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A Cross-Country Analysis of Achievements and Inequities in Economic Growth and Standards of Living

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Contents

Abstract	v
Executive Summary	vii
I. Introduction	1
II. Living Standards: Concepts and Indicators	3
III. Cross–Country Inequities in Standards of Living	5
IV. Achievements in Standards of Living	7
V. Relationship between Per Capita GDP and Standards of Living	11
VI. Performance in Standards of Living	14
A. Methodological Framework	14
B. Identifying Countries with Superior (Inferior) Performance	15
C. Relative Performance of Asian Countries	17
VII. Convergence in Standards of Living	20
VIII. Public Spending and Standards of Living	24
IX. Concluding Remarks	25
Appendix	27
References	41

Abstract

This paper compares achievements and inequities in standards of living across countries. Achievement is measured by an index, which is constructed to reflect greater achievement for an increase in the standard of living of a country that is already at a high level compared to that of another country with an equal increase but from a lower base. The paper tests for the statistical relationship between indicators of standards of living and per capita income across countries. It analyzes the disparity of achievement in standards of living across countries and explains inequality in achievement in standards of living both within and between regions. Furthermore, the paper estimates the number of years it will take for different regions and selected Asian countries to catch up with the average standard of living of industrialized countries. The analysis presented is based on data from 177 countries covering the period 2000–2007.

Executive Summary

This study compares achievements and inequalities in standards of living across 177 countries over the period 2000–2007. Standard of living is based on six indicators: per capita gross domestic product (GDP) at 2005 purchasing power parity terms; life expectancy at birth; adult literacy rate; primary enrollment rate; under-5 survival rate; and births attended by skilled health personnel. These indicators are selected to reflect people's material well-being, health, and education, and are a mixture of both inputs and results that satisfy certain criteria such as availability of data and statistical correlation with other development indicators.

In this study, achievements in standards of living are measured and inequities are compared across countries using an achievement index. The achievement index is constructed to reflect greater achievement for a further increase in the standard of living of a country that is already at a high level compared to that of another country with an equal increase but from a lower base. The results suggest a large disparity in living standards across countries, and the disparity in per capita income is far greater than that in the other indicators of living standards. Sub-Saharan Africa is the poorest region with a per capita GDP that is only 19.9% of the world average during 2000–2007, while South Asia is the second poorest region with a per capita GDP that is 23.1% of the world average. The gap in per capita GDP between industrialized countries (including Japan) and the rest of the world is extremely large, with the former region having a per capita income that is almost four times as large as the world average. By comparison, the inequality for the other five non-income indicators of living standards—life expectancy at birth, adult literacy rate, net primary enrollment rate, under-5 survival rate, and births attended by skilled health personnel—is much lower than that for per capita GDP. Inequality in births attended by skilled health personnel is far higher than the other four indicators but substantially lower compared to per capita GDP.

The study also attempts to explain achievements in standard of living in terms of within- and between-region disparities. The study finds that inequalities in standards of living **between** regions account for most of the total inequality between countries. For instance, the regional inequality in the under-5 survival rate explains between-country inequality by more than 86%. This suggests that the inequality in standards of living **within** regions plays a minor role in explaining the total inequality between countries.

The study also investigates relative achievements in standards of living by different regions. Results suggest that South Asia has lower achievements in standards of

living relative to East Asia and the Pacific as well as to Central Asia. Individual country experiences in the relative achievements are also explored.

In South Asia, Sri Lanka presents an interesting study in achievements in standards of living. While Sri Lanka's per capita income is relatively higher than that of other South Asian countries, its growth rate is much lower than India's. However, achievements in standard of living indicators in Sri Lanka are shown to be far superior to all other countries in the region, including India. In particular, achievements in life expectancy at birth and net primary enrollment rate in Sri Lanka are superior not only to its neighboring countries in South Asia but also to those in Asia as a whole. In other words, Sri Lanka is punching above its economic weight in terms of improving people's lives, delivering beyond what is expected based on its income. This points to an impressive ability of Sri Lanka's institutions to effectively deliver social services to its citizens despite its weak macroeconomic performance; this ability could be a model for study and replication.

The study further explores the relationship between per capita GDP and achievements in standards of living. The relationship is investigated by deriving the growth elasticity of standard of living, which provides the responsiveness of changes in standards of living to economic growth. This elasticity is calculated for each of the 177 countries. The study finds that the growth elasticity of living standards for industrialized countries is extremely low, suggesting that they have already achieved high living standards; further improvements will be difficult and will require additional resources. The results also reveal that the impact of economic growth on standards of living in lower income countries—such as African countries—is more pronounced: at low levels of income, relatively small differences in per capita income can mean big improvements in outcomes. Moreover, the study results show that births attended by skilled health workers are the most responsive to growth in per capita GDP, while life expectancy at birth is more responsive to economic growth than the under-5 survival rate.

The current study also evaluates the prospects for countries in different regions to catch up with the living standards of industrialized countries. A methodology is introduced to estimate the number of years it would take for different regions or countries to catch up with the average standard of living of industrialized countries. Results show that the convergence in standards of living would take longer than the convergence in per capita incomes. For instance, South Asia would take 79 years to catch up with the industrialized countries in terms of life expectancy at birth while East Asia and the Pacific would take 34 years to achieve the same goal.

However, this aggregate regional picture hides the challenges faced by individual

countries. Results suggest that Nepal would never be able to catch up with the living standards of industrialized countries because during 2000–2007, Nepal’s per capita GDP growth rate of 1.1% is lower than the 1.5% of industrialized countries. This suggests that for Nepal to be able to catch up, it would require a substantially higher growth rate in per capita income as well as public policies that promote the efficient and effective delivery of social services, with a focus on improving health and education outcomes. If economic growth is the only channel to improve standards of living, it will take an exceptionally long—perhaps unrealistically long—period to improve standards of living; therefore, policies other than those promoting economic growth are essential to achieve this objective.

Other factors besides income influence the standards of living of a country. As shown in the experiences of Indonesia, Qatar, and Thailand, economic growth and increased public spending, though essential, are not enough to improve people’s standards of living. Rather, the government’s planning, delivery, and management of basic social services are major factors in improving people’s lives. The paper further discusses policy prescriptions to improve the delivery of basic social services from the perspective of public spending, highlighting the patterns of public spending that can effectively ensure that public money is spent on services utilized by the poor and that such services reach the intended program targets.

Finally, while procurement of and access to basic services are important, the quality of these services and the institutions that deliver them are just as crucial in improving people’s standards of living. The mere provision of services without quality maintenance and institutional development will fail to improve standards of living and could even prove detrimental if this results in a misalignment of priorities (e.g., bad schools could lead to lower enrollment rates). As the experiences of the countries covered by this study show, it is not enough that schools are built, medicines are distributed, and wells are dug—teachers will also have to be trained, patients have to be taught on proper use, and water has to be continually treated. This requires not only the enlargement of the economic pie and the allocation of resources toward basic services but also the development of policies and institutions that will enable the continuous and efficient delivery of quality basic social services.

I. Introduction

It is commonly believed that economic growth ought to be broad-based enough so that even the poorer segments of the population may experience strong improvements in their living standards. The contemporary concept of human development views development as a broader and richer process than mere economic growth and wealth accumulation (UNDP 2007). According to this concept, development means the creation of an environment in which all members of a society can fully take advantage of their potentials, live lives they wish to live, and have more choices. There are numerous instances of countries where rapid growth did not lead to strong improvements in human development. Countries with high per capita incomes can have poor records on human development, while those with low per capita incomes or growth rates can nevertheless do well on this front.

Experience in economic development demonstrates that economic growth needs to be complemented by reforms of the public services sector if sustainable improvements in human development are to be achieved. Moreover, without these reforms, rapid growth will likely be difficult to sustain. One key goal of these reforms should be the equitable provision of basic public services such as education and health, which constitute the most important guarantees and determinants of human development. Effective delivery of basic public services plays a critical role in promoting a more equitable pattern of human development by gradually realizing the equalization of opportunities.

Human development outcomes in health and education are determined by more than the availability and quality of education and health care. Many factors influence outcomes on both the demand and the supply sides, and are linked at many levels. Better nutrition helps children learn better, while better storage facilities and transport networks help keep medicines safe. The demand for health and education is determined by individuals and households who weigh the benefits and costs of making a particular choice based on the constraints they face, while the supply side covers many factors ranging from global trade networks all the way to teacher absenteeism and water supplies. While the issues related to the demand and the supply sides are important, these are beyond the scope of the current study.

The main objective of this study is to assess inequities and achievements in health and education outcomes across countries. It should be noted at the outset that “health and education outcomes” and “standards of living” are interchangeably used in this study. Six indicators of standards of living are selected; namely, life expectancy at birth, literacy rate, primary enrollment rate, under-5 survival rate, births attended by skilled health personnel, and per capita gross domestic product (GDP). While these indicators are a mixture of both inputs and results, they are selected based on criteria such as availability of data and statistical correlation with other development indicators.

This paper uses an achievement function to assess the achievements of countries in standards of living at different stages of economic development. It purports that a further increase in the standard of living of a country that is already at a high level signifies a greater achievement than that of another country with an equal increase in standard of living but from a lower base.

The main focus of the paper is to assess the performance of countries in different regions, particularly those in Asia. The paper also tests for the statistical relationship between indicators of the countries’ standards of living and per capita GDP. The questions this paper will address include: To what extent can aggregate income measures such as per capita GDP explain people’s standards of living? Can growth in per capita GDP alone bring about significant improvements in people’s standards of living in a reasonable period of time? How many years will it take for Asia to achieve the standards of living of the rich industrialized countries?

The analysis presented is based on data from 177 countries over the period 2000–2007. The data are averaged over the period to avoid any adverse effects of yearly fluctuations. The study analyzes disparity in standards of living across regions in the world. Living standards in Asia as a whole are compared to that of the world. The paper also explains the disparity in standards of living within and between regions.

The remainder of the paper is structured as follows. Section II discusses the concepts and indicators of standards of living. Section III is devoted to cross-country inequities in living standards. Section IV introduces the achievement index, and Section V looks into the relationship between income and standards of living. Section VI explores a country’s performance in standards of living in relation to its per capita income, while Section VII deals with the convergence of per capita income and standards of living. Section VIII provides a brief discussion of policies that are required to facilitate the convergence process, and the final section summarizes the major findings of the study.

II. Living Standards: Concepts and Indicators

As stated in the *Human Development Report 1990* (UN 1990), the primary objective of economic development is to improve the well-being of people. Several approaches have been used to define well-being or standard of living, including social indicators, quality of life, and basic needs (see Hicks and Streeten 1979, Hicks 1979, Drewnowski 1974, Morris 1979, Sen 1973, Streeten 1979, and Dasgupta 1990). While these approaches are evidently related to the concept of standard of living, they lack a unifying conceptual framework for defining and measuring standard of living. Such a framework has been developed by Sen (1985 and 1987), who defines standard of living in terms of functionings and capabilities. According to Sen (1985), standard of living must be seen in terms of an individual's achievements (i.e., functionings) and his ability to achieve (i.e., capabilities), and not merely in terms of that individual's means.

Having defined standard of living, the focus of attention should be on the selection of appropriate indicators to reflect people's capabilities or abilities to achieve. Ideally, the measurement of standard of living should incorporate all the capabilities that enhance human well-being, but from an empirical standpoint this is not a feasible task. After applying a few selection criteria, six indicators that can adequately reflect capability are chosen: life expectancy at birth, adult literacy rate, primary enrollment rate, under-5 survival rate, births attended by skilled health personnel, and per capita GDP. Note that these indicators are selected based on their data availability and their ability to reflect an individual's quality of life.

Reiterating Sen's conceptualization of standard of living, the primary concern should be with individual achievements and not with means. While input indicators are important because they enhance capabilities and extend functionings, they are not indicators of achievements; thus, only those variables that reflect results, not inputs, should be selected. Hicks and Streeten (1979) argue that output indicators are, in general, better measures of the level of welfare and basic needs achievement.

