Global Inequality

As a Consequence of Human Diversity

A New Theory Tested by Empirical Evidence

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This book is dedicated to colleagues and other researchers who have attempted to explore the impact of human nature on global inequality in human conditions.

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Preface

Enormous economic and other global disparities in human conditions persist in the world. Scholars and political leaders have debated on the causes of these problems and on the means to solve them, but no agreement has yet been reached on the causes of global disparities or on the best methods of reducing them. It has been characteristic of this debate that explanations for global inequality have been sought only from various cultural, political and other environmental factors, not from any characteristics of human nature, although phenotypic phenomena are always affected not only by environmental but also by genotypic factors. The limitation to environmental factors seems to be common for all previous theories of global inequality and poverty: for cultural theories, modernization theories, dependency and world-system theories, and political and institutional theories. Unfortunately it has not been possible to test the explanatory power of those theories satisfactorily by empirical evidence for the reason that it has been difficult to operationalize their central concepts and hypotheses. Consequently, we do not know to what extent those theories are capable of explaining the emergence and persistence of global inequality and poverty.

It is characteristic for all environmental theories of development that they seem to be based on an implicit assumption that innate abilities of all nations are more or less the same and that, therefore, it is not necessary to pay any special attention to possible differences in average innate abilities of nations. Environmental factors are assumed to be enough to explain the emergence and persistence of global inequality, although each

theory refers, to some extent, to different kinds of environmental factors. The assumption that environmental factors are enough to explain the existence of enormous developmental gaps between countries implies an idea that it might be possible to eradicate developmental gaps by appropriate changes in relevant environmental factors and policies. In other words, poverty and other disparities in human conditions are not assumed to be inevitable. They are assumed to be partly consequences of geographical factors, but even more consequences of economic, social, and political selections and policies, which means that it would be possible to reduce those disparities significantly by correcting those policies. Of course, this kind of argumentation is justified to some extent. The United Nations Millennium Declaration adopted by the United Nations General Assembly in 2000 is based on such argumentation. The United Nations accepted the eight Millennium Development Goals that are intended to reduce poverty and to improve various aspects of human conditions. It is certainly possible to reduce poverty and to improve human conditions to some extent in some places in the world, but according to my theory formulated in this study it will never be possible to equalize human conditions in the world.

James D. Wolfensohn, the President of the World Bank, noted in his Foreword to *World Development Report 2000/2001* that "at the start of a new century, poverty remains a global problem of huge proportion." He said that the report "seeks to expand the understanding of poverty and its causes and sets actions to create a world free of poverty in all its dimensions." In other words, he believed it to be possible to eliminate poverty completely. In his Forward to *World Development Report 2004,* Wolfensohn declared confidently: "For the first time in human history, we have the possibility of eradicating global poverty in our life time." Many other scholars and politicians have expressed the same idea about the possibility of creating a world free of poverty.

Serious attention has not been paid to the significance of the evolved human diversity. My purpose in this book is to challenge contemporary environmental theoretical explanations of global inequality and poverty and to introduce a transformed phenotypic worldview which is based on the idea that to some extent global inequality is a natural and inevitable consequence of human diversity. In this book, the evolutionary roots of global inequality and poverty are traced to the continual struggle for existence and to the evolved human diversity measured by national IQ. Together, these two evolutionary factors are assumed to explain a significant part of the enormous global disparities in human conditions. These theoretical arguments will be tested by empirical evidence by correlating national IQ as a measure of the evolved human diversity with various indicators of global inequality and poverty. The results of empirical analyses will show to what extent the evolved human diversity measured by national IQ is able to explain the variation in some measures of global inequality and poverty. The unexplained part of the variation is assumed to be due to various environmental factors discussed in contemporary and previous developmental theories.

The book is divided into two parts. The first part concerns theories of global inequality and variables and includes three chapters. In the first chapter some previous studies and data on global inequality are reviewed, and six measures of human conditions are selected to be used in the final test of the hypothesis. In the second chapter, contemporary theoretical explanations of global inequality and poverty are reviewed and my own phenotypic theoretical explanation of global inequality in human conditions is introduced. In the third chapter, national IQ and the six measures of global inequality are introduced and combined into an Index of Global Inequality (IGI).

The second part of the book concerns the test of the hypothesis and includes three chapters. In chapter 4, the hypothesis is tested by the six components of IGI, and the results

of the correlation analysis are complemented by regression analyses, which disclose how well the average relationship between national IQ and a dependent variable applies to single countries. In chapter 5, the test of the hypothesis is complemented by exploring the results of the regression analysis of IGI on national IQ at the level of single countries. Finally, in chapter 6, the contradictory worldviews on the causes of global inequality are compared, the central ideas of the new phenotypic worldview are explained, and the results of empirical analyses are summarized. Because human diversity measured by national IQ explains 74 percent of the variation in the combined Index of Global Inequality, it provides the most powerful theoretical explanation for the emergence and persistence of great global disparities in human conditions.

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Tatu Vanhanen

Acknowledgements

The idea that global inequality is a consequence of human diversity has evolved since the 1990s into the phenotypic worldview described in this book. I want to use this opportunity to express my gratitude to all the people who helped me in this long process. I first referred to this idea in 1992 in my book *On the Evolutionary Roots of Politics,* in which I noted: "The genetic diversity of individuals and the necessity to compete for scarce resources can be assumed to be behind the omnipresent inequalities in human societies" (p. 61). Many colleagues, especially Heiner Flohr, Peter Meyer, and Vincent Falger, had helped me by their comments, criticism, and advice in that book project. I am grateful to the Academy of Finland for several travel and research grants which helped me to gather material for that study and to meet colleagues in international conferences.

