitrary class code, is accepted at all levels of the educational system, which in turn legitimizes the perpetuation of social classes and consequent politico-socio-economic behavior and practices of people (Bourdieu, 1978; Nash, 1990; Van Zanten, 2005). Societal norms lead to development and pattern-maintenance of institutions in society with particular structures and ways of functioning. These include the family, education system, political system and legislation. These institutions, once established, reinforce societal norms and conditions that led to their establishment. Hofstede (2001) called it *collective social programming* or *collective programming of the mind.* He argues that societies use education as a way of conserving and passing on these mental programs. Therefore, those "mental programs" are passed to children by way of education in which a society is interested. For example, a democratic

society passes on ideas and lessons of democracy to the younger generation; a totalitarian society passes on ideas and lessons in obedience. Those who succeed in school end up learning these lessons the best. Generally, those who do well in school end up getting high-positioned jobs, perpetuating their long-learned beliefs now through creating, implementing or supporting certain national policies. As a Japanese proverb states, "the soul of a 3-year-old stays with him until he is 100" (Hofstede, 2001, p. 4).

Corruption perception index variable was also moved from the *Perception of collective destiny* factor into *Common institutions/rights and duties for all members* factor. Support for such an outcome was found in the literature in the ideas of La Porta et al. (1998), Hofstede (2001) and Kaufmann (1998). They suggest that institutions are those structures of a society which govern and regulate the way society operates. From this standpoint, corruption may be considered as a modified sub-institution (although a harmful one) in a society. It serves the goal of perpetuating the existing structure of a society, and is supported by society in turn.

Level of Government Consumption variable, although originally hypothesized to be a part of *Common Norms, Values, and Culture* factor, did not load as hypothesized. Instead, three out of six times it loaded on *Common institutions/rights and duties for all members* factor. This has been explained in the above sections.

Perpetuation of Common Myths and Historic Memories

Number of Years a Country Has Been Independent variable loaded together with *Number of Nobel Prize Laureates* as hypothesized on *Perpetuation of Common Myths and Historic Memories* factor. As discussed in Chapter III, the length of a country's

actual independence may be positively correlated with the number of myths and memories in a nation and their strength of presence in citizens' awareness due to the time factor. Number of Nobel Prize winners in a country nicely adds up to this, as Nobel Prize winners are rare occasions (not as fleeting as sports victories). A Nobel Prize winner becomes a permanent national hero, which in a sense is similar to the notion of national myth and memory.

Character Qualities of Population in a Country Construct as Created by Factor Analysis

Character as Manifested in Public Life

The *Eligible voters participating in national elections* variable loaded as hypothesized on *Character as manifested in public life* factor. The rest of the variables that were hypothesized to load on this factor (*International NGO membership density, Independence of judicial system, Level of political rights in a country,* and *Level of civil liberties in a country)* did not load on this factor. Instead, *Parliamentary seats held by women* and *Reported police offenses* variables loaded on this factor five and three times respectfully. All of the variables that loaded together on this factor (*Eligible voters participating in national elections, Parliamentary seats held by women* and *Reported police offenses)* signify an active approach to citizenship and assuming personal responsibility in influencing the activities of public institutions.

Character as Manifested in Private Life

Although several variables (*Reported police offenses, Suicide rate, Prison population* and *Attitude toward women in a society*) were hypothesized to form

Character as manifested in private life factor, this factor did not load as hypothesized. Only the *prison population* variable was retained in that factor (five out of six years tested).

Environment Where Specific Population is Located

The loading of variables on the *Environment where specific population is located* factor is consistent with Veenhoven's (1993) model of assessment of the degree of happiness in a country. According to Veenhoven (1993), this factor can be assessed by the following measures: material comfort, social equality, freedom, and access to knowledge. Loading of variables in this study represent good correspondence with this model. The variables that loaded on this factor are as follows: *Level of civil liberties and political rights in a country, Independence of judicial system, Population above income poverty rate, Attitude toward women in society (family, job), Expenditure on leisure and recreation, International NGOs membership density.* Absence of any variables to indicate "access to knowledge" is explained by the fact that the researcher did not incorporate any *access to knowledge* measures in order to avoid multicollinearity in the next step of analysis.

A variable that does not fit this model (*Inverse of suicide rate*) can still be considered as the one belonging to measures of happiness in a nation if the Economist Intelligence Unit's (EIU, 2005) more expanded model is used. The EIU's model includes such additional variables as health, family and community life, and job security. All of these factors are known to reduce suicide rate thanks to their provision of social support

and connections to people, a powerful tool in suicide reduction (*Suicide rate* variable is always negative in this factor).

Family Background Construct as Created by Factor Analysis

The *Family* factor was hypothesized to be constructed out of two measures: *Family as governing development of children* and *Family as meeting psychological needs of all family members.* Number of children in the family (and corresponding size of the family) was hypothesized to be the most significant variable. This is consistent with an economic approach to family and limited resources theory (Becker, 1995; Becker & Tomes, 1976; Buchman, 2002; Mincer, 1974).

The factor of *Family as meeting psychological needs of all family members* was hypothesized to be a separate factor proxied by the divorce rate variable. However, this factor was not created during factor analysis, as all the variables loaded on one factor, with the *Number of children in the family* having the highest loading. *Number of single parent households in a population* variable is generally considered as describing *family type*, while family income (and parents' education) is generally considered as referring to *family background.* Therefore, the factor created as a result of FA can be described as the *Family background* factor.

Analytical Summary

Another result of the study is evidence provided for the usefulness of incorporating latent variables into the HC index. This was accomplished via multiple regression analysis tests. This section reports on the results of these tests.

Discussion of Regression Analyses Results

Overall, based on the results of this study, the EHCI-II seems to reflect the actual state of human resources in a country better than UNHCI, and EHCI-1. As the test results presented in the previous chapter indicate, EHCI-II generally has higher degrees of correlation with the outcome variables, and has higher explanatory power than UNHCI or EHCI-1. The fit of the model is also better when the EHCI-II is used than when UNHCI or EHCI-1 are used.

EHCI-II and Export of Services Variable

According to the results of the tests reported in the previous chapter (Table 15), adjusted R², which corresponds to the equation with EHCI-II and export of services variable, is on average more than five times higher than the adjusted R² corresponding to the equation with UNHCI and export of services variable. This indicates that EHCI-II can explain more than five times more variation in the outcome variable than UNHCI. The F-test associated with the use of EHCI-II is on average almost six times bigger than the F-test corresponding to the use of UNHCI (both tests are significant). This indicates that EHCI-II improves prediction of the outcome (compared to the level of inaccuracy in the model) almost six times better than UNHCI. Standardized *B* coefficient between the EHCI-II and the Export of Services variable is on average twice larger than the standardized *B* coefficient between UNHCI and this variable (both statistics are significant). These results indicate that based on the Export of Services variable, EHCI-II has significantly more explanatory power than the UNHCI.

EHCI-II and a Country's High-Value-Added Export Variable

According to the results of the tests reported in the previous chapter (Table 15), Adjusted R^2 in the equation with EHCI-II and the high-value-added export variable is on average 1.5 times higher than the adjusted R^2 in the equation with UNHCI and high-value-added export variable. This indicates that EHCI-II can explain 1.5 times more variation in the in the outcome variable than UNHCI. The F-test associated with the use of the EHCI-II is on average 1.3 times larger than the F-test corresponding to the use of the UNHCI (both tests are significant). This translates to EHCI-II predicting the outcome (compared to the level of inaccuracy in the model) 30% better than the UNHCI. Standardized *B* coefficient between EHCI-II and high-value-added products in the export variable is on average 1.24 times (24 percent) larger than the standardized *B* coefficient between UNHCI and this variable (both statistics are significant).These results indicate that based on the high-value-added export variable, EHCI-II has more explanatory power than UNHCI.

EHCI-II and Foreign Direct Investments Variable

According to the results of the tests reported in the previous chapter (Table 15), adjusted R^2 in the equation with EHCI-II and the foreign investments variable is on average 1.22 times larger (22 percent) than the adjusted R^2 in the equation with UNHCI and foreign investments. The F-test associated with the use of EHCI-II is on average 15 percent smaller than the F-test corresponding to the use of UNHCI (both tests are significant). This indicates that UNHCI improves prediction of the outcome (compared to

the level of inaccuracy in the model) 15 percent better than EHCI-II. Standardized *B*

coefficient between EHCI-II and foreign investments variable is on average 1.13 times

(13 percent) larger than the standardized *B* coefficient between UNHCI and this variable

(both statistics are significant). These results indicate that based on the foreign direct

investments variable, EHCI-II has more explanatory power than UNHCI.

Conclusion

Overall, based on the reported results, the EHCI-II reflects the actual state of

human resources in a country significantly better than UNHCI. As the test results

indicate, EHCI-II generally has a higher degree of correlation with the outcome variables,

has higher explanatory power of the outcome variables and displays better fit of the

model than UNHCI.

Implications for Research

This study adds to the relevant research literature in several ways. Specifically, it

highlights the importance of intangible factors in measuring national HC development. It

shows that intangible characteristics of a country's population affect its HC and

consequently, national economic development. Most importantly, this study suggests that

HC theory may be changed from the theory of distribution of individual/group education

and economic welfare to the theory of distribution of individual/group productive skills,

qualities, education and economic welfare. Moreover, this study created models of three

intangible factors (ID, Family, and Character) and suggested their empirical proxies. The

following subsections describe these contributions in more details.

Implications for HC Theory

The fundamental principle governing modern HC theory is the belief that people's learning capacities and educational achievements are as valuable in production of goods and services as such conventional resources as physical and financial capital (Lucas, 1988, 1990). Consequently, modern HC theory is the theory of joint distribution of education and earnings/economic welfare (Hartog, 2001; Psacharopoulos, 1988). Although many factors other than education have been suggested to comprise HC, measurement difficulties, as well as the measurement of their effect on production, have kept HC theory in the boundaries of education-earnings distribution. Furthermore, a sizable group of economists and educators hold a belief that education is the most important part of HC, with other factors merely complementing it (Lau, Jamison & Louat, 1991). This dissertation has provided some theoretical evidence toward the importance of intangible qualities and skills of a population in shaping national HC. It has also shown some statistically significant results toward the importance of these skills and qualities in improved national production. Moreover, it provided evidence for the selected intangible factors to be of a higher significance than education in terms of producing economic results. Therefore, consistent with prior conceptual discussions by economists and HRD scholars (Hartog, 2001; Heckman, 2000), this study supports the expansion of HC theory from a theory of joint distribution of education and economic welfare of population to a theory of joint distribution of skills, qualities, and education of population and economic welfare.

Implications for HRD Research

As suggested by a group of HRD scholars and professionals (McLean, 2001; 2004; McLean, Bartlett, & Cho, 2003; Wang & McLean, 2007), national HRD and international HRD should go beyond employment issues and include a host of other considerations that have not typically been considered as human capital investment, such as culture, community and many others. A view of the labor force only in terms of unified "faceless" manpower greatly diminishes the diversity of ways training and development can be conducted and HRD practices may be deployed and assessed. Similarly resistance to embracing the importance of considering HRD issues at the national and international level diminishes the potential to develop more effective approaches to HRD related research and measurement. Consequently, such a view significantly limits productivity frontiers that may be achieved if all aspects of HRD are addressed. Much greater growth and productivity on corporate and national levels may be achieved if these and other intangible human characteristics are addressed through training and development. At the same time, few researchers have actually measured these characteristics or organizational/national improvements associated with their development (Cho & McLean, 2000; Nafukho et al., 2004).

In tandem with this suggestion, McLean (2007) emphasized the need to explore diverse subfacets of HRD and investigate how national cultures influence national HRD. He proposes that every country may have its own unique process of development of HRD based on specific and unique characteristics of its citizens. This view is supported by a United Nations expert group, which concluded that "an HRD Master Plan must be sensitive to culturally-influenced change processes" (United Nations, 1994, p. 3), because

much depends on the culture and worldviews of the society, which looks for improvement strategies. Additionally, a different view is expressed by Wang & Swanson (2008), who proposed that a unified approach to HRD on national and international levels needs to be achieved.

This dissertation has provided evidence that human capital on a national level is formed not only by formal education, but by other diverse factors as well. Specifically, this study assessed *National Identity Awareness, Character most common in population,* and *Family Background* factor as factors contributing to HC development, and provided some evidence toward the significance of these factors in HC. The proposed model suggests a holistic approach to HC as it is influenced by many variables. Therefore, these and other factors need to be taken into consideration by HRD professionals and scholars in their pursuit of improving employee quality and increasing organizational effectiveness. If people are considered as a form of capital for development, education, training and development of national and corporate human resources needs to address a wide range of human factors that affect production.

Implications for Educational Research

This dissertation provides support for the view expressed by a large group of educational scholars and economists (e.g., Hanushek, 1997; Heckman, 2000, 2007) about the importance of non-cognitive qualities in economic success of individuals. It argues that other factors, for example, character qualities, social skills played important roles in achieving personal well-being. Therefore, educational institutions need to pay as close attention to providing opportunities for students to develop these traits as they do in

providing opportunities to develop academic skills. National Educational ministries need to create national policies which will raise this issue to the national level. Thus, it would not depend on the initiative and willingness of certain schools, but would be required for all schools. Consequently, assessment of educational outcomes should not single out academic achievement and drop-out rates as the major measures of school quality. Other variables in line with the above discussion need to be employed in order to increase the quality of assessment of education outcome.

Implications for Research of Development

This dissertation utilizes a highly complex set of latent variables from established sources for cross-country time series assessment for a large sample. An array of research attempting to incorporate latent variables into cross-country analysis mostly uses either World Values Survey (Inglehart, 1998, 2004) or International Social Surveys Series (2002, 2003) (Glaeser, Laibson, Scheinkman, & Soutter, 2000; Shulman, 2005). Although very helpful, these surveys cover only a few countries. The maximum number of countries that the latest and the most exhaustive (1999-2001) WVS surveyed was 81. ISS generally has different sample sizes, which are even smaller than the one used in WVS. It also does not collect data systematically. This presents severe limitations for the number of countries (and time periods) that may be studied. Generally, studies attempting cross-country comparisons or index creation overcome this problem by using small samples of countries (based on available data), as well as using available but not necessarily current indicators. For example,

- Nehru, Swanson, and Dubey (1995) created a database on human capital stock for 85 countries using estimates of the stock of education in these countries.

- Cohen and Soto (2001) created a new set of data on HC using OECD and UNESCO censuses on years of schooling per country for 95 countries (the range of data used inconsistently for different countries: 1960-2010).

- Mankiw, Romer and Weil (1992) created a measure of HC for 121 countries, using the percentage of the working-age population that is in secondary school as the proxy for HC.

- Diener (1995) created a value-based index for measuring national quality of life for 101 countries.

- Veenhoven (1993) created an indicator of happiness in nations for 55 countries.

- Ranis, Stewart and Samman (2005) attempted development of a new HDI index for less than 100 countries using the data with a decade difference between some indicators and the rest of the indicators.

- International Social Survey Program (ISSP) (a part of International Social Survey Program Series) conducted a survey study on the perception of national identity for 23 countries.

- Adelman and Taft-Morris (1967) assessed interdependence between the economic growth of a country and its social, political and economic characteristics for 74 countries, using available cross-country data as well as expert interviews in case of the absence of data.

- Alesina et al. (2003) constructed ethnic-linguistic-religious fractionalization indices for 190 countries. The indices were created for different years for different countries (time span is 1979-2001), which makes it difficult to use these indices for cross-country comparison or for future analysis.

- Annett (2000) calculated ethnolinguistic fractionalization for 150 countries using pooled time-series cross section data for the index (range of data used:1960s-1980s, whatever was available), and looked for its correlation with his index of political instability (for 108 countries), created using 1996 measures.

- Di Pietro (2006) conducted cross-country comparison of interdependence between average IQ level in a country and its socio-economic development for 101 countries.

- The World Bank has been measuring of the global gender gap for the past few years. Its results are aggregated into The Global Gender Gap Index. The 2006 Index is based on 115 countries, and the 2007 Index is based on 128 countries.

- Ganzeboom, Graaf, and Treiman (1992) created a Standard International Socio-Economic Index of Occupational Status using 31 datasets, covering 16 nations for various years ranging from 1968 to 1982 for different countries.

- La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) examined legal rules covering protection of corporate shareholders and creditors in 49 countries.

The choice of variables and the number of countries for comparison can be explained by a general lack of cross-country data. Generally, data on poor and developing countries is scarce, while data on wealthy ones is abundant. Such a situation describes

even the most recent publications. To increase the sample of assessed countries, one often

needs to spend much time "digging for data" or estimate the missing values by

her/himself, using the definitions and methodologies used to calculate the existing

measures. Such a situation with data is not conducive to quality research that can benefit

poor and developing countries, which are the ones that need data-based policies most of

all. Such a situation demonstrates the pressing need for improvements in the availability

of relevant, reliable and timely statistics for all countries of the world.

A contribution of this dissertation to research of development is in its attempt to

incorporate current, readily available empirical measures for a significantly bigger

sample (N=163), which is the total population of independent world countries with

populations of 100,000+, for six consecutive years (2000-2005). Although not all 163

countries have data for each of the 31 variables used, the researcher made all possible

attempts to find or replace the missing data utilizing approaches described earlier.

Creation of Latent Variables out of Empirical Measures

Measuring intangible factors is often connected with difficulties and limitations

because of their non-physical nature. Generally, latent variables are qualitatively

measured, which requires a certain level of funding and research infrastructure. For

example, in 2003, National Identity Awareness was measured as a part of International

Social Survey Series (ISS) in a sample of 34 industrialized countries; in 2002, Family and

Gender Roles were evaluated with a sample of 34 highly developed nations. Many poor

and developing countries cannot afford this kind of research to be conducted

systematically, which negatively affects socio-economic policies implemented in these

countries. Therefore, there is a need to create measurement tools of latent factors by way of utilizing easily accessible empirical measures. This dissertation created tools to assess three variables in a country (national identity awareness of population, character qualities of population, and families in the country) by using existing empirical measures.

Providing Evidence for Usefulness of Expanding Currently Used Narrow

Measures of HC

This study supports the group of researchers that find positive correlations between national human capital and a country's economic development, when human capital is measured as a combination of literacy rate in a country, school enrollment rates (primary, secondary and tertiary), and measures of national identity awareness, character development of citizens, and family strength. Although this study used UNHCI as a base for the creation of EHCI, the results of significance of EHCI in relation to UNHCI are applicable to other HC measures. As extensively discussed in the Literature Review (Chapter II), all currently used measuring tools of HC rely primarily on education/training variables (incorporating different forms and combinations of these variables). Modification of HC measures by intangible variables has not been done before.

Implications for Practice

Findings from this dissertation may be applied in practice in several ways. Specifically, they may assist national policy makers in their pursuit of creating policies

that improve the socio-economic condition of countries. The following subsections describe these applications in more detail.

Affecting National Economic Development through Strengthening Citizens' National Identity Awareness

Based on the results of the study, intangible characteristics of a country's population cause significant modifications in the productivity of education that the population possesses. Therefore, national policies aiming at quality improvement of national human resources need to take into consideration these factors as well. Based on the results of this study, resources allocated toward strengthening of families in a country, strengthening citizen affiliation with the country, and improvement of the overall ethical and democratic climate in a country will affect improvement of the quality of national human resources.

Specifically, this research provides evidence that national identity awareness in the nation affects the level of economic development of this nation. Linguistic, ethnic and religious cohesion of the population are some of the factors that influence national identity awareness. Increase in these variables lead to an increase in the national identity awareness of people in a country. Out of these three measures, ethnic and religious structures of the societal fabric are not flexible in the short run. However, linguistic structure is more elastic. Therefore, one way to increase the level of national identity awareness in a population (and consequently, the level of national socio-economic development) is by increasing the level of linguistic cohesion in a society. This may be achieved by, for example, enforcing the knowledge and use of one national language

together with the use of other different languages that exist in the country. Although many groups in a country may have their own diverse mother tongues, there needs to be one national language that all citizens in the country know and use.

The study shows that awareness of collective destiny within a country's population is positively affected by the number of memorable events (for example, national holidays that are celebrated in a country, winnings at international sporting events). This leads to a conclusion that one way to strengthen the level of citizens' association with their country (and consequently, increase the level of socio-economic development in the country) is by making sure such events are consistently conducted. For example, a government may try to either add a number of meaningful national holidays or improve the way the existing ones are celebrated. A government may also try to invest more money in developing national athletes.

According to the findings of this study, perpetuation of historic memories in a nation (which is positively associated with the level of national identity awareness) depends on the number of Nobel Prize laureates in a country. Although it is very difficult to affect this measure because of its uniqueness, national governments may try to use similarly powerful, but less unique events, for example, paying more attention to raising talented national artists (for example, musicians, painters, sculptors, etc) who can represent the country internationally and whose achievements can stand the test of time.

Affecting National Economic Development through Influencing Citizens' Character

Qualities

This research provides evidence that character qualities of a population affect the level of economic development of this nation. Therefore, a possible way of improving economic development of a country is through paying attention to the elements that comprise this factor. More specifically, this goal can be achieved by influencing the variables that affect this factor. This study provides evidence for importance of selected variables toward Character factor. Consequently, these variables may attract the attention of national policy makers attempting to design policies toward strengthening of socio-economic development of a country. For example, specific policies may be designed, which influence the overall environment in the country by creating policies aiming to improve attitudes toward women in society; making sure that the national judicial system is capable of making independent decisions; increasing election participation rates by providing evidence in importance of a general population's voice in the elections' outcomes; increasing trust in institutions of the country and so on.

Affecting National Economic Development through Improving Status of Families in the

Country

This study shows that the condition of families in a country affects the level of economic development of the nation. It establishes specific variables that affect the Family background factor, and therefore, the economic development of a country. Strengthening of families through paying attention to these specific variables may lead to increased level of national economic development. More specifically, the Family factor

may be affected by increasing resources available to families with children. Moreover, this factor may be affected by improving the living conditions of people in rural areas by increasing business/educational/cultural infrastructure available to them and closing the gap between rural and urban opportunities.

Implications for HRD Practitioners

This study is useful for HRD practitioners. Human resources of an organization are the primary determinant of organizational success due to ever increasing competition and changes in the employer-employee relationships (Egan, 2002; 2005; Egan, Upton, Lynham, 2006). Much has been written on how to measure the value of human resources (Fitz-Enz, 2000; Wang & Swanson, 2008). At the same time, measuring intangible qualities of employees still requires additional research. This study supports the relevance of national level considerations for HRD, having demonstrated how intangible qualities of citizens may be incorporated into a measure of human capital of the country. A similar approach may be suggested as a possible way of evaluating intangible qualities of organizational or other levels of human resources.