The six indicators selected for this study are a mixture of both results and inputs. Note that the distinction between input and output indicators may not be precise. For instance, primary and secondary school enrollments are input indicators because they provide the means to achieve higher literacy in the population. However, can literacy itself be considered as ultimate achievement of a society? Or is it only a means to achieve other functionings and capabilities? It is clear that a literate person is open to more capabilities—for example, being able to communicate more effectively with other members of a society. The literacy rate can thus be considered as both an input and an output indicator.

The under-5 survival rate and life expectancy at birth are the two most important indicators of achievement. The under-5 survival rate shows the number of children per one thousand live births who survive until their fifth birthday. This is a good indicator

of the availability of sanitation and clean water facilities that can protect children from diseases and infections caused by unsanitary household conditions. Moreover, the survival rate of children under five years old is largely determined by their nutritional status; thus, a child who is seriously malnourished because of dietary inadequacies or deficiencies in the mother's diet during pregnancy and lactation has a lower chance of survival. The infant mortality rate, similarly, points to the fulfillment of several basic needs such as health, sanitation, clean water supply, and good nutrition, making it a good indicator of achievement.

Life expectancy at birth indicates the number of years a newborn infant would live if patterns of mortality prevailing for all people at the time of birth were to stay the same throughout his life. It is the outcome of several input variables such as nutrition, water supply, sanitation, and medical facilities. As most people would prefer to live longer irrespective of the quality of life, life expectancy can be regarded as an indicator of achievement and, therefore, can be considered an important component of standard of living.

Births attended by skilled health personnel measures the proportion of births in which a skilled health worker is present. According to the World Health Organization (2008), complications arising from pregnancy and childbirth cause the deaths of more than half a million women every year and leave many others with serious and lifelong health problems. This input indicator is related to accessibility of appropriate health care services throughout pregnancy and childbirth. Evidence suggests that having a skilled health worker during delivery is highly associated with reduced maternal mortality (Graham et al. 2001). In this regard, the proportion of births attended by skilled health personnel can be regarded as an input measure because having a skilled attendant at birth provides the means to achieve lower maternal mortality.

Per capita GDP is considered an input variable because it provides a measure of the degree of command people have over commodities. It is an indicator of opulence, which is not the same thing as the standard of living.

Analysis in this study is confined to the five aggregate measures of well-being, in addition to per capita GDP. It excludes many other social and psychological characteristics that affect quality of life, such as security, justice, freedom of choice, human rights, employment, and satisfaction (see Morris 1979). The analysis is rather restricted mainly due to the unavailability of appropriate data and may appear to be too narrow in its scope. Nevertheless, it should be recognized that the five selected indicators apart from per capita GDP are proxies to a large number of important capabilities that influence human well-being.

In fact, the five indicators considered in this study are highly aggregated measures of well-being. Ideal measures would be those that reflect the well-being of individuals or

groups. In this context, Dasgupta (1990) correctly argues that focus should be on the distribution of well-being across class, caste, gender, or religion. It should be pointed out that the methodology used in this paper can be applied to analyze the standards of living at individual or socioeconomic group levels. However, it may not be feasible to carry out the same analysis for a large number of countries because of the demanding data requirements.

It must be emphasized that this study does not attempt to construct a single index of living standards. Several attempts have been made in this regard, including the widely known human development index (Morris 1979, UNRISD 1972, UN 1990). It is convenient and appealing to have a single overall index of well-being to be able to rank the countries, but the construction of such an index has many drawbacks. One of the main difficulties is the aggregation of several components of well-being into a single measure, and the selection of weights that should be attached to each component. In 1979, Morris constructed a single index derived by simply averaging three components: life expectancy at birth, infant mortality rate, and literacy rate. While this index has the merit of being simple, it is obviously arbitrary. There exists no rational economic justification for assigning equal weights to different components. An alternative approach that has been suggested in the literature is that of principal components in which the weights for indicators are taken as proportional to the leading principal component of the correlation matrix. The rationale behind this approach is that the data determine the optimal weights that capture the largest variation in the selected indicators.

In this study, analysis is done on each country's achievements in terms of the five separate indicators of living standards. There is no attempt to combine the five indicators into one single index. According to Sen (1987), measurements of living standards or well-being that has inherent plurality should not be seen as a one-dimensional measure such as that of weight or height; therefore, a partial ordering approach is adopted in which comparisons of living standards are made by ranking countries in accordance with each of the capabilities considered.

III. Cross-Country Inequities in Standards of Living

The analysis presented here is based on data from 177 countries, which are divided into eight mutually exclusive regions. As discussed in Section II, the standard of living is measured by five indicators; life expectancy at birth; adult literacy rate; net primary school enrollment rate; under-5 survival rate; and births attended by skilled health personnel. Per capita GDP at 2005 purchasing power parity (PPP) terms is a measure of a country's opulence or the command people have over goods and services; the higher is this measure, the richer a country is. Since per capita GDP is measured in PPP terms, values are comparable across countries. These six indicators used in the study are selected from World Development Indicators.

Table 1 presents, on a regional¹ basis, the weighted average of per capita GDP (at 2005 PPP terms) and the five indicators of standard of living, using the countries' relative populations as weights. Using population weights is appropriate since larger countries should be assigned a heavier weight when the standard of living is aggregated across regions. To assess the various regions' relative performance, the average standard of living shown in Table 1 is normalized by making the average world standard of living equal to 100. The normalized results are presented in Table 2.

Table 1: Average Standard of Living by Region, 2000–2007

Region	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific	4217	70.4	98.2	94.7	969	89.8
South Asia	1959	63.8	74.0	85.6	918	39.5
Central Asia	3547	68.0	99.7	92.0	948	95.3
Eastern Europe	10204	69.3	98.6	91.2	981	96.6
Latin America and Caribbean	8256	72.2	96.1	95.2	972	89.2
Middle East and North Africa	8330	70.5	88.9	89.9	961	78.4
Sub-Saharan Africa	1686	49.7	69.7	64.2	844	46.2
Industrialized Countries	33641	78.9	99.7	97.5	994	99.4
World	8469	68	87	88	947	74

Source: Author's calculations based on World Development Indicators.

It is evident that regional inequality in per capita GDP is extremely high. Sub-Saharan Africa is the poorest region with a per capita GDP that is only 19.9% of the world average, while South Asia is the second poorest region with a per capita GDP that is 23.1% of the world average. The gap in per capita GDP between industrialized countries (including Japan) and the rest of the world is extremely large with the former having a per capita GDP that is almost four times the world average.

The disparity between countries can be assessed through a well-known measure of inequality, the Theil index, with each country as an observation. The estimated index for per capita GDP is 66.51, which could be considered as extremely high.

The Theil index has an interesting property: it can be decomposed into between- and within-group inequalities. The groups in this case correspond to the eight regions as shown in Table 2. The between-region inequality is calculated to be 54.0. This means that the disparity in per capita GDP between regions explains most of the total inequality between countries by 81.26%.

¹ The composition of each region is defined in Appendix Table 1.

Table 2: Relative Standard of Living Index by Region, 2000–2007

Region	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific	49.8	103.9	112.6	107.7	102.3	121.9
South Asia	23.1	94.1	84.9	97.3	97.0	53.7
Central Asia	41.9	100.3	114.2	104.6	100.1	129.4
Eastern Europe	120.5	102.2	113.1	103.7	103.6	131.2
Latin America and Caribbean	97.5	106.5	110.1	108.3	102.6	121.1
Middle East and North Africa	98.4	104.0	101.9	102.2	101.5	106.5
Sub-Saharan Africa	19.9	73.4	79.9	73.0	89.2	62.8
Industrialized Countries	397.2	116.5	114.2	110.9	105.0	135.0
World	100.0	100.0	100.0	100.0	100.0	100.0
Between-region Inequality (BRI)	54.00	0.80	1.00	0.80	0.10	6.60
Within-region Inequality	12.51	0.07	0.50	0.55	0.04	4.76
Between-country Inequality (BCI)	66.51	0.87	1.50	1.35	0.14	11.36
Contribution of BRI to BCI (%)	81.26	87.44	67.78	55.61	81.01	58.09

Source: Author's calculations based on World Development Indicators.

By comparison, the between-country inequality for the five indicators of standard of living is much lower than that for per capita GDP. For instance, inequality in life expectancy at birth between countries is just 0.87 compared with 66.51 for per capita GDP. For births attended by skilled health personnel, the corresponding measure of inequality is 11.36, which is much higher relative to the other four nonincome indicators but substantially lower compared to per capita GDP.

It should be noted, though, that a lower between-country inequality in standard of living does not suggest that poorer countries with a lower standard of living perform relatively better in achieving a higher standard of living. The issue of standard of living should be distinguished from that of actual status before assessing individual country achievements. This issue will be dealt with in the next section.

IV. Achievements in Standards of Living

Unlike per capita GDP, the indicators of standard of living have asymptotic limits, reflecting physical and biological maxima—they cannot go on increasing limitlessly or infinitely. For example, life expectancy at birth has an upper limit of around 85 years and the adult literacy rate cannot exceed 100. Another important characteristic is that as the standard of living reaches progressively higher limits, any incremental improvement would represent a higher level of achievement than similar incremental improvements from a lower base. For instance, an increase in life expectancy at birth from 70 to 75 years

would imply a greater achievement than an increase from 45 to 50 years. In this regard, the relationship between achievement and the value of the indicator is not linear; thus, the observed differences in the levels of indicators of living standards do not reflect their true achievement.

Using an axiomatic approach, Kakwani (1993) derived an achievement index that lies between 0 and 100. The achievement index considers a further increase in the standard of living of a country that it is already at a higher level as an achievement greater than that of another country with an equal increase in standard of living but from a lower base. While Kakwani (1993) derived a class of achievement functions, the present study uses only the following member of the class:²

$$f(y, M_0, M) = \frac{100 \times [\ln(M - M_0) - \ln(M - y)]}{\ln(M - M_0)} \quad (1)$$

where y is a value of an indicator of living standard that has a minimum value of M_0 and a maximum value of M . The achievement function becomes 0 when $y = M_0$ and becomes equal to 100 when y approaches M .

To compute the achievement index, the minimum and maximum values need to be specified. Based on the data for 177 countries, the following minimum and maximum values are calculated:

- (i) Life expectancy at birth: 35 to 86
- (ii) Adult literacy rate: 0 to 100
- (iii) Net primary enrollment rate: 0 to 100
- (iv) Under-5 survival rate: 0 to 1000
- (v) Births attended by skilled health personnel: 0 to 100

The results of the achievement index are shown in Tables 3 and 4. Table 3 presents the weighted average of the achievement index by region. Table 4 presents the relative achievement index that is the normalized index of achievement relative to the average achievement of the world; i.e., the world index is set to 100.

Recall from Table 2 that the average life expectancy at birth for industrialized countries was about 16.5% higher than the world average. According to Table 4, however, the average achievement in this indicator for industrialized countries is 76.3% higher than the average of achievement in the world. This suggests that the disparity in achievement in life expectancy at birth between countries is far greater than that in actual terms. The Theil inequality measure also shows that across countries, the inequality of achievement

² This study focuses only on one member of a class of achievement functions because (i) it is the most relevant to the current analysis and (ii) using other member of the class does not add new insight into the analysis.

in this indicator is much greater than the inequality in actual life expectancy at birth. Similar results hold for the other four indicators of living standards considered in this study.

Table 3: Achievements in Standards of Living by Region, 2000–2007

Region	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific	30.6	92.8	69.7	51.7	65.1
South Asia	21.2	29.9	44.5	36.4	11.7
Central Asia	26.6	100.0	63.0	43.7	77.4
Eastern Europe	29.0	91.3	55.0	58.6	88.6
Latin America and Caribbean	33.7	74.4	72.9	52.5	60.4
Middle East and North Africa	30.8	56.2	57.3	48.6	42.2
Sub-Saharan Africa	8.9	28.7	25.7	27.7	16.3
Industrialized Countries	51.0	99.8	84.5	74.8	99.8
World	28.9	63.3	57.2	48.9	50.6

Source: Author's calculations.