First and foremost I am deeply grateful to Professor Richard Lynn with whom I have co-operated since 1999 in our common research projects, and whose statistical material on national and racial differences in intelligence made it possible for me to make my first comparative study on social consequences of human diversity measured by national IQ. He encouraged me and suggested that we should start to co-operate. Since then we have published three co-authored books: *IQ and the Wealth of Nations* (2002), *IQ and Global Inequality* (2006), and *Intelligence: A Unifying Construct for the Social Sciences* (2012). His data on national IQs of all countries of the world have crucial significance also in this book.

I am grateful to Yrjö Ahmavaara for our co-operation and for our common book *Geenien tulo yhteiskutatieteisiin* (2001) (=

The coming of genes into social sciences). In that book I noted that the genetic diversity of individuals constitutes the basic evolutionary cause of inequality.

Science Council of Japan (President Kiyoshi Kurokawa and Professor Takashi Inoguchi) invited me to present a paper at their conference in Kyoto in 2005. I presented a paper "Human Development Related to Human Diversity," in which I paid attention to the great gaps in economic development between Asian countries and argued that because of significant differences in national IQs, it will not be possible to equalize the level of human development in Asia. I thank especially Professor Shinichi Ichimura with whom I was a co-leader of Theme 3: "Economic and Social Development: Creating a Breakthrough on Human Development."

I participated in the XVIII Biennial Congress of the International Society for Human Ethology in Detroit (2006), in which congress I met close colleagues like J. Philippe Rushton, Johan M. G. van der Dennen, Hiram P. Caton and Frank Salter. In my paper "Evolutionary Roots of Global Problems" I argued that many global problems have their evolutionary roots in the evolved characteristics of human nature.

Kimmo Pietiläinen, the publisher of Terra Cognita, kindly published my book "Globaalit ongelmat" (= Global problems) in Finnish in 2008. Professors Andrei Melville and Michael Ilyin (Moscow State Institute for International Relations), whom I had met in Istanbul in 2005, invited me to give some lectures on my studies and ideas in Moscow in November 2005 and again in April 2008.

Albert Somit and Steven A. Peterson, the leaders of the biopolicy movement, have supported my research work for many years and published my articles in the books edited by them. In their biopolicy book in 2012 they published my article "Evolution, IQ, and Wealth," in which I repeated my argument that enormous global disparities in the wealth and poverty of nations can be explained primarily by the evolved human diversity measured by national IQ.

Since the 1990s I had argued in many conference papers, articles and books that many kinds of global disparities in human conditions can be traced to the evolved human diversity measured by national IQ. When Arno Tanner (East-West Books, Helsinki) asked me to prepare a collection of my studies to be published by East-West Books Helsinki, I focused on papers in which I had argued that the persistence of global inequality is ultimately due to the evolved human diversity. In that book (2013) "Miksi Kiina lähtee lentoon ja Kongo ei?" (= Why does China start to fly and Congo not?) I formulated preliminarily a new worldview based on the idea that it is not possible to remove global inequality and poverty because they are to a significant extent based on the evolved human diversity.

Finally, I thank Richard Lynn, who accepted this book to be published by Ulster Institute for Social Research, Huw Gruffydd for his editorial work, and my son Tuomo for valuable technical help.

Part 1

Theories of Global Inequality and Variables

Chapter 1

Some Previous Studies on Global Inequality

1. Studies on Global Inequality

2. Some Measures of Global Inequality

The problem of global inequality and poverty has been explored and described from many perspectives since World War II, but any generally accepted theoretical explanation for the persistence of global inequality has not yet emerged. My intention in this first chapter is to refer to several recent studies of global inequality and then to introduce some available data on various aspects of global inequality and to see how strongly they are related to the evolved human diversity measured by national IQ, which measure will be used as the explanatory variable in this study.

1. Studies of Global Inequality

Let us start by referring to some recent books on global inequality and poverty. Mitchell A. Seligson and John T. Passé-Smith have published many articles on global inequality in their book *Development and Underdevelopment: The Political Economy of Global Inequality* since its first edition in 1993. Seligson refers to W. W. Rostow's thesis, according to which "underdevelopment is only a stage that nations pass through on their way to becoming developed". However, he notes that the data presented in their

book tell a different story: "The income gap between rich and poor countries has grown dramatically since World War II" (Seligson, 2008a, p. 1). Passé-Smith explored the gap between rich and poor countries in the period 1960-2005 on the basis of extensive statistical data and came to the conclusion that the "absolute gap between the high-income and non-high-income countries has grown steadily since 1960" (Passé-Smith, 2008, p. 28). The gap between the rich and poor countries widened from $11,924 in 1960 to $23,901 in 2005.

Poverty and Development into the 21st Century (2000), edited by Tim Allen and Alan Thomas, includes many articles on global poverty and development. Alan Thomas notes that in this "new era of globalization, the question of the appalling poverty of large numbers of the world's people, with continuing enormous inequities between rich and poor, remains as potent as ever" (Thomas, 2000, p. 4). He illustrates the achievements of developing countries in the last third of the twentieth century by referring to some data from UNDP's *Human Development Report 1998:* life expectancy at birth for developing countries has increased from 46 to 62 years; the adult literacy rate in developing countries increased from 48 to 70%; the female education enrolment ratio in developing countries rose from 38% to 68%; the average GDP per capita for all developing countries rose from $330 to $867 (Thomas, 2000, p. 7). These are significant achievements, but many gaps between rich and poor countries are still wide.