Implication for Educational Practices

This research provides evidence that national economic welfare does not depend only on the level of basic education of the population, but also on many other factors. Specifically, this study shows that a population's characteristics, such as its national consciousness, strength of families, and general character, are of great importance as well. National education policy-makers need to take this fact into consideration by

designing policies that promote the importance of not only educational skills and competencies but also of those that aim to develop character qualities of students.

For international development practitioners and national governments, this study provides some useful insights into how different intangible factors affect human capital and the economic development of countries. It provides empirical evidence to support the argument that investment in basic education only, as well as physical capital, is not enough for improvement of the quality of national human resources and economic development of countries. Attention needs to be devoted to intangible factors as well.

Implications for Future Research

The results of this dissertation indicate that EHCI-II is a better measure of national HC than the currently used UNHCI. This tool provides more accurate measurement of national HC than previous measures that used only education variables. National identity awareness of the population, Strength of families in a country and average Character of citizens of a country are important factors that affect a country's human capital and therefore positively augment the existing HC measure. Furthermore, HC, as measured by the suggested variables, is an important determinant of many cross-country economic measures. The results suggest that investment in improving a sense of national identity in the population, strengthening families, and developing fundamental character traits in people in the country can create the conditions under which a country's economic wellbeing will improve. This study creates preliminary models of the three latent factors. These models may be further developed by employing the structural linear modeling technique (SEM).

Schultz pointed out the extensively diverse nature of human capital. Although there are many more that may be added to the index, this dissertation examined only three new constructs (and their underlying elements), Therefore, it would be interesting to conduct further research in this direction. For example, one of the variables mentioned consistently as one affecting national HC is the variable of culture. This variable was not included in this study in an attempt to keep the parsimonious character of the dissertation (study of culture's affect on national HC development is a very complex topic, has few clear supporting measures within the scope of this global investigation, and could easily comprise a separate dissertation). Furthermore, the results of this study may be used to create a measurement tool for assessment of human resources level on a corporate level.

Strengths and Limitations of the Study

The major strength of this study is in its attempt to cover a broad range of countries and utilize a significant number of empirical measures to describe them consistently for the 2000-2005 period. This dissertation utilizes a large number of variables (31) to develop a new HCI, while all the previous studies used significantly fewer numbers of variables. Furthermore, this study employs a wide spectrum of variables not commonly found in HC measures, and not only educational variables as in the previous studies. Another strength of this dissertation is the large number of countries it includes, which is the population of all independent countries with more than 100,000 citizens. Covering such a large number of countries allows for broad comparison of countries. This is different from many previous studies, which generally cover fewer states, and are often based on a sample of convenience based on readily available data.

Generally, data on poor and developing countries is scarce, while data on wealthy nations is abundant. Such a situation with data is not conducive to quality research that can benefit poor and developing countries, which are the ones that need data-based policies most of all. To increase the sample of assessed countries, this study spent much time "digging for data" and estimated the missing values using the definitions and methodologies used to calculate the existing measures. Using data on six consecutive years (2000-2005) adds to the overall strength of the dissertation. While many previous studies utilized data on different years for different countries for the same variable, this study made all possible efforts to use the data for the 2000-2005 years only. Furthermore, this dissertation utilized measures, which are credible, easily accessible, measurable, and available for all countries. Although using qualitative data may have been easier for certain indicators, the researcher chose to use only quantitative data because of its availability for most (especially poor) of the world's countries. Another plausible quality of this dissertation is that it used a large literature base for its theoretical framework. More than 200 articles and books from reputed academic journals and publishing houses were selected for inclusion in the study from a much larger pool of reviewed publications.

There are also several limitations in this study. Limitations of the study are mainly caused by availability and quality of data. One major limitation is in variation in availability of data from different sources. Although some sources have data available for all countries (for example, the World Bank, UNESCO), other sources (for example, ILO, WHO) have data on a limited number of countries. The researcher looked for comparable data across sources yet kept the purity of the study by making sure that only the data

created by the same methodology was used in the study. Sometimes, the researcher had to estimate the data by herself, using the methodologies that were utilized to calculate the available measures. Missing data from the data sources has been another major difficulty. A source may have all world countries list-wise, but have missing data for some/many. This necessitated the use of missing data substitutes such as calculated regional averages and interpolation. Sometimes, country data reported even by the same source was different in different editions of the publication. Another weakness is the fact that indicators may have different meaning in different places, cultures, subcultures, et al. Moreover, even within a given place, the meanings of indicators may change over the course of time because of historical events, changes in norms, and political upheavals, to name a few. Although all reasonable precautions were taken to use only comparable data, some error inevitably was introduced.

Summary

Although a country's political situation, potential economic risk, rule of law, and available legal/business infrastructure have been named as the primary factors of its economic development, it also has been argued that national human capital is quite possibly more important. HC is a measure of the economic value of knowledge, skills, abilities, attitudes and experiences of a citizenry—the "brain" behind all other determinants. The level of development and quality of human capital is one of the most important factors that differentiate between countries with similar geographic and natural resources but do vary in terms of their socio-economic development.

An alternative method of measuring HC was formed herein by constructing an expanded human capital index. Rigorous validation procedures have established this new measure as more reliable in predicting national economic development. It can be utilized for policy formation, which may bring positive changes to development in countries by addressing areas that are of highest importance to national development and individual well-being. The new variables suggested for inclusion in the index may attract the attention of policy formulators in different countries in order to affect human resources development of these countries in positive and effective ways.

REFERENCES

Adelman, I., & Taft-Morris, C. (1967). *Society, politics and economic development.* Baltimore, MD: The John Hopkins Press.

Adelman, I., & Taft-Morris, C. (1972). The measurement of institutional characteristics of nations: Methodological considerations. *Journal of Development Studies, 8*(3), 111-135.

Aghion, P., Caroli, E., & Garcia-Penalosa, C. (1999). Inequality and economic growth: The perspective of the New Growth theories. *Journal of Economic Literature, 37*(4), 1615-1661.

Akerlof, G., & Canton, R. (2000). Economics and identity. *The Quarterly Journal of Economics, 115*(3), 715-753.

Alesina, A., Baqir, R., & Easterly, W. (1999). Public goods and ethnic provisions. *Quarterly Journal of Economics*, *114,* 1243-1284.

Alesina, A., & La Ferrara, E. (2000). Participation in heterogeneous communities. *The Quarterly Journal of Economics, 115*(3), 847-904.

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth, 8,* 155-194.

Alesina, A., & La Ferrara, E. (2005). Ethnic diversity and economic performance. *Journal of economic literature, 43(3), 762-800.*

Almond, G., & Verba, S. (1963). *The civic culture: Political attitudes and democracy in five nations.* Princeton: Princeton University Press.

Annett, A. (2000). *Social fractionalization, political instability, and the size of government.* Retrieved October 15, 2007, from http://ssrn.com/abstract=879607

Appleton, S., & Teal, F. (1998). *Human capital and economic development.* Retrieved

    May 10, 2007, from

    http://www.afdb.org/pls/portal/docs/page/adb_admin_pg/documents/economicsan

    dresearch/erp-39.pdf

Babbie, E. (2004). *The practice of social research.* Belmont, CA: Wadsworth/Thomson

    Learning.

Badaracco, J. (1997). *Defining moments: When managers must choose between right and*

    right. Boston: Harvard Business School Press.

Bagozzi, R. (1981). Evaluating structural equation models with unobservable variables

    and measurement error: A comment. *Journal of Marketing Research, 18,* 375-

    381.

Bagozzi, R., & Fornell, C. (1982). Theoretical concepts, measurements, and meaning. In

    Fornell, C. (Ed.) *A second generation of multivariate analysis* (pp. 24-38). New

    York: Praeger.

Baier, S., Dwyer, G., & Tamura, R. (2006). How important are capital and total factor

    productivity for economic growth? *Economic Inquiry, 44*(1)*,* 23-50.

Barrick, M. R., & Mount M. K. (1991). The big five personality dimensions and job

    performance: A meta-analysis. *Personnel Psychology*, *44*, 1-26.

Bar-On, R., Brown, J., Kirkcaldy, B., & Thome, E. (2000). Emotional expression and

    implications for occupational stress: An application of the Emotional Quotient

    Inventory. *Personality and Individual Differences, 28,* 1107-1118.

Bar-On, R, & Parker J. D. A. (2000). *The handbook of emotional intelligence: Theory,*

    development, assessment, and application at home, San Francisco: Jossey-Bass.

Barro, R. (1991). Economic growth in cross-section of countries. *Quarterly Journal of Economics, 106,* 407-444.

Barro, R., & Sala-i-Martin, X. (1995). *Economic growth.* Cambridge, MA: MIT Press.

Barro, R., & Lee, J. (2000). *Data set for a panel of 138 countries*. Retrieved October 10, 2006, from http://www2.cid.harvard.edu/ciddata.html

Barro R., & Lee, J. (2001). International data on educational attainment: Updates and implications. *Oxford Economic Papers, 53*(3), 541-563.

Baster, N. (1972). Development indicators: An introduction. *Journal of Development Studies, 8*(3), 2-20.

Beck, A., Steer, R., & Garbin, M. (1988). Psychometric properties of the Beck depression inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8,* 77-100.

Becker, G. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy,* 70, 9-49.

Becker, G. (1964). *Human capital.* New York, NY: National Bureau of Economic Research.

Becker, G. (1993). Nobel lecture: The economic way of looking at behavior. *Journal of Political Economy 101,* 385-409.

Becker, G. (1995). An economic analysis of fertility. In R. Febrero & P. Schwartz (Eds.) *The essence of Becker* (pp. 241-273). Stanford University: Hoover Institution Press Publication.

Becker, G., & Tomes, N. (1976). Child endowments and the quantity and quality of children. *Journal of Political Economy, 84*(4-2), 143-162.

Becker, G., & Tomes, N. (1979). An equilibrium theory of distribution of income and

      Intergenerational mobility. *The Journal of Political Economy 87*(6), 1153-1189.

Becker, G., & Tomes, N. (1986). Human capital and the rise and fall of families. *Journal*

      of Labor Economics, 4(3), 1-39.

Benhabib, J., & Spiegel, M.(1992). The role of human capital in economic development:

      Evidence from aggregate cross-country data. *Journal of Monetary Economics, 34*,

      143-173.

Ben-Porath, Y. (1980). The F-connection: Families, friends, and firms and the

      organization of exchange. *Population and Development Review, 6*(1), 1-30.

Bentler. P. (1980). Multivariate analysis with latent variables: Causal modeling. *Annual*

      Review of Psychology, 31, 419-456.

Berkowitz, D., & Jackson, J. (2005). *The Evolution of an economic and political middle*

      class in transition countries. Retrieved February 8, 2008, from

      http://polisci.lsa.umich.edu/documents/jjackson/apsa05db.pdf

Bernstein, B. (1975). *Class, codes and control: Toward a theory of educational*

      transmission. London: Routledge & Kegan Paul.

Blake, J. (1981). Family size and the quality of children. *Demography, 18*(4), 421-442.

Blau, F., & Kahn, L. (1996). International differences in male wage inequality:

      Institutions versus marker forces. *Journal of Political Economy, 104*, 791-837.

Boettke, P., & Subrick, R. (2003). *Rule of law, development, and human capabilities.*

      Chicago: University of Chicago.

Bollen, K. (1984). Multiple indicators: Internal consistency or no necessary relationship?

      Quality and Quantity, 18, 377-385.

Bollen, K., & Lennox, R. (1991). Conventional wisdom on measurement: A structural equation perspective. *Psychological Bulletin, 110*(2), 305-314.

Bonk, M. (Ed.). (2000). *Worldmark Yearbook* (Vols. 1-3). Farmington Hills, MI: The Gale Group.

Booysen, F. (2002). An overview and evaluation of composite indices of development. *Social Indicators Research,* 59, 115-151.

Bossert, W., D'Ambrosio, C., & LaFerrara, E. (2006). A generalized index of fractionalization. Retrieved March 1, 2008, from ftp://ftp.igier.uni-bocconi.it/wp/2006/313.pdf

Bourdieu, P. (1977). Cultural reproduction and social reproduction. In J. Karabel, & A. Halsey, (Eds.), *Power and ideology in education* (pp. 487-511). New York: Oxford University Press.

Bourdieu, P. (1978). Changes in the social structure and changes in the demand for education. In S. Giner, & M. Archer (Eds.), *Contemporary Europe: Social structures and patters* (pp.38-50). London: Routledge & Kegan Paul.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp.241-258). New York: Greenwood.

Bourdieu, P., & Passeron, J. C. (1990). Reproduction in education, society and culture. London: Sage Publications.

Bowles, S., Gintis, H., & Osborne, M. (2001). The determinants of earnings: A behavioral approach. *Journal of Economic Literature, 39*(4), 1137-1176.

Buchmann, C. (2002). Measuring family background in international studies of

    Education: Conceptual issues and methodological challenges. In A. Porter & A.

    Gamoran (Eds.), *Methodological advances in cross-national surveys of*

    educational achievement (pp. 150-197). Washington, DC: National Academy

    Press.

Cameron, S., & Heckman, J. (1998). Life cycle schooling and dynamic selection bias:

    Models and evidence for five cohorts of American males. *Journal of Political*

    Economy, 106, 262-333.

Campbell, A., Converse, P., & Rodgers, W. (1976). *The quality of American life.* New

    York: Sage.

Canovan, M. (1996). *Nationhood and political theory.* Cheltenham, UK: Edward Elgar.

Carneiro, P., & Heckman, J. (2003). Human capital policy. In B. Friedman (Ed.),

    Inequality in America. What role for human capital policies? (pp. 71-241).

    Cambridge, MS: MIT Press.

Cho, E., & McLean, G. (2000). Measures and indicators of intangibles for research

    institutes and colleges: A literature review. In K. Kuchinke (Ed.), *Proceedings of*

    the academy of human resource development (pp. 326-333). Baton Rouge, LA:

    AHRD.

Cohen, D., & Soto, M. (2001). *Growth and human capital: Good data, good results*.

    London: Centre for Economic Policy Research.

Coleman, J. (1988). Social capital in the creation of human capital. *The American*

    Journal of Sociology, 94, S95-S120.

Cremer, J. (1986). Cooperation in ongoing organizations. *Quarterly Journal of Economics, 101*, 33-49.

Daniels, M., Devlin, B., & Roeder, K. (1997). Of genes and IQ. In B. Devlin, S. Fienberg, D. Resnik, & K. Roeder (Eds.), *Intelligence, genes and success: Scientists respond to the Bell Curve* (pp.3-19). NY: Springer Verlag.

Dean, James (2000). Ukraine: Europe's forgotten economy, *Challenge, 43*(6), 93-108.

Denzau, A., & North, D. (1994). Shared mental models: Ideologies and institutions. *Kyklos, 47,* 3-31.

DeVries, R., & Zan, B. (1994). *Moral children: Constructing a constructivist atmosphere in early education.* New York: Teachers College Press.

Diamantopoulos, A., & Winklhofer, H. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of Marketing Research, 38,* 269-277.

Dickey, S., Runchock, R. (Eds.) (2001). *Worldmark Encyclopedia of the Nations*. Detroit: Thomson Gale.

Diener, E. (1995). A value based index for measuring national quality of life. *Social Indicators Research, 36*, 107-127.

Diener, E., Sandvik, L., Seidlitz, L., & Diener, M. (1993). The relationship between income and subjective well-being: Relative or absolute. *Social Indicators Research, 28,* 195-223.

Diener, E., & Diener, C. (1995). The wealth of nations revisited: Income and quality of life. *Social Indicators Research, 36,* 275-286.

Diener, E., & Suh, E. (1997). Measuring quality of life: Economic, social, and subjective indicators. *Social Indicators Research, 40,* 189-216.

Dijkstra, G. A., & Hanmer, L. C. (2000). Measuring socio-economic gender inequality: Toward an alternative to the UNDP gender-related development index. *Feminist Economics, 6*(2)*,* 41-75.

Di Pietro, W. (2006). Income per capita, health and cross-country IQ: An international comparison. *Applied Econometrics and International Development, 6*(2), 5-14.

Drucker, P. (1999). *Management challenges for the 21*[st] *century.* New York: Harper Collins Publishers.

Druskat, V., Wolff, S. (2001). Building the emotional intelligence of groups. *The Harvard Business Review, 79*(3)*,* 80-90.

Duijker, H., & Frijda, N. (1960). *National character and national stereotypes.* Amsterdam: North-Holland Publishing Company.

Dunning, J. (1998). The changing geography of foreign direct investment: Explanations and implications. In Kumar, N. (Ed.) *Globalization, foreign direct investment and technology transfer: Impacts on and prospects for developing countries* (pp. 43-91). London: Routledge.

Dunning, J., & Narula, R. (2004). *Multinationals and industrial competitiveness.* Northampton, MA: Edward Edgar Publishing.

Durkheim, E. (2002). *Moral education.* Mineola, NY: Dover Publications.

Dyker, D., Nagy, A., Spilek, H. (2003). "East"— "West" networks and their alignment: Industrial networks in Hungary and Slovenia, *Technovation, 23,* 603-616.

Easterly, W., & Levine, R. (1997). Africa's growth's tragedy: Policies and ethnic divisions. *Quarterly Journal of Economics, 111*(4), 1203-1250.

Economic and Social Commission for Asia and the Pacific (2003). *Statistical Yearbook for Asia and the Pacific 2002.* New York: United Nations Publications.

Egan, T. (2002). Organization development: An examination of definitions and dependent variables. *Organization Development Journal, 20*(2), 59-70.

Egan, T. (2005). Creativity in the context of team diversity: Team leader perspective. In Waight, C., and Egan, T. (Eds.). Underpinning of creativity in human resource development. *Advances in Developing Human Resources, 7*(2), 207-225.

Egan, T., Upton, M., Lynham, S. (2006). Career development, loadbearing wall or window dressing?: Exploring definitions, theories and prospects of HRD related theory building. *Human Resource Development Review, 5*(4), 442-477.

Eke, S., & Kuzio, T. (2000). Sultanism in Eastern Europe: The socio-political roots of authoritarian populism in Belarus. *Europe-Asia Studies, 52*(3), 523-547.

Euromonitor International (2005). *European marketing data and statistics.* Chicago, IL: Euromonitor International, INC.

Euromonitor International (2006). *International marketing data and statistics.* Chicago, IL: Euromonitor International, INC.

Fearon, J. (2003). Ethnic structure and cultural diversity by country. *Journal of Economic Growth, 8*(2), 195-222.

Fidrmuc, J. (2000). Political support for reforms: Economics of voting in transition countries. *European Economic Review, 44*, 1491-1513.

Field, A. (2005). *Discovering statistics using SPSS.* London: Sage Publications.

Fienburg, S., & Resnick, D. (1997). Reexamining the Bell Curve. In B. Devlin, S. Fienberg, D. Resnik, & K. Roeder (Eds.), *Intelligence, genes and success: Scientists respond to the Bell Curve* (pp.3-19). NY: Springer Verlag.

Fisher, I. (1906). *The nature of capital and income.* New York: The Macmillan Company.

Fitz-Enz, J. (2000). *The ROI of human capital.* New York: American Management Association.

Ford, J. (1997). *Improving training effectiveness in work organizations.* Lawrence Erlbaum, Mahwah, NJ.

Fornell, C., & Bookstein, F. (1982). Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. *Journal of Marketing Research, 19,* 440-452.

Franke, R., Hofstede, G., & Bond, M. (1991). Cultural roots of economic performance: A research note. *Strategic Management Journal, 12,* 165-173.

Freeman, R. (1986). Demand for education. In O. Ashenfelter & R. Layard (Eds.), *Handbook of labour economics* (pp.359-395). Amsterdam: North-Holland.

Freedom House International. (n.d.). Survey methodology. Retrieved May 5, 2008, from http://www.freedomhouse.org/uploads/fop08/Methodology2008.pdf

Fukuyama, F. (1995). *Trust.* New York: Free Press.

Fukuyama, F., & Avineri, S. (1994). Comments on nationalism and democracy. In L. Diamond & M. Plattner (Eds.), *Nationalism, ethnic conflict and democracy. 23-35.* Baltimore, MD: The John Hopkins University Press.

Fullan, M. (2003). *Change forces: With a vengeance.* New York, NY: Routledge Falmer.

Gall, T. (Ed.). (2004). *Worldmark Encyclopedia of the Nations* (11th ed., Vols. 1-5). Detroit, MI: Thomson Gale.

Gall, T., & Hobby, J. (2007). (Eds.) *Worldmark Encyclopedia of the Nations* (12th ed., Vols. 1-5). Detroit, MI: Thomson Gale.

Ganzeboom, L., De Graaf, P., & Treiman, D. (1992). A standard international socio-economic index of occupational status. *Social Science Research, 21*, 1-56.

Gemmell, N. (1996). Evaluating the impacts of human capital stocks and accumulation on economic growth: Some new evidence. *Oxford Bulletin of Economics and Statistics, 58*(1), 9-28.

Gerber, T., & Hout, M. (1995). Educational stratification in Russia during the Soviet period. *American Journal of Sociology, 101*, 611-660.

Glaeser, E., Laibson, D., Scheinkman, J., & Soutter, C. (2000). Measuring Trust. *The Quarterly Journal of Economics, 115*(3), 811-846.

Glaeser, E., Scheinkman, J, & Shleifer, A. (2003). The injustice of inequality. *Journal of Monetary Economics: Carnegie-Rochester Series on Public Policy, 50*(1), 199-222.

Globerman, S., & Shapiro, D. (2002). Global foreign direct investment flows: The role of governance infrastructure. *World Development, 30*(11), 1899-1919.

Godfrey, M. (1997). Introduction. In M. Godfrey (Ed.), *Skill development for international competitiveness* (pp. xv-xxix). Cheltenham, UK: Edward Elgar.

Goldin, C., & Katz, L. (1999). Human capital and social capital: The rise of secondary schooling in America. *Journal of Interdisciplinary History, 29*, 683-723.

Goleman, D. (1995). *Emotional intelligence.* New York: Bantam Books.

Goleman, D., Boyatsis, R., & McKee, A. (2002). *Primal leadership*. Boston: Harvard Business School Publishing.

Graaf, P., & Huinink, J. (1992). Trends in measured and unmeasured effects of family background on educational attainment and occupational status in the Federal Republic of Germany. *Social Science Research, 21*, 84-112.