Table 4: Relative Achievements in Standards of Living by Region, 2000–2007

Region	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific	105.6	146.6	121.9	105.5	128.5
South Asia	73.3	47.2	77.8	74.4	23.2
Central Asia	92.0	157.9	110.2	89.3	152.9
Eastern Europe	100.2	144.3	96.2	119.8	175.0
Latin America and Caribbean	116.4	117.5	127.4	107.3	119.4
Middle East and North Africa	106.5	88.7	100.2	99.3	83.3
Sub-Saharan Africa	30.8	45.4	45.0	56.7	32.2
Industrialized Countries	176.3	157.7	147.7	152.7	197.2
World	100.0	100.0	100.0	100.0	100.0
Between-region Inequality	9.50	13.10	6.20	4.10	27.80
Within-region Inequality	1.78	2.51	4.22	0.67	12.62
Between-country Inequality	11.28	15.61	10.42	4.77	40.42
Regional Inequality (%)	84.22	83.92	59.50	85.95	68.78

Source: Author's calculations.

Figure 1 shows that countries in South Asia have lower achievement in standards of living than countries in East Asia and the Pacific and Central Asia. This result holds uniformly for all six indicators of standard of living. The gap between South Asia and the rest of Asia is narrowest in per capita GDP, but is much wider in the adult literacy rate and births attended by skilled personnel, suggesting that the South Asian region needs to pay greater attention to improving its education and health sectors. Yet, individual country experiences may differ across countries in South Asia.

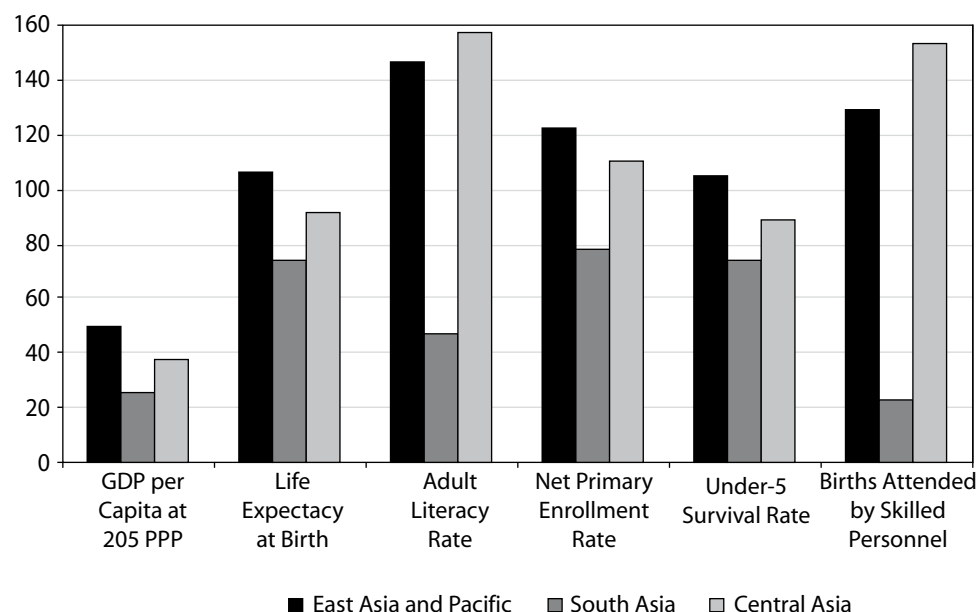
Figure 1: Relative Achievements in Standards of Living in Asia

Table 5 provides the relative achievements of five major countries in South Asia. It can be seen that Sri Lanka has the most outstanding achievements in standards of living in South Asia, with a higher per capita GDP than its four neighbors and a growth rate lower only to India. Furthermore, achievements in standards of living in Sri Lanka are far superior to other countries in the region; in particular, two indicators of living standards stand out for Sri Lanka: life expectancy at birth and net primary enrollment rate, which are the highest among the selected countries in Asia.

Table 5: Relative Achievements in Standards of Living in Selected Countries in Asia

Country	Growth Rate	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Bangladesh	3.8	12.0	68.0	34.7	85.6	75.0	6.6
India	6.1	24.4	72.9	49.6	81.6	74.0	25.3
Nepal	1.1	11.1	23.4	41.4	56.4	79.0	6.8
Pakistan	3.1	24.7	75.8	36.1	36.6	68.0	12.7
Sri Lanka	4.5	39.9	129.3	107.1	152.3	123.0	138.1
China, People's Rep. of	9.5	43.5	109.0	153.5	–	105.0	150.4
Indonesia	3.7	36.2	87.1	149.2	148.0	96.0	48.0
Lao People's Dem. Rep.	4.8	20.1	68.1	52.7	60.7	73.0	9.3
Philippines	2.9	33.7	105.2	103.4	102.2	99.0	38.1
Thailand	4.3	78.2	98.0	134.2	82.8	137.0	174.8
Viet Nam	6.3	23.4	102.2	–	95.1	113.0	75.4
Industrialized Countries	1.5	397.2	176.3	157.7	147.7	152.7	197.2
World	5.0	100.0	100.0	100.0	100.0	100.0	100.0

– indicates data not available.

Source: Author's calculations.

In East Asia and the Pacific, the People's Republic of China (PRC) is the fastest growing economy and its overall performance in virtually all available indicators of living standards surpasses world averages by wide margins, particularly in terms of adult literacy rate and births attended by skilled health personnel. On the other hand, while Thailand has a higher achievement in per capita GDP than the PRC, its achievements in standards of living are not as consistent. Note that although achievements in life expectancy at birth and adult literacy rate are better for the PRC, Thailand has superior achievements in the two other health indicators. Gaps (urban–rural gaps, regional disparities, gender gaps, and gaps among different social groups) in access to basic public services in health and education remain among the challenges facing the PRC in its current phase of development (UNDP 2007).

V. Relationship between Per Capita GDP and Standards of Living

Per capita GDP measures the total output per person that is produced in an economy: the higher the output, the greater the access people have to goods and services. Therefore, there would be a strong association between national income and standards of living, with higher national income being strongly associated with lower child mortality and higher primary school completion (World Bank 2004).

As noted earlier, however, the relationship between per capita GDP and standards of living is nonlinear. As per capita GDP increases, the standard of living increases less and less steeply until it reaches an asymptotic limit (Hicks and Streeten 1979). Many attempts have been made in the past to estimate the nonlinear relationship, which captures the asymptotic behavior of indicators of standard of living (Sheehan and Hopkins 1979, Morris 1979, Grosse and Perry 1983, Goldstein 1985). All these models are generally flawed because of the frequent misspecification of the nature of nonlinearity inherent in them.

The achievement index discussed in the previous section captures the nature of nonlinearity of indicators of standards of living. Kakwani (1993) argues that it is more natural to relate the achievement index to per capita GDP. Following this argument, the following model is adopted:

$$f_i(y_i, M_0, M) = \alpha + \beta \log(x_i) + u_i \quad (2)$$

where $f_i(y_i, M_0, M)$ defined in equation (1) is the achievement index of the i th country with a social indicator y_i , x_i is the per capita GDP of the i th country, and u_i is the error term. The use of the achievement function captures the nonlinear characteristics of standards of living.

The achievement equation (2) is estimated for each of the five indicators of living standards using the least squares method. The coefficient estimates along with the t -values are presented in Table 6. One of the assumptions of the least squares method is that the residual variance is constant over the observations. This assumption is unlikely to hold using cross-country data. Even if this assumption is violated, the least-squares estimates are still unbiased yet the estimates of t -values are biased. To remedy this situation, robust t -values are calculated using a heteroskedastic-consistent covariance matrix estimator proposed by White (1980).

Table 6: Regression Coefficients of Achievement in Standards of Living on per Capita GDP

Achievements in Standards of Living	log (GDP per capita)	Robust t-values	R-squared	Number of Observations
Life Expectancy at Birth	9.5	21.2	0.7	177
Adult Literacy Rate	18.1	11.3	0.6	108
Net Primary Enrollment Rate	13.6	11.1	0.4	159
Under-5 Survival Rate	11.7	12.4	0.8	175
Births Attended by Skilled Health Personnel	23.2	22.7	0.6	162

Source: Author's calculations.

The coefficient of determination—the R-squared—is estimated to assess the accuracy of regression models. Table 6 shows that the estimated values of the coefficient of determination for the regression equations vary from 0.6 to 0.8, which could be regarded as quite high given that the sample observations range from 108 to 177. This suggests that the model is reasonably well specified and that per capita GDP at 2005 PPP terms is an important determinant of achievements in standards of living.

Differentiating equation (2) and using equation (1), the elasticity of standard of living y_i with respect to x_i is obtained as

$$\eta_i = \beta \log(M - M_0) \left(\frac{M}{y_i} - 1 \right) / 100 \quad (3)$$

which shows that the higher the standard of living of a country, the smaller the elasticity. When the standard of living (y_i) approaches its maximum value M , the elasticity approaches 0. Its implication is that economic growth will have a greater impact on standards of living among poorer countries than richer ones. This is explained by the fact that standard of living becomes more difficult to raise as it reaches a higher level. An earlier study by Bruns et al. (2003) finds that among lower income countries, 10% more income per capita is associated with, on average, a 6.6% lower child mortality rate and a 4.8% higher primary school completion rate. Among middle-income countries, however, 10% more income per capita is associated with 7.7% less mortality but little improvement in primary completion.

Table 7: Average Elasticity of Standards of Living by Region, 2000–2007

Region	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific	0.08	0.02	0.04	0.03	0.17
South Asia	0.13	0.30	0.11	0.07	2.12
Central Asia	0.10	0.00	0.06	0.04	0.06
Eastern Europe	0.09	0.01	0.06	0.02	0.04
Latin America and Caribbean	0.07	0.03	0.03	0.02	0.20
Middle East and North Africa	0.08	0.11	0.08	0.03	0.45
Sub-Saharan Africa	0.27	0.44	0.41	0.15	2.99
Industrialized Countries	0.03	0.00	0.02	0.00	0.01
World	0.11	0.15	0.11	0.05	0.96

Source: Author's calculations.

The growth elasticity of standards of living defined in equation (3) is a useful indicator because it provides the responsiveness of changes in standards of living to economic growth. This elasticity is calculated for each of the 177 countries, and Table 7 presents the weighted average of elasticities for the eight regions using the population of each country as the corresponding weight.

A 1% economic growth in the world increases the world's life expectancy at birth by 0.11%. The impact of economic growth on life expectancy at birth in Africa is much greater as indicated by an elasticity of 0.27. This is expected because given the current low level of life expectancy at birth in Africa, the indicator would be easily improved with only small increases in per capita income. In industrialized countries, on the other hand, the growth elasticity of life expectancy at birth is extremely low at 0.03, since these countries have already achieved high levels of this indicator and further improvements will require substantially larger resources.

Moreover, results reveal that life expectancy at birth is more responsive to per capita GDP than the under-5 survival rate, and this result holds uniformly across regions. This finding suggests that achievement in improving child mortality has been much more impressive in the world and, thus, higher growth rates would be required to achieve the same level of improvement in the indicator in the future. The magnitude of elasticity for Africa, 0.15, can be considered high; as such, economic growth will play a significant role in improving the under-5 survival rate in the African region.

Compared to the other indicators, the indicator for births attended by skilled health personnel is found to be the most responsive to economic growth. A 1% growth in the world would improve the health indicator by 0.96%. In Africa, the same growth rate would lead to an almost 3% higher proportion of births with skilled health staff. In South Asia, an extra 1% growth rate would improve this indicator by 2.12%.

The education indicators—adult literacy rate and net primary school enrollment rate—are much more responsive to per capita income in South Asia as well as in Africa. In these two regions, higher income per capita would result in more school-age children attending primary school and thus a higher adult literacy rate.

This section showed that income and standards of living are strongly associated, particularly in low-income countries. However, the low elasticities shown in Table 7 suggest that improving living standards will require significantly high growth rates if this is the only channel used for achieving such goals. Thus, policies that can do more than increase growth are required; these policies will be discussed in Section VIII.

VI. Performance in Standards of Living

A. Methodological Framework

Per capita GDP in PPP dollars measures how rich a country is in terms of material consumption. The regression model estimated in the previous section demonstrates that per capita GDP is an important determinant of a country's standard of living. The positive and highly statistically significant values of β imply that the richer a country is, the higher is the expected standards of living. However, a one-to-one relationship between the country's material prosperity and the standards of living does not exist because the model only explains around 60–80% of variations in standards of living. There is still a considerable unexplained variation which implies that there are factors other than income that impact a country's standard of living. These factors may include the scope and quality of basic services in health and education provided by governments.