Surjit S. Bhalla argues in his book *Imagine there's no Country: Poverty, Inequality, and Growth in the Era of Globalization* (2002), contrary to the conventional wisdom, that poverty and inequality are declining as a consequence of globalization. According to his data, inequality was, by the end of 2000, at its lowest level for 50 years. He rejects the World Bank's claim that poor countries have grown at a slower pace than rich countries. Bhalla's conclusion is the opposite: poor countries have grown more quickly. Further, "if the unit of observation is not the poor country but the poor *individual,* then the growth rate has

been considerably faster than ever before, and considerably higher than the growth rate in industrialized economies" (Bhalla, 2002, p. 1). He supports his argument by various empirical evidence. However, his data indicate that poverty has declined principally in China and India. He admits that sub-Saharan Africa has remained as an exception. Poverty rates in sub-Saharan Africa are at the same level as in the 1960s. The reality is even worse because the "population has more than doubled during the past four decades, which means that the absolute number of poor people has also more than doubled" (Bhalla, 2002, p. 147).

Francois Bourguignon and Christian Morrison (2002) explored the inequality among world citizens over the period 1820-1992. Their paper shows that income inequality was already high in the early 19th century and rose almost continuously from 1820 to the eve of World War I. The increase in inequality decelerated between the wars and slowed even more after 1950. They say that "world inequality peaked in the middle of the 20th century after more than a century of continuous divergence. Changes during the last 50 years look minor compared with that dramatic evolution, and the situation appears to be stabilizing" (Borguignon and Morrison, 2002, p. 728). It should be noted that they measured the degree of inequality or poverty among world citizens, not between countries. They note that poverty, which was largely an Asian problem until just after World War II, is now becoming an African problem.

Glenn Firebaugh concludes that "income inequality across nations peaked in the last third of the twentieth century and is now declining," whereas inequality within nations has begun to rise. He argues that the shift from between-nation to within-nation income inequality will continue and he pays attention to the possibility that the growing income inequality within nations may raise the specter of growing civil unrest and terrorism (Firebaugh, 2003, pp. xi, 218).

Under-Secretary-General (Department of Economic and Social Affairs, United Nations) José Antonio Ocampo complains in his Executive summary to *The Inequality Predicament: Report*

on the World Social Situation 2005 (2005) that the global commitment to overcoming inequality between the wealthy and poor is fading: "Eighty per cent of the world´s gross domestic product belongs to the 1 billion people living in the developed world; the remaining 20 per cent is shared by the 5 billion people living in developing countries." He says that this report examines the causes and consequences of inequality and focuses on the traditional aspects of inequality, including the distribution of income and wealth and inequality in health, education, and opportunities for social and political participation. In fact, economic and non-economic inequality has increased in many parts of the world. It is noted that there "has never been any illusion that inequality would be wholly and systematically eliminated, but the struggle to achieve even a measure of success has become increasingly difficult" (Ocampo, 2005, p. 9). In the report, trends and patterns of inequality are discussed from various perspectives, including income inequality between countries, poverty, and noneconomic aspects of inequality, such as life expectancy, maternal and child health, hunger and malnutrition, and education. Income inequality is measured by Gini coefficient and by per capita gross domestic product. Poverty is measured by the percentage of people living on less than US $1 a day and on less than US $2 a day. The proportion of the world's population living on less than US $1 a day decreased between 1981 and 2001 from 40 to 21 per cent and the share of those living on less than $2 a day from 67 to 53 percent (*The Inequality Predicament,* 2005, pp. 43-54). Life expectancy is measured by the years of life expectancy at birth. Maternal and child health is measured by under-five mortality rates and by maternal mortality rates. Hunger and malnutrition is measured by the percentage of undernourished people. Global inequality in education is measured by school enrolment ratios and by the average years of schooling *(*pp. 58-76). The report pays attention to the fact that the gap "between Africa and the rest of the world remains and has even widened in some respects" (*The Inequality Predicament,* 2005, pp. 58-76, 134).

Jeffrey Sachs (2005) is sure that it is possible to end poverty in our time. He says that the "wealth of the rich world, the power of today's vast storehouses of knowledge, and the declining fraction of the world that needs help to escape from poverty all make the end of poverty a realistic possibility by the year 2025" (Sachs, 2005, p. 3). It is a courageous prediction! He emphasizes that ending global poverty by 2025 requires a global compact between the rich and poor countries. His argument is that "technological progress enables us to meet basic human needs on global scale and to achieve a margin above basic needs unprecedented in history" (Sachs, 2005, pp. 266, 347). In his later book, Sachs estimates that the end of extreme poverty would "require less than 1 percent of the annual income of the rich world to finance the crucial investments needed in the poor countries to extricate them from the poverty trap" (Sachs, 2008, p. 12). I suspect that the eradication of global poverty by 2025 is not possible and that it will remain as one of the world's greatest challenges.

Alastair Craig et al. note in their book *Challenging Global Inequality* (2007) that after the Second World War confidence abounded among Western academics and politicians that the gap between richer and poorer countries could be bridged through economic growth. However, a half century later it was clear that this development project had failed. The "per-capita income gap between the richest and poorest countries has progressively increased over the past 200 years from a ratio of 3:1 to between 30:1 or 50:1" (Craig et al., 2007, p. 2). However, they argue that the pursuit of the equality of opportunity and the equality of outcome should be continued. My argument is that it may be possible, in principle, to approach equality of opportunity, whereas it will remain impossible to ensure equality of outcome for the reason that people do not have the same abilities to utilize equality of opportunity. Craig et al. think that enlightened self-interest should motivate rich countries to challenge global inequality, but it is also "morally unacceptable to ignore the fate of the extreme poor, especially once their plight has registered in

the minds of the wealthy and globally connected." They emphasize that humanity is not a slave to fate. Besides, in the contemporary world, where meeting the basic annual needs of the world's poorest would cost the equivalent of Europe's consumption of perfume, "it is difficult to argue that humanity does not possess the means to challenge global inequality" (Craig et al., 2007, p. 258; see also Mosley, 2012).