Granovetter, M., & Swedberg, R. (2001). Introduction to the second edition. In M. Granovetter & R. Swedberg (Eds.), *Sociology of economic life* (pp.1-30). Boulder: Westview Press.

Griliches, Z. (1997). Education, human capital, and growth: A personal perspective. *Journal of Labor Economics, 15*(1), 330-344.

Groot, W., & Maassen, H. (2007). The effects of education on health. In. Hartog, J., & H. Maassen (Eds.), *Human capital: Advances in theory and evidence* (pp. 65-81). Cambridge: Cambridge University Press.

Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes? *Journal of Economic Perspectives, 20*(2), 23-48.

Haller, A., & Portes, A. (1973). Status attainment process. *Sociology of Education, 46*, 51-91.

Hanson, J. (1996). Human capital and direct investments in poor countries. *Explorations in Economic History, 33(1),* 86-106.

Hanushek, E. (1997). Assessing the effects of school resources on student performance: An update. *Educational Evaluation and Policy Analysis, 19*(2), 141-164.

Hanushek, E. (2005). Why quality matters in education. Retrieved October 12, 2006, from http://www.imf.org/external/pubs/ft/fandd/2005/06/hanushek.htm

Harbison, F., & Myers, C. (1964). *Education, manpower, and economic growth.* New York: McGraw-Hill Book Company.

Harmon, C., Walker, I, & Westergaard-Nielsen, N. (2001). *Education and earnings in Europe.* Cheltenham: Edward Elgar.

Harrison, L. E. (1992). *Who prospers?* New York: Basic Books.

Hartog, J. (2001). On human capital and individual capabilities. *Review of Income and Wealth, 47*(4), 515-540.

Hartog, J., & Maasen van den Brink, H. (2007). Prologue. In J. Hartog & H. Maassen (Eds.), *Human capital: Advances in theory and evidence* (pp.1-7). Cambridge: Cambridge University Press.

Hartog, J., & Oosterbeek, H. (2007). What should you know about private returns to education? In J. Hartog, & H. Maassen van den Brink, (Eds.). *Human capital: Advances in theory and evidence* (pp. 7-20). Cambridge: Cambridge University Press.

Hauser, R., & Goldberger, A. (1971). The treatment of unobservable variables in path analysis. In H. Costner (Ed.), *Sociological methodology* (pp.81-117). San Francisco: Jossey-Bass.

Hauser, R., Sewell, W. (1986). Family effects in simple models of education, occupational status, and earnings: Findings from the Wisconsin and Kalamazoo studies. *Journal of Labor Economics 4*(3), 83-115.

Haveman, R., Bershadker, A., & Schwabish, J. (2003). *Human capital in the United States from 1975 to 2000.* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Healy, T., & Cote, S. (2001). *The well-being of nations: The role of human and social capital.* Paris, Center for Educational Research and Innovation: Organization for Economic Cooperation and Development.

Heckman, J. (1995). Lessons from the bell curve. *Journal of Political Economy, 103*(5), 1091-1120.

Heckman, J. (2000). Policies to foster human capital. *Research in Economics, 54,* 3-56.

Heckman, J., Layne-Farrar, A., & Todd, P. (1996). Human capital pricing equations with an application to estimating the effect of schooling quality on earnings. *The Review of Economics and Statistics, 78*, 562-610.

Heckman, J., Stixrud, J., & Urzua, S. (2006). The effects of cognitive and noncognitive Abilities on labor market outcomes and social behavior. *Journal of Labor Economics, 24*(3), 411-482.

Heckman, J., & Cunha, F. (2007). *The technology of skills formation.* Paper presented as American Economic Association Conference. Chicago, IL: Jan 5-7.

Hellman, J., Klich, J., Kaufman, D. (2000). Seize the state, seize the day: State capture corruption and influence in transition. Washington, DC: World Bank.

Herrnstein, R., & Murray, C. (1994). *The bell curve: Intelligence and class structure in American life.* New York: Free Press.

Hills, P., & Argyle, M. (2001). Emotional stability as a major dimension of happiness. *Personality and Individual Differences, 31,* 1357-1364.

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values,* Beverly Hills, CA: Sage.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations.* Thousand Oaks, CA: Sage.

Hopkins, K., & Bracht, G. (1975). Ten-year stability of verbal and nonverbal IQ scores. *American Educational Research Journal, 12*(4), 469-477.

Hoselitz, B. (1960). *Sociological aspects of economic growth.* New York: The Free Press of Glencoe.

Howard, S., Dryden, J., & Johnson, B. (1999). Childhood resilience: Review and critique of literature. *Oxford Review of Education*, *25*(3), 307-323.

Inglehart, R. (1998). *Human values and beliefs: A cross-cultural sourcebook,* Ann Arbor, MI: University of Michigan Press.

Inglehart, R. (2004) *Human beliefs and values: A cross-cultural sourcebooh based on the 1999-2002 values surveys,* Mexico: Siglo Editors.

International Social Survey Series (2003). *National identity survey.* Retrieved on May 25, 2008, from

http://www.gesis.org/en/data_service/issp/data/2003_National_Identity_II.htm

International Social Survey Series (2002). *Family and gender roles survey.* Retrieved on May 25, 2008,

fromhttp://www.gesis.org/en/data_service/issp/data/2002_Family_III.htm

Jarvis, C., Mackenzie, S., & Podsakoff, P. (2003). A critical review of construct Indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research, 30,* 199-218.

Jaw, B., Yu PingWang, C., & Chen, Y. (2006). Knowledge flows and performance of multinational subsidiaries: The perspective of human capital. *International Journal of Human Resource Management, 17*(2), 225-244.

Jenkins, B., & Sofos, S. (1996). Nation and nationalism in contemporary Europe: A theoretical perspective. In B. Jenkins & S. Sofos (Eds.), *Nation and identity in contemporary Europe* (pp.7-30). New York, NY: Routledge.

Johnson, J. B., & Reynolds, H. (2005). *Political science research methods.*Washington, DC: A Division of Congressional Quarterly Inc.

Jöreskog, K., & Goldberger, A. (1975). Estimation of a model with multiple indicators and multiple causes of a single latent variable. *Journal of the American Statistica Association, 10,* 631-639.

Kallmann, K. (1997). *An introduction to social indicators and social reporting: A digest of the literature.* South Africa: University of Natal.

Kalotay, K. (2008). FDI in Bulgaria and Romania in the wake of EU accession. *Journal of East-West Business, 14*(1), 5-39.

Kaufmann, D. (1998). Research on corruption: Critical empirical issues. In A. Jain (Ed.), *Economics of corruption* (pp. 163-194). Boston: Kluwer Academic Publishers.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2007). *Governance matters VI: Aggregate and individual governance indicators 1996-2006.* Washington D.C.: The World Bank.

Kendrick, J. (1976). *The formation and stock of total capital.* New York: Columbia University Press.

Kevane, J. (1997). *Can there be an identity economics?* Harvard, MS: Harvard Academy for International and Area Studies.

Kluckhohn, C. (1954). *Culture and behavior.* New York: Free Press.

Knight, F. (1944). Diminishing returns from investment. *The Journal of Political Economy, 52*(1), 26-47.

Knight, J. (1996). Human Capital in Economic Development. *Oxford Bulletin of Economics and Statistics, 58*(1), 5-8.

Kogut, B., & Chang, S. (1996). Platform investments and volatile exchange rate: Direct investments in the U.S. by Japanese electronic companies. *The Review of Economics and Statistics, 78*(2), 221-231.

Kohlberg, L. (1973). The claim to moral adequacy of a highest stage of moral judgment. *The Journal of Philosophy, 70*(18), 630-646.

Kohlberg, L. (1981). *Essays on moral development: The philosophy of moral development.* San Francisco, CA: Harper & Row

Kotkin, J. (1993). *Tribes.* New York: Random House.

Korenman, S, & Winship, C. (2000). In K. Arrow, S. Durlauf, & S. Bowles (Eds.), *Meritocracy and inequality* (pp.137-160). Princeton: Princeton University Press.

Krueger, A. (2002). Inequality, too much of a good thing. In Friedman, B. (Ed.), *Inequality in America. What role for human capital policies?* (pp.1-77). Cambridge, MS: the MIT Press.

Krugman, P. (1991). *Geography and trade.* Cambridge, MA: Leuven University Press and MIT University Press.

Kuzio, T. (2000). Transition in post-communist states: Triple or quadruple? *Politics, 21*(3), 172-189.

Kuznets, S. (1961). *Capital in the American economy: Its formation and financing.* Princeton, NJ: Princeton University Press.

Lal, D. (1996). *The political economy of poverty, equity, and growth.* Oxford: Clarendon Press.

Lal, D. (1998). *Unintended consequences.* Cambridge, MS: MIT Press.

Landa, J. (1994). *Trust, ethnicity and identity: Beyond the new institutional economics of trading networks.* Ann Arbor: University of Michigan Press.

La Palombara, J. (1963). *Bureaucracy and political development.* Princeton, NJ: Princeton University Press.

La Porta, R., Lopez-de-Silanes, F., Scleifer, A., & Vishny, R. (1997). Trust in large organizations. *AEA Papers and Proceedings, 87*(2), 310-321.

La Porta R., Lopez-de-Silanes, F., Scleifer, A., & Vishny, R. (1998). Law and finance. *The Journal of Political Economy, 106*(6), 1113-1155.

La Porta R., Lopez-de-Silanes, F., Scleifer, A., & Vishny, R. (1999). The quality of Government. *The Journal of Law, Economics, & Organization, 15*(1), 222-279.

Lau, L., Jamison, D., & Louat, F. (1991). *Education and productivity in developing countries: An aggregate production function approach.* Washington, D.C.: The World Bank.

Lester, P., Bishop, L. (2000). *Handbook of tests and measurement in education and the social sciences.* Lanham, Maryland: The Scarecrow Press.

Levin, A., & Raut, L. (1997). Complementarities between exports and human capital in economic growth: Evidence from the semi-industrialized countries. *Economic Development and Cultural Change, 46*(1), 155-174.

Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *American Economic Review, 82,* 942-963.

Lim, V. (2002). Money matters; An empirical investigation of money, face and Confucian work ethic. *Personality and Individual Differences, 35,* 953-970.

Lindahl, M., & Canton, E. (2007). The social returns to education. In J. Hartog & H. Maasen van den Brink (Eds.), *Human capital: Advances in theory and evidence* (pp. 21-33). Cambridge: Cambridge University Press.

Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics, 22*(1), 3-42.

Lucas, R. (1990). Why doesn't capital flow from rich to poor countries? *American Economic Review, 80*(2), 92-96.

MacCallum, R., & Browne, M. (1993). The use of causal indicators in covariance structure models: Some practical issues. *Psychological Bulletin*, *114*(3), 533-541.

MacIntosh, R. (1998). Global attitude measurement: An assessment of the world values survey postmaterialism scale. *American Sociological Review, 63*(3), 452-464.

Mankiw, G., Romer, D., & Weil, D. (1992) A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, *152*, 407-437.

Margenau, H. (1950). *The nature of physical reality: A philosophy of modern physics.* New York: McGraw-Hill.

Mason, D. (1995). Attitudes toward the market and political participation in the

    postcommunist states. *Slavic Review, 54*(2), 385-406.

McCleary, R., & Barro, R. (2006). Religion and economy. *Journal of Economic

    Perspectives, 20*(2), 49-72.

McGranahan, D. (1972). Development indicators and development models. *Journal of

    Development Studies, 8*(3), 91-102.

McGranahan, D. (1995). Measurement of development: Research at the UN's research

    institute for social development. *International Social Science Journal 143,* 39-57.

McGue, M., Bouchard, T., Iacono, W., & Lykken, D. (1993). Behavioral genetics of

    cognitive ability: A life-span perspective. In Plomin, R. and McClearn G. (Eds.),

    Nature, nurture and psychology (pp.59-76). Washington, DC: American

    Psychological Association.

McLean, G. (2001). Human resource development: Where are we going and how will we

    get there? In D. Kress (Ed.), *Proceedings of the 6th international ASHRM

    conference* (p. 229-236). Dammamm, Saudi Arabia: Al-Wafa Printing, for the

    Arabian Society for Human Resource Management.

McLean, G. (2004). National human resource development: What in the world is it?

    Advances in Developing Human Resources, 6(3), 269-275.

McLean, G. (2007). Déjá Vu, all over again. *Human Resource Development

    International, 10*(4), 459-463.

McLean, G., Bartlett, K., & Cho, E. (2003). Human resource development as national

    policy: Republic of Korea and new Zealand. *Pacific-Asian Education, 15*(1), 41-

    59.

McLean, G., Yang, B., Kuo, M., Tolbert, A., & Larkin, C. (2005). Development and initial validation of an instrument measuring managerial coaching skill. *Human Resource Development Quarterly, 16*(2), 157-178

Mincer, J. (1958). Investment in human capital and personal income distribution. *The Journal of Political Economy, 66*(4), 281-302.

Mincer, J., (1974). *Schooling, experience and earnings.* National Bureau for Economic Research. New York: Columbia University Press.

Mincer, J., & Polachek, S. (1974). Family investment in human capital: Earnings of women. In T. Schultz, (Ed.), *Economics of the family* (pp.397-430). Chicago, IL: University of Chicago Press.

Mingione, E. & Goodrick, P. (1991). *Fragmented societies: A sociology of economic life beyond the market paradigm.* Cambridge, MA: Blackwell Publishers.

Mody, A., & Srinivasan, K. (1998). Japanese and U.S. firms as foreign investors: Do they march to the same tune? *The Canadian Journal of Economics, 31*(4), 778-799.

Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *The Future of Children: Critical Issues for Children and Youth, 5*, 113-127.

Mulligan, C., & Sala-i-Martin, X., (1997). A labor income-based measure of the value of human capital: An application to the states of the Unites States. *Japan and the World Economy, 9*, 159-191.

Nafukho, F., Hairston, N., & Brooks, K. (2004). Human capital theory: Implications for human resource development. *Human Resource Development International, 7*(4), 545-551.

Nash, R. (1990). Bourdieu on education and social and cultural reproduction. *British Journal of Sociology of Education, 11*(4), 431-447.

Neher, S. (2004). The world data. In K. Jacobs-Sparks (Ed.), *Encyclopedia Britannica: 2004 Book of the year* (pp. 499-853). Chicago, IL: Encyclopedia Britannica, Inc.

Neher, S. (2005). The world data. In K. Jacobs-Sparks (Ed.), *Encyclopedia Britannica: 2005 Book of the year* (pp. 499-855). Chicago, IL: Encyclopedia Britannica, Inc.

Neher, S. (2006). The world data. In K. Jacobs-Sparks (Ed.), *Encyclopedia Britannica: 2006 Book of the year* (pp. 499-853). Chicago, IL: Encyclopedia Britannica, Inc.

Neher, S., PeBenito, M., & Sturgis, J. (2000). The world data. In C. Trumbull (Ed.), *Encyclopedia Britannica: 2000 Book of the year* (pp. 531-885). Chicago, IL: Encyclopedia Britannica, Inc.

Neher, S., PeBenito, M., & Sturgis, J. (2001). The world data. In C. Trumbull (Ed.), *Encyclopedia Britannica: 2001 Book of the year* (pp. 531-883). Chicago, IL: Encyclopedia Britannica, Inc.

Neher, S., PeBenito, M., & Sturgis, J. (2002). The world data. In C. Trumbull (Ed.), *Encyclopedia Britannica: 2002 Book of the year* (pp. 531-885). Chicago, IL: Encyclopedia Britannica, Inc.

Nehru, V., Swanson, E., & Dubey, A. (1995). A new database on human capital stock in developing and industrial countries: Sources, methodology, and result. *Journal of Development Economics, 46,* 379-401.

Nelson, R., & Phelps, E. (1966). Investment in humans, technological diffusion, and economic growth. *American Economic Review, 56*(1-2), 69-75.

Noorbakhsh, F., Paloni, A., & Youssef, A. (2001). Human capital and FDI inflows to developing countries: New empirical evidence. *World Development, 29*(9), 1593-1610.

Organization of Economic Cooperation and Development. (n.d.). Investment Compact for south east Europe. Retrieved October 10, 2006, from www.investmentcompact.org

Overstreet, H. (1954). *The mature mind.* New York, NY: W-W-Norton Company-INC.

Pedhazur, E., & Schmelkin, L. (1991). *Measurement, design, and analysis: An integrated approach.* Hillsdale, NJ: Lawrence Erlbaum Associates Publishers.

Piaget, J. (1997). *The moral judgment of the child.* New York, NY: Free Press.

Pigou, A. (1950). *The economics of welfare.* London:

Plomin, R. (1999). Genetics and general cognitive ability. *Nature, 402*, 25-29.

Plug, E. (2007). Are successful parents the secret to success? In J. Hartog & H. Maasen van den Brink (Eds.), *Human capital: Advances in theory and evidence* (pp. 81-101). Cambridge: Cambridge University Press.

Plug, E., & Vijverberg, W. (2003). Schooling, family background, and adoption: Is it nature or is it nurture? *Journal of Political Economy, 111,* 611-641.

Porter, M. (1998). *The competitive advantage of nations.* New York: The Free Press.

Prizel, I. (1998). *National identity and foreign policy.* Cambridge, UK: Cambridge University Press.

Psacharopoulos, G. (1988). Education and development: A review. *World Bank Research Observer, 3,* 99-116.

Psacharopoulos, G., & Woodhall, M. (1985). *Education for development: An Analysis of investment choices.* Oxford: Oxford University Press.

Psacharopoulos, G., & Arriagada, A. (1986). The educational composition of the labour force: An international comparison. *International Labour Review, 125*(5), 561-574.

Putnam, R. (1995). *Making democracy work: Civic traditions in modern Italy.* Princeton, NJ: Princeton University Press.

Ranis, R., Stewart, F., & Samman, E. (2005). *Human development: Beyond the HDI.* New Haven, CN: Economic Growth Center.

Reisinger, W., Miller, A., Hesli, & Maher, K. (1994). Political values in Russia, Ukraine and Lithuania: Sources and implications for democracy. *British Journal of Political Science, 24*(2), 183-223.

Richards P., & Amjad, R. (1994). *New approaches to manpower planning and analysis.* Geneva: International Labor Organization.

Rodrik, D. (1997). *What drives public employment?* Cambridge, MS: National Bureau of Economic Research.

Rolle, A. (2000). *Matching to the beat of a different drum: An empirical analysis of public school corporations as budget-maximizing bureaus.* Ann Arbor, MI: UMI Dissertation Services, A Bell & Howell Company.

Romanenko, Y. (2007). What will the next revolution be like? Retrieved October 12, 2007, from http://www.pravda.com.ua/news

Romer, P. (1989). Human capital and growth: Theory and evidence. *National Bureau of Economic Research.* Working paper No 3173. Cambridge, MA.

Romer, P. (1990). Endogenous technological change. *Journal of Political Economy, 98*(5), 71-102.

Rose, R. (Ed.). (2000). *International Encyclopedia of Elections.* Washington, DC:CQ Press.

Rustow, D. A. (1970). Transitions to democracy: Toward a dynamic model *Comparative Politics, 2*(3), 350-360.

Sadie, J. (1960). The social anthropology of economic underdevelopment. *Economic Journal, 70*, 290-301.

Sapford, R., & Abbott, P. (2006). Trust, confidence and social environment in post-communist societies. *Communist and Post-Communist Studies. 39*, 59-71.

Schneider, F., & Frey, B. (1985). Economic and political determinants of foreign direc investment. *World Development, 13*, 161-175.

Schultz, T. (1961). Investment in human capital. *The American Economic Review,* 51, 1-17.

Schultz, T. (1962). Reflections on investment in man. *Journal of Political Economy,* 70, 1-8.

Schultz, T. (1971). *Investment in human capital.* New York: NY: The Free Press.

Schultz, T. (1974). Fertility and economic values. In T. Schultz (Ed.), *Economics of the family: Marriage, children, and human capital* (pp. 3-25). Chicago: University of Chicago Press.

Schultz, T. (1981). *Investing in people: The economics of population quality.* Berkeley, CA: University of California Press.

Schultz, T. (1986). The changing economy and the family. *Journal of Labor Economics. 4*(3-2), 278-287.

Sen, A. (1985). Goals, commitment, and identity. *Journal of Law, Economics and Organization, 1*, 341-355.

Sen, A. (1986). Rationality, interest and identity. In A. Foxley (Ed.), *Development democracy, and the art of trespassing* (pp. 343-353). Notre Dame: University of Notre Dame Press.

Sewell, W., Haller, A., & Portes, A. (1969). The educational and early occupational attainment process. *American Sociological Review, 34*, 82-92.

Shleifer, A., Vishny, R. (1993). Corruption. *Quarterly Journal of Economics. 58*(3), 599-617.

Shulman, S. (2005). National identity and public support for political and economic reform in Ukraine. *Slavic Review, 64*(1), 59-88.

Sjaastad, L. (1962). The costs and returns on human migration. *The Journal of Political Economy, 70,* 80-93.

Solow, R. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics,* LXX, 65-94.

Solow, R.(1988). *Growth theory.* New York: Oxford University Press.

Solow, R. (2000). *Human capital: The Lucas model.* UK: Oxford University Press.

Smith, A. (1937). *An inquiry into the nature and causes of the wealth of nations.* New York: Random House. (Original work published 1776).

Smith, A. (1991). *National identity.* Reno, Nevada: the University of Nevada Press.

Smith, A. (2005). Foreign direct investments and international trade. In D. Turnock & F.

    Carter (Eds.), *Foreign direct investment and regional development in East*

    Central Europe and the Former Soviet Union (pp. 55-71). Burlington, VT:

    Ashgate Publishing Company.

Spengler, J. (1977). Adam Smith on human capital. *The American Economic Review,*

    67(1), 32-36.

Stapleton, L., & Garrod, G. (2007). Keeping things simple: Why the human development

    index should not diverge from its equal weights assumption. *Social Indicators*

    Research, 84, 179-188.

Stevens, J. (1992). *Applied multivariate statistics for the social sciences.* Hillsdale, NJ:

    Erlbaum.

Stigler, G. (1962). Information in the labor market. *The Journal of Political Economy, 70,*

    94-105.

Sztompka P. (1999). *Trust: A sociological theory.* Cambridge, MA: Cambridge

    University Press.

Sztompka, P. (2002). Cultural trauma: The other face of social change. *European Journal*

    of Social Theory, 3, 441-465.

Thomas, K. (1996). The defensive self: A psychodynamic perspective. In R. Stevens

    (Ed.), *Understanding the self* (pp. 281-338). Thousand Oaks, CA: Sage

    Publications.