The unexplained variation in the model suggests that the level and distribution of health and education services vary widely among different countries even if they have the same level of per capita income. A country may be assessed as having superior (inferior) performance in standards of living if it enjoys higher (lower) living standards than what is expected on the basis of its per capita income. The residual term in the model includes the effect of factors other than income that affect the living standards. If the residual, or the difference, between actual and expected values of the achievement index is positive (negative), it can be said that the country has higher (lower) standards of living relative to its per capita income. This methodology allows the identification of countries that have superior (inferior) performance in standards of living.

The residual term in equation (2) is given by

$$\hat{u}_i = (f_i - \beta \log(x_i)) \quad (4)$$

For large samples, it is expected that \tilde{u}_i is normally distributed with zero mean and variance s^2 , where s is the estimated standard error of the regression. This gives the studentized residual as

$$\hat{u}_i^* = \frac{(f_i - \hat{\beta} \log(x_i))}{s} \quad (5)$$

which, for large samples, is normally distributed with zero mean and unit variance. In this study, the value of \hat{u}_i^* is calculated for each country. The performance of a country in standards of living can be assessed by the magnitude of \hat{u}_i^* : the larger this value is, the more superior is the performance of the i th country. The average value of \hat{u}_i^* for all countries is equal to zero as some countries will register a positive value and others will record a negative value, with positive (negative) values implying superior (inferior) performance. Thus, \hat{u}_i^* can be used as an indicator of a country's relative performance in living standards.

If \hat{u}_i^* is greater than 1.96, the i th country can be regarded as an outlier or a country with exceptionally superior performance. This is because the probability of achieving such an outcome is less than 0.05; i.e., the estimate is statistically significant at the 5% level. Similarly, if \hat{u}_i^* is less than -1.96, the i th country can be regarded as a country with exceptionally inferior performance in standards of living. Such outliers or exceptionally superior- and inferior-performing countries deserve special attention from the standpoint of policy making.

B. Identifying Countries with Superior (Inferior) Performance

Using the proposed indicator of a country's relative performance, this section identifies the countries that have exceptionally superior or inferior performance in standards of living. Appendix Table 2 in the presents the values of relative performance for individual countries.

The results show that Japan is the only country with exceptionally superior performance in life expectancy at birth. Other positive outliers or higher achievers in this indicator include Costa Rica; Hong Kong, China; and Sri Lanka. On the other hand, countries that have exceptionally inferior performance in life expectancy at birth are Angola, Botswana, Gabon, Equatorial Guinea, Namibia, Qatar, South Africa, and Swaziland. None of the Asian countries is included in the list of these negative outliers. In fact, a majority of the exceptionally inferior-performing countries is located in Sub-Saharan Africa.

The high incidence of HIV/AIDS in Africa could be a cause of such low level of life expectancy in relation to its per capita income level. Africa faces a particular challenge in combating the HIV/AIDS pandemic, which is reversing gains in life expectancy made over decades. HIV/AIDS is undermining growth, reducing the productivity of the workforce,

and diverting scarce public resources away from making progress in other health issues and increasing access to education. Moreover, the pandemic is now threatening countries with huge populations such as the PRC and India. Effective policies, backed by adequate resources, are required to check the spread of the pandemic and to provide health care for the millions who are or will be affected.

The under-5 survival rate is an indicator that reflects the health status of a country's population. The results show that no country can be categorized as a positive outlier or exceptionally high achiever in this indicator; however, there are three countries (Moldova, Sri Lanka, and Viet Nam) that are close to being exceptional and could be regarded as having relatively better performance in the under-5 survival rate compared to the other 174 countries. The value of this performance indicator for these three countries is higher than 1.90 but less than 1.96. In contrast, six countries (Angola, Botswana, Gabon, Equatorial Guinea, Qatar, and Swaziland) have shown exceptionally inferior performance in the under-5 survival rate. Their poor performance in this indicator could be largely explained in terms of barriers to quality basic health services such as lack of information and knowledge, inaccessibility and poor quality of service, unresponsive service providers, and high costs involved in seeking health care.

Access to safe water and adequate sanitation has a direct impact on the health status and mortality of people, particularly children. A study of eight countries by the World Bank (2004) found that the prevalence of diarrhea in children under 3 years old from households with no sanitation declined by six percentage points as conditions shifted from no improved water to "optimal" water. Moreover, the same study finds that moving from no sanitation to "optimal" sanitation results in a drop of 10 percentage points in diarrhea incidence in households with no improved water source. As with education, there are spillover effects associated with sanitation at the community level. In Peru, for example, sanitation investments by a family's neighbors were associated with better nutritional status for that family's children (Alderman et al. 2006).

Another indicator that is related to the delivery of health services is the number of births attended by skilled personnel. The results suggest that seven countries (Fiji Islands, Jordan, Kyrgyz Republic, Moldova, Mongolia, Samoa, and Uzbekistan) have achieved exceptionally superior performance in this indicator. In contrast, Equatorial Guinea is the only negative outlier, suggesting an exceptionally low achievement in terms of births attended by skilled personnel.

As regards net primary school enrollment rate, results suggest that Oman is an exceptionally inferior performer in relation to its per capita GDP, while another rich country in the Middle East and North African region, Qatar, is found to have exceptionally low achievement in adult literacy rate. These findings suggest that an overriding focus on economic growth without similar attention to public service systems and institutions would not produce a strong human development outcome. The absence of complementary actions to establish effective social services can be detrimental to long-term growth.

C. Relative Performance of Asian Countries

Section B was devoted to identifying countries with exceptionally superior or inferior performance; in this section, a relative performance index is introduced to analyze the performance of Asian countries with respect to the world average. The average value of the relative performance index for all countries included in the present study is equal to zero and is regarded as a benchmark in assessing a country's relative performance in standards of living. If an individual country has a value for the index greater (less) than zero, then the performance of that country is judged as better (worse) than the average performance of the world. The average values of the relative performance index are presented in Table 8 for eight different regions of the world; the corresponding values for individual countries are shown in Appendix Table 3.

The relative performance indexes for Sub-Saharan Africa and Middle East and North Africa are negative for all aspects of living standards that are considered in the current study, suggesting lower standards of living in relation to what is expected from their per capita income levels. As noted earlier, the per capita GDP of the African region is, on average, only 19% of the world GDP per capita. While sustainable and rapid economic growth is a prerequisite for improving living standards of people, most people have higher expectations of governments in terms of public services in health and education. Governments are expected to provide basic health services that will reduce infant and maternal mortality rates, as well as primary school and higher education that will enable people to compete in the labor market.

Table 8: Performance in Standard of Living by Region, 2000–2007

Region	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific	0.37	0.50	0.38	0.51	0.18
South Asia	0.36	−0.31	0.23	0.12	−0.84
Central Asia	0.56	2.46	0.30	0.07	1.18
Eastern Europe	−0.10	0.92	−0.16	0.73	0.96
Latin America and Caribbean	0.26	0.04	0.39	−0.02	−0.07
Middle East and North Africa	−0.12	−0.64	−0.51	−0.50	−0.46
Sub-Saharan Africa	−0.75	−0.46	−0.50	−0.68	−0.35
Industrialized Countries	0.61	0.22	0.44	0.51	−0.18
World	0.00	0.00	0.00	0.00	0.00

Source: Author's calculations.

It is surprising to note that the relative performance of countries in Central Asia is quite impressive in all aspects of living standards. In terms of adult literacy rate in particular, two countries (Armenia and Tajikistan) show exceptionally high performance. While statistics indicate very high adult literacy rates in Central Asia, there is a clear need to continue to expand opportunities for adult literacy programs and provide an

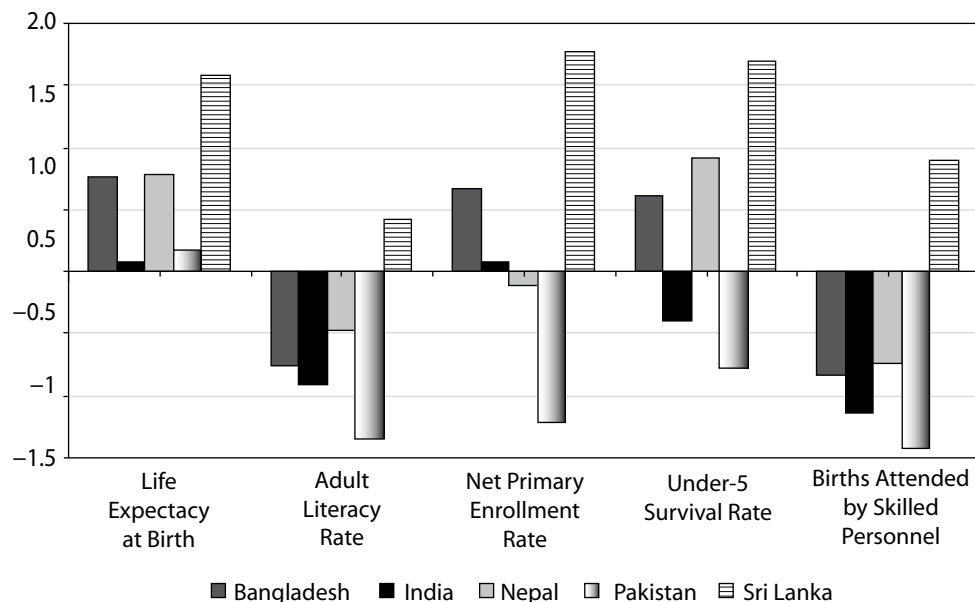
enabling literacy environment for all (World Bank 2004). Equally important are concerns over gender disparity as these remain a challenge in some countries in the region. In Tajikistan, for instance, boys are favored, such that there are only 95 girls enrolled per 100 boys in primary education. Meanwhile, primary education appears to favor of girls in Armenia, where 104 girls are enrolled for every 100 boys.

Countries in East Asia and the Pacific surpass the world average performance in all aspects of living standards, although Papua New Guinea and Brunei Darussalam have the worst outcomes in the region. In contrast, South Asia as a whole has performed worse than the world average in adult literacy rate and births attended by skilled personnel, but better than the world average in life expectancy at birth, under-5 survival rate, and net primary enrollment rate.

South Asia faces many challenges regarding health services and health outcomes. Results show that South Asia's indicator for births attended by skilled health staff is extremely poor compared to other regions. South Asia accounts for one third of maternal deaths worldwide (ADB 2007), and chances of dying during pregnancy are 1 in 43 in South Asia, compared to 1 in 30,000 in Sweden. However, there is a large variation in maternal death rates within South Asia, ranging from 58 per 100,000 live births in Sri Lanka to 450 in India in 2005 (World Bank 2008). Maternal mortality can be prevented with appropriate medical care and management, and thus depends mainly on health services. It is worth noting that midwifery services are linked to dramatic declines in maternal mortality in Sri Lanka (World Bank 2004). On the other hand, nutrition and child mortality depend on many other services such as education, water, food security, communication, electrification, and transportation.

In South Asia, the worst performing countries in all dimensions of standards of living are Bhutan and Pakistan. In Pakistan, poor performance in the social sector is attributed to the effects of elite dominance (Hussain 1999), as well as to the division into linguistic, religious, and regional factions that challenge Pakistan's ability to provide social services (Easterly 2001). In India, performance is particularly poor in terms of births attended by skilled personnel and adult literacy rate. All countries in South Asia (except Sri Lanka) show particularly poor performance in births attended by skilled personnel, suggesting a strong need for provision of health services by governments in the region. It should be noted that Sri Lanka is a positive outlier or a superior performer in every dimension of standards of living considered in the current study, exceptionally in the net primary enrollment rate and the under-5 survival rate (see Figure 2).

Figure 2: Relative Performance in Standards of Living in Selected Countries in South Asia



Source: Author's calculations.

The factors contributing to observed achievements have been the center of debate in the 1980s (Dreze and Sen 1989, Pyatt 1987, Bhalla and Glewwe 1986, Sen 1981, Isenman 1980). The countries with the best achievements identified here are also known for their excellent public welfare programs that include direct public provision of health, education, and other vital services. Sri Lanka has been known for a long time as a unique example of a developing country whose achievement in terms of basic needs has been impressive relative to its income level. Sen (1981) and Isenman (1980) have concluded that it is government action that made Sri Lanka an extraordinary country in promoting extensive social opportunities and providing widespread and equitable schooling, health, and other basic services.