David Held and Ayse Kaya note in the introduction of their book *Global Inequality* (2007/2011) that powerful evidence illustrates global disparities. For example, about 2,742 million people live without adequate sanitation, the difference in the average life expectancy between poor and rich countries is 19 years, and the richest 10 per cent of the world's population receive approximately half of the world's income (Held and Kaya, 2007/2011, p. 1).

Mitchell A. Seligson (2008b) comes to the conclusion "that inequality in income, both within and between countries, is failing to disappear or even diminish." He notes that "there is little reason to believe that the international income gap is narrowing." This gap "seems to remain the single most serious problem confronting the family of nations, and it cries out for the attention of policymakers" (Seligson, 2008b, pp. 405, 412). I agree. The problem is, why does this gap persists despite all efforts to eradicate poverty? My intention in this book is to argue that this gap and many other global inequalities are inevitable and in some way natural consequences of human diversity.

Paul Collier differs in his book *The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It* (2007/2008) from most other development researchers, who are used to define developing countries so that they include five billion of the six billion people in the world (Collier, 2007/2008, p. xi). He notes that it is "time to redefine the development problem as being about the countries of the bottom billion, the ones who are stuck in poverty" (Collier, 2007/2008, p. 190). According to his argument, they are stuck in poverty because of

four traps: conflict, natural resources, landlocked with bad neighbors, and bad governance (Collier, 2007/2008, p. 175)

The books reviewed above deal with the basic problems of global inequality and poverty. Both inequality and poverty are multidimensional phenomena. The variables used to measure the gaps between the rich and poor countries illustrate various dimensions of inequality and poverty. Economic and other inequalities are measured by variables like per capita income, Gini index, life expectancy, the adult literacy rates, school enrolment ratios, under-five mortality rates, and maternal mortality rates. Poverty is measured by variables like the percentage of population living on less than $1.00 per day (extreme poverty); and the percentage of population living on less than $2.00 a day (moderate poverty).

In addition to single studies, there are several highly useful international compilations of various measures of human conditions. The World Bank's *World Development Indicators* (WDI) and *World Development Report* (WDR) as well as UNDP's *Human Development Report* (HDR) include the most extensive statistical data on various measures of human conditions. Data on global inequality and poverty used in other studies are quite often derived from these publications. *The CIA World Factbook* (CIA) is another useful source of empirical data on many kinds of human conditions. My dataset *FSD1289 Measures of Democracy 1810-2010* includes data on electoral participation, competition and the Index of Democratization (ID) from nearly all independent countries of the world. Freedom House's report *Freedom in the World: The Annual Survey of Political Rights and Civil Liberties* provides estimated data on political rights and civil liberties, which are assumed to measure also the level of democracy. Besides, *Polity IV Project: Political Regime Characteristics and Transitions, 1800-2010* measures authority characteristics (and democracy) of all independent states whose population is 500,000 inhabitants or more (see Marshall and Jaggers, 2003). Transparency International publishes an annual Corruption

Perceptions Index (CPI), whose scores vary from 0.1 to 10.0. A high score means less corruption.

There has been discussion on global inequality and poverty also on the internet. In the following, I refer briefly only to some contributions, which refer to data on the extent of inequality and poverty as well as to data on variables by which global inequality and poverty have been measured.

Global Inequality (downloaded 2012) informs us that 85 percent of the world's population (low and middle income countries) earned 20 percent of the Gross National income in 2001 and that 20 percent of the population (high income countries) earned 80 percent of the GNI. These percentages illustrate the extent of economic inequality in the world. Global inequality has two different dimensions: the inequalities between countries and inequalities within countries (*Global Inequality,* internet, 2013). As noted earlier, my attention in this book is focused on global inequality between countries. In 1989, 23.4 percent of the total earth population lived on $1 or less a day and 56.1 percent lived on less than $2 a day.

The University of California's *Atlas of Global Inequality* claims that "Global inequality has grown dramatically over the last 300 years" and that at the end of the last century "global income inequality was greater than ever before." It is noted that "the richest 1% of people in the world receives as much as the bottom 57%" and that the ratio "between the average income of the top 5% in the world to the bottom 5% increased from 78 to 1 in 1988 to 114 to 1 in 1993" (The University of California, internet, 2012). These figures illustrate the extreme income inequality in the world. Most of the world's people are poor.

According to Wikipedia's *Poverty* definition, poverty is the deprivation of food, shelter, money and clothing that occurs when people cannot satisfy their basic needs. Absolute poverty refers to the state of severe deprivation of basic human needs, which commonly include food, water, sanitation, clothing, shelter, health care, education and information. Relative poverty is defined as economic inequality in the society in which people live

(Wikipedia, internet, 2012, p. 1). The World Bank estimated that 1.29 billion people were living in absolute poverty in 2008. Of these, about 400 million lived in India and 173 million in China. The highest incidence rate of absolute poverty was in sub-Saharan Africa, 47% of the population. The "proportion of the developing world's population living in extreme economic poverty fell from 28 percent in 1990 to 21 percent in 2001." Most of the improvement occurred in East and South Asia, whereas in sub-Saharan Africa extreme poverty increased from 41 percent in 1981 to 46 percent in 2001. Various variables have been used to measure the extent and variation of poverty: Percentage of population living on less than $1.25 per day; percentage of population suffering from hunger; life expectancy; the Human Development Index; and the Gini coefficient (Wikipedia, internet, 2012, pp.1, 4).