Turiel, E. (1983). *The development of social knowledge: Morality and convention.* New

    York: Cambridge University Press.

Turkheimer, E., Haley, A., Waldron, M.,& D'Onofrio, B. (2003). Socioeconomic status

   modifies heritability of IQ in young children. *Psychological Science, 14*(6), 623-

   628.

United Nations. (1994). *Changing perspectives on human resource development.*

   Retrieved July 20, 2008, from

   http://unpan1.un.org/intradoc/groups/public/documents/un/unpan000116.pdf

United States Agency for International Development Program Office. (2006). *Monitoring*

   Country progress in Eastern Europe & Eurasia. Retrieved November 20, 2006,

   from

   http://www.usaid.gov/locations/europe_eurasia/country_progress/ninth/sc.pdf

United Nations Conference on Trade and Development. (2002). *World investment report.*

   Geneva: Printing Office.

United Nations Conference on Trade and Development. (2003). *World investment report.*

   Geneva: Printing Office.

United Nations Conference on Trade and Development. (2004). *World investment report.*

   Geneva: Printing Office.

United Nations Conference on Trade and Development. (2005). *World investment report.*

   Geneva: Printing Office.

United Nations Conference on Trade and Development. (2006). *World investment report.*

   Geneva: Printing Office.

United Nations Conference on Trade and Development. (2007). *World investment report.*

   Geneva: Printing Office.

United Nations. (2007) *United Nations e-government knowledge base.* Retrieved on

March 1, 2008, from

http://www.unpan.org/egovkb/egovernment_overview/humancapital.htm

United Nations Department of Economics and Social Affairs. (2003). *E-Government*

Report. Retrieved on November, 5, 2006, from

http://www.unpan.org/egovkb/egovernment_overview/humancapital.htm

United Nations Statistics Division. (n.d.). Retrieved on April 3, 2008 from

http://unstats.un.org/unsd/default.htm

Van Zanted, A. (2005). New modes of reproducing social inequality in education: The

changing role of parents, teachers, schools and educational policies. *European*

Educational research Journal, 4(3), 155-169.

Veenhoven, R. (1993). *Happiness in nations.* Rotterdam, Netherlands: Erasmus

University of Rotterdam.

Velychenko, S. (1993). *Shaping identity in eastern Europe and Russia.* New York, NY:

St. Martin's Press.

Vigdor, J. (2002). Interpreting ethnic fragmentation effects. *Economic Letters, 75,* 271-

276.

Vitterso, J. (2001). Personality traits and subjective well-being: Emotional stability, not

extraversion, is probably the important predictor. *Personality and Individual*

Differences, 31, 903-914.

Vogel, J. (1989). Social indicators: A Swedish perspective. *Journal of Public Policy,*

9(4), 439-444.

Wang, X., & McLean, G. (2007). The dilemma of defining international human resource development. *Human Resource Development Review, 6*(1), 96-108.

Wang, G., & Swanson, R. (2008). The idea of national human resource development: An analysis based on economic and theory development methodology. *Human Resource Development Review, 7*(1), 79-106.

Warner, A. (2002). *International wage determination and globalization*. Paper presented at the NBER conference on Labor and Global Economy, May 30 2002, Helsinki, Finland.

Weisbrod, B. (1961). The valuation of human capital. *The Journal of Political Economy, 69,* 425-436.

Welch, F. (1965). Human capital theory: Education, discrimination, and life cycles. *The American Economic Review, 65*(2), 63-73.

Werner, E., & Smith, R. (1992*). Overcoming the odds. High risk children from birth to adulthood.* Ithaca: Cornell University Press.

Wolfmayr-Schnitzer, Y. (1998). Trade performance of CEECs according to technology classes. In Organization of Economic Cooperation and Development (Ed.), *The competitiveness of transition economies* (pp.41-70). Paris: OECD Publishing.

Wooldridge, J. M. (2006). *Introductory econometrics*. Mason, OH: Thomson Higher Education.

World Bank. (2006). World Development Indicators. Retrieved December 8, 2006, from http://devdata.worldbank.org/wdi2006/contents/

World Bank. (2007). *The global gender gap index (2006).* Retrieved January 29, 2008, from http://www.weforum.org/pdf/gendergap/rankings2007.xls

World Health Organization. (2007). *World health indicators.* Retrieved March 7, 2008

from http://www.who.int/

Wright, D. (1997). *Understanding statistics: An introduction for the social sciences.*

London: Sage.

APPENDIX A

Tests for Factor Analysis Adequacy

Table A-1

National Identity Factor

	2000	2001	2002	2003	2004	2005	Average
KMO	0.760	0.750	0.742	0.742	0.759	0.761	0.752
Bartlett's test of Sphericity	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)

Table A-2

Character Factor

	2000	2001	2002	2003	2004	2005	Average
KMO	0.846	0.855	0.823	0.822	0.831	0.834	0.835
Bartlett's test of Sphericity	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)

Table A-3

Family Factor

	2000	2001	2002	2003	2004	2005	Average
KMO	0.710	0.691	0.701	0.699	0.697	0.703	0.700
Bartlett's test of Sphericity	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)	Sig. 0.000 (p<0.001)

APPENDIX B

Factor Analysis Tests

ID Factor

Table B-1

Total Variance explained for the ID Factor (2000)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.743	36.486	36.486	3.775	29.036	29.036
2	1.697	13.056	49.542	1.849	14.226	43.262
3	1.512	11.632	61.174	1.785	13.734	56.996
4	1.029	7.913	69.087	1.572	12.091	69.087
5	.870	6.689	75.777			
6	.794	6.111	81.887			
7	.600	4.614	86.501			
8	.461	3.550	90.051			
9	.432	3.320	93.370			
10	.326	2.507	95.877			
11	.257	1.975	97.853			
12	.201	1.545	99.398			
13	.078	.602	100.000			

Table B-2

Total Variance explained for the ID Factor (2001)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.689	36.067	36.067	3.904	30.034	30.034
2	1.656	12.736	48.803	1.843	14.176	44.210
3	1.517	11.670	60.474	1.675	12.882	57.092
4	1.073	8.255	68.729	1.513	11.637	68.729
5	.864	6.648	75.377			
6	.809	6.221	81.597			
7	.621	4.778	86.376			
8	.477	3.668	90.044			
9	.427	3.282	93.326			
10	.335	2.574	95.900			
11	.269	2.072	97.972			
12	.195	1.503	99.475			
13	.068	.525	100.000			

Table B-3

Total Variance explained for the ID Factor (2002)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.632	35.632	35.632	3.684	28.337	28.337
2	1.660	12.772	48.404	1.864	14.336	42.673
3	1.492	11.476	59.880	1.785	13.727	56.400
4	1.082	8.326	68.207	1.535	11.807	68.207
5	.924	7.110	75.316			
6	.815	6.268	81.584			
7	.610	4.690	86.274			
8	.481	3.698	89.972			
9	.429	3.300	93.272			
10	.354	2.726	95.999			
11	.260	1.998	97.997			
12	.194	1.493	99.489			
13	.066	.511	100.000			

Table B-4

Total Variance explained for the ID Factor (2003)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.782	36.783	36.783	3.907	30.055	30.055
2	1.633	12.564	49.347	1.816	13.967	44.022
3	1.507	11.596	60.943	1.638	12.600	56.621
4	1.048	8.062	69.005	1.610	12.384	69.005
5	.872	6.711	75.717			
6	.795	6.119	81.836			
7	.621	4.775	86.610			
8	.481	3.699	90.309			
9	.420	3.230	93.540			
10	.332	2.550	96.090			
11	.261	2.010	98.099			
12	.188	1.448	99.548			
13	.059	.452	100.000			

Table B-5

Total Variance explained for the ID Factor (2004)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.881	37.547	37.547	4.505	34.651	34.651
2	1.669	12.835	50.382	1.900	14.618	49.269
3	1.523	11.719	62.101	1.668	12.832	62.101
4	.986	7.587	69.688			
5	.854	6.571	76.259			
6	.747	5.744	82.004			
7	.616	4.741	86.745			
8	.485	3.730	90.475			
9	.431	3.316	93.791			
10	.305	2.346	96.138			
11	.267	2.052	98.189			
12	.179	1.379	99.568			
13	.056	.432	100.000			

Table B-6

Total Variance explained for the ID Factor (2005)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.897	37.672	37.672	3.868	29.756	29.756
2	1.701	13.081	50.753	1.820	14.002	43.758
3	1.496	11.508	62.261	1.737	13.361	57.119
4	1.021	7.855	70.116	1.690	12.997	70.116
5	.835	6.426	76.542			
6	.760	5.849	82.392			
7	.594	4.573	86.964			
8	.467	3.596	90.560			
9	.403	3.101	93.661			
10	.309	2.380	96.041			
11	.262	2.017	98.058			
12	.187	1.442	99.499			
13	.065	.501	100.000			

Table B-7

Rotated Component Matrix for the ID factor (2000)

	Component			
	1	2	3	4
GVMT Effectiveness Index for 2000	.914			
Corruption Perception Index for 2000	-.865			
Voice and Accountability Index for 2000	.854			
School Life Expectancy in years for 2000	.742			
GVMT expenses as % of GDP without military expenses for 2000				
Language Fractionalization Index for 2000		.849		
Ethnic Fractionalization Index for 2000		.747		
Religious Fractionalization Index for 2000		.613		
Number of national holidays a country celebrates			-.777	
Gini Coefficient for 2000			.739	
Percent of total Olympic Games medals for 1994-2000 period				
Years a country has been independent by 2000				.818
Percent of total Nobel Prize laureates in the country by 2000				.686

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization
4 Components extracted

Table B-8

Rotated Component Matrix for the ID factor (2001)

	Component			
	1	2	3	4
GovEff01	.916			
VAI01	.855			
CorInd01	-.854			
School01	.751			
MedPer01	.505			
GovExp01				
LangFr01		.863		
EthFra01		.766		
RelFra01		.557		
Gini01			.781	
Holida01			-.727	
YERind01				.812
PercNP01	.527			.603

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization
4 Components extracted

Table B-9

Rotated Component Matrix for the ID factor (2002)

	Component			
	1	2	3	4
GovEff02	.904			
CorInd02	-.877			
VAI02	.841			
School02	.745			
LangFr02		.855		
EthFra02		.764		
RelFra02		.577		
Gini2002			.792	
Holida02			-.620	
MedPer02			.571	
GovExp02				
YERind02				.817
PercNP02				.555

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization
4 Components extracted

Table B-10

Rotated Component Matrix for the ID factor (2003)

	Component			
	1	2	3	4
GovEff03	.899			
VAI03	.857			
CorInd03	-.852			
School03	.744			
GovExp03	.549			
MedPer03				
LangFr03		.844		
EthFra03		.742		
RelFra03		.619		
Gini2003			.751	
Holida03			-.751	
YERind03				.828
PercNP03				.672

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization
4 Components extracted

Table B-11

Rotated Component Matrix for the ID factor (2004)

	Component		
	1	2	3
GovEff04	.901		
CorInd04	-.865		
VAI04	.854		
PercNP04	.733		
School04	.727		
MedPer04	.653		
GovExp04	.535		
LangFr04		.856	
EthFra04		.760	
RelFra04		.603	
Holida04			.726
YERind04			.645
Gini2004			-.593

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization
3 Components extracted

Table B-12

Rotated Component Matrix for the ID factor (2005)

	Component			
	1	2	3	4
GovEff05	.900			
VAI05	.871			
CorInd05	-.856			
School05	.744			
GovExp05	.574			
LangFr05		.829		
EthFra05		.720		
RelFra05		.657		
Holida05			-.783	
Gini2005			.722	
MedPer05				
YERind05				.812
PercNP05				.738

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization
4 Components extracted

APPENDIX C

Factor Analysis Tests

Character Factor

Table C-1

Total Variance explained for the Character Factor (2000)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.166	43.052	43.052	4.355	36.292	36.292
2	1.054	8.784	51.836	1.590	13.249	49.542
3	1.028	8.564	60.401	1.303	10.859	60.401
4	.947	7.894	68.294			
5	.859	7.161	75.455			
6	.682	5.683	81.138			
7	.646	5.381	86.519			
8	.523	4.358	90.878			
9	.374	3.120	93.997			
10	.348	2.904	96.901			
11	.304	2.534	99.436			
12	.068	.564	100.000			

Table C-2

Total Variance explained for the Character Factor (2001)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.164	43.030	43.030	4.572	38.099	38.099
2	1.119	9.328	52.358	1.711	14.259	52.358
3	.993	8.273	60.631			
4	.975	8.122	68.753			
5	.829	6.910	75.663			
6	.654	5.453	81.117			
7	.623	5.191	86.308			
8	.516	4.299	90.607			
9	.374	3.117	93.725			
10	.361	3.009	96.734			
11	.321	2.677	99.411			
12	.071	.589	100.000			

Table C-3

Total Variance explained for the Character Factor (2002)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.188	43.230	43.230	4.185	34.878	34.878
2	1.141	9.504	52.734	1.890	15.747	50.625
3	1.033	8.608	61.342	1.286	10.717	61.342
4	.986	8.219	69.561			
5	.810	6.751	76.312			
6	.649	5.409	81.721			
7	.600	4.997	86.718			
8	.516	4.298	91.016			
9	.379	3.161	94.177			
10	.332	2.770	96.947			
11	.319	2.656	99.603			
12	.048	.397	100.000			

Table C-4

Total Variance explained for the Character Factor (2003)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.068	42.237	42.237	3.815	31.788	31.788
2	1.159	9.657	51.894	2.233	18.612	50.400
3	1.048	8.735	60.629	1.227	10.229	60.629
4	.928	7.736	68.365			
5	.886	7.382	75.747			
6	.718	5.981	81.728			
7	.639	5.323	87.051			
8	.502	4.183	91.234			
9	.389	3.245	94.479			
10	.337	2.808	97.287			
11	.277	2.310	99.598			
12	.048	.402	100.000			

Table C-5

Total Variance explained for the Character Factor (2004)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.066	42.217	42.217	3.852	32.099	32.099
2	1.169	9.744	51.961	2.153	17.944	50.043
3	1.061	8.842	60.803	1.291	10.760	60.803
4	.903	7.528	68.332			
5	.821	6.845	75.176			
6	.719	5.989	81.165			
7	.687	5.721	86.886			
8	.519	4.321	91.208			
9	.390	3.250	94.458			
10	.363	3.026	97.484			
11	.257	2.140	99.624			
12	.045	.376	100.000			

Table C-6

Total Variance explained for the Character Factor (2005)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.073	42.277	42.277	4.120	34.331	34.331
2	1.132	9.433	51.710	1.910	15.920	50.251
3	1.058	8.820	60.530	1.233	10.279	60.530
4	.936	7.797	68.327			
5	.841	7.005	75.332			
6	.732	6.097	81.429			
7	.630	5.250	86.679			
8	.507	4.224	90.903			
9	.394	3.284	94.186			
10	.368	3.068	97.254			
11	.280	2.330	99.584			
12	.050	.416	100.000			

Table C-7

Rotated Component Matrix for the *Character* factor (2000)

	Component		
	1	2	3
Civil Liberties in 2000	.877		
Political rights in 2000	.851		
Independence of Judicial system from the government in 2000	.812		
% of Population above Income Poverty Line in 2000	.651		
Respect toward women in the family, at the work place and in society as a whole in 2000	.639		
Number of reported criminal offenses per 100,000 of population in 2000	.625		
Expenditure on leisure and recreation as % of a household budget	.604		
Intl NGO membership density in 2000	.516		
Number of suicides as measured per 100,000 of population in 2000			
Elections Participation rates for 2000		.803	
Seats in Parliament held by women as % of total in 2000		.529	
Prison population per 100,000 of people in the country in 2000			-.915

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization

Table C-8

Rotated Component Matrix for the *Character* factor (2001)

	Component	
	1	2
CivLib01	.828	
PolRig01	.791	
Women01	.721	
RecExp01	.704	
Judici01	.690	
Report01	.677	
PopAb01	.658	
ParWE01	.637	
ElecPT01		
Prison01		-.859
INGOde01		.575
Suicid01		

Table C-9

Rotated Component Matrix for the *Character* factor (2002)

	Component		
	1	2	3
PolRig02	.803		
CivLib02	.796		
Judici02	.792		
PopAb02	.743		
Women02	.668		
RecExp02	.576		
Report02	.553		
Suicid02	-.542		
INGOde02	.508		
ElecPT02		.758	
ParWE02		.745	
Prison02			.923

Table C-10

Rotated Component Matrix for the *Character* factor (2003)

	Component		
	1	2	3
PopAb03	.804		
PolRig03	.752		
Judici03	.750		
CivLib03	.740		
Women03	.698		
RecExp03	.595		
Suicid03	-.566		
INGOde03			
ParWE03		.860	
Report03		.710	
ElecPT03		.525	
Prison03			.924

Table C-11

Rotated Component Matrix for the *Character* factor (2004)

	Component		
	1	2	3
PopAb04	.861		
Women04	.768		
Judici04	.742		
CivLib04	.738		
PolRig04	.713		
RecExp04	.602		
Suicid04	-.522		
ParWE04		.835	
Report04		.677	
ElecPT04		.550	
Prison04			.851
INGOde04			

Table C-12

Rotated Component Matrix for the *Character* factor (2005)

	Component		
	1	2	3
CivLib05	.821		
PolRig05	.798		
PopAb05	.793		
Judici05	.771		
Women05	.731		
RecExp05	.619		
INGOde05	.513		
Suicid05			
ParWE05		.884	
Report05		.731	
ElecPT05			
Prison05			-.924

APPENDIX D

Factor Analysis Tests

Family Factor

Table D-1

Total Variance explained for the Family Factor (2000)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.787	55.747	55.747
2	.778	15.563	71.310
3	.742	14.846	86.156
4	.545	10.904	97.060
5	.147	2.940	100.000

Table D-2

Total Variance explained for the Family Factor (2001)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.744	54.880	54.880
2	.788	15.764	70.645
3	.756	15.126	85.771
4	.586	11.727	97.497
5	.125	2.503	100.000

Table D-3

Total Variance explained for the Family Factor (2002)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.770	55.407	55.407
2	.776	15.521	70.928
3	.756	15.116	86.044
4	.579	11.574	97.618
5	.119	2.382	100.000

Table D-4

Total Variance explained for the Family Factor (2003)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.736	54.725	54.725
2	.780	15.609	70.335
3	.772	15.443	85.778
4	.597	11.947	97.724
5	.114	2.276	100.000

Table D-5

Total Variance explained for the Family Factor (2004)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.702	54.050	54.050
2	.810	16.197	70.247
3	.764	15.275	85.522
4	.611	12.220	97.742
5	.113	2.258	100.000

Table D-6

Total Variance explained for the Family Factor (2005)

| Component | Initial Eigenvalues | | |
	Total	% of Variance	Cumulative %
1	2.704	54.082	54.082
2	.822	16.441	70.523
3	.735	14.692	85.215
4	.623	12.459	97.674
5	.116	2.326	100.000

Table D-7

Rotated Component Matrix for the *Family* factor (2000)

Rotated Component Matrix, 2000

| | Component |
	1
Number of children under age 15 in a family in 2000	-.887
Average size of a family in 2000	-.885
Share of total population living in urban areas in 2000	.736
Family services in 2000	.601
Divorce rate in 2000	.561

Table D-8

Rotated Component Matrix for the *Family* factor (2001)

| | Component |
	1
Average size of a family in 2001	-.893
Number of children under age 15 in a family in 2001	-.893
Share of total population living in urban areas in 2001	.701
Family services in 2001	.597
Divorce rate in 2001	.550

Extraction Method: Principal Component Analysis
1 component extracted

Table D-9

Rotated Component Matrix for the *Family* factor (2002)

	Component
	1
Average size of a family in 2002	-.898
Number of children under age 15 in a family in 2002	-.894
Share of total population living in urban areas in 2002	.702
Family services in 2002	.585
Divorce rate in 2002	.573

Extraction Method: Principal Component Analysis
1 component extracted

Table D-10

Rotated Component Matrix for the *Family* factor (2003)

	Component
	1
Number of children under age 15 in a family in 2003	-.899
Average size of a family in 2003	-.898
Share of total population living in urban areas in 2003	.687
Family services in 2003	.575
Divorce rate in 2003	.564

Extraction Method: Principal Component Analysis
1 component extracted

Table D-11

Rotated Component Matrix for the *Family* factor (2004)

	Component
	1
Number of children under age 15 in a family in 2004	.902
Average size of a family in 2004	.901
Share of total population living in urban areas in 2004	-.660
Family services in 2004	-.569
Divorce rate in 2004	-.564

Extraction Method: Principal Component Analysis
1 component extracted

Table D-12

Rotated Component Matrix for the *Family* factor (2005)

	Component
	1
Number of children under age 15 in a family in 2005	-.903
Average size of a family in 2005	-.895
Share of total population living in urban areas in 2005	.643
Divorce rate in 2005	.589
Family services in 2005	.571