The Sri Lankan government in 1977 changed the earlier welfare-oriented development strategy and introduced new economic policies that focused more on growth and investment. One of the many policy changes was the substitution of food subsidies by a means-tested food stamps program. The enormous savings that were realized as a result of the policy changes were directed to production and employment activities. In addition, the trade sector was liberalized and foreign exchange control was virtually withdrawn. Results of the current study suggest that cuts in welfare expenditures in the late 1970s did not make Sri Lanka an inferior performer in the 1980s and onward.

Government expenditures on education and health have an ability to influence human development outcomes; hence, public spending must concentrate in areas where market failure is pervasive and positive spillover is largest. Given limited public resources, the balance needs to shift more toward investments in primary health and education services. Additionally, the private sector and public–private partnerships should be encouraged to provide tertiary health and education services where market failure is minimal.

VII. Convergence in Standards of Living

In the previous sections, it was noted that the disparity in standards of living between industrialized countries and the rest of the world is extremely large. As pointed out in Section III, the average GDP per capita of industrialized countries is almost four times the average GDP per capita of the world. This section explores the likelihood of the rest of the world catching up with industrialized countries' living standards. Assuming catch-up is feasible, the length of time for the process to be completed is estimated. Specifically, the number of years it will take for the different regions to catch up with the average standard of living in industrialized countries is calculated.

Suppose x_k is the per capita GDP of the k th region, which is growing at an annual rate of γ_k percent on average. Over the period of n years, the per capita GDP of the k th region will be given by

$$x_{kn} = x_k(1 + \gamma_k)^n \quad (6)$$

Following this, a similar expression can be derived for the reference group, i.e., the industrialized countries. Consider that the per capita GDP of the reference group is denoted as x_0 and it grows at an annual rate of γ_0 percent on average. In n years, the average per capita GDP of the reference group will be

$$x_{0n} = x_0(1 + \gamma_0)^n \quad (7)$$

Suppose that after n years, the per capita GDP of the k th region approaches that of the reference group. This scenario results in $x_{kn} = x_{0n}$ and also

$$n = \frac{\log(x_0) - \log(x_k)}{\log(1 + \gamma_k) - \log(1 + \gamma_0)} \quad (8)$$

which is obtained from equations (6) and (7). Since $x_0 > x_k$ for all k regions, n will be positive if $\gamma_k > \gamma_0$. Estimating the number of years (n) in equation (8) requires the growth rate γ_k for the k th region.

Based on per capita GDP at 2005 PPP terms, annual growth rate is calculated for each of the 177 countries for the period 2000 to 2007. The growth rate is then averaged over the period for each country. The aggregate growth rates for each region are calculated by averaging the countries' growth rates using their respective populations as weights. The regional growth rates are presented in the first numerical column of Table 9. The regions that exhibited the highest growth were Central Asia and East Asia and the Pacific. Although Central Asia went through a severe economic crisis in the first half of the 1990s, it performed well in 2000–2007 when its average growth rate was 8.13% per annum. East Asia and the Pacific include rapidly-growing economies like the PRC and slow-growing ones like the Pacific island countries; thus, the region's average growth rate was 7.82% over the first seven years of the 21st century.

Table 9: Number of Years Required to Catch up with Industrialized Countries' Living Standards by Region

Region	Average Annual Growth Rate	Number of Years for Convergence					
		GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific	7.82	34	34	6	17	31	24
South Asia	5.43	74	79	97	74	82	96
Central Asia	8.13	35	39	0	24	40	15
Eastern Europe	6.11	27	50	10	47	30	10
Latin America and Caribbean	2.24	184	235	181	110	243	219
Middle East and North Africa	2.91	98	147	166	138	153	172
Sub-Saharan Africa	3.09	188	273	241	265	246	222
Industrialized Countries	1.46	0	0	0	0	0	0
World	5.01	40	66	57	57	62	60

Source: Author's calculations.

The second column of Table 9 presents the number of years it will take for the different regions to achieve the average per capita GDP of industrialized countries. Results show that it will take 40 years for the world to catch up with industrialized countries' per capita income. The corresponding figures for Sub-Saharan Africa and South Asia are 188 and 74 years, respectively. Although Latin American countries enjoyed high growth rates in the 1960s and 1970s, their growth rates were extremely low in the 2000s, which is why it will take 184 years for these countries to catch up with the per capita GDP of the industrialized countries. Note that the results presented here are based on the assumption that countries in the different regions will maintain the same average growth rates over time.

Calculating the number of years to catch up with the reference group in terms of the five indicators of living standards requires a different approach. The growth elasticity of living standards presented in Table 7 cannot be used to project future standards of living. This is because elasticities do not remain constant over time since elasticity declines with rising standards of living. To tackle this problem, the following methodology is adopted.

The regression model presented in equation (2) provides the estimated achievement for the k th region as

$$\hat{f}_k = \hat{\alpha} + \hat{\beta} \log(x_k) \quad (9)$$

which, on taking first differences, gives the change in achievement as

$$\Delta \hat{f}_k = \hat{\beta} \Delta \log(x_k) = \hat{\beta} \gamma_k \quad (10)$$

where $\gamma_k = \Delta \log(x_k)$ is the growth rate of the k th region and $\Delta \hat{f}_k$ is the annual absolute change in achievement of the k th region, of which its per capita GDP increases at an annual rate of γ_k percent.

In n years, the achievement of the k th region will be given by

$$f_{kn} = f_k + n \hat{\beta} \gamma_k \quad (11)$$

Similarly, the achievement of the reference group over n years will be given by

$$f_{0n} = f_0 + n \hat{\beta} \gamma_0 \quad (12)$$

Suppose that after n years, the achievement of the k th region approaches the achievement of the reference group. This will lead to $f_{kn} = f_{0n}$ as well as

$$n = \frac{(f_0 - f_k)}{\hat{\beta}(\gamma_k - \gamma_0)} \quad (13)$$

which is obtained from equations (11) and (12). n in equation (13) is the number of years it will take for the standard of living in the k th region to approach that of the reference group, i.e., the industrialized countries. Note that n should always be positive. Since $f_0 > f_k$ for all k regions, n will be positive if $\gamma_k > \gamma_0$. Tables 9 and 10 present the values of n for the five indicators of living standards considered in this study.

The results in Table 9 suggest that convergence in standards of living will take longer than convergence in per capita GDP. East Asia and the Pacific will take 273 years to catch up with the reference group in life expectancy at birth while South Asia will take only 79 years.

This regional picture, however, hides the challenges faced by individual countries. For instance, Pakistan and Bangladesh would take 187 and 141 years, respectively, to catch up with industrialized countries' achievement in terms of life expectancy at birth (Table 10). The results also show that Nepal would not be able to catch up with the living standards of industrialized countries because its average growth rate of 1.1% during 2000–2007 falls short of the 1.5% achieved by industrialized countries during the same period. This suggests that for Nepal to be able to catch up with industrialized countries' living standards, it would require a substantially higher growth rate in per capita income and/or public policies that can promote greater efficiencies and effective delivery mechanisms, with a focus on improved health and education outcomes.

In calculating n , it is assumed that while per capita GDP changes over time, other factors that may influence standards of living remain constant. This means that income is assumed to be a major contributor to improving standards of living. Yet results suggest that if growth is the only channel, it will take an exceptionally long—perhaps unrealistically long—period to improve living standards. Policies other than increasing growth alone are required to achieve this objective.

Table 10: Number of Years Required for Selected Asian Countries to Catch up with Industrialized Countries

Country	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Bangladesh	153	141	184	112	138	178
India	62	68	81	60	71	81
Nepal	*	*	*	*	*	*
Pakistan	173	187	259	285	216	246
Sri Lanka	78	47	58	-6	40	43
China, People's Rep. of	29	26	2	–	25	13
Indonesia	110	121	13	0	106	146
Lao People's Dem. Rep.	92	99	110	110	100	123
Philippines	175	151	132	133	155	241
Thailand	59	84	29	96	23	17
Viet Nam	61	47	–	46	34	55
Industrialized Countries	0	0	0	0	0	0
World	40	66	57	57	62	60

* indicates unable to catch up; – indicates data not available

Source: Author's calculations.

VIII. Public Spending and Standards of Living

This study has demonstrated that per capita GDP is an important determinant of a country's living standards: the richer a country is, the higher is the expected standard of living. An implication of this observation is that a country can enhance its living standards by promoting economic growth. This study, however, finds that countries' relative performance in standards of living varies widely in relation to their per capita GDP. This finding suggests that a one-to-one relationship between a country's material prosperity and its living standards does not exist. There are factors other than income that have an impact on a country's standard of living, including the basic services provided by governments in health and education, and access to these services by the population, which determines health and education outcomes. Countries whose performance in standards of living is inferior in relation to their per capita GDP do not have systems that promote the efficient delivery of services in health and education. While economic growth is essential, it is not enough to improve citizens' well being.

If growth is not enough, then what else can governments do to improve standards of living?³ One approach would be to increase public spending. More spending by governments can be crucial in promoting improvements in health and education outcomes. For instance, policy interventions to reduce mortality may require increased public spending or, similarly, it may be necessary to spend more on educational programs that aim to increase primary completion rates. However, what matters is not only how much was spent but also how effectively this money was spent.

There are a handful of countries that suggest an inconsistent relationship between changes in public spending and outcomes. For example, Thailand has increased public spending on primary schooling more than Peru did, yet primary school completion fell in Thailand and increased in Peru. Likewise, an analysis of Malaysia over the late 1980s found little association between public spending on doctors and infant or maternal mortality, and the increased construction of public schools in Indonesia that occurred in the 1970s did not have a significant positive impact on school enrollments. The cross-country association between public spending and outcomes, after controlling for national income, is found to be statistically and substantively weak. The message is not that public funding cannot be successful; rather, it is commitment and appropriate policies, backed by effective public spending, that can achieve these goals.

³ Governments often see improving health and education outcomes as a public responsibility. There are two economic rationales for this responsibility. The first rationale is market failure; more specifically, if there is no government intervention, the amount of services produced and consumed would be less than optimal from society's point of view. As there is no market incentive to produce public goods, government intervention is required. The other economic justification for public responsibility is related to equity concerns. Issues such as improving outcomes in health and education for poor people or reducing the gaps in outcomes between the poor and the better-off are often considered a government responsibility.

Most poor people do not get their fair share of government spending on public services in health and education. Benefit incidence analysis on public expenditure provides a clearer picture of who benefits from government spending. Evidence largely suggests that the poorest fifth of the population receives less than a fifth of education and health expenditures, while the richest fifth gets more: 46% of education spending in Nepal goes to the richest fifth, and the poorest receive only 11% (Filmer 2003). Similarly, in India the richest fifth receives three times the curative health care subsidy of the poorest fifth. One reason for this imbalance is that spending is biased toward services mainly utilized by richer people; another reason is that while channeling public spending toward services utilized by the poor helps, such services may not be reaching the targeted beneficiaries.

Indeed, public spending is not always effective in providing quality services and reaching the intended beneficiaries, who are often the poor, and this partly explains why spending has a weak relationship with outcomes. Another reason for such a weak relationship is the interaction between private and public sectors. Increasing public provision may simply crowd out, in part or in whole, equally effective services offered by nongovernment providers. Unless resources support services that work for poor people, the public resources spent on these services will not get the optimal outcome.

If more public money is spent on services and more of that money is spent on services utilized by the poor, the spending pattern will determine the efficacy of spending. For instance, wages and salaries of teachers on average account for 75% of recurrent public expenditure on education. There is no doubt that teachers play a critical role in the schooling process and giving them adequate incentives is important; however, spending on other vital inputs (such as textbooks) is also important. Too much spending on one input will have a negative impact on the quality of learning. To address this issue, governments must tackle not only the technical or managerial questions of how much to spend on one input relative to another, but also the institutional and political contexts that generate these decisions.

IX. Concluding Remarks

There are numerous cases where a country's rapid growth did not generate strong improvements in human development. Countries with high per capita incomes can have poor records on human development, while those with low per capita incomes or growth rates can nevertheless do well on this front. The lack of a systematic relationship between progress in human development and economic growth suggests that in order to achieve social progress, patterns of investment in human development matter more than economic growth per se.