One World (City University of London) notes that the "consequences of persistent poverty include hunger, children out of school, exposure to unnecessary health risk, and diminution of household back-up resources" (City University of London, internet, 2013, p. 1). Poverty is a multidimensional phenomenon. The United Nations Development Programme (UNDP) has taken this into account by establishing a new Multidimensional Poverty Index in 2010. The international poverty line based on the World Bank figures is $1.25 per day. "A second tier international poverty line of $2 per day is derived from the average of national poverty lines in all lower and middle income countries" (City University of London, 2013, internet, p 5). According to the World Bank figures, the number of people living under the international poverty line of $1.25 per day fell from 1.82 billion to 1.37 billion between 1990 and 2005. China accounted for 475 million of the reduction to 2005, which means that poverty increased elsewhere, in India the increase was 91 million people (City University of London, 2013, internet, p. 2).

John J. Macionis and Linda M. Gerber describe the extent of global inequality by the fact that "the richest 20% receives 80% of global income and the poorest 20% receives 1%." They classify

the 192 nations into high-income, middle-income, and low-income categories. The group of high-income countries comprises primarily Western Europe, North America, New Zealand and Australia, but also Japan, Hong Kong, Singapore, and South Korea. This category comprises 18% of the world's population but over 80% of the world's income. The middle-income countries are characterized by per capita income in the $2 500 to $10 000 range. The group covers the former Soviet Union and Eastern Europe and some Latin American, African, South American, and Asian countries, including China and India. The majority of people in low-income countries are "abjectly poor and starvation is a recurrent feature of life." These countries are primarily in Central and Eastern Africa, as well as in Asia. This category comprises 12% of the world's population. Poverty in poor countries is most extensive. People are dying from the lack of nutrition. "The magnitude of this tragedy is almost impossible to imagine with 40,000 people dying each day from starvation" (Maciones and Gerber, 2012, pp. 2-3).

Anup Shah notes that "poverty is the state for the majority of the world's people and nations" (Shah, 2005, internet, p. 2). In 2005, 1.4 billion people lived on or below the poverty line of $1.25 a day, and over three billion people lived on less than $2.50 a day.

2. Some Measures of Global Inequality

As stated in the Preface, the central purpose of this study is to explore to what extent global inequality in human conditions can be explained by the evolved human diversity measured by national IQ. Richard Lynn's and my book *Intelligence: A Unifying Construct for the Social Sciences* (2012a) includes our latest data and estimates of national IQs for 199 countries. Our previous dataset of national IQs was published in our 2006 book *IQ and Global Inequality,* which includes national IQs for 192 countries. Our first dataset of national IQs was published in our 2002 book *IQ and the Wealth of Nations.* Because national IQs

given in these datasets in many cases differ slightly from each other, and because all measurements of national IQs may include measurement errors, I decided to calculate for each country the arithmetic mean of the two latest measurements. So my intention is to use in this study the mean of 2012 and 2006 measurements as my principal measure of national IQ.

The selection of dependent variables was much more problematic for the reason that it is not self-evident what aspects of global inequality should be taken into account. Besides, satisfactory statistical data may not be available from all important aspects of global inequality. My intention is to focus on such aspects of human conditions as are crucially affected by conscious human policies and selections and which, in principle, are relevant for all countries of the world. Consequently, disparities in human conditions that are principally due to geographical, climatic, and other factors outside conscious human control are excluded, as well as various local factors, which do not seem to be relevant for other countries of the world.

The studies discussed above provide some information about various variables which could be used to measure global inequality from different perspectives. The most frequently measured inequality concerns income inequality, poverty, education, and health, but references have also been made to disparities in economic growth, life expectancy, nutrition, sanitation, corruption, and democracy. Many kinds of variables have been used to measure such disparities in human conditions, but the number of countries covered by these measurements varies greatly. Some indicators are intended to cover all countries of the world, but some others are focused on more limited geographical, cultural, or civilizational regions of the world. Because the results of measurements based on biased samples of countries would not be comparable with each other, I have avoided such indicators.

Inequality is a multidimensional phenomenon. For the purposes of this preliminary review, I selected nine dimensions or fields of inequality, which might be useful to take into account in attempts to measure the impact of national IQ on the average

global inequality in human conditions: income inequality, poverty, education, health, life expectancy, nutrition, sanitation, the level of democracy, and corruption. As the following review of variables used to measure global inequality in these nine dimensions indicates, the extent of inequality can be measured by one or more variables in each dimension. The problem was to decide which of those variables and datasets might be most appropriate to take into account in the final statistical analysis. Let us first see the available sources on variables that measure global inequality from different perspectives. Most data on the indicators used in this study are available from The World Bank's *World Development Indicators 2012* (WDI-12) and *World Development Report 2010* (WDR-10), UNDP's *Human Development Report* (HDR 2010-2012), and CIA's *The CIA World Factbook* (2011 and 2013) (CIA).

Data on national IQs are given for 199 states and territories in Lynn and Vanhanen's above mentioned *Intelligence* book (2012a), but all those countries and territories are not taken into account in this study. Territories lacking independence (Bermuda, Cook Islands, Hong Kong, Macao, Netherlands Antilles, New Caledonia, Puerto Rico, St. Helena, and Tibet) and small countries whose population in 2010 was less than 100,000 inhabitants (Andorra, Antigua & Barbuda, Liechtenstein, Marshall Islands, Northern Mariana Islands, and St. Kitts and Nevis) were excluded from this study. For the same reason Dominica, Grenada, Kiribati, and Seychelles, whose population was around 100,000 in 2010, were also excluded. Territories without independence may be too much depending on the policies of their host countries. Exceptional environmental factors may affect the nature of human conditions in dwarf states much more than in larger states, and data on their human conditions may be less reliable than data on bigger countries. Palestine was excluded for the reason that its government does not control its territories. Also, I had to exclude Somalia for the reason that it was a failed state without any effective national government since the 1990s at least to 2012 (See *Freedom in the World 2012,* 2011, pp. 613-

618). However, Somalia's governmental system started to stabilize in 2012 when Hassan Sheik Mohamud was elected President (Perry, internet, 2013, pp. 12-17). After these exclusions, the study covers 178 countries whose population in 2010 was clearly higher than 100,000 inhabitants.