Extraction Method: Principal Component Analysis
1 component extracted

APPENDIX E

Human Capital Indices

Table E-1

EHCI-1 (2000-2005) Non-Standardized

Country	EHCI1_00	EHCI1_01	EHCI1_02	EHCI1_03	EHCI1_04	EHCI1_05
Afghanis						
Albania	0.61172	0.62155	1.77962	1.73809	0.78776	1.19514
Algeria	-1.41529	-0.91211	-0.95053	-0.97571	1.33296	-1.68087
Angola	-5.8665	-2.8173	-2.22277	-1.65651	-3.60449	-5.89156
Argentin	4.20535	3.12888	5.00643	4.67852	4.66005	3.91683
Armenia	-0.40849	-0.05092	0.6694	0.67227	0.64255	-0.09554
Australi	9.44964	8.16537	10.10527	10.53116	4.40901	9.6624
Austria	9.1689	8.64687	9.69168	9.23134	4.7658	8.75553
Azerbaij	-0.06349	-0.27189	-0.45675	-1.05855	-2.36763	-0.24876
Bahamas	4.53343	3.62659	-0.88032	-0.98785	-1.07369	5.8444
Bahrain	-0.09475	-0.11592	-0.622	-0.41423	0.3063	-0.12398
Banglade	-1.98916	-1.90614	-0.29364	-0.25711	2.17889	-1.79412
Barbados						
Belarus						
Belgium	8.97059	8.15854	9.4756	9.15655	4.44324	8.7446
Belize	0.61984	0.66058	-4.50819	-4.81655	-1.08995	1.6405
Benin	-4.41791	-3.63684	-2.28983	-2.26725	0.24479	-4.47973
Bhutan	0.31028	-0.53743	-1.36695	-0.68162	-0.44813	-0.25338
Bolivia	-0.63071	-0.8448	1.0869	0.14609	2.71434	-1.47498
Bos&Ger	1.33621	1.46054	-0.00329	0.7587	-2.88017	0.60177
Botswana	-0.04238	0.28433	-2.487	-2.50011	-0.54223	0.77074
Brazil	2.08383	1.88574	3.31665	2.63355	3.62179	2.10608
Brunei						
Bulgaria	5.17108	5.39015	4.9191	5.58382	0.17638	5.68997
BurkFaso	-6.35654	-5.66695	-4.20054	-4.18395	-0.03985	-6.54121
Burundi	-1.62094	-2.8068	-1.62077	-1.80224	-0.2769	-1.35082
Cambodia	-0.98671	-1.70089	-0.27977	-0.04888	1.49964	-1.15619
Cameroon	-3.65335	-3.13066	-3.52741	-3.587	-1.90086	-3.58451
Canada	7.39518	7.13827	8.61246	8.80105	3.07617	7.21055
Cape Ver	0.68244	1.37572	1.2152	1.18055	2.072	0.8739
CenAfrRe				-5.94789	-2.38828	-5.56306
Chad	-4.88275	-4.64316	-3.19265	-3.6216	-1.70336	-4.9742
Chile	2.16849	1.98922	2.47306	1.97188	3.5593	2.72581
China						
Colombia						
Comoros	-1.64462	-0.8776	-0.28019	-0.24063	0.93411	-2.06348
CostaRic	3.20822	3.40496	4.44556	3.60094	5.31034	3.48565
CotedIvo	-5.03374	-3.58477	-5.4963	-4.17159	-2.87015	-5.58913
Croatia					1.75443	4.68619
Cuba						

Cyprus						
CzechRep	6.40708	6.77532	5.27925	5.72614	-0.09304	6.86158
Denmark						
Djibouti	-2.5697	-0.81794	-1.55558	-1.419	-2.89629	-1.89594
DominRep	0.92638	0.84249	1.91592	1.75847	3.71642	1.24785
Ecuador	0.03923	-0.08807	1.75234	1.01824	3.68437	0.06098
Egypt	-0.52663	0.75142	0.12679	0.51236	0.32396	-0.71696
ElSalvad	-0.88837	-0.02307	-0.02331	-0.01207	3.1509	0.48496
EqGuinea	-2.79818	-2.48276	-3.03224	-3.31935	-0.54289	-2.54735
Eritrea	-3.74001	-3.77241	-3.83805	-3.84844	-1.99801	-3.68138
Estonia	5.75511	6.05994	0.42258	1.0386	-3.13778	6.55106
Ethiopia						
Fiji				-1.3587	1.81883	-0.82044
Finland				10.13211	5.47065	9.79459
France						
Gabon	-2.4395	-2.07667	-2.11851	-2.36612	-2.14532	-2.73887
Gambia						
Georgia	0.46014	0.60558	-0.4119	-0.04585	-2.42841	1.95586
Germany						
Ghana	-4.36537	-2.68291	-0.32581	-0.17235	1.14311	-2.29655
Greece	4.11383	5.84743	8.30247	7.73861	5.85308	5.95211
Guatemal	-4.09866	-2.80082	-1.6421	-1.67251	0.8387	-3.55211
Guinea	-3.77845		-2.06805		1.94165	-3.85543
Guyana						
Haiti						
Honduras						
Hungary	6.86158	7.21125	5.14948	5.8145	0.02694	6.50789
Iceland						
India	-1.88221					
Indonesi	-0.84937	-1.17262	0.61761	0.21923	1.56115	-1.20255
Iran	-2.63018	-1.39167	-2.73342	-3.11536	-2.41853	-1.86293
Iraq						
Ireland	6.40421	6.95223	7.1803	7.27662	4.67141	6.20105
Israel	5.25116	5.07805	4.56753	4.59843	1.14758	5.95786
Italy	9.64748	9.17141	11.909	11.60865	6.15186	9.66132
Jamaica	1.84114	2.22473	1.69059	1.68688	-0.52376	1.75085
Japan						
Jordan	-1.29554	-0.21119	-1.3251	-0.83261	1.28891	-0.74149
Kazakhst	3.02764	2.17536	-4.62006	-3.78081	-7.54788	2.80115
Kenya						
Korea N						
Korea S						
Kuwait				-0.64331	-1.3814	-0.63777
Kyrgyzst	1.14331	0.6555	-4.10676	-2.42649	-4.00247	0.42127
Laos	-0.6072	-2.74438	-3.07148	-3.01832	0.52901	-1.43623
Latvia	5.67267	5.47411	0.11314	0.78755	-3.04254	5.63208
Lebanon	-1.4863	-0.49257	-2.10917	-2.36054	-1.14668	-1.58476
Lesotho	-2.1838	-1.95375	-1.4579	-1.90027	0.96098	-1.67601
Liberia						
Libya	0.28444	0.12709	-0.87916	-1.2679	1.25075	0.04941

Country						
Lithuani				3.47121		
Macedoni	0.97826	0.96923	1.99634	2.38422	-0.29113	1.87383
Madagasc						
Malawi	-2.69627	-3.05668	-1.71576	-1.59781	-0.19179	-3.06705
Malaysia				-0.76853	1.38565	-1.46383
Mali	-4.99553	-4.0275	-2.19089	-2.18447	0.18772	-5.39508
Malta						
Mauritan	-2.39512	-1.62285	-0.73296	-0.9012	-0.01809	-2.66173
Mexico	0.53055	0.71883	2.41693	1.60101	3.82883	1.32217
Moldova	1.34431	1.32741	-1.13982	-0.34348	-5.56444	2.24658
Mongolia	2.19444	1.95914	-0.36771	-0.87806	-0.41543	1.47206
Morocco						
Mozambiq				-1.33595	-1.69523	-3.4933
Burma						
Namibia						
Nepal	-2.13587	-2.46658	-0.60044	-0.8532	1.45157	-3.13047
Netherla	10.97012	9.96326	12.09198	11.65596	5.81004	10.46604
New Zela				6.60721	2.82829	7.81525
Nicaragu	0.05258	-0.78878	1.07276	0.12816	3.33346	-0.43135
Niger	-4.93033	-3.86475	-2.67076	-2.73277	0.04965	-5.01136
Nigeria	-4.48285	-4.33228	-2.38635	-2.23527	-0.82775	-4.8579
Norway	11.7606	11.17362	12.65535	12.58502	6.02586	11.6199
Oman	-1.58945	-1.50105	-0.79063	-0.61575	1.01628	-1.65268
Pakistan	-2.79554	-2.00166	-2.02844	-2.20362	-0.19334	-3.98004
Panama	0.63554	0.3521	0.18534	-1.1675	2.65101	1.83304
Papua NG			-1.30784	-1.45845	0.15308	-3.28524
Paraguay	-1.53892	-0.86124	0.52618	0.06586	3.44448	-1.64515
Peru	0.32699	-0.37538	2.94327	1.97713	5.29111	0.84188
Philippi	-2.29721	-1.92796	-0.31341	-0.59386	1.34005	-2.43344
Poland	7.22871	7.35778				
Portugal						
Qatar	-1.54369	-1.28849	-1.70298	-1.3238	-0.1497	-1.42586
Romania	5.71098	5.88168	5.091	5.42919	0.64463	5.60921
Russia						
Rwanda				-1.65677	0.88774	-0.6681
Samoa	-0.45389	-0.03321	-1.99755	-1.81113	0.9847	1.29666
Saudi Ar						
Senegal						
Sierra L	-6.8044	-5.54113	-4.43593	-4.70774	0.35878	-4.79894
Singapor						
Slovakia	5.32274	5.15878	5.21304	4.89831	0.95291	4.77123
Slovenia	5.79133	5.7382	4.7756	5.07591	2.03795	5.19084
Somalia						
South Af	3.12244	1.8475	0.09855	-0.40148	0.13004	3.21652
Spain	7.85966	7.581	10.04428	9.24425	7.70737	7.99474
Sri Lank				0.07247	1.1951	-0.08284
Sudan	-5.31493	-5.27237	-4.5035	-4.39553	-1.69826	-5.43952
Suriname					-2.50941	
Swazilan	-1.62048	-1.6357	-4.85939	-4.68211	-0.35339	-2.23788
Sweden						

Switzerl	11.49977	12.2906	12.43425	12.88792	5.74075	11.58624
Syria	-1.70012	-1.61294	-1.04142	-1.13053	0.38729	-2.00698
Taiwan						
Tajikist	-0.31545	-1.61124	-1.24555	-0.92958	-0.48057	-0.09058
Tanzania	-3.06529	-3.17545	-1.96886	-2.29985	-0.03092	-2.76495
Thailand		4.40016	4.01629	3.21016	4.29629	3.68494
Togo				-4.40362	0.74836	-5.26452
Trin&Tob	2.20217	1.75186	-1.20826	-1.56137	-0.15477	2.34725
Tunisia	1.92453	1.58621	0.60492	-0.29231	1.75318	1.7583
Turkey	0.52145	0.44263	1.94345	1.41247	1.70143	0.34915
Turkmeni	2.41561	0.6675	-4.77356	-4.95783	-3.97595	1.93849
Uganda	-3.75193	-4.46576	-2.43731	-2.21836	-0.49249	-2.91241
Ukraine	5.47704	4.16642	-0.90111	-0.44231	-4.47842	5.30427
UnArabEm				-4.43869	-1.37706	-1.6786
UnitedKi						
USA						
Uruguay	5.63975	5.19421	4.90807	4.56871		5.62889
Uzbekist	1.33639	-0.10016	-1.28615	-1.07844	-1.23455	0.08683
Venezuel	-0.53861	0.25537	1.48881	1.10174	2.99659	-0.75218
Vietnam						
Yemen	-2.35384	-2.06719	-1.32037	-1.35286	1.77877	-2.70244
Zambia	-4.43414	-3.81152	-4.2467	-3.97396	-2.08107	-4.60549
Zimbabwe	-2.64622	-2.619	-3.51174	-3.43967	-2.99609	-2.15101

Table E-2

EHCI-1 (2000-2005) Standardized

Country	EHCI1_00 SCORE	EHCI1_01 SCORE	EHCI1_02 SCORE	EHCI1_03 SCORE	EHCI1_04 SCORE	EHCI1_05 SCORE
Afghanis						
Albania	0.40	0.35	0.40	0.41	0.55	0.43
Algeria	0.29	0.26	0.25	0.26	0.58	0.27
Angola	0.05	0.16	0.18	0.23	0.26	0.04
Argentin	0.59	0.49	0.58	0.56	0.80	0.58
Armenia	0.34	0.31	0.34	0.35	0.54	0.35
Australi	0.88	0.77	0.86	0.87	0.78	0.89
Austria	0.86	0.80	0.84	0.81	0.81	0.84
Azerbaij	0.36	0.30	0.28	0.26	0.34	0.35
Bahamas	0.61	0.52	0.25	0.26	0.42	0.68
Bahrain	0.36	0.31	0.27	0.29	0.51	0.35
Banglade	0.26	0.21	0.29	0.30	0.64	0.26
Barbados						
Belarus						
Belgium	0.85	0.77	0.82	0.80	0.79	0.84
Belize	0.40	0.35	0.05	0.06	0.42	0.45
Benin	0.13	0.11	0.18	0.20	0.51	0.11
Bhutan	0.38	0.29	0.23	0.28	0.47	0.35
Bolivia	0.33	0.27	0.36	0.32	0.67	0.28
Bos&Ger	0.44	0.40	0.30	0.36	0.31	0.39
Botswana	0.36	0.33	0.17	0.18	0.46	0.40
Brazil	0.48	0.42	0.49	0.46	0.73	0.48
Brunei						
Bulgaria	0.65	0.62	0.57	0.61	0.51	0.67
BurkFaso	0.02	0.00	0.07	0.09	0.49	0.00
Burundi	0.28	0.16	0.21	0.22	0.48	0.29
Cambodia	0.31	0.22	0.29	0.31	0.59	0.30
Cameroon	0.17	0.14	0.11	0.13	0.37	0.16
Canada	0.76	0.71	0.78	0.78	0.70	0.76
Cape Ver	0.40	0.39	0.37	0.38	0.63	0.41
CenAfrRe				0.00	0.34	0.05
Chad	0.10	0.06	0.13	0.12	0.38	0.09
Chile	0.48	0.43	0.44	0.42	0.73	0.51
China						
Colombia						
Comoros	0.28	0.27	0.29	0.30	0.56	0.25
CostaRic	0.54	0.51	0.55	0.51	0.84	0.55
CotedIvo	0.10	0.12	0.00	0.09	0.31	0.05
Croatia					0.61	0.62
Cuba						
Cyprus						
CzechRep	0.71	0.69	0.59	0.62	0.49	0.74
Denmark						

Djibouti	0.23	0.27	0.22	0.24	0.30	0.26
DominRep	0.42	0.36	0.41	0.41	0.74	0.43
Ecuador	0.37	0.31	0.40	0.37	0.74	0.36
Egypt	0.34	0.36	0.31	0.34	0.52	0.32
ElSalvad	0.32	0.31	0.30	0.32	0.70	0.39
EqGuinea	0.22	0.18	0.14	0.14	0.46	0.22
Eritrea	0.17	0.11	0.09	0.11	0.36	0.16
Estonia	0.68	0.65	0.33	0.37	0.29	0.72
Ethiopia						
Fiji				0.24	0.61	0.31
Finland				0.85	0.85	0.90
France						
Gabon	0.24	0.20	0.19	0.19	0.35	0.21
Gambia						
Georgia	0.39	0.35	0.28	0.31	0.34	0.47
Germany						
Ghana	0.13	0.17	0.28	0.31	0.57	0.23
Greece	0.59	0.64	0.76	0.73	0.88	0.69
Guatemal	0.15	0.16	0.21	0.23	0.55	0.16
Guinea	0.16		0.19		0.62	0.15
Guyana						
Haiti						
Honduras						
Hungary	0.74	0.72	0.59	0.62	0.50	0.72
Iceland						
India	0.27					
Indonesi	0.32	0.25	0.34	0.33	0.60	0.29
Iran	0.22	0.24	0.15	0.15	0.34	0.26
Iraq						
Ireland	0.71	0.70	0.70	0.70	0.80	0.70
Israel	0.65	0.60	0.55	0.56	0.57	0.69
Italy	0.89	0.83	0.96	0.93	0.90	0.89
Jamaica	0.47	0.44	0.40	0.41	0.46	0.46
Japan						
Jordan	0.30	0.30	0.23	0.27	0.58	0.32
Kazakhst	0.53	0.44	0.05	0.12	0.00	0.51
Kenya						
Korea N						
Korea S						
Kuwait				0.28	0.40	0.33
Kyrgyzst	0.43	0.35	0.08	0.19	0.23	0.38
Laos	0.33	0.16	0.13	0.16	0.53	0.28
Latvia	0.67	0.62	0.31	0.36	0.30	0.67
Lebanon	0.29	0.29	0.19	0.19	0.42	0.27
Lesotho	0.25	0.21	0.22	0.21	0.56	0.27
Liberia						
Libya	0.38	0.32	0.25	0.25	0.58	0.36
Lithuani				0.50		
Macedoni	0.42	0.37	0.41	0.44	0.48	0.46
Madagasc						

Malawi	0.22	0.15	0.21	0.23	0.48	0.19
Malaysia				0.27	0.59	0.28
Mali	0.10	0.09	0.18	0.20	0.51	0.06
Malta						
Mauritan	0.24	0.23	0.26	0.27	0.49	0.21
Mexico	0.40	0.36	0.44	0.40	0.75	0.43
Moldova	0.44	0.39	0.24	0.30	0.13	0.48
Mongolia	0.48	0.42	0.28	0.27	0.47	0.44
Morocco						
Mozambiq				0.24	0.38	0.17
Burma						
Namibia						
Nepal	0.25	0.18	0.27	0.27	0.59	0.19
Netherla	0.96	0.87	0.97	0.93	0.88	0.94
New Zela				0.67	0.68	0.79
Nicaragu	0.37	0.27	0.36	0.32	0.71	0.34
Niger	0.10	0.10	0.16	0.17	0.50	0.08
Nigeria	0.13	0.07	0.17	0.20	0.44	0.09
Norway	1.00	0.94	1.00	0.98	0.89	1.00
Oman	0.28	0.23	0.26	0.28	0.56	0.27
Pakistan	0.22	0.20	0.19	0.20	0.48	0.14
Panama	0.40	0.34	0.31	0.25	0.67	0.46
Papua NG			0.23	0.24	0.50	0.18
Paraguay	0.28	0.27	0.33	0.32	0.72	0.27
Peru	0.38	0.29	0.46	0.42	0.84	0.41
Philippi	0.24	0.21	0.29	0.28	0.58	0.23
Poland	0.76	0.73				
Portugal						
Qatar	0.28	0.24	0.21	0.25	0.48	0.28
Romania	0.67	0.64	0.58	0.60	0.54	0.67
Russia						
Rwanda				0.23	0.55	0.32
Samoa	0.34	0.31	0.19	0.22	0.56	0.43
Saudi Ar						
Senegal						
Sierra L	0.00	0.01	0.06	0.07	0.52	0.10
Singapor						
Slovakia	0.65	0.60	0.59	0.58	0.56	0.62
Slovenia	0.68	0.64	0.57	0.59	0.63	0.65
Somalia						
South Af	0.53	0.42	0.31	0.29	0.50	0.54
Spain	0.79	0.74	0.86	0.81	1.00	0.80
Sri Lank				0.32	0.57	0.36
Sudan	0.08	0.02	0.05	0.08	0.38	0.06
Suriname					0.33	
Swazilan	0.28	0.22	0.04	0.07	0.47	0.24
Sweden						
Switzerl	0.99	1.00	0.99	1.00	0.87	1.00
Syria	0.27	0.23	0.25	0.26	0.52	0.25
Taiwan						

Tajikist	0.35	0.23	0.23	0.27	0.46	0.36
Tanzania	0.20	0.14	0.19	0.19	0.49	0.21
Thailand		0.56	0.52	0.49	0.78	0.56
Togo				0.08	0.54	0.07
Trin&Tob	0.49	0.41	0.24	0.23	0.48	0.49
Tunisia	0.47	0.40	0.34	0.30	0.61	0.46
Turkey	0.39	0.34	0.41	0.39	0.61	0.38
Turkmeni	0.50	0.35	0.04	0.05	0.23	0.47
Uganda	0.16	0.07	0.17	0.20	0.46	0.20
Ukraine	0.66	0.55	0.25	0.29	0.20	0.65
UnArabEm				0.08	0.40	0.27
UnitedKi						
USA						
Uruguay	0.67	0.60	0.57	0.56		0.67
Uzbekist	0.44	0.31	0.23	0.26	0.41	0.36
Venezuel	0.34	0.33	0.38	0.37	0.69	0.32
Vietnam						
Yemen	0.24	0.20	0.23	0.24	0.61	0.21
Zambia	0.13	0.10	0.07	0.10	0.36	0.11
Zimbabwe	0.22	0.17	0.11	0.13	0.30	0.24

Table E-3

EHCI-II (2000-2005) Non-Standardized

Country	EHCI2_00	EHCI2_01	EHCI2_02	EHCI2_03	EHCI2_04	EHCI2_05
Afghanis						
Albania	-0.17595	-0.20561	0.94228	0.93493	0.24142	0.42629
Algeria	-1.92985	-1.49734	-1.54325	-1.54043	-1.70064	-2.21899
Angola	-6.61044	-3.62033	-3.03747	-2.38307	-5.86850	-6.61439
Argentin	3.31751	2.23199	4.11857	3.78679	5.53453	3.05829
Armenia	-1.14074	-0.84233	-0.09550	-0.09278	0.05546	-0.82887
Australi	8.39490	7.07265	9.02680	9.44944	6.82157	8.59127
Austria	8.13950	7.58960	8.64442	8.18213	6.81936	7.70519
Azerbaij	-0.76583	-1.01563	-1.19180	-1.80394	-3.18422	-0.98510
Bahamas	3.71319	2.78207	-1.73111	-1.81645	-1.03206	
Bahrain	-0.72598	-0.79354	-1.30930	-1.08114	-1.25274	-0.74978
Banglade	-2.67801	-2.64937	-1.04062	-0.97350	-0.55688	-2.46628
Barbados						
Belarus						
Belgium	7.89046	7.04134	8.35552	8.02259	7.35063	7.62209
Belize	0.07630	0.08564	-5.10091	-5.42428	-3.47236	1.07392
Benin	-5.08518	-4.36984	-3.01362	-2.94834	-3.10384	-5.09596
Bhutan	-0.39237	-1.31178	-2.12881	-1.42064	-2.87986	-0.95957
Bolivia	-1.36902	-1.59323	0.33515	-0.58306	1.67505	-2.14907
Bos&Ger	0.51065	0.60355	-0.85524	-0.08334	-2.96253	-0.22067
Botswana	-0.67642	-0.39611	-3.19783	-3.20407	-2.06522	0.08923
Brazil	1.22204	1.01368	2.43322	1.74539	4.21766	1.24403
Brunei						
Bulgaria	4.21504	4.41405	3.94266	4.58410	1.87725	4.67579
BurkFaso	-7.02781	-6.41725		-4.89680	-3.91710	-7.21565
Burundi	-2.48836	-3.73434	-2.51517	-2.65296	-1.95239	-2.22200
Cambodia	-1.60247	-2.37791	-0.93376	-0.67994	-1.15151	-1.78056
Cameroon	-4.33849	-3.88075	-4.26549	-4.31379	-3.78842	-4.29681
Canada	6.36341	6.08607	7.57349	7.75112	5.21287	6.16975
Cape Ver	-0.03759	0.60981	0.45657	0.41668	0.95457	0.11788
CenAfrRe				-6.76138	-4.45531	-6.35720
Chad	-5.62367	-5.44732	-3.97915	-4.42756	-4.13185	-5.71735
Chile	1.31412	1.10505	1.58862	1.08245	4.29822	1.85524
China						
Colombia						
Comoros	-2.36913	-1.66322	-1.04944	-0.95748	-1.84134	-2.73439
CostaRic	2.32782	2.48688	3.54588	2.70280	5.62602	2.59417
CotedIvo	-5.69683	-4.33609	-6.20948	-4.85105	-6.21158	-6.26013
Croatia					2.98058	3.72746
Cuba						
Cyprus						
CzechRep	5.32300	5.65473	4.16908	4.60498	2.39682	5.74252
Denmark						
Djibouti	-3.52734	-1.84182	-2.56676	-2.41351	-2.90182	-2.87778