Empirical evidence suggests that growth in per capita GDP does not necessarily translate to progress in human development, and similar results are seen from this study on cross-country variations in standards of living. Clearly, however, more work on causality is required to explain the major findings that emerge from the study.

Several important implications emerged from the results of this study. First, bridging the gap in indicators of living standards between low-income and industrialized economies appears to be a more feasible goal than closing the gap in per capita incomes. Second, bridging the gap in per capita incomes is not a necessary condition for bridging the gap in standards of living reflected by life expectancy, child mortality, births attended by skilled health personnel, and education. Third, adequate resources must flow into human development in health and education to bridge the gap in standards of living between developing and developed economies. While increased public spending is essential, it is not enough to improve people's standards of living. Rather, governments' planning, delivery, and management of public services are major factors that determine progress in human development.

It should be noted that this study does not call for a de-emphasis on economic growth. On the contrary, it finds that per capita income is an important explanatory variable for standard of living, and that standard of living is more responsive to growth in per capita income among lower income countries than in higher income countries. However, it also finds that there are countries that have comparable per capita incomes but are poles apart with respect to standards of living. For these countries, public policies and institutions that enable the continuous and efficient delivery of quality basic services can play a more important role than mere growth in per capita GDP in improving life expectancy and education, as well as in reducing child and maternal mortality.

Appendix

Appendix Table 1: Standards of Living by Countries, 2000–2007

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific						
Brunei Darussalam	47938	76.7	98.9	96.9	991	99.8
Cambodia	1299	57.6	83.4	91.1	909	37.8
China, People's Rep. of	3683	71.2	98.9		971	97.0
Fiji Islands	4152	68.1		97.6	982	99.0
Hong Kong, China	33450	81.4		97.0		100.0
Indonesia	3064	67.1	98.7	98.0	961	67.3
Kiribati	1374	62.3		99.7	934	88.9
Korea, Rep. of	20228	77.3		97.1	995	100.0
Lao People's Dem. Rep.	1706	62.5	78.5	79.8	915	19.4
Macao, China	33196	80.0	99.6	88.5		100.0
Malaysia	11201	73.4	97.2	96.8	987	97.3
Micronesia, Fed. States of	2899	67.8		92.3	957	87.7
Mongolia	2428	66.1	97.7	91.1	950	98.3
Myanmar	735	60.7	94.5	97.7	894	62.3
Papua New Guinea	1899	57.1	66.7	74.9	924	41.5
Philippines	2852	70.6	95.1	93.2	965	58.9
Samoa	3477	70.5	99.3	97.1	970	100.0
Singapore	40965	79.1	99.5		996	99.9
Solomon Islands	1464	62.6		63.3	921	
Thailand	6623	69.3	98.0	88.7	990	98.3
Timor-Leste, Dem. Rep. of	746	55.8		68.1	926	21.0
Tonga	3391	72.5		96.6	975	96.7
Vanuatu	3254	68.9		95.2	959	88.0
Viet Nam	1979	70.1		91.8	978	82.8
South Asia						
Bangladesh	1019	62.5	63.6	89.5	922	14.2
Bhutan	3498	63.8		65.3	918	43.6
India	2070	63.7	76.4	88.4	919	44.6
Maldives	4071	66.4	98.2	98.6	961	77.2
Nepal	940	61.9	70.1	77.3	930	14.7
Pakistan	2089	64.5	65.1	61.9	899	25.7
Sri Lanka	3378	74.3	95.6	98.2	985	96.0
Central Asia						
Armenia	3612	71.3	99.8	86.4	971	97.3
Azerbaijan	4076	72.1		83.7	910	90.6
Georgia	3180	70.5		82.5	966	95.7
Kazakhstan	7763	65.9		97.9	966	99.6
Kyrgyz Republic	1672	68.2		93.7	955	98.6
Tajikistan	1331	66.0	99.9	96.9	923	77.3
Uzbekistan	1890	67.4			949	97.8

continued.

Appendix Table 1: continued.

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Eastern Europe						
Albania	5120	75.7	99.4	92.8	980	99.0
Belarus	7660	68.4		91.6	985	99.9
Bosnia and Herzegovina	5880	74.2	99.8		984	99.6
Bulgaria	8607	72.1	98.2	96.6	985	99.3
Croatia	12430	74.7	99.7	92.7	993	99.9
Cyprus	24157	78.9	99.8	98.5	995	99.0
Czech Republic	19158	75.6		92.5	995	99.9
Estonia	15007	71.5	99.8	98.1	992	99.7
Hungary	15896	72.4		96.4	992	99.6
Latvia	11945	70.7	99.8	92.2	989	100.0
Lithuania	12674	71.6	99.7	95.1	991	100.0
Macedonia, FYR	7174	73.6	98.7	97.6	984	98.0
Moldova	1940	68.0	99.7	90.3	979	99.5
Montenegro	7721	74.4			989	98.8
Poland	13026	74.5		97.6	992	99.9
Romania	8686	71.4	97.8	94.3	980	98.5
Russian Federation	10901	65.3	99.7	89.4	981	99.4
Serbia	8010	72.4			990	99.0
Slovak Republic	15157	73.7		92.1	991	99.5
Slovenia	22014	76.8	99.9	96.4	995	99.8
Turkey	9615	70.9	95.6	90.2	967	83.0
Ukraine	5050	68.1	99.8	88.0	977	99.9
Latin America and Caribbean						
Antigua and Barbuda	15372	75.2			987	99.9
Argentina	10353	74.5	98.9	99.3	983	98.8
Belize	6101	71.9		98.0	981	89.3
Bolivia	3691	64.2	97.3	96.4	930	66.9
Brazil	8302	71.3	95.5	93.5	976	96.6
Chile	11578	77.8	99.0	94.1	990	99.9
Colombia	5737	71.9	98.0	91.5	977	91.4
Costa Rica	8747	78.3	97.6		987	98.0
Dominica	6526	76.5		93.2	984	100.0
Dominican Republic	5360	71.3	94.2	85.9	967	97.0
Ecuador	6271	74.3	96.4	99.4	973	74.7
El Salvador	5131	70.9	88.5	94.1	971	92.4
Grenada	6743	72.7		90.9	978	100.0
Guatemala	4069	69.1	82.2	90.5	954	41.4
Guyana	2607	64.6			935	89.8
Haiti	1113	58.9			909	25.0
Honduras	3168	69.1	88.9	92.5	968	63.2
Jamaica	6012	70.9		90.9	969	97.0

continued.

Appendix Table 1: continued.

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Mexico	11240	74.3	97.4	99.6	963	89.2
Nicaragua	2238	71.3	86.2	89.6	961	66.9
Panama	8882	74.9	96.1	99.0	976	91.9
Paraguay	3798	71.1	95.9	94.5	976	77.1
Peru	6200	70.3	96.9	99.6	969	73.2
St. Kitts and Nevis	12592	71.1		97.0	979	99.8
St. Lucia	8599	73.5		98.5	985	99.7
St. Vincent and the Grenadines	6232	70.9		93.3	979	100.0
Suriname	6226	69.5	94.9	94.3	960	84.5
Trinidad and Tobago	16949	69.3	99.5	91.3	964	96.8
Uruguay	8905	75.1		97.3	986	99.4
Venezuela, RB	9646	73.8	97.2	92.3	978	94.5
Middle East and North Africa						
Algeria	6736	71.2	90.1	97.0	960	94.4
Bahrain	30186	75.2	97.0	98.9	989	99.0
Djibouti	1824	53.8		31.0	863	76.8
Egypt, Arab Rep.	4497	70.1	84.9	96.8	959	68.2
Iran, Islamic Rep.	8861	69.8	97.4	86.5	962	89.6
Israel	22494	79.5		97.9	994	
Jordan	4095	71.5	99.1	96.4	973	99.5
Kuwait	38632	77.3	99.7	88.5	989	100.0
Lebanon	9107	71.3		86.5	970	95.5
Libya	12397	73.3	98.0		980	
Malta	20280	78.6		94.8	994	100.0
Morocco	3423	69.8	70.5	84.0	956	62.6
Oman	18631	74.7	97.3	81.1	987	96.4
Qatar	64681	74.7	95.9	97.3	979	100.0
Saudi Arabia	20371	72.0	95.9	86.5	973	94.5
Syrian Arab Republic	3940	73.3	93.8	96.9	984	84.2
Tunisia	6157	73.1	94.3	97.1	974	89.9
United Arab Emirates	43316	78.7	97.0	85.9	991	100.0
Yemen, Rep.	2139	60.9	75.2	67.8	896	26.8
Sub-Saharan Africa						
Angola	3442	41.6	72.2		740	45.9
Benin	1212	55.2	45.3	73.8	847	73.1
Botswana	11299	48.6	94.0	86.1	885	94.2
Burkina Faso	985	51.1	32.1	38.6	800	45.7
Burundi	329	47.8	73.3	52.1	819	29.4
Cameroon	1929	50.3			850	61.6
Cape Verde	2530	70.2	96.3	94.8	963	
Central African Republic	678	44.0	58.5		821	48.8
Chad	1199	50.6	37.6	56.7	793	15.4

continued.

Appendix Table 1: continued.

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Comoros	1111	62.2		55.5	926	61.8
Congo, Dem. Rep.	259	45.2	70.4		795	67.4
Congo, Rep.	3190	53.7	97.4	54.4	877	86.2
Cote d'Ivoire	1647	47.5	60.7	56.2	869	62.5
Equatorial Guinea	22248	50.0	94.9	91.6	796	64.6
Eritrea	535	55.9		44.4	917	28.3
Ethiopia	596	51.3	49.9	48.4	867	5.7
Gabon	13816	57.1	96.2	89.5	909	85.5
Gambia, The	1070	58.3		70.2	879	55.8
Ghana	1116	59.0	70.7	60.7	883	48.4
Guinea	1058	54.2	46.6	60.4	830	46.8
Guinea-Bissau	479	45.7		45.4	793	36.8
Kenya	1328	52.4	80.3	71.3	881	41.6
Lesotho	1289	44.9		77.4	876	57.6
Liberia	364	44.3	67.4	66.2	765	50.9
Madagascar	835	57.8	70.2	76.4	876	48.8
Malawi	661	46.4		94.0	866	56.5
Mali	968	52.4		55.2	780	40.6
Mauritania	1668	62.7	61.3	71.5	875	56.9
Mauritius	9532	72.3	94.5	94.1	984	99.0
Mozambique	629	43.5		64.3	846	47.7
Namibia	4353	52.6	92.3	77.1	936	75.5
Niger	582	55.0	36.6	35.9	740	16.7
Nigeria	1625	46.8	84.2	63.3	803	36.3
Rwanda	732	43.6	77.6	72.1	831	35.0
Sao Tome and Principe	1359	64.6	95.4	99.1	904	78.6
Senegal	1482	62.0	49.1	62.2	878	56.5
Seychelles	14916	72.2	99.1	95.6	986	
Sierra Leone	536	41.4	47.9		727	42.5
South Africa	8156	47.2		95.0	933	92.0
Sudan	1622	57.0	77.2	44.0	908	68.1
Swaziland	4448	42.8	88.4	75.9	845	72.0
Tanzania	993	50.5	78.4	78.3	873	43.4
Togo	767	57.9	74.4	80.0	886	57.3
Uganda	816	48.7	76.6		862	40.6
Zambia	1138	40.4		76.7	818	43.4
Industrialized Countries						
Australia	30773	80.2		95.8	994	99.7
Austria	33729	78.9		96.9	995	
Belgium	31328	78.6		98.9	995	
Canada	34114	79.8		99.5	994	99.2
Denmark	33032	77.4		98.8	995	

continued.