Next I am going to introduce different variables that have been used to measure global inequality in the nine dimensions of inequality listed above. The values of each variable are assumed to depend principally on conscious human selections and policies, although all of them are affected by various environmental factors, too. Each variable will be correlated with national IQ in order to see to what extent they are related to human diversity measured by national IQ. On the basis of these reviews, the most appropriate measures of human conditions were selected for the final empirical analysis.

Income inequality

The statistical datasets given in the World Bank's *World Development Indicators 2012* (WDI-12), UNDP's *Human Development Report 2010* (HDR-10) and CIA's *World Factbook 2013* (CIA-13) include more than ten variables that measure income inequality from different perspectives. The problem was to select some suitable variables for this preliminary analysis. The selection of variables was based on two principal criteria: (1) data on variables should be available from all or from nearly all 178 countries of this study, and (2) the variables should measure income inequality from different perspectives.

Several datasets on various indicators of global income inequality are available, including PPP/GNI per capita 2010, GNI per capita 2010, and Gini Index. According to the definition given in WDI-12, GNI "measures total domestic and foreign value added claimed by residents. GNI comprises GDP plus net receipts of primary income (compensation of employees and property income) from nonresident sources," and "Purchasing power parity (PPP) gross national income is GNI converted to international dollars using PPP rates." An international dollar has the same

purchasing power over GNI that a U.S. dollar has in the United States. Gross national income per capita is GNI divided by the midyear population (The World Bank WDI-12, 2012, pp. 23-77). "Gini Index measures the extent to which the distribution of income (or consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution." WDI-2011 emphasizes that because "the underlying household surveys differ in method and type of data collected, the distribution data are not strictly comparable across countries. For example, the distribution of income is typically more unequal than the distribution of consumption. A Gini Index of 0 represents perfect equality, while an index of 100 implies perfect inequality" (The World Bank, WDI-11, 2011, p. 71). Thus we have three indicators of global income inequality for this preliminary statistical analysis:

(1) Purchasing power parity gross national income per capita 2010 (PPP/GNI) (WDI-12, Table 1.1 and Table 1.6),
(2) Gross national income *Atlas method* per capita $ 2010 (WDI-12, Table 1.1 and Table 1.6), and
(3) Gini index (WDI-12, Table 2.9).

Data on PPP/GNI per capita 2010 are available from WDI-2012 (tables 1.1 and 1.6) for 172 countries, and data on GNI per capita 2010 are from WDI-12 (tables 1.1 and 1.6) for 173 countries. It is hypothesized that these two indicators of global income inequality are positively correlated with national IQ. The results of correlation analysis support the hypothesis. The correlation between national IQ and PPP/GNI per capita 2010 is 0.671 and between national IQ and GNI per capita 2010 it is 0.619.

Data on Gini index are from WDI-2012 (Table 2.9) for 151 countries. It is hypothesized that Gini index is negatively correlated with national IQ. The results of correlation analysis support this hypotheses, but only weakly. The negative correlation between national IQ and Gini index is not higher than -0.424.

These three variables measure global income inequality from different perspectives, and all of them are moderately correlated with national IQ. Of these three indicators, PPP/GNI per capita 2010 is most strongly correlated with national IQ, and data on this variable are missing only from six countries of this study. GNI per capita 2010 is nearly as strongly correlated with national IQ, but because it and PPP/GNI per capita 2010 are extremely strongly intercorrelated (0.951), it would not be sensible to take both of them into account. Gini index is much more weakly correlated with national IQ, and because data on this variable are available only from 151 countries, Gini index is excluded from the final statistical analysis.

Poverty

The extent of poverty can be measured by UNDP's Multidimensional Poverty Index 2000-2008 (MPI) and by the percentage of population living below the two international poverty lines: population living on less than $1.25 a day and on less than $2 a day. It is reasonable to hypothesize that all these indicators of poverty are negatively correlated with national IQ. Below $1.25 a day variable indicates the percentage of population living in extreme poverty. Below $2 a day variable indicates the share of very poor people. MPI is UNDP's combined index of poverty, which combines variables indicating intensity of deprivation, population at risk of multidimensional poverty, population with at least one severe deprivation in education, health, or living standard, and population below income poverty line PPP $1.25 a day (UNDP, 2010, pp. 94-100). Thus we have three measures of poverty for statistical analysis:

(4) International poverty line. Percentage of population living on less than $1.25 per day (WDI-2012, Table 2.8),
(5) International poverty line. Percentage of population living on less than $2 a day (WDI-2012, Table 2.8),
(6) Multidimensional Poverty Index 2000-2008 (UNDP-2010, Table 5).

Data on population below $1.25 a day and $2 a day are available from WDI-2012 only for 102 countries of this study. Such a small sample of 102 countries may be seriously biased. For example, most economically highly developed countries are missing from this sample, but the group of missing countries includes also many poor countries. Data on Multidimensional Poverty Index (MPI) are available only for 95 countries.

The results of correlation analysis support the hypothesis strongly. The correlation between national IQ and Below $1.25 a day variable is -0.729 and between national IQ and Below $2 a day variable -0.737 in the group of 102 countries. MPI is even more strongly correlated with national IQ in the sample of 95 countries (-0.761). The extent of poverty seems to be significantly dependent on national IQ, but because the samples of countries are too small and biased, I did not take any poverty indicator to the group of final measures of global inequality.