DominRep	0.15700	0.05043	1.11107	0.97163	3.14101	0.50418
Ecuador	-0.65889	-0.81936	1.01322	0.30120	2.51533	-0.60238
Egypt	-1.25699	-0.03143	-0.65511	-0.24910	-1.40660	-1.42622
ElSalvad	-1.56056	-0.73115	-0.76323	-0.72989	1.69321	-0.18545
EqGuinea	-3.50577	-3.23936	-3.77040	-4.04475	-2.04399	-3.26486
Eritrea	-4.52637	-4.61200	-4.66631	-4.63512	-4.28845	-4.42554
Estonia	4.71420	4.98389	-0.62695	-0.02072	-0.97342	5.48079
Ethiopia						
Fiji				-1.93686	-0.73964	-1.35548
Finland				9.06644	7.66719	8.72957
France						
Gabon	-3.28276	-2.95330	-2.99396	-3.22812	-2.48574	-3.55720
Gambia						
Georgia	-0.32731	-0.21025	-1.22035	-0.85355	-2.61060	1.16622
Germany						
Ghana	-5.04465	-3.40681	-1.05327	-0.92356	-0.93837	-2.95070
Greece	3.22569	4.94797	7.40099	6.82658	6.82970	5.03343
Guatemal	-4.71661	-3.46363	-2.32288	-2.33417	-1.40710	-4.17371
Guinea	-4.54648		-2.84272		-1.26730	-4.50514
Guyana						
Haiti						
Honduras						
Hungary	5.86017	6.18078	4.12467	4.78740	1.82096	5.47320
Iceland						
India	-2.52424					
Indonesi	-1.52901	-1.89423	-0.08396	-0.50073	0.23881	-1.89396
Iran	-3.39229	-2.21556	-3.55604	-3.93298	-3.18273	-2.64649
Iraq						
Ireland	5.51495	6.03158	6.26154	6.35491	5.62931	5.26642
Israel	4.31955	4.12041	3.62149	3.65095	2.37204	5.02313
Italy	8.72563				7.44339	
Jamaica	1.05538	1.39664	0.86083	0.85422	-0.65988	0.92581
Japan						
Jordan	-1.89289	-0.84966	-1.95745	-1.43746	-0.96490	-1.29510
Kazakhst	2.16457	1.27228				1.90174
Kenya						
Korea N						
Korea S						
Kuwait				-1.55849	-1.06925	-1.51391
Kyrgyzst	0.39888	-0.11658	-4.85899	-3.16106	-4.97026	-0.31635
Laos	-1.18995	-3.35451	-3.66676	-3.57002	-3.10687	-1.94836
Latvia	4.64085	4.43349	-0.92593	-0.22373	-1.25265	4.57356
Lebanon	-2.25574	-1.31691	-2.92057	-3.17564	-1.47115	-2.39092
Lesotho	-2.79532	-2.60220	-2.10535	-2.52647	-1.55056	-2.25640
Liberia						
Libya	-0.27759	-0.47083	-1.46416	-1.82372	-1.37060	-0.42788
Lithuani				2.40740		
Macedoni	0.20403	0.16196	1.20610	1.58422	-0.69759	1.07442
Madagasc						
Malawi	-3.34797	-3.75621	-2.41455	-2.26656	-2.63782	-3.69535

Malaysia				-1.49999	0.25144	-2.15329
Mali	-5.74594	-4.87546	-3.04015	-2.98921	-2.57837	-6.15933
Malta						
Mauritan	-3.16917	-2.45684	-1.54735	-1.66597	-2.20840	-3.41633
Mexico	-0.19428	-0.05094	1.64004	0.81512	3.34053	0.54884
Moldova	0.39094	0.30402	-2.17584	-1.42016	-3.98447	1.20858
Mongolia	1.48307	1.21131	-1.10502	-1.62047	-1.15126	0.73662
Morocco						
Mozambiq				-2.13044	-3.64158	-4.23733
Burma						
Namibia						
Nepal	-2.78879	-3.17804	-1.31083	-1.52115	-1.51724	-3.76388
Netherla	9.92883	8.89577	11.04515	10.60517	8.05095	9.42487
New Zela				5.55171	5.01306	6.78063
Nicaragu	-0.64436	-1.54250	0.35706	-0.57548	1.57751	-1.12426
Niger					-3.36283	-5.73457
Nigeria	-5.15992	-5.05754	-3.11752	-2.91259	-3.13679	-5.50372
Norway	10.71801				8.38326	10.55610
Oman	-2.16482	-2.14868	-1.43673	-1.24769	-1.37005	-2.25656
Pakistan	-3.45713	-2.73111	-2.75458	-2.87303	-3.46125	-4.59723
Panama	-0.06648	-0.38663	-0.56566	-1.90862	1.80086	1.13980
Papua NG			-2.05204	-2.18843	-2.29146	-3.94742
Paraguay	-2.19109	-1.55348	-0.17615	-0.62250	2.06737	-2.30176
Peru	-0.32984	-1.06974	2.22756	1.27885	4.12228	0.17728
Philippi	-2.87740	-2.56176	-0.95535	-1.22163	-0.54751	-3.03079
Poland	6.36141	6.46015				
Portugal						
Qatar	-2.16484	-1.93714	-2.36458	-1.95324	-2.06752	-2.01177
Romania	4.77031	4.91609	4.12475	4.45672	1.83711	4.64664
Russia						
Rwanda				-2.32636	-1.72730	-1.28609
Samoa	-0.96840	-0.62310	-2.54284	-2.33772	-2.33174	0.74926
Saudi Ar						
Senegal						
Sierra L	-7.43155	-6.21901	-5.12414	-5.37401	-3.10196	-5.40051
Singapor						
Slovakia	4.37803	4.17920	4.23068	3.91437	2.22514	3.78692
Slovenia	4.87978	4.80180	3.84170	4.13687	3.24397	4.24713
Somalia						
South Af	2.41466	1.07668	-0.66798	-1.16933	-0.72567	2.46170
Spain	6.96606	6.65606	9.11364	8.29058		7.00308
Sri Lank				-0.66197	0.07736	-0.81544
Sudan	-6.01044	-6.02436	-5.24590	-5.09133	-4.54554	-6.07796
Suriname					-2.85351	
Swazilan	-2.14834	-2.20155	-5.43151	-5.22201	-3.81415	-2.72125
Sweden						
Switzerl	10.47931				8.09641	
Syria	-2.35337	-2.33958	-1.74829	-1.83864	-1.16505	-2.72904
Taiwan						
Tajikist	-0.84716	-2.18666	-1.80168	-1.47858	-3.10570	-0.64260

Tanzania	-3.69352	-3.86077	-2.65947	-2.96868	-2.65493	-3.38684
Thailand		3.50627	3.11955	2.31042	4.80243	2.80866
Togo				-5.07189	-2.01470	-5.90152
Trin&Tob	1.42129	0.95936	-2.00111	-2.34688	-0.88253	1.56844
Tunisia	1.13538	0.74846	-0.22640	-1.12101	1.18094	0.93700
Turkey	-0.19334	-0.31073	1.18344	0.67035	0.92955	-0.39108
Turkmeni	1.76158	-0.03134	-5.43869		-5.62189	1.29049
Uganda	-4.48613	-5.23142	-3.18863	-2.93609	-2.64500	-3.61034
Ukraine	4.38669	3.04860	-2.00586	-1.54161	-2.25816	4.18244
UnArabEm				-5.10722	-3.40559	-2.27748
UnitedKi						
USA						
Uruguay	4.64509	4.16569	3.90390	3.42192		4.55496
Uzbekist	0.71853	-0.74859	-1.91387	-1.69980	-3.22210	-0.52470
Venezuel	-1.21369	-0.45448	0.77317	0.40374	1.80328	-1.40772
Vietnam						
Yemen	-2.93374	-2.69812	-1.92989	-1.90514	-2.42322	-3.18218
Zambia	-5.11470	-4.53018	-4.96366	-4.68323	-4.33472	-5.22959
Zimbabwe	-3.33074	-3.35001	-4.25873	-4.17551	-4.29192	-2.84766

Table E-4

EHCI-II (2000-2005) Standardized

Country	EHCI2_00 SCORE	EHCI2_01 SCORE	EHCI2_02 SCORE	EHCI2_03 SCORE	EHCI2_04 SCORE	EHCI2_05 SCORE
Afghanis						
Albania	0.40	0.41	0.41	0.44	0.44	0.43
Algeria	0.30	0.32	0.27	0.30	0.31	0.28
Angola	0.05	0.18	0.18	0.25	0.02	0.03
Argentin	0.59	0.56	0.60	0.61	0.80	0.58
Armenia	0.35	0.36	0.35	0.38	0.43	0.36
Australi	0.87	0.88	0.88	0.93	0.89	0.89
Austria	0.86	0.91	0.86	0.86	0.89	0.84
Azerbaij	0.37	0.35	0.29	0.29	0.21	0.35
Bahamas	0.61	0.60	0.26	0.28	0.35	
Bahrain	0.37	0.37	0.28	0.33	0.34	0.36
Banglade	0.26	0.25	0.30	0.33	0.39	0.27
Barbados						
Belarus						
Belgium	0.84	0.88	0.84	0.85	0.93	0.83
Belize	0.41	0.42	0.06	0.08	0.19	0.47
Benin	0.13	0.13	0.19	0.22	0.21	0.12
Bhutan	0.39	0.33	0.24	0.31	0.23	0.35
Bolivia	0.33	0.32	0.38	0.36	0.54	0.29
Bos&Ger	0.44	0.46	0.31	0.38	0.22	0.39
Botswana	0.37	0.39	0.17	0.20	0.28	0.41
Brazil	0.48	0.49	0.50	0.49	0.71	0.48
Brunei						
Bulgaria	0.64	0.71	0.59	0.65	0.55	0.67
BurkFaso	0.02	0.00		0.11	0.16	0.00
Burundi	0.27	0.18	0.21	0.24	0.29	0.28
Cambodia	0.32	0.26	0.31	0.35	0.35	0.31
Cameroon	0.17	0.17	0.11	0.14	0.17	0.16
Canada	0.76	0.82	0.80	0.84	0.78	0.75
Cape Ver	0.41	0.46	0.39	0.41	0.49	0.41
CenAfrRe				0.00	0.12	0.05
Chad	0.10	0.06	0.13	0.13	0.14	0.08
Chile	0.48	0.49	0.45	0.45	0.72	0.51
China						
Colombia						
Comoros	0.28	0.31	0.30	0.33	0.30	0.25
CostaRic	0.54	0.58	0.57	0.54	0.81	0.55
CotedIvo	0.10	0.14	0.00	0.11	0.00	0.05
Croatia					0.63	0.62
Cuba						
Cyprus						
CzechRep	0.70	0.79	0.60	0.65	0.59	0.73
Denmark						

Djibouti	0.22	0.30	0.21	0.25	0.23	0.24
DominRep	0.42	0.42	0.42	0.45	0.64	0.43
Ecuador	0.37	0.37	0.42	0.41	0.60	0.37
Egypt	0.34	0.42	0.32	0.37	0.33	0.33
ElSalvad	0.32	0.37	0.32	0.35	0.54	0.40
EqGuinea	0.22	0.21	0.14	0.16	0.29	0.22
Eritrea	0.16	0.12	0.09	0.12	0.13	0.16
Estonia	0.67	0.74	0.32	0.39	0.36	0.71
Ethiopia						
Fiji				0.28	0.37	0.33
Finland				0.91	0.95	0.90
France						
Gabon	0.23	0.23	0.19	0.20	0.26	0.21
Gambia						
Georgia	0.39	0.41	0.29	0.34	0.25	0.47
Germany						
Ghana	0.13	0.20	0.30	0.34	0.36	0.24
Greece	0.59	0.74	0.79	0.78	0.89	0.69
Guatemal	0.15	0.19	0.23	0.25	0.33	0.17
Guinea	0.16		0.20		0.34	0.15
Guyana						
Haiti						
Honduras						
Hungary	0.73	0.82	0.60	0.67	0.55	0.71
Iceland						
India	0.27					
Indonesi	0.33	0.30	0.35	0.36	0.44	0.30
Iran	0.22	0.27	0.15	0.16	0.21	0.26
Iraq						
Ireland	0.71	0.81	0.72	0.76	0.81	0.70
Israel	0.65	0.69	0.57	0.60	0.59	0.69
Italy	0.89				0.94	
Jamaica	0.47	0.51	0.41	0.44	0.38	0.46
Japan						
Jordan	0.31	0.36	0.25	0.31	0.36	0.33
Kazakhst	0.53	0.50				0.51
Kenya						
Korea N						
Korea S						
Kuwait				0.30	0.35	0.32
Kyrgyzst	0.43	0.41	0.08	0.21	0.09	0.39
Laos	0.34	0.20	0.15	0.18	0.21	0.30
Latvia	0.67	0.71	0.31	0.38	0.34	0.66
Lebanon	0.29	0.33	0.19	0.21	0.32	0.27
Lesotho	0.26	0.25	0.24	0.24	0.32	0.28
Liberia						
Libya	0.39	0.39	0.27	0.28	0.33	0.38
Lithuani				0.53		
Macedoni	0.42	0.43	0.43	0.48	0.38	0.47
Madagasc						

Malawi	0.23	0.17	0.22	0.26	0.24	0.20
Malaysia				0.30	0.44	0.28
Mali	0.09	0.10	0.18	0.22	0.25	0.06
Malta						
Mauritan	0.23	0.26	0.27	0.29	0.27	0.21
Mexico	0.40	0.42	0.45	0.44	0.65	0.44
Moldova	0.43	0.44	0.23	0.31	0.15	0.47
Mongolia	0.49	0.50	0.30	0.30	0.35	0.45
Morocco						
Mozambiq				0.27	0.18	0.17
Burma						
Namibia						
Nepal	0.26	0.21	0.28	0.30	0.32	0.19
Netherla	0.96	1.00	1.00	1.00	0.98	0.94
New Zela				0.71	0.77	0.79
Nicaragu	0.37	0.32	0.38	0.36	0.53	0.34
Niger					0.20	0.08
Nigeria	0.13	0.09	0.18	0.22	0.21	0.10
Norway	1.00				1.00	1.00
Oman	0.29	0.28	0.28	0.32	0.33	0.28
Pakistan	0.22	0.24	0.20	0.22	0.19	0.15
Panama	0.41	0.39	0.33	0.28	0.55	0.47
Papua NG			0.24	0.26	0.27	0.18
Paraguay	0.29	0.32	0.35	0.35	0.57	0.28
Peru	0.39	0.35	0.49	0.46	0.71	0.42
Philippi	0.25	0.25	0.30	0.32	0.39	0.24
Poland	0.76	0.84				
Portugal						
Qatar	0.29	0.29	0.22	0.28	0.28	0.29
Romania	0.67	0.74	0.60	0.65	0.55	0.67
Russia						
Rwanda				0.26	0.31	0.33
Samoa	0.36	0.38	0.21	0.25	0.27	0.45
Saudi Ar						
Senegal						
Sierra L	0.00	0.01	0.06	0.08	0.21	0.10
Singapor						
Slovakia	0.65	0.69	0.61	0.61	0.58	0.62
Slovenia	0.68	0.73	0.58	0.63	0.65	0.65
Somalia						
South Af	0.54	0.49	0.32	0.32	0.38	0.54
Spain	0.79	0.85	0.89	0.87		0.80
Sri Lank				0.35	0.43	0.36
Sudan	0.08	0.03	0.06	0.10	0.11	0.06
Suriname					0.23	
Swazilan	0.29	0.28	0.05	0.09	0.16	0.25
Sweden						
Switzerl	0.99				0.98	
Syria	0.28	0.27	0.26	0.28	0.35	0.25
Taiwan						

Tajikist	0.36	0.28	0.26	0.30	0.21	0.37
Tanzania	0.21	0.17	0.21	0.22	0.24	0.22
Thailand		0.65	0.54	0.52	0.75	0.56
Togo				0.10	0.29	0.07
Trin&Tob	0.49	0.48	0.24	0.25	0.37	0.49
Tunisia	0.47	0.47	0.35	0.32	0.51	0.46
Turkey	0.40	0.40	0.43	0.43	0.49	0.38
Turkmeni	0.51	0.42	0.04		0.04	0.48
Uganda	0.16	0.08	0.18	0.22	0.24	0.20
Ukraine	0.65	0.62	0.24	0.30	0.27	0.64
UnArabEm				0.10	0.19	0.28
UnitedKi						
USA						
Uruguay	0.67	0.69	0.59	0.59		0.66
Uzbekist	0.45	0.37	0.25	0.29	0.20	0.38
Venezuel	0.34	0.39	0.40	0.41	0.55	0.33
Vietnam						
Yemen	0.25	0.24	0.25	0.28	0.26	0.23
Zambia	0.13	0.12	0.07	0.12	0.13	0.11
Zimbabwe	0.23	0.20	0.11	0.15	0.13	0.25

Table E-5

United Nations HCI (UNHCI) (2000-2005)

Country	UNHCI_00	UNHCI_01	UNHCI_02	UNHCI_03	UNHCI_04	UNHCI_05
Afghanis					0.27	0.27
Albania	0.80	0.80	0.80	0.89	0.80	0.89
Algeria	0.69	0.69	0.69	0.71	0.69	0.69
Angola	0.36	0.38	0.38	0.54	0.38	0.38
Argentin	0.92	0.94	0.96	0.96	0.94	0.96
Armenia	0.92	0.86	0.90	0.90	0.86	0.90
Australi	0.99	0.99	0.99	0.99	0.99	0.99
Austria	0.96	0.97	0.96	0.96	0.97	0.96
Azerbaij	0.88	0.88	0.89	0.89	0.88	0.88
Bahamas	0.88	0.88	0.88	0.89	0.88	0.88
Bahrain	0.85	0.86	0.85	0.86	0.86	0.85
Banglade	0.40	0.45	0.45	0.45	0.45	0.45
Barbados	0.91	0.96	0.95	0.96	0.96	0.95
Belarus	0.92	0.95	0.95	0.95	0.95	0.95
Belgium	0.99	0.99	0.99	0.99	0.99	0.99
Belize	0.86	0.88	0.86	0.77	0.88	0.75
Benin	0.40	0.42	0.42	0.41	0.42	0.44
Bhutan	0.42	0.42	0.48	0.48	0.42	0.48
Bolivia	0.80	0.85	0.86	0.87	0.85	0.86
Bos&Ger	0.83	0.83	0.84	0.86	0.83	0.84
Botswana	0.75	0.79	0.76	0.76	0.79	0.76
Brazil	0.83	0.90	0.88	0.89	0.90	0.88
Brunei	0.86	0.89	0.87	0.86	0.89	0.87
Bulgaria	0.90	0.91	0.91	0.91	0.91	0.91
BurkFaso	0.23	0.24	0.16	0.16	0.24	0.16
Burundi	0.38	0.43	0.45	0.51	0.43	0.45
Cambodia	0.66	0.64	0.66	0.69	0.64	0.66
Cameroon	0.65	0.64	0.64	0.64	0.64	0.64
Canada	0.98	0.97	0.98	0.97	0.97	0.98
Cape Ver	0.75	0.77	0.77	0.75	0.77	0.75
CenAfrRe	0.39	0.40	0.43	0.43	0.40	0.43
Chad	0.39	0.41	0.42	0.30	0.41	0.42
Chile	0.90	0.89	0.90	0.91	0.89	0.90
China	0.80	0.79	0.83	0.84	0.79	0.83
Colombia	0.85	0.85	0.84	0.86	0.85	0.84
Comoros	0.49	0.51	0.51	0.53	0.51	0.53
CostaRic	0.86	0.86	0.87	0.87	0.86	0.87
CotedIvo	0.44	0.46	0.46	0.46	0.46	0.47
Croatia	0.88	0.88	0.90	0.90	0.88	0.90
Cuba	0.90	0.90	0.91	0.91	0.90	0.91
Cyprus	0.88	0.90	0.89	0.91	0.90	0.89
CzechRep	0.89	0.91	0.92	0.93	0.91	0.92
Denmark	0.98	0.99	0.98	0.99	0.99	0.98
Djibouti	0.50	0.51	0.51	0.52	0.51	0.52

DominRep	0.80	0.81	0.82	0.84	0.81	0.82
Ecuador	0.87	0.85	0.85	0.86	0.85	0.85
Egypt	0.62	0.63	0.63	0.62	0.63	0.62
ElSalvad	0.74	0.74	0.74	0.76	0.74	0.75
EqGuinea	0.77	0.76	0.77	0.78	0.76	0.76
Eritrea	0.46	0.49	0.49	0.49	0.49	0.49
Estonia	0.95	0.96	0.98	0.97	0.96	0.98
Ethiopia	0.35	0.38	0.39	0.40	0.38	0.39
Fiji	0.90	0.88	0.86	0.86	0.88	0.86
Finland	0.99	0.99	0.99	0.99	0.99	0.99
France	0.97	0.96	0.96	0.97	0.96	0.96
Gabon	0.76	0.75	0.72	0.72	0.75	0.72
Gambia	0.39	0.41	0.41	0.41	0.41	0.40
Georgia	0.89	0.89	0.89	0.90	0.89	0.89
Germany	0.97	0.96	0.95	0.96	0.96	0.95
Ghana	0.62	0.64	0.65	0.51	0.64	0.65
Greece	0.92	0.93	0.95	0.97	0.93	0.95
Guatemal	0.62	0.65	0.65	0.66	0.65	0.65
Guinea	0.37		0.37	0.41	0.39	0.37
Guyana	0.88	0.94	0.89	0.90	0.94	0.89
Haiti	0.50	0.51	0.51	0.50	0.51	0.52
Honduras	0.70	0.71	0.71	0.74	0.71	0.74
Hungary	0.93	0.93	0.95	0.96	0.93	0.95
Iceland	0.96	0.96	0.96	0.98	0.96	0.96
India	0.57	0.57	0.59	0.61	0.57	0.59
Indonesi	0.79	0.80	0.89	0.81	0.80	0.80
Iran	0.75	0.73	0.73	0.74	0.73	0.74
Iraq					0.93	0.93
Ireland	0.96	0.96	0.96	0.97	0.96	0.96
Israel	0.91	0.93	0.94	0.95	0.93	0.94
Italy	0.94	0.93	0.93	0.95	0.93	0.93
Jamaica	0.79	0.83	0.83	0.83	0.83	0.83
Japan	0.93	0.94	0.94	0.94	0.94	0.94
Jordan	0.78	0.86	0.86	0.86	0.86	0.86
Kazakhst	0.91	0.92	0.93	0.94	0.92	0.93
Kenya	0.72	0.73	0.74	0.66	0.73	0.74
Korea N					0.96	0.97
Korea S	0.95	0.96	0.97	0.97	0.98	0.98
Kuwait	0.74	0.73	0.81	0.80	0.73	0.81
Kyrgyzst	0.87	0.91	0.92	0.93	0.91	0.92
Laos	0.52	0.63	0.64	0.66	0.63	0.64
Latvia	0.93	0.95	0.95	0.96	0.95	0.95
Lebanon	0.83	0.83	0.84	0.84	0.83	0.84
Lesotho	0.76	0.77	0.77	0.76	0.77	0.76
Liberia					0.00	0.00
Libya	0.84	0.84	0.87	0.86	0.84	0.87
Lithuani	0.93	0.94	0.96	0.97	0.94	0.96
Macedoni	0.86	0.86	0.87	0.87	0.86	0.87
Madagasc	0.58	0.58	0.60	0.64	0.58	0.60
Malawi	0.65	0.65	0.66	0.67	0.65	0.66