Appendix Table 1: *continued.*

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Finland	29696	78.4		99.5	996	99.9
France	30167	79.6		99.6	995	
Germany	30396	78.5			995	100.0
Greece	27716	78.7	98.9	98.6	995	
Iceland	33087	80.1		98.9	997	
Ireland	36276	78.0		94.3	994	100.0
Italy	27966	80.1	99.8	99.6	995	99.0
Japan	29665	81.7		99.9	996	99.8
Luxembourg	67689	78.4		97.8	995	99.9
Netherlands	34342	78.7		98.9	994	100.0
New Zealand	23928	79.2		99.1	993	96.6
Norway	46361	79.4		99.3	996	
Portugal	20044	77.4	99.6	99.2	994	99.8
Spain	26595	79.7		99.8	995	
Sweden	31025	80.2		99.1	996	
Switzerland	35095	80.6		97.0	995	100.0
United Kingdom	30518	78.4		99.9	994	
United States	40665	77.3		94.4	992	

Note: Blanks indicate data not available.

Source: Author's calculations based on World Development Indicators.

Appendix Table 2: Relative Achievement in Standards of Living, 2000–2007

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific						
Brunei Darussalam	566	149.5	154.4	131.9	140	197.5
Cambodia	15	51.4	61.5	91.7	71	20.4
China, People's Rep. of	43	109.0	153.5		105	150.4
Fiji Islands	49	91.9		141.0	119	197.5
Hong Kong, China	395	212.3		132.8		197.5
Indonesia	36	87.1	149.2	148.0	96	48.0
Kiribati	16	67.5		174.9	80	94.3
Korea, Rep. of	239	155.4		134.2	156	197.5
Lao People's Dem. Rep.	20	68.1	52.7	60.7	73	9.3
Macao, China	392	188.1	157.9	82.1		197.5
Malaysia	132	122.9	123.1	130.7	130	154.9
Micronesia, Fed. States of	34	90.7		97.4	93	89.9
Mongolia	29	82.9	129.5	91.7	89	175.8
Myanmar	9	61.7	99.6	143.9	66	41.8
Papua New Guinea	22	49.8	37.7	52.5	76	23.0
Philippines	34	105.2	103.4	102.2	99	38.1
Samoa	41	104.9	157.9	134.6	103	197.5
Singapore	484	175.2	157.9		167	197.5
Solomon Islands	17	68.5		38.0	75	
Thailand	78	98.0	134.2	82.8	137	174.8
Timor-Leste, Dem. Rep. of	9	46.1		43.4	77	10.1
Tonga	40	116.7		127.9	110	145.7
Vanuatu	38	96.0		114.9	95	90.9
Viet Nam	23	102.2		95.1	113	75.4
South Asia						
Bangladesh	12	68.0	34.7	85.6	75	6.6
Bhutan	41	73.2		40.2	74	24.5
India	24	72.9	49.6	81.6	74	25.3
Maldives	48	84.1	137.2	161.0	96	63.3
Nepal	11	66.0	41.4	56.4	79	6.8
Pakistan	25	75.8	36.1	36.6	68	12.7
Sri Lanka	40	129.3	107.1	152.3	123	138.1
Central Asia						
Armenia	43	109.2	157.9	75.6	105	154.9
Azerbaijan	48	114.5		68.8	71	101.4
Georgia	38	104.7		66.2	100	135.0
Kazakhstan	92	81.8		145.8	100	197.5
Kyrgyz Republic	20	92.6		105.1	92	182.6
Tajikistan	16	82.3	157.9	131.9	76	63.5
Uzbekistan	22	88.8			88	162.7

continued.

Appendix Table 2: *continued.*

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Eastern Europe						
Albania	60	140.7	157.9	99.9	116	196.1
Belarus	90	93.6		94.0	125	197.5
Bosnia and Herzegovina	69	128.3	157.9		123	197.5
Bulgaria	102	114.5	138.0	128.4	123	197.5
Croatia	147	132.9	157.9	99.3	147	197.5
Cyprus	285	172.9	157.9	160.2	156	197.5
Czech Republic	226	139.4		98.4	159	197.5
Estonia	177	110.8	157.9	150.1	141	197.5
Hungary	188	116.0		126.4	144	197.5
Latvia	141	105.9	157.9	96.9	134	197.5
Lithuania	150	111.4	157.9	114.1	138	197.5
Macedonia, FYR	85	124.2	150.0	141.0	122	167.8
Moldova	23	91.5	157.9	88.5	114	197.5
Montenegro	91	129.9			133	189.7
Poland	154	131.1		141.5	143	197.5
Romania	103	110.1	130.3	108.5	116	180.1
Russian Federation	129	79.4	157.9	85.1	117	197.5
Serbia	95	116.4			136	197.5
Slovak Republic	179	125.4		96.4	140	197.5
Slovenia	260	150.9	157.9	126.0	159	197.5
Turkey	114	107.2	107.1	88.3	101	76.0
Ukraine	60	92.1	157.9	80.6	111	197.5
Latin American and Caribbean						
Antigua and Barbuda	182	136.2			129	197.5
Argentina	122	130.9	155.3	174.9	120	190.9
Belize	72	112.9		148.3	118	95.9
Bolivia	44	74.9	124.1	126.2	79	47.4
Brazil	98	109.4	106.4	103.7	111	144.8
Chile	137	160.4	157.6	107.7	137	197.5
Colombia	68	113.1	133.7	93.6	112	105.2
Costa Rica	103	165.9	128.1		129	167.8
Dominica	77	147.4		101.9	123	197.5
Dominican Republic	63	109.5	97.8	74.5	101	149.9
Ecuador	74	129.3	114.4	174.9	107	59.0
El Salvador	61	107.0	74.1	107.5	105	110.5
Grenada	80	118.4		91.0	112	197.5
Guatemala	48	97.1	59.2	89.5	91	22.9
Guyana	31	76.2			81	97.9
Haiti	13	55.7			71	12.3
Honduras	37	97.0	75.5	98.6	102	42.8
Jamaica	71	107.2		91.0	102	150.4
Mexico	133	129.6	124.5	174.9	98	95.3

continued.

Appendix Table 2: continued.

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Nicaragua	26	109.4	68.0	86.0	96	47.4
Panama	105	134.3	111.1	173.7	110	107.8
Paraguay	45	108.0	109.6	110.2	110	63.2
Peru	73	103.5	119.6	174.9	102	56.5
St. Kitts and Nevis	149	108.0		132.6	114	197.5
St. Lucia	102	123.4		159.7	124	197.5
St. Vincent and the Grenadines	74	106.9		102.7	114	197.5
Suriname	74	99.2	101.9	108.8	96	80.0
Trinidad and Tobago	200	97.9	157.9	92.6	98	147.6
Uruguay	105	136.0		137.6	127	197.5
Venezuela, RB	114	125.9	122.6	97.5	113	124.4
Middle East and North Africa						
Algeria	80	108.8	79.5	133.1	95	123.4
Bahrain	356	136.3	120.5	169.5	133	197.5
Djibouti	22	40.5		14.1	59	62.6
Egypt, Arab Rep.	53	102.3	64.9	130.2	94	49.1
Iran, Islamic Rep.	105	101.0	125.6	76.1	97	97.1
Israel	266	181.2		147.2	152	
Jordan	48	110.8	157.9	126.4	107	197.5
Kuwait	456	155.7	157.9	82.1	132	197.5
Lebanon	108	109.2		75.9	103	133.0
Libya	146	122.3	134.9		116	
Malta	239	170.0		111.9	149	197.5
Morocco	40	101.0	41.8	69.5	93	42.2
Oman	220	132.3	123.6	63.2	129	142.0
Qatar	764	132.5	109.7	137.4	114	197.5
Saudi Arabia	241	113.9	109.4	75.9	107	124.4
Syrian Arab Republic	47	121.9	95.5	132.1	122	79.2
Tunisia	73	121.0	98.5	134.6	108	98.3
United Arab Emirates	511	170.4	119.9	74.4	139	197.5
Yemen, Rep.	25	62.4	47.8	43.0	67	13.4
Sub-Saharan Africa						
Angola	41	12.1	43.9		40	26.4
Benin	14	44.3	20.7	50.8	56	56.3
Botswana	133	27.2	96.3	74.9	64	122.1
Burkina Faso	12	33.3	13.3	18.5	48	26.2
Burundi	4	25.5	45.3	27.9	51	14.9
Cameroon	23	31.3			56	41.0
Cape Verde	30	103.0	112.6	112.0	98	
Central African Republic	8	17.1	30.2		51	28.7
Chad	14	32.2	16.2	31.7	47	7.1
Comoros	13	66.9		30.7	77	41.3

continued.

Appendix Table 2: *continued.*

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Congo, Dem. Rep.	3	19.6	41.8		47	48.0
Congo, Rep.	38	40.3	125.7	29.8	62	84.9
Cote d'Ivoire	19	24.8	32.0	31.3	60	42.1
Equatorial Guinea	263	30.6	101.8	93.8	47	44.5
Eritrea	6	46.3		22.3	74	14.3
Ethiopia	7	34.0	23.7	25.1	60	2.5
Gabon	163	50.0	112.5	85.5	71	82.8
Gambia, The	13	53.6		46.0	63	35.0
Ghana	13	55.9	42.1	35.4	63	28.4
Guinea	12	41.7	21.5	35.1	52	27.1
Guinea-Bissau	6	20.8		22.9	47	19.6
Kenya	16	36.7	55.8	47.4	63	23.1
Lesotho	15	18.9		56.5	62	36.8
Liberia	4	17.6	38.4	41.2	43	30.5
Madagascar	10	52.0	41.6	54.8	62	28.7
Malawi	8	22.3		106.8	60	35.7
Mali	11	36.7		30.5	45	22.3
Mauritania	20	68.8	32.6	47.6	61	36.1
Mauritius	113	115.6	99.7	107.4	123	197.5
Mozambique	7	16.1		39.1	55	27.8
Namibia	51	37.3	88.1	56.0	81	60.3
Niger	7	43.9	15.6	16.9	40	7.8
Nigeria	19	23.0	63.3	38.0	48	19.3
Rwanda	9	16.2	51.4	48.4	53	18.4
Sao Tome and Principe	16	76.2	105.8	174.9	69	66.1
Senegal	17	66.1	23.2	37.0	62	35.7
Seychelles	176	115.0	157.9	118.3	127	
Sierra Leone	6	11.8	22.4		38	23.7
South Africa	96	24.1		113.4	80	108.3
Sudan	19	49.7	50.7	22.0	71	49.0
Swaziland	53	14.5	73.9	54.0	55	54.6
Tanzania	12	31.8	52.6	58.0	61	24.4
Togo	9	52.4	46.7	61.1	64	36.5
Uganda	10	27.6	49.9		58	22.3
Zambia	13	9.8		55.4	50	24.4
Industrialized Countries						
Australia	363	191.0		120.3	152	197.5
Austria	398	173.5		131.7	154	
Belgium	370	170.0		172.6	156	
Canada	403	184.7		174.9	152	197.5
Denmark	390	156.3		168.2	155	
Finland	351	167.2		174.9	164	197.5
France	356	183.1		174.9	157	

continued.

Appendix Table 2: *continued.*

Economy	GDP per Capita at 2005 PPP	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Germany	359	168.5			159	197.5
Greece	327	170.8	155.9	163.2	155	
Iceland	391	189.5		172.6	173	
Ireland	428	163.3		108.6	153	197.5
Italy	330	189.6	157.9	174.9	158	197.5
Japan	350	218.4		174.9	163	197.5
Luxembourg	799	166.9		145.4	157	197.5
Netherlands	406	170.5		170.9	153	197.5
New Zealand	283	177.4		174.9	148	145.0
Norway	547	180.2		174.9	161	
Portugal	237	156.0	157.9	174.9	153	197.5
Spain	314	184.4		174.9	158	
Sweden	366	190.6		174.9	166	
Switzerland	414	197.8		133.4	154	197.5
United Kingdom	360	167.6		174.9	151	
United States	480	155.9		109.4	143	

Note: Blanks indicate data not available.

Source: Author's calculations based on World Development Indicators.