Tertiary education

There are several variables suitable to measure international disparities in the extent of education. Adult literacy rate is the basic measure of education. It indicates "the percentage of the population ages 15 and older that can, with understanding, both read and write a short simple statement about their everyday life" (The World Bank WDI-12, 2012, p. 97). Data on this variable are available from the World Bank's publications WDI and WDR as well as from UNDP's HDR and from CIA's *World Factbooks*. Gross enrollment ratios of secondary and tertiary education are two other available indicators of education. Gross enrollment ratio "is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown" (The World Bank WDI-12, 2012, p.89). Data on these two variables are available from the same sources as in the case of Adult literacy rate. I think that these three variables are enough to indicate global inequalities in the extent of

education. It is reasonable to hypothesize that each of these three variables is positively correlated with national IQ.

(7) Adult literacy rate, % ages 15 and older 2005-10 (WDI-12, tables 2.14 and 1.6).
(8) Gross enrollment ratio, % of relevant age group, Secondary 2010 (WDI-2012, Table 2.12).
(9) Gross enrollment ratio, % of relevant age group, Tertiary 2010 (WDI-2012, Table 2.12).

Data on literacy are available for 140 countries from WDI-12. Data on secondary education are available for 124 countries and on tertiary education for 112 countries from WDI-12. The results of correlation analysis show that all three variables are positively correlated with national IQ as hypothesized. The positive correlation between national IQ and Literacy is moderate (0.681) in the sample of 140 countries, whereas Secondary is more strongly correlated with national IQ (0.711) in the sample of 124 countries, and Tertiary is even more strongly correlated with national IQ (0.810) in the sample of 112 countries. The large number of missing data constitutes a problem, but it is possible to complement data on Tertiary education from other sources.

Any one of the three indicators could be used in the final analysis to measure the extent of global inequality in the field of education, but I think that the Tertiary variable would be the most appropriate for the purposes of this study. The fact that the level of literacy has already reached 100 percent, or is approaching 100 percent in most countries of the world, diminishes seriously the ability of this variable to measure differences in the educational achievements of nations. The fact that the gross enrollment ratio of secondary education indicates only the relative number of students receiving secondary education but not differences in the quality of secondary education diminishes the ability of this variable to measure global inequalities in education. Besides, the different national definitions of "secondary education" reduce the comparability of data. For these reasons I decided to exclude

Literacy and Secondary variables from the final analysis. It is true that significant national differences in the definition of "tertiary education" reduce the comparability of data on this variable, too, but it indicates much greater global variation than Literacy and Secondary. Therefore I decided to select it for the final analysis to measure global inequality in education.

Health

In addition to great global inequality in per capita income, poverty, and education, there are also significant disparities in health conditions between countries. It is reasonable to assume that those disparities depend to a significant extent on conscious human policies and skills, although differences in geographical circumstances and other environmental factors affect also global disparities in health conditions. There are several variables that could be used to measure disparities in health conditions from different perspectives. I selected for this purpose variables that measure under-five mortality rate per 1,000 live births and maternal mortality ratio per 100,000 live births. Under-five mortality rate "is the probability of a child born in a specific year dying before reaching age 5, if subject to the age-specific mortality rate of that year". Maternal mortality ratio "is the number of women who die from pregnancy-related causes during pregnancy and childbirth, per 100,000 live births. Data are from various years and adjusted to a common 2008 base year" (The World Bank WDI-12, 2012, pp. 27, 31). Both variables indicate great differences in the quality of health conditions between countries. It is hypothesized that both of these variables are negatively correlated with national IQ.

(10) Under-five mortality rate per 1,000 live births, 2010 (WDI-12, tables 1.2 and 2.23).
(11) Maternal mortality ratio, modeled estimate per 100,000 live births, 2008 (WDI-12, tables 1.3 and 2.19).

Data on Under-five mortality rate are available for 153 countries from WDI-12 and on Maternal mortality ratio for 152 countries from WDI-12. Both variables are negatively correlated with national IQ as hypothesized. The correlation between national IQ and Under-five mortality rate is -0.808 and between national IQ and Maternal mortality rate -0.733. Both variables could be used to measure global inequality from the perspective of health conditions. Under-five mortality rate was selected to be used in the final analysis for the reason that it is possible to find data for all missing cases from other sources.

Life expectancy

Life expectancy is another variable which indicates the quality of health conditions in a country. The better those conditions are, the longer people can be expected to live. Life expectancy at birth "is the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life" (The World Bank WDI-12, 2012, p. 131). It is reasonable to assume that more intelligent nations are able to establish better health conditions in a country than less intelligent nations.

(12) Life expectancy at birth, years, 2010 (WDI-12, Table 1.6 and Table 2.23). Statistical data on the estimated life expectancy are available for 177 countries from WDI-12. The correlation between Life expectancy 2010 and national IQ is positive as hypothesized and relatively strong (0.813). The explained part of variation rises to 66 percent. This variable will be used in the final analysis of global inequality in human conditions.

Nutrition

Global inequalities in the level of nutrition are great, and it is justified to assume that more intelligent nations are able to take care of the population's nutrition better than less intelligent nations. The World Bank's *World Development Indicators* and *World Development Report* as well as UNDP's *Human*

Development Report provide data on prevalence of undernourishment and prevalence of child malnutrition from most countries of the world. The following two variables seem to be suited to measure global inequality in human conditions from the perspective of nutrition:

(13) Prevalence of undernourishment, % of population 2006-08 (WDI-12, Table 2.20).
(14) Prevalence of child malnutrition, % of children under 5, underweight, 2000-07 (WDR-2010, Table 3).