Malaysia	0.80	0.83	0.83	0.83	0.83	0.83
Mali	0.37	0.27	0.21	0.23	0.27	0.21
Malta	0.88	0.87	0.87	0.85	0.87	0.87
Mauritan	0.40	0.41	0.42	0.49	0.41	0.42
Mexico	0.84	0.86	0.85	0.85	0.86	0.85
Moldova	0.90	0.86	0.87	0.85	0.86	0.87
Mongolia	0.88	0.87	0.89	0.90	0.87	0.89
Morocco	0.50	0.50	0.53	0.53	0.50	0.53
Mozambiq	0.37	0.43	0.45	0.45	0.43	0.45
Burma	0.75	0.72	0.73	0.76	0.72	0.73
Namibia	0.81	0.80	0.79	0.80	0.80	0.79
Nepal	0.48	0.50	0.50	0.53	0.50	0.50
Netherla	0.99	0.99	0.99	0.99	0.99	0.99
New Zela	0.99	0.99	0.99	0.99	0.99	0.99
Nicaragu	0.65	0.66	0.73	0.74	0.66	0.73
Niger	0.16	0.17	0.17	0.17	0.17	0.18
Nigeria	0.58	0.59	0.59	0.66	0.59	0.59
Norway	0.98	0.99	0.99	0.99	0.99	0.99
Oman	0.67	0.68	0.71	0.71	0.68	0.71
Pakistan	0.42	0.41	0.40	0.44	0.41	0.40
Panama	0.86	0.86	0.86	0.88	0.86	0.86
Papua NG	0.55	0.57	0.57	0.52	0.57	0.57
Paraguay	0.83	0.84	0.85	0.86	0.84	0.85
Peru	0.87	0.88	0.86	0.88	0.88	0.86
Philippi	0.91	0.90	0.89	0.89	0.90	0.89
Poland	0.94	0.95	0.96	0.96	0.95	0.96
Portugal	0.94	0.97	0.97	0.97	0.97	0.97
Qatar	0.79	0.82	0.83	0.87	0.82	0.83
Romania	0.88	0.88	0.88	0.89	0.88	0.88
Russia	0.92	0.93	0.95	0.96	0.93	0.95
Rwanda	0.58	0.63	0.64	0.61	0.63	0.64
Samoa	0.89	0.89	0.89	0.89	0.89	0.89
Saudi Ar	0.71	0.71	0.71	0.72	0.71	0.71
Senegal	0.37	0.38	0.38	0.39	0.38	0.39
Sierra L	0.33	0.41	0.39	0.35	0.41	0.39
Singapor	0.91	0.91	0.87	0.87	0.87	0.91
Slovakia	0.91	0.90	0.91	0.91	0.90	0.91
Slovenia	0.94	0.94	0.96	0.98	0.94	0.96
Somalia					0.10	0.00
South Af	0.88	0.83	0.82	0.81	0.83	0.83
Spain	0.97	0.97	0.97	0.97	0.97	0.97
Sri Lank	0.84	0.82	0.82	0.83	0.82	0.83
Sudan	0.50	0.51	0.51	0.52	0.51	0.52
Suriname	0.90	0.88	0.87	0.83	0.88	0.87
Swazilan	0.77	0.79	0.74	0.73	0.79	0.74
Sweden	0.99	0.99	0.99	0.99	0.99	0.99
Switzerl	0.94	0.95	0.95	0.93	0.95	0.95
Syria	0.71	0.70	0.75	0.76	0.70	0.75
Taiwan						
Tajikist	0.88	0.90	0.90	0.91	0.90	0.90

Tanzania	0.61	0.61	0.61	0.60	0.61	0.62
Thailand	0.84	0.88	0.86	0.86	0.88	0.86
Togo	0.59	0.61	0.62	0.57	0.61	0.62
Trin&Tob	0.84	0.88	0.87	0.88	0.88	0.87
Tunisia	0.72	0.73	0.73	0.73	0.73	0.74
Turkey	0.77	0.77	0.80	0.82	0.77	0.80
Turkmeni	0.92	0.92	0.93	0.91	0.92	0.93
Uganda	0.60	0.69	0.70	0.71	0.69	0.70
Ukraine	0.92	0.93	0.94	0.95	0.93	0.94
UnArabEm	0.74	0.73	0.74	0.76	0.73	0.74
UnitedKi	0.99	0.99	0.99	0.99	0.99	0.99
USA	0.98	0.97	0.97	0.97	0.97	0.97
Uruguay	0.92	0.93	0.94	0.94	0.93	0.94
Uzbekist	0.91	0.91	0.91	0.91	0.91	0.91
Venezuel	0.83	0.84	0.86	0.87	0.84	0.86
Vietnam	0.84	0.83	0.83	0.82	0.83	0.82
Yemen	0.48	0.49	0.50	0.51	0.49	0.50
Zambia	0.68	0.68	0.68	0.61	0.68	0.68
Zimbabwe	0.81	0.79	0.78	0.78	0.79	0.79

Source: United Nations, Human Development Reports (2000-2007),
United Nations, E-Government Readiness Knowledge Base.

Table E-6

Expanded HCI-1 (2000-2005) Standardized (Sorted According to Values)

Country	SCORE EHCI1_00	Country	SCORE EHCI1_01	Country	SCORE EHCI1_02	Country	SCORE EHCI1_03	Country	SCORE EHCI1_04	Country	SCORE EHCI1_05
Norway	1.00	Switzerl	1.00	Norway	1.00	Switzerl	1.00	Spain	1.00	Norway	1.00
Switzerl	0.99	Norway	0.94	Switzerl	0.99	Norway	0.98	Italy	0.90	Switzerl	1.00
Netherla	0.96	Netherla	0.87	Netherla	0.97	Netherla	0.93	Norway	0.89	Netherla	0.94
Italy	0.89	Italy	0.83	Italy	0.96	Italy	0.93	Greece	0.88	Finland	0.90
Australi	0.88	Austria	0.80	Australi	0.86	Australi	0.87	Netherla	0.88	Australi	0.89
Austria	0.86	Australi	0.77	Spain	0.86	Finland	0.85	Switzerl	0.87	Italy	0.89
Belgium	0.85	Belgium	0.77	Austria	0.84	Spain	0.81	Finland	0.85	Austria	0.84
Spain	0.79	Spain	0.74	Belgium	0.82	Austria	0.81	CostaRic	0.84	Belgium	0.84
Canada	0.76	Poland	0.73	Canada	0.78	Belgium	0.80	Peru	0.84	Spain	0.80
Poland	0.76	Hungary	0.72	Greece	0.76	Canada	0.78	Austria	0.81	New Zela	0.79
Hungary	0.74	Canada	0.71	Ireland	0.70	Greece	0.73	Ireland	0.80	Canada	0.76
CzechRep	0.71	Ireland	0.70	CzechRep	0.59	Ireland	0.70	Argentin	0.80	CzechRep	0.74
Ireland	0.71	CzechRep	0.69	Slovakia	0.59	New Zela	0.67	Belgium	0.79	Estonia	0.72
Slovenia	0.68	Estonia	0.65	Hungary	0.59	Hungary	0.62	Australi	0.78	Hungary	0.72
Estonia	0.68	Romania	0.64	Romania	0.58	CzechRep	0.62	Thailand	0.78	Ireland	0.70
Romania	0.67	Greece	0.64	Argentin	0.58	Bulgaria	0.61	Mexico	0.75	Israel	0.69
Latvia	0.67	Slovenia	0.64	Bulgaria	0.57	Romania	0.60	DominRep	0.74	Greece	0.69
Uruguay	0.67	Latvia	0.62	Uruguay	0.57	Slovenia	0.59	Ecuador	0.74	Bahamas	0.68
Ukraine	0.66	Bulgaria	0.62	Slovenia	0.57	Slovakia	0.58	Brazil	0.73	Bulgaria	0.67
Slovakia	0.65	Uruguay	0.60	Israel	0.55	Argentin	0.56	Chile	0.73	Latvia	0.67
Israel	0.65	Slovakia	0.60	CostaRic	0.55	Israel	0.56	Paraguay	0.72	Uruguay	0.67
Bulgaria	0.65	Israel	0.60	Thailand	0.52	Uruguay	0.56	Nicaragu	0.71	Romania	0.67
Bahamas	0.61	Thailand	0.56	Brazil	0.49	CostaRic	0.51	ElSalvad	0.70	Ukraine	0.65
Argentin	0.59	Ukraine	0.55	Peru	0.46	Lithuani	0.50	Canada	0.70	Slovenia	0.65
Greece	0.59	Bahamas	0.52	Chile	0.44	Thailand	0.49	Venezuel	0.69	Slovakia	0.62

CostaRic	0.54	CostaRic	0.51	Mexico	0.44	Brazil	0.46	New Zela	0.68	Croatia	0.62
South Af	0.53	Argentin	0.49	Macedoni	0.41	Macedoni	0.44	Bolivia	0.67	Argentin	0.58
Kazakhst	0.53	Jamaica	0.44	Turkey	0.41	Peru	0.42	Panama	0.67	Thailand	0.56
Turkmeni	0.50	Kazakhst	0.44	DominRep	0.41	Chile	0.42	Banglade	0.64	CostaRic	0.55
Trin&Tob	0.49	Chile	0.43	Albania	0.40	DominRep	0.41	Cape Ver	0.63	South Af	0.54
Mongolia	0.48	Mongolia	0.42	Ecuador	0.40	Albania	0.41	Slovenia	0.63	Kazakhst	0.51
Chile	0.48	Brazil	0.42	Jamaica	0.40	Jamaica	0.41	Guinea	0.62	Chile	0.51
Brazil	0.48	South Af	0.42	Venezuel	0.38	Mexico	0.40	Fiji	0.61	Trin&Tob	0.49
Tunisia	0.47	Trin&Tob	0.41	Cape Ver	0.37	Turkey	0.39	Yemen	0.61	Moldova	0.48
Jamaica	0.47	Tunisia	0.40	Bolivia	0.36	Cape Ver	0.38	Croatia	0.61	Brazil	0.48
Moldova	0.44	Bos&Ger	0.40	Nicaragu	0.36	Venezuel	0.37	Tunisia	0.61	Georgia	0.47
Uzbekist	0.44	Cape Ver	0.39	Armenia	0.34	Estonia	0.37	Turkey	0.61	Turkmeni	0.47
Bos&Ger	0.44	Moldova	0.39	Indonesi	0.34	Ecuador	0.37	Indonesi	0.60	Macedoni	0.46
Kyrgyzst	0.43	Macedoni	0.37	Tunisia	0.34	Latvia	0.36	Cambodia	0.59	Panama	0.46
Macedoni	0.42	DominRep	0.36	Paraguay	0.33	Bos&Ger	0.36	Nepal	0.59	Tunisia	0.46
DominRep	0.42	Egypt	0.36	Estonia	0.33	Armenia	0.35	Malaysia	0.59	Jamaica	0.46
Cape Ver	0.40	Mexico	0.36	Panama	0.31	Egypt	0.34	Philippi	0.58	Belize	0.45
Panama	0.40	Turkmeni	0.35	Egypt	0.31	Indonesi	0.33	Algeria	0.58	Mongolia	0.44
Belize	0.40	Belize	0.35	Latvia	0.31	Bolivia	0.32	Jordan	0.58	Mexico	0.43
Albania	0.40	Kyrgyzst	0.35	South Af	0.31	Nicaragu	0.32	Libya	0.58	Samoa	0.43
Mexico	0.40	Albania	0.35	Bos&Ger	0.30	Sri Lank	0.32	Sri Lank	0.57	DominRep	0.43
Turkey	0.39	Georgia	0.35	ElSalvad	0.30	Paraguay	0.32	Israel	0.57	Albania	0.43
Georgia	0.39	Turkey	0.34	Cambodia	0.29	ElSalvad	0.32	Ghana	0.57	Cape Ver	0.41
Peru	0.38	Panama	0.34	Comoros	0.29	Georgia	0.31	Oman	0.56	Peru	0.41
Bhutan	0.38	Botswana	0.33	Bangladesh	0.29	Cambodia	0.31	Samoa	0.56	Botswana	0.40
Libya	0.38	Venezuel	0.33	Philippi	0.29	Ghana	0.31	Lesotho	0.56	Bos&Ger	0.39
Nicaragu	0.37	Libya	0.32	Ghana	0.28	Comoros	0.30	Slovakia	0.56	ElSalvad	0.39
Ecuador	0.37	ElSalvad	0.31	Mongolia	0.28	Bangladesh	0.30	Comoros	0.56	Kyrgyzst	0.38
Botswana	0.36	Samoa	0.31	Georgia	0.28	Tunisia	0.30	Rwanda	0.55	Turkey	0.38
Azerbaij	0.36	Armenia	0.31	Azerbaij	0.28	Moldova	0.30	Guatemal	0.55	Uzbekist	0.36
Bahrain	0.36	Ecuador	0.31	Nepal	0.27	South Af	0.29	Albania	0.55	Ecuador	0.36
Tajikist	0.35	Uzbekist	0.31	Bahrain	0.27	Bahrain	0.29	Togo	0.54	Libya	0.36
Armenia	0.34	Bahrain	0.31	Mauritan	0.26	Ukraine	0.29	Romania	0.54	Sri Lank	0.36
Samoa	0.34	Jordan	0.30	Oman	0.26	Philippi	0.28	Armenia	0.54	Tajikist	0.36
Egypt	0.34	Azerbaij	0.30	Libya	0.25	Oman	0.28	Laos	0.53	Armenia	0.35
Venezuel	0.34	Peru	0.29	Bahamas	0.25	Kuwait	0.28	Syria	0.52	Bahrain	0.35

Laos	0.33	Lebanon	0.29	Ukraine	0.25	Bhutan	0.28	Sierra L	0.52	Azerbaij	0.35
Bolivia	0.33	Bhutan	0.29	Algeria	0.25	Malaysia	0.27	Egypt	0.52	Bhutan	0.35
Indonesi	0.32	Nicaragu	0.27	Syria	0.25	Jordan	0.27	Bahrain	0.51	Nicaragu	0.34
ElSalvad	0.32	Djibouti	0.27	Moldova	0.24	Nepal	0.27	Benin	0.51	Kuwait	0.33
Cambodia	0.31	Bolivia	0.27	Trin&Tob	0.24	Mongolia	0.27	Mali	0.51	Rwanda	0.32
Jordan	0.30	Paraguay	0.27	Tajikist	0.23	Mauritan	0.27	Bulgaria	0.51	Egypt	0.32
Algeria	0.29	Comoros	0.27	Uzbekist	0.23	Tajikist	0.27	Papua NG	0.50	Jordan	0.32
Lebanon	0.29	Algeria	0.26	Papua NG	0.23	Algeria	0.26	South Af	0.50	Venezuel	0.32
Paraguay	0.28	Indonesi	0.25	Yemen	0.23	Bahamas	0.26	Niger	0.50	Fiji	0.31
Qatar	0.28	Qatar	0.24	Jordan	0.23	Azerbaij	0.26	Hungary	0.50	Cambodia	0.30
Oman	0.28	Iran	0.24	Bhutan	0.23	Uzbekist	0.26	Mauritan	0.49	Indonesi	0.29
Swazilan	0.28	Oman	0.23	Lesotho	0.22	Syria	0.26	Tanzania	0.49	Burundi	0.29
Burundi	0.28	Tajikist	0.23	Djibouti	0.22	Panama	0.25	BurkFaso	0.49	Qatar	0.28
Comoros	0.28	Syria	0.23	Burundi	0.21	Libya	0.25	CzechRep	0.49	Laos	0.28
Syria	0.27	Mauritan	0.23	Guatemal	0.21	Qatar	0.25	Qatar	0.48	Malaysia	0.28
India	0.27	Swazilan	0.22	Qatar	0.21	Mozambiq	0.24	Trin&Tob	0.48	Bolivia	0.28
Banglade	0.26	Cambodia	0.22	Malawi	0.21	Yemen	0.24	Malawi	0.48	Lebanon	0.27
Nepal	0.25	Banglade	0.21	Tanzania	0.19	Fiji	0.24	Pakistan	0.48	Paraguay	0.27
Lesotho	0.25	Philippi	0.21	Samoa	0.19	Djibouti	0.24	Burundi	0.48	Oman	0.27
Philippi	0.24	Lesotho	0.21	Pakistan	0.19	Papua NG	0.24	Macedoni	0.48	Lesotho	0.27
Yemen	0.24	Pakistan	0.20	Guinea	0.19	Trin&Tob	0.23	Swazilan	0.47	UnArabEm	0.27
Mauritan	0.24	Yemen	0.20	Lebanon	0.19	Malawi	0.23	Mongolia	0.47	Algeria	0.27
Gabon	0.24	Gabon	0.20	Gabon	0.19	Angola	0.23	Bhutan	0.47	Banglade	0.26
Djibouti	0.23	Nepal	0.18	Mali	0.18	Rwanda	0.23	Tajikist	0.46	Iran	0.26
Iran	0.22	EqGuinea	0.18	Angola	0.18	Guatemal	0.23	Uganda	0.46	Djibouti	0.26
Zimbabwe	0.22	Zimbabwe	0.17	Benin	0.18	Burundi	0.22	Jamaica	0.46	Syria	0.25
Malawi	0.22	Ghana	0.17	Nigeria	0.17	Samoa	0.22	Botswana	0.46	Comoros	0.25
Pakistan	0.22	Laos	0.16	Uganda	0.17	Lesotho	0.21	EqGuinea	0.46	Zimbabwe	0.24
EqGuinea	0.22	Guatemal	0.16	Botswana	0.17	Mali	0.20	Nigeria	0.44	Swazilan	0.24
Tanzania	0.20	Burundi	0.16	Niger	0.16	Pakistan	0.20	Bahamas	0.42	Ghana	0.23
Cameroon	0.17	Angola	0.16	Iran	0.15	Uganda	0.20	Belize	0.42	Philippi	0.23
Eritrea	0.17	Malawi	0.15	EqGuinea	0.14	Nigeria	0.20	Lebanon	0.42	EqGuinea	0.22
Uganda	0.16	Cameroon	0.14	Laos	0.13	Benin	0.20	Uzbekist	0.41	Mauritan	0.21
Guinea	0.16	Tanzania	0.14	Chad	0.13	Tanzania	0.19	UnArabEm	0.40	Yemen	0.21
Guatemal	0.15	CotedIvo	0.12	Zimbabwe	0.11	Lebanon	0.19	Kuwait	0.40	Gabon	0.21
Ghana	0.13	Benin	0.11	Cameroon	0.11	Gabon	0.19	Mozambiq	0.38	Tanzania	0.21

Benin	0.13	Eritrea	0.11	Eritrea	0.09	Kyrgyzst	0.19	Sudan	0.38	Uganda	0.20
Zambia	0.13	Zambia	0.10	Kyrgyzst	0.08	Botswana	0.18	Chad	0.38	Malawi	0.19
Nigeria	0.13	Niger	0.10	BurkFaso	0.07	Niger	0.17	Cameroon	0.37	Nepal	0.19
Chad	0.10	Mali	0.09	Zambia	0.07	Laos	0.16	Eritrea	0.36	Papua NG	0.18
Niger	0.10	Nigeria	0.07	Sierra L	0.06	Iran	0.15	Zambia	0.36	Mozambiq	0.17
Mali	0.10	Uganda	0.07	Sudan	0.05	EqGuinea	0.14	Gabon	0.35	Guatemal	0.16
CotedIvo	0.10	Chad	0.06	Belize	0.05	Zimbabwe	0.13	Azerbaij	0.34	Cameroon	0.16
Sudan	0.08	Sudan	0.02	Kazakhst	0.05	Cameroon	0.13	CenAfrRe	0.34	Eritrea	0.16
Angola	0.05	Sierra L	0.01	Turkmeni	0.04	Chad	0.12	Iran	0.34	Guinea	0.15
BurkFaso	0.02	BurkFaso	0.00	Swazilan	0.04	Kazakhst	0.12	Georgia	0.34	Pakistan	0.14
Sierra L	0.00			CotedIvo	0.00	Eritrea	0.11	Suriname	0.33	Benin	0.11
		Afghanis				Zambia	0.10	CotedIvo	0.31	Zambia	0.11
Afghanis		Barbados		Afghanis		CotedIvo	0.09	Bos&Ger	0.31	Sierra L	0.10
Barbados		Belarus		Barbados		BurkFaso	0.09	Djibouti	0.30	Nigeria	0.09
Belarus		Brunei		Belarus		Sudan	0.08	Zimbabwe	0.30	Chad	0.09
Brunei		CenAfrRe		Brunei		Togo	0.08	Latvia	0.30	Niger	0.08
CenAfrRe		China		CenAfrRe		UnArabEm	0.08	Estonia	0.29	Togo	0.07
China		Colombia		China		Swazilan	0.07	Angola	0.26	Mali	0.06
Colombia		Croatia		Colombia		Sierra L	0.07	Turkmeni	0.23	Sudan	0.06
Croatia		Cuba		Croatia		Belize	0.06	Kyrgyzst	0.23	CenAfrRe	0.05
Cuba		Cyprus		Cuba		Turkmeni	0.05	Ukraine	0.20	CotedIvo	0.05
Cyprus		Denmark		Cyprus		CenAfrRe	0.00	Moldova	0.13	Angola	0.04
Denmark		Ethiopia		Denmark				Kazakhst	0.00	BurkFaso	0.00
Ethiopia		Fiji		Ethiopia		Afghanis					
Fiji		Finland		Fiji		Barbados		Afghanis		Afghanis	
Finland		France		Finland		Belarus		Barbados		Barbados	
France		Gambia		France		Brunei		Belarus		Belarus	
Gambia		Germany		Gambia		China		Brunei		Brunei	
Germany		Guinea		Germany		Colombia		China		China	
Guyana		Guyana		Guyana		Croatia		Colombia		Colombia	
Haiti		Haiti		Haiti		Cuba		Cuba		Cuba	
Honduras		Honduras		Honduras		Cyprus		Cyprus		Cyprus	
Iceland		Iceland		Iceland		Denmark		Denmark		Denmark	
Iraq		India		India		Ethiopia		Ethiopia		Ethiopia	
Japan		Iraq		Iraq		France		France		France	
Kenya		Japan		Japan		Gambia		Gambia		Gambia	