Appendix Table 3: Individual Country Performance, 2000–2007

Economy	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
East Asia and the Pacific					
Brunei Darussalam	−0.91	−0.46	−0.63	−0.95	−0.49
Cambodia	−0.15	−0.13	0.67	0.04	−0.76
China, People's Rep. of	0.72	1.81		0.55	1.09
Fiji Islands	−0.06		1.29	1.16	2.04
Hong Kong, China	1.89		−0.36		−0.12
Indonesia	0.13	1.85	1.71	0.28	−1.02
Kiribati	0.38		3.09	0.48	0.84
Korea, Rep. of	0.37		0.02	1.12	0.40
Lao People's Dem. Rep.	0.14	−0.65	−0.39	−0.22	−1.30
Macao, China	0.99	−0.02	−1.82		−0.11
Malaysia	−0.12	−0.13	0.32	0.43	0.05
Micronesia, Fed. States of	0.33		0.29	0.20	−0.03
Mongolia	0.26	1.43	0.25	0.20	2.11
Myanmar	0.93	1.58	2.61	0.54	0.30
Papua New Guinea	−0.67	−1.21	−0.70	−0.18	−1.10
Philippines	0.89	0.47	0.44	0.57	−1.17
Samoa	0.64	2.0*	1.23	0.53	2.23*
Singapore	0.25	−0.20		0.77	−0.33
Solomon Islands	0.34		−0.94	0.12	
Thailand	−0.40	0.67	−0.68	1.57	1.03
Timor-Leste, Dem. Rep. of	0.33		−0.33	1.12	−0.42
Tonga	1.11		1.06	0.91	1.06
Vanuatu	0.39		0.71	0.14	−0.12
Viet Nam	1.23		0.49	1.84*	0.04
South Asia					
Bangladesh	0.76	−0.75	0.67	0.62	−0.83
Bhutan	−0.55		−1.47	−1.12	−1.69*
India	0.08	−0.91	0.07	−0.40	−1.13
Maldives	−0.33	1.20	1.89*	−0.11	−0.97
Nepal	0.79	−0.47	−0.11	0.92	−0.74
Pakistan	0.18	−1.35	−1.22	−0.78	−1.43
Sri Lanka	1.59	0.43	1.77*	1.70*	0.90
Central Asia					
Armenia	0.75	1.98	−0.47	0.58	1.21
Azerbaijan	0.80		−0.75	−1.49	−0.12
Georgia	0.74		−0.66	0.47	0.89
Kazakhstan	−1.20		1.00	−0.75	1.38
Kyrgyz Republic	1.07		0.89	0.87	2.67
Tajikistan	0.97	2.95*	1.82*	0.27	0.18
Uzbekistan	0.78			0.51	2.07*
Eastern Europe					
Albania	1.50	1.65*	−0.02	0.71	1.78*

continued.

Appendix Table 3: continued.

Economy	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Belarus	-0.74		-0.46	0.66	1.40
Bosnia and Herzegovina	0.87	1.53		0.94	1.67*
Bulgaria	-0.11	0.56	0.44	0.44	1.28
Croatia	0.12	0.86	-0.64	1.28	0.90
Cyprus	0.80	0.27	0.65	0.87	0.21
Czech Republic	-0.16		-0.96	1.38	0.45
Estonia	-0.93	0.69	0.68	0.68	0.70
Hungary	-0.80		-0.03	0.74	0.64
Latvia	-0.83	0.89	-0.68	0.61	0.94
Lithuania	-0.70	0.84	-0.23	0.76	0.88
Macedonia, FYR	0.47	1.10	0.92	0.58	0.79
Moldova	0.85	2.57*	0.31	1.94*	2.87
Montenegro	0.59			1.13	1.21
Poland	0.00		0.53	0.99	0.85
Romania	-0.28	0.31	-0.13	0.01	0.87
Russian Federation	-1.71*	0.97	-0.95	-0.22	1.03
Serbia	0.05			1.24	1.35
Slovak Republic	-0.40		-0.86	0.59	0.69
Slovenia	0.10	0.35	-0.27	1.18	0.31
Turkey	-0.52	-0.49	-0.78	-0.97	-1.58
Ukraine	-0.29	1.67*	-0.56	0.46	1.83*
Latin America and Caribbean					
Antigua and Barbuda	-0.01			-0.03	0.68
Argentina	0.27	0.94	1.65*	-0.01	0.93
Belize	0.25		1.24	0.57	-0.65
Bolivia	-0.55	0.88	0.95	-0.93	-1.23
Brazil	-0.25	-0.38	-0.24	-0.22	0.13
Chile	1.24	0.91	-0.35	0.79	0.97
Colombia	0.33	0.79	-0.28	0.34	-0.38
Costa Rica	1.79	0.24		0.74	0.59
Dominica	1.46		-0.13	0.78	1.56
Dominican Republic	0.28	-0.26	-0.77	-0.21	0.69
Ecuador	0.82	0.11	1.99	-0.06	-1.52
El Salvador	0.24	-0.96	0.19	0.08	-0.15
Grenada	0.33		-0.46	0.15	1.53
Guatemala	0.15	-1.22	-0.16	-0.36	-1.89*
Guyana	-0.08			-0.34	0.26
Haiti	0.20			0.24	-0.79
Honduras	0.46	-0.48	0.26	0.58	-1.17
Jamaica	0.06		-0.38	-0.26	0.58
Mexico	0.12	-0.09	1.59	-1.36	-1.30
Nicaragua	1.35	-0.41	0.14	0.73	-0.71
Panama	0.59	-0.30	1.72	-0.34	-0.77

continued.

Appendix Table 3: *continued.*

Economy	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Paraguay	0.64	0.40	0.47	0.80	-0.90
Peru	-0.12	0.28	2.00	-0.29	-1.56
St. Kitts & Nevis	-0.81		0.30	-0.61	0.88
St. Lucia	0.22		1.33	0.49	1.28
St. Vincent & Grenadines	0.00		-0.07	0.34	1.61
Suriname	-0.28	-0.27	0.10	-0.69	-1.03
Trinidad & Tobago	-1.56	0.58	-1.04	-1.91*	-0.54
Uruguay	0.65		0.68	0.58	1.24
Venezuela, RB	0.18	-0.01	-0.52	-0.32	-0.48
Middle East and North Africa					
Algeria	-0.02	-1.03	0.74	-0.83	-0.14
Bahrain	-0.83	-1.11	0.76	-0.70	-0.02
Djibouti	-0.97		-1.78*	-1.10	-0.16
Egypt, Arab Republic	0.23	-1.13	0.93	-0.31	-1.40
Iran, Islamic Republic	-0.64	0.15	-1.07	-1.10	-1.01
Israel	1.20		0.32	0.76	
Jordan	0.65	1.86	0.88	0.50	2.05
Kuwait	-0.41	-0.15	-1.92*	-1.09	-0.27
Lebanon	-0.37		-1.09	-0.76	-0.23
Libya	-0.26	0.14		-0.47	
Malta	0.91		-0.61	0.74	0.39
Morocco	0.51	-1.61	-0.61	-0.05	-1.27
Oman	-0.39	-0.57	-1.96*	-0.28	-0.77
Qatar	-1.93*	-2.19*	-0.68	-2.90*	-0.81
Saudi Arabia	-1.19	-1.10	-1.65	-1.65	-1.26
Syrian Arab Republic	1.12	-0.06	1.07	1.43	-0.58
Tunisia	0.54	-0.36	0.84	0.03	-0.61
United Arab Emirates	-0.00	-1.46	-2.24*	-0.85	-0.39
Yemen, Republic	-0.35	-1.00	-1.05	-0.86	-1.44
Sub-Saharan Africa					
Angola	-2.85*	-1.55		-3.09*	-1.64
Benin	-0.33	-1.34	-0.44	-0.73	0.11
Botswana	-3.83*	-0.97	-1.27	-3.36*	-0.70
Burkina Faso	-0.49	-1.39	-1.23	-0.90	-0.35
Burundi	0.56	0.60	-0.22	0.75	0.53
Cameroon	-1.39			-1.32	-0.70
Cape Verde	0.95	0.86	0.80	0.64	
Central African Republic	-0.64	-0.53		-0.21	0.09
Chad	-0.77	-1.48	-0.98	-1.23	-0.98
Comoros	0.62		-0.96	0.58	-0.13
Congo, Dem. Republic	0.64	0.70		0.87	1.54
Congo, Rep.	-1.67*	1.06	-1.71*	-1.68*	-0.23

continued.

Appendix Table 3: continued.

Economy	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Cote d'Ivoire	-1.44	-1.26	-1.21	-0.88	-0.52
Equatorial Guinea	-4.65*	-1.42	-1.19	-5.56*	-3.24*
Eritrea	0.75		-0.71	1.39	0.01
Ethiopia	0.15	-0.62	-0.70	0.45	-0.37
Gabon	-3.17*	-0.65	-1.11	-3.23*	-1.80*
Gambia, The	0.17		-0.50	-0.17	-0.24
Ghana	0.20	-0.60	-0.83	-0.18	-0.43
Guinea	-0.26	-1.20	-0.80	-0.73	-0.40
Guinea-Bissau	-0.07		-0.61	0.02	0.25
Kenya	-0.73	-0.33	-0.60	-0.44	-0.73
Lesotho	-1.36		-0.32	-0.47	-0.39
Liberia	0.14	0.29	0.10	0.17	0.78
Madagascar	0.41	-0.36	-0.08	0.12	-0.12
Malawi	-0.41		1.58	0.31	0.27
Mali	-0.34		-0.87	-1.03	-0.42
Mauritania	0.19	-1.25	-0.75	-0.83	-0.67
Mauritius	-0.19	-0.71	-0.23	0.26	1.17
Mozambique	-0.58		-0.33	0.14	0.15
Namibia	-2.17*	-0.38	-1.16	-1.00	-1.11
Niger	0.55	-0.85	-0.92	-0.63	-0.22
Nigeria	-1.49	-0.27	-1.01	-1.56	-1.02
Rwanda	-0.76	0.06	-0.17	-0.22	-0.22
Sao Tome and Principe	0.72	1.21	3.10*	-0.12	0.22
Senegal	0.24	-1.45	-0.98	-0.63	-0.55
Seychelles	-0.76	0.69	-0.22	-0.10	
Sierra Leone	-0.55	-0.56		-0.60	0.22
South Africa	-3.51*		0.05	-1.93*	-0.67
Sudan	-0.49	-0.66	-1.47	-0.28	-0.35
Swaziland	-3.09*	-0.83	-1.23	-2.54*	-1.26
Tanzania	-0.55	-0.17	-0.10	-0.16	-0.40
Togo	0.53	-0.12	0.16	0.37	0.14
Uganda	-0.47	-0.08		-0.03	-0.24
Zambia	-1.55		-0.27	-0.94	-0.54
Industrialized Countries					
Australia	1.19		-0.66	0.34	-0.04
Austria	0.42		-0.39	0.33	
Belgium	0.38		0.83	0.55	
Canada	0.83		0.83	0.16	-0.14
Denmark	-0.20		0.67	0.39	
Finland	0.34		0.93	1.05	0.00
France	0.92		0.92	0.62	
Germany	0.36			0.71	-0.02

continued.

Appendix Table 3: *continued.*

Economy	Life Expectancy at Birth	Adult Literacy Rate	Net Primary Enrollment Rate	Under-5 Survival Rate	Births Attended by Skilled Personnel
Greece	0.56	0.08	0.64	0.66	
Iceland	1.04		0.79	1.42	
Ireland	−0.05		−1.11	0.16	−0.20
Italy	1.25	0.14	0.97	0.78	0.06
Japan	2.28*		0.93	0.99	0.00
Luxembourg	−0.68		−0.48	−0.43	−0.85
Netherlands	0.29		0.72	0.22	−0.15
New Zealand	0.98		1.07	0.44	−0.96
Norway	0.28		0.63	0.27	
Portugal	0.40	0.43	1.19	0.95	0.41
Spain	1.12		1.00	0.84	
Sweden	1.16		0.90	1.12	
Switzerland	1.28		−0.37	0.29	−0.17
United Kingdom	0.32		0.91	0.31	
United States	−0.46		−1.16	−0.53	−0.32
World	0	0	0	0	0

Note: * indicates statistically significant at the 5% level. Blanks indicate data not available.

Source: Author's calculations.

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About the Paper

Hyun H. Son compares achievements and inequalities in standards of living across 177 countries over the period 2000–2007. To measure achievement, an achievement index is introduced, which holds the view that an increase in the standard of living of a country when it is already at a high level signifies a greater achievement than that of another country with an equal increase but from a lower base. Moreover, the paper estimates the number of years it will take for different regions and selected Asian countries to catch up with the average standard of living of industrialized countries.

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