Korea N	Kenya	Kenya	Germany	Germany	Germany
Korea S	Korea N	Korea N	Guinea	Guyana	Guyana
Kuwait	Korea S	Korea S	Guyana	Haiti	Haiti
Liberia	Kuwait	Kuwait	Haiti	Honduras	Honduras
Lithuani	Liberia	Liberia	Honduras	Iceland	Iceland
Madagasc	Lithuani	Lithuani	Iceland	India	India
Malaysia	Madagasc	Madagasc	India	Iraq	Iraq
Malta	Malaysia	Malaysia	Iraq	Japan	Japan
Morocco	Malta	Malta	Japan	Kenya	Kenya
Mozambiq	Morocco	Morocco	Kenya	Korea N	Korea N
Burma	Mozambiq	Mozambiq	Korea N	Korea S	Korea S
Namibia	Burma	Burma	Korea S	Liberia	Liberia
New Zela	Namibia	Namibia	Liberia	Lithuani	Lithuani
Papua NG	New Zela	New Zela	Madagasc	Madagasc	Madagasc
Portugal	Papua NG	Poland	Malta	Malta	Malta
Russia	Portugal	Portugal	Morocco	Morocco	Morocco
Rwanda	Russia	Russia	Burma	Burma	Burma
Saudi Ar	Rwanda	Rwanda	Namibia	Namibia	Namibia
Senegal	Saudi Ar	Saudi Ar	Poland	Poland	Poland
Singapor	Senegal	Senegal	Portugal	Portugal	Portugal
Somalia	Singapor	Singapor	Russia	Russia	Russia
Sri Lank	Somalia	Somalia	Saudi Ar	Saudi Ar	Saudi Ar
Suriname	Sri Lank	Sri Lank	Senegal	Senegal	Senegal
Sweden	Suriname	Suriname	Singapor	Singapor	Singapor
Taiwan	Sweden	Sweden	Somalia	Somalia	Somalia
Thailand	Taiwan	Taiwan	Suriname	Sweden	Suriname
Togo	Togo	Togo	Sweden	Taiwan	Sweden
UnArabEm	UnArabEm	UnArabEm	Taiwan	UnitedKi	Taiwan
UnitedKi	UnitedKi	UnitedKi	UnitedKi	USA	UnitedKi
USA	USA	USA	USA	Uruguay	USA
Vietnam	Vietnam	Vietnam	Vietnam	Vietnam	Vietnam

Table E-7

Expanded HCI-II (2000-2005) Standardized (Sorted According to Values)

Country	SCORE EHCI2_00	Country	SCORE EHCI2_01	Country	SCORE EHCI2_02	Country	SCORE EHCI2_03	Country	SCORE EHCI2_04	Country	SCORE EHCI2_05
Norway	1.00	Netherla	1.00	Netherla	1.00	Netherla	1.00	Norway	1.00	Norway	1.00
Switzerl	0.99	Austria	0.91	Spain	0.89	Australi	0.93	Switzerl	0.98	Netherla	0.94
Netherla	0.96	Australi	0.88	Australi	0.88	Finland	0.91	Netherla	0.98	Finland	0.90
Italy	0.89	Belgium	0.88	Austria	0.86	Spain	0.87	Finland	0.95	Australi	0.89
Australi	0.87	Spain	0.85	Belgium	0.84	Austria	0.86	Italy	0.94	Austria	0.84
Austria	0.86	Poland	0.84	Canada	0.80	Belgium	0.85	Belgium	0.93	Belgium	0.83
Belgium	0.84	Hungary	0.82	Greece	0.79	Canada	0.84	Greece	0.89	Spain	0.80
Spain	0.79	Canada	0.82	Ireland	0.72	Greece	0.78	Australi	0.89	New Zela	0.79
Canada	0.76	Ireland	0.81	Slovakia	0.61	Greece	0.78	Austria	0.89	Canada	0.75
Poland	0.76	CzechRep	0.79	CzechRep	0.60	New Zela	0.71	Ireland	0.81	CzechRep	0.73
Hungary	0.73	Estonia	0.74	Romania	0.60	Hungary	0.67	CostaRic	0.81	Estonia	0.71
Ireland	0.71	Greece	0.74	Hungary	0.60	CzechRep	0.65	Argentin	0.80	Hungary	0.71
CzechRep	0.70	Romania	0.74	Argentin	0.60	Bulgaria	0.65	Canada	0.78	Ireland	0.70
Slovenia	0.68	Slovenia	0.73	Bulgaria	0.59	Romania	0.65	New Zela	0.77	Greece	0.69
Romania	0.67	Latvia	0.71	Uruguay	0.59	Slovenia	0.63	Thailand	0.75	Israel	0.69
Estonia	0.67	Bulgaria	0.71	Slovenia	0.58	Slovakia	0.61	Chile	0.72	Bulgaria	0.67
Uruguay	0.67	Slovakia	0.69	Israel	0.57	Argentin	0.61	Brazil	0.71	Romania	0.67
Latvia	0.67	Uruguay	0.69	CostaRic	0.57	Israel	0.60	Peru	0.71	Latvia	0.66
Ukraine	0.65	Israel	0.69	Thailand	0.54	Uruguay	0.59	Mexico	0.65	Uruguay	0.66
Slovakia	0.65	Thailand	0.65	Brazil	0.50	CostaRic	0.54	Slovenia	0.65	Slovenia	0.65
Israel	0.65	Ukraine	0.62	Peru	0.49	Lithuani	0.53	DominRep	0.64	Ukraine	0.64
Bulgaria	0.64	Bahamas	0.60	Mexico	0.45	Thailand	0.52	Croatia	0.63	Slovakia	0.62
Bahamas	0.61	CostaRic	0.58	Chile	0.45	Brazil	0.49	Ecuador	0.60	Croatia	0.62
Argentin	0.59	Argentin	0.56	Macedoni	0.43	Macedoni	0.48	CzechRep	0.59	Argentin	0.58
Greece	0.59	Jamaica	0.51	Turkey	0.43	Peru	0.46	Israel	0.59	Thailand	0.56
South Af	0.54	Kazakhst	0.50	DominRep	0.42	Chile	0.45	Slovakia	0.58	CostaRic	0.55
CostaRic	0.54	Mongolia	0.50	Ecuador	0.42	DominRep	0.45	Paraguay	0.57	South Af	0.54
Kazakhst	0.53	Chile	0.49	Albania	0.41	Albania	0.44	Bulgaria	0.55	Kazakhst	0.51
Turkmeni	0.51	South Af	0.49	Jamaica	0.41	Jamaica	0.44	Romania	0.55	Chile	0.51
Mongolia	0.49	Brazil	0.49	Venezuel	0.40	Mexico	0.44	Hungary	0.55	Trin&Tob	0.49

Trin&Tob	0.49	Trin&Tob	0.48	Cape Ver	0.39	Turkey	0.43	Venezuel	0.55	Turkmeni	0.48
Chile	0.48	Tunisia	0.47	Nicaragu	0.38	Cape Ver	0.41	Panama	0.55	Brazil	0.48
Brazil	0.48	Cape Ver	0.46	Bolivia	0.38	Venezuel	0.41	ElSalvad	0.54	Moldova	0.47
Tunisia	0.47	Bos&Ger	0.46	Indonesi	0.35	Ecuador	0.41	Bolivia	0.54	Georgia	0.47
Jamaica	0.47	Moldova	0.44	Armenia	0.35	Estonia	0.39	Nicaragu	0.53	Panama	0.47
Uzbekist	0.45	Macedoni	0.43	Paraguay	0.35	Bos&Ger	0.38	Tunisia	0.51	Macedoni	0.47
Bos&Ger	0.44	Belize	0.42	Tunisia	0.35	Armenia	0.38	Cape Ver	0.49	Belize	0.47
Kyrgyzst	0.43	DominRep	0.42	Panama	0.33	Latvia	0.38	Turkey	0.49	Tunisia	0.46
Moldova	0.43	Turkmeni	0.42	Estonia	0.32	Egypt	0.37	Malaysia	0.44	Jamaica	0.46
Macedoni	0.42	Egypt	0.42	Egypt	0.32	Indonesi	0.36	Albania	0.44	Samoa	0.45
DominRep	0.42	Mexico	0.42	South Af	0.32	Nicaragu	0.36	Indonesi	0.44	Mongolia	0.45
Belize	0.41	Kyrgyzst	0.41	ElSalvad	0.32	Bolivia	0.36	Sri Lank	0.43	Mexico	0.44
Cape Ver	0.41	Albania	0.41	Bos&Ger	0.31	Paraguay	0.35	Armenia	0.43	DominRep	0.43
Panama	0.41	Georgia	0.41	Latvia	0.31	Sri Lank	0.35	Philippi	0.39	Albania	0.43
Albania	0.40	Turkey	0.40	Cambodia	0.31	Cambodia	0.35	Banglade	0.39	Peru	0.42
Turkey	0.40	Panama	0.39	Philippi	0.30	ElSalvad	0.35	Jamaica	0.38	Cape Ver	0.41
Mexico	0.40	Botswana	0.39	Banglade	0.30	Georgia	0.34	Macedoni	0.38	Botswana	0.41
Libya	0.39	Venezuel	0.39	Comoros	0.30	Ghana	0.34	South Af	0.38	ElSalvad	0.40
Georgia	0.39	Libya	0.39	Ghana	0.30	Comoros	0.33	Fiji	0.37	Bos&Ger	0.39
Peru	0.39	Samoa	0.38	Mongolia	0.30	Banglade	0.33	Trin&Tob	0.37	Kyrgyzst	0.39
Bhutan	0.39	ElSalvad	0.37	Azerbaij	0.29	Bahrain	0.33	Ghana	0.36	Turkey	0.38
Nicaragu	0.37	Uzbekist	0.37	Georgia	0.29	Tunisia	0.32	Jordan	0.36	Libya	0.38
Ecuador	0.37	Bahrain	0.37	Bahrain	0.28	South Af	0.32	Estonia	0.36	Uzbekist	0.38
Botswana	0.37	Ecuador	0.37	Nepal	0.28	Philippi	0.32	Bahamas	0.35	Ecuador	0.37
Bahrain	0.37	Armenia	0.36	Oman	0.28	Oman	0.32	Kuwait	0.35	Tajikist	0.37
Azerbaij	0.37	Jordan	0.36	Libya	0.27	Moldova	0.31	Mongolia	0.35	Bahrain	0.36
Tajikist	0.36	Azerbaij	0.35	Algeria	0.27	Bhutan	0.31	Cambodia	0.35	Sri Lank	0.36
Samoa	0.36	Peru	0.35	Mauritan	0.27	Jordan	0.31	Syria	0.35	Armenia	0.36
Armenia	0.35	Bhutan	0.33	Bahamas	0.26	Tajikist	0.30	Latvia	0.34	Bhutan	0.35
Laos	0.34	Lebanon	0.33	Syria	0.26	Malaysia	0.30	Bahrain	0.34	Azerbaij	0.35
Venezuel	0.34	Algeria	0.32	Tajikist	0.26	Nepal	0.30	Guinea	0.34	Nicaragu	0.34
Egypt	0.34	Nicaragu	0.32	Uzbekist	0.25	Algeria	0.30	Oman	0.33	Rwanda	0.33
Bolivia	0.33	Paraguay	0.32	Yemen	0.25	Ukraine	0.30	Libya	0.33	Jordan	0.33
Indonesi	0.33	Bolivia	0.32	Jordan	0.25	Kuwait	0.30	Egypt	0.33	Fiji	0.33
ElSalvad	0.32	Comoros	0.31	Trin&Tob	0.24	Mongolia	0.30	Guatemal	0.33	Venezuel	0.33
Cambodia	0.32	Djibouti	0.30	Ukraine	0.24	Mauritan	0.29	Lebanon	0.32	Egypt	0.33

Jordan	0.31	Indonesi	0.30	Papua NG	0.24	Uzbekist	0.29	Nepal	0.32	Kuwait	0.32
Algeria	0.30	Qatar	0.29	Lesotho	0.24	Azerbaij	0.29	Lesotho	0.32	Cambodia	0.31
Swazilan	0.29	Oman	0.28	Bhutan	0.24	Bahamas	0.28	Algeria	0.31	Indonesi	0.30
Oman	0.29	Tajikist	0.28	Moldova	0.23	Libya	0.28	Rwanda	0.31	Laos	0.30
Qatar	0.29	Swazilan	0.28	Guatemal	0.23	Syria	0.28	Comoros	0.30	Qatar	0.29
Paraguay	0.29	Iran	0.27	Qatar	0.22	Yemen	0.28	Burundi	0.29	Bolivia	0.29
Lebanon	0.29	Syria	0.27	Malawi	0.22	Panama	0.28	Togo	0.29	Malaysia	0.28
Syria	0.28	Cambodia	0.26	Burundi	0.21	Fiji	0.28	EqGuinea	0.29	Algeria	0.28
Comoros	0.28	Mauritan	0.26	Samoa	0.21	Qatar	0.28	Botswana	0.28	Burundi	0.28
Burundi	0.27	Philippi	0.25	Djibouti	0.21	Mozambiq	0.27	Qatar	0.28	Lesotho	0.28
India	0.27	Lesotho	0.25	Tanzania	0.21	Papua NG	0.26	Mauritan	0.27	Oman	0.28
Banglade	0.26	Banglade	0.25	Pakistan	0.20	Malawi	0.26	Ukraine	0.27	UnArabEm	0.28
Nepal	0.26	Yemen	0.24	Guinea	0.20	Rwanda	0.26	Papua NG	0.27	Paraguay	0.28
Lesotho	0.26	Pakistan	0.24	Lebanon	0.19	Guatemal	0.25	Samoa	0.27	Lebanon	0.27
Philippi	0.25	Gabon	0.23	Gabon	0.19	Samoa	0.25	Yemen	0.26	Banglade	0.27
Yemen	0.25	Nepal	0.21	Benin	0.19	Trin&Tob	0.25	Gabon	0.26	Iran	0.26
Mauritan	0.23	EqGuinea	0.21	Angola	0.18	Angola	0.25	Mali	0.25	Swazilan	0.25
Gabon	0.23	Zimbabwe	0.20	Mali	0.18	Djibouti	0.25	Georgia	0.25	Syria	0.25
Zimbabwe	0.23	Laos	0.20	Nigeria	0.18	Lesotho	0.24	Malawi	0.24	Comoros	0.25
Malawi	0.23	Ghana	0.20	Uganda	0.18	Burundi	0.24	Uganda	0.24	Zimbabwe	0.25
Iran	0.22	Guatemal	0.19	Botswana	0.17	Pakistan	0.22	Tanzania	0.24	Djibouti	0.24
Pakistan	0.22	Angola	0.18	Iran	0.15	Nigeria	0.22	Suriname	0.23	Ghana	0.24
EqGuinea	0.22	Burundi	0.18	Laos	0.15	Uganda	0.22	Bhutan	0.23	Philippi	0.24
Djibouti	0.22	Malawi	0.17	EqGuinea	0.14	Benin	0.22	Djibouti	0.23	Yemen	0.23
Tanzania	0.21	Tanzania	0.17	Chad	0.13	Tanzania	0.22	Bos&Ger	0.22	EqGuinea	0.22
Cameroon	0.17	Cameroon	0.17	Zimbabwe	0.11	Mali	0.22	Sierra L	0.21	Tanzania	0.22
Uganda	0.16	CotedIvo	0.14	Cameroon	0.11	Kyrgyzst	0.21	Benin	0.21	Mauritan	0.21
Eritrea	0.16	Benin	0.13	Eritrea	0.09	Lebanon	0.21	Tajikist	0.21	Gabon	0.21
Guinea	0.16	Zambia	0.12	Kyrgyzst	0.08	Botswana	0.20	Laos	0.21	Uganda	0.20
Guatemal	0.15	Eritrea	0.12	Zambia	0.07	Gabon	0.20	Nigeria	0.21	Malawi	0.20
Ghana	0.13	Mali	0.10	Belize	0.06	Laos	0.18	Iran	0.21	Nepal	0.19
Benin	0.13	Nigeria	0.09	Sierra L	0.06	Iran	0.16	Azerbaij	0.21	Papua NG	0.18
Zambia	0.13	Uganda	0.08	Sudan	0.06	EqGuinea	0.16	Uzbekist	0.20	Guatemal	0.17
Nigeria	0.13	Chad	0.06	Swazilan	0.05	Zimbabwe	0.15	Niger	0.20	Mozambiq	0.17
Chad	0.10	Sudan	0.03	Turkmeni	0.04	Cameroon	0.14	UnArabEm	0.19	Cameroon	0.16
CotedIvo	0.10	Sierra L	0.01	CotedIvo	0.00	Chad	0.13	Pakistan	0.19	Eritrea	0.16

Mali	0.09	BurkFaso	0.00			Eritrea	0.12	Belize	0.19	Guinea	0.15
Sudan	0.08			Afghanis		Zambia	0.12	Mozambiq	0.18	Pakistan	0.15
Angola	0.05	Afghanis		Barbados		CotedIvo	0.11	Cameroon	0.17	Benin	0.12
BurkFaso	0.02	Barbados		Belarus		BurkFaso	0.11	Swazilan	0.16	Zambia	0.11
Sierra L	0.00	Belarus		Brunei		Togo	0.10	BurkFaso	0.16	Sierra L	0.10
		Brunei		BurkFaso		Sudan	0.10	Moldova	0.15	Nigeria	0.10
Afghanis		CenAfrRe		CenAfrRe		UnArabEm	0.10	Chad	0.14	Chad	0.08
Barbados		China		China		Swazilan	0.09	Eritrea	0.13	Niger	0.08
Belarus		Colombia		Colombia		Sierra L	0.08	Zimbabwe	0.13	Togo	0.07
Brunei		Croatia		Croatia		Belize	0.08	Zambia	0.13	Sudan	0.06
CenAfrRe		Cuba		Cuba		CenAfrRe	0.00	CenAfrRe	0.12	Mali	0.06
China		Cyprus		Cyprus				Sudan	0.11	CotedIvo	0.05
Colombia		Denmark		Denmark		Afghanis		Kyrgyzst	0.09	CenAfrRe	0.05
Croatia		Ethiopia		Ethiopia		Barbados		Turkmeni	0.04	Angola	0.03
Cuba		Fiji		Fiji		Belarus		Angola	0.02	BurkFaso	0.00
Cyprus		Finland		Finland		Brunei		CotedIvo	0.00		
Denmark		France		France		China				Afghanis	
Ethiopia		Gambia		Gambia		Colombia		Afghanis		Bahamas	
Fiji		Germany		Germany		Croatia		Barbados		Barbados	
Finland		Guinea		Guyana		Cuba		Belarus		Belarus	
France		Guyana		Haiti		Cyprus		Brunei		Brunei	
Gambia		Haiti		Honduras		Denmark		China		China	
Germany		Honduras		Iceland		Ethiopia		Colombia		Colombia	
Guyana		Iceland		India		France		Cuba		Cuba	
Haiti		India		Iraq		Gambia		Cyprus		Cyprus	
Honduras		Iraq		Italy		Germany		Denmark		Denmark	
Iceland		Italy		Japan		Guinea		Ethiopia		Ethiopia	
Iraq		Japan		Kazakhst		Guyana		France		France	
Japan		Kenya		Kenya		Haiti		Gambia		Gambia	
Kenya		Korea N		Korea N		Honduras		Germany		Germany	
Korea N		Korea S		Korea S		Iceland		Guyana		Guyana	
Korea S		Kuwait		Kuwait		India		Haiti		Haiti	
Kuwait		Liberia		Liberia		Iraq		Honduras		Honduras	
Liberia		Lithuani		Lithuani		Italy		Iceland		Iceland	
Lithuani		Madagasc		Madagasc		Japan		India		India	
Madagasc		Malaysia		Malaysia		Kazakhst		Iraq		Iraq	

Malaysia	Malta	Malta	Kenya	Japan	Italy
Malta	Morocco	Morocco	Korea N	Kazakhst	Japan
Morocco	Mozambiq	Mozambiq	Korea S	Kenya	Kenya
Mozambiq	Burma	Burma	Liberia	Korea N	Korea N
Burma	Namibia	Namibia	Madagasc	Korea S	Korea S
Namibia	New Zela	New Zela	Malta	Liberia	Liberia
New Zela	Niger	Niger	Morocco	Lithuani	Lithuani
Niger	Norway	Norway	Burma	Madagasc	Madagasc
Papua NG	Papua NG	Poland	Namibia	Malta	Malta
Portugal	Portugal	Portugal	Niger	Morocco	Morocco
Russia	Russia	Russia	Norway	Burma	Burma
Rwanda	Rwanda	Rwanda	Poland	Namibia	Namibia
Saudi Ar	Saudi Ar	Saudi Ar	Portugal	Poland	Poland
Senegal	Senegal	Senegal	Russia	Portugal	Portugal
Singapor	Singapor	Singapor	Saudi Ar	Russia	Russia
Somalia	Somalia	Somalia	Senegal	Saudi Ar	Saudi Ar
Sri Lank	Sri Lank	Sri Lank	Singapor	Senegal	Senegal
Suriname	Suriname	Suriname	Somalia	Singapor	Singapor
Sweden	Sweden	Sweden	Suriname	Somalia	Somalia
Taiwan	Switzerl	Switzerl	Sweden	Spain	Suriname
Thailand	Taiwan	Taiwan	Switzerl	Sweden	Sweden
Togo	Togo	Togo	Taiwan	Taiwan	Switzerl
UnArabEm	UnArabEm	UnArabEm	Turkmeni	UnitedKi	Taiwan
UnitedKi	UnitedKi	UnitedKi	UnitedKi	USA	UnitedKi
USA	USA	USA	USA	Uruguay	USA
Vietnam	Vietnam	Vietnam	Vietnam	Vietnam	Vietnam

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