Prevalence of undernourishment "is the percentage of the population whose dietary energy consumption is continuously below a minimum requirement for maintaining a healthy life and carrying out light physical activity with an acceptable minimum weight for height." It is evident that well-nourished children perform better in school, grow into healthy adults, and give their children a better start in life. Prevalence of child malnutrition "is the percentage of children under age 5 whose weight for age (underweight) or height for age (stunting) is more than two standard deviations below the median for the international reference population ages 0-59 months." Further, it is noted that "the proportion of underweight children is the most common malnutrition indicator. Being only mildly underweight increases the risk of death and inhibits cognitive development in children" (The World Bank WDI-12, 2012, p. 119). Therefore it is reasonable to hypothesize that both variables are negatively correlated with national IQ.

Data on undernourishment are available for 143 countries from WDI-12, and data on underweight children are available for 118 countries from *World Development Report 2010*. Both variables are negatively correlated with national IQ as hypothesized. The correlation between national IQ and the undernourishment variable is -0.564 in the group of 143 countries and between national IQ and the underweight children variable is -0.722 in the group of 118 countries.

I decided to exclude the undernourishment variable from the final analysis because data on undernourishment are only rough estimates and because its correlation with national IQ is relatively weak. The underweight children variable is more strongly correlated with national IQ, but because data are missing from too many countries, I excluded it from the final analysis.

Clean water and sanitation facilities

Global disparities in sanitation conditions are enormous in the world. It is noted in WDI-12 that lack of "clean water and basic sanitation is the main reason diseases transmitted by feces are so common in developing countries" (The World Bank WDI-12, 2012, p. 111). Improved drinking water technologies and improved sanitation facilities would provide safe drinking water and prevent contact with human excreta. Two variables can be used to measure access to clean water and sanitation:

(15) Access to an improved water source, % of population, 2010 (WDI-12, Table 2.18).
(16) Access to improved sanitation facilities, % of population, 2010 (WDI-12, Table 2.18).

Access to an improved water source "refers to people with access to at least 20 liters of water a person a day from an improved source, such as piped water into a dwelling, public tap, tube well, protected dug well, and rainwater collection, within 1 kilometer of the dwelling". Further, access "to improved sanitation facilities refers to people with at least adequate access to excreta disposal facilities that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from protected pit latrines to flush toilets" (The World Bank WDI-12, 2012, p. 111). *The Economist* describes the consequences of insufficient sanitation facilities in the case of India as follows: "Sanitation and public hygiene are awful, especially in the north: half of all Indians still defecate in the open, resulting in many deaths from diarrhoea and encephalitis" (Indian development:

Beyond bootstraps, 2013). It is reasonable to assume that more intelligent nations are able to take care of these basic needs more effectively than less intelligent nations. Consequently, these variables should correlate positively with national IQ.

Data on both variables are available for 145 countries from WDI-12, and both variables are correlated positively with national IQ as hypothesized. The correlation between national IQ and Clean water is 0.696 and between national IQ and Sanitation 0.767. Because Sanitation is more strongly correlated with national IQ than Clean water, I will take it into account in the final analysis. It measures a significant aspect of global inequality in human conditions.

Democracy

The nature of a country's political system depends crucially on conscious human selections and policies. It can be argued that democracies provide better living conditions for people than autocratic systems. Democracy allows people to take part in political decision-making through elections and to use their political rights and freedoms. It is justified to assume that more intelligent nations are usually able to establish more democratic systems than less intelligent nations, although various environmental factors may affect significantly the nature of political systems independently from the level of intelligence. It is difficult to measure reliably the extent and quality of democracy in a country, but there are some international datasets on the measurements of democracy. I take into account two measures of democracy: my own Index of Democratization (ID) and Freedom House's ratings of countries by the levels of political rights and civil liberties. Both datasets cover practically all independent countries of the world.

(18) Index of Democratization 2010 (ID-10) (FSD1289 Measures of Democracy, 1810-2010).
(19) Freedom House's combined ratings of political rights and civil liberties 2010 (FH-10) (*Freedom in the World 2011)*.

(20) Freedom House's combined ratings of political rights and civil liberties 2011 (FH-11) (*Freedom in the World 2012*).

The Index of Democratization (ID) measures the level of democracy through two crucial dimensions of democracy: Competition and Participation. Competition is calculated by subtracting the percentage of votes won by the largest party from 100. Participation is the percentage of the total population who voted in the election. Also, the impact of referendums is added to the Participation variable in such a way that each national referendum adds the degree of participation by 5 points and each state referendum by 1 point for the year when referendum took place. The impact of referendums is limited to 30 points for a year and the combined score of electoral participation and referendums is limited to 70. The same 70 percent upper limit is used in the case of Competition. The two basic variables are combined into an Index of Democratization by multiplying the two percentages and by dividing the product by 100. As a consequence of multiplication, ID can reach a high value only if the values of both basic variables are high (see Vanhanen, 2003, 2009; Lynn and Vanhanen, 2012b, pp. 129-130).

Freedom House's combined ratings of political rights and civil liberties constitute an alternative measure of democracy. The Freedom House rates political rights and civil liberties separately on a seven category scale, in which 1 represents the most free and 7 the least free country. The country is regarded to be the more democratized, the lower the combined rating is (*Freedom in the World 2012,* 2011, p. 18). The Freedom House ratings are taken into account separately for the years 2010 and 2011.

It is hypothesized that ID-10 is positively and FH-10 and FH-11 negatively correlated with national IQ. The results of correlation analysis support these hypotheses. The correlation between national IQ and ID-10 is positive 0.557 in the total group of 178 countries, whereas FH-10 and FH-11 are negatively correlated with national IQ (-0.423 and -0.418). It is evident that the variation in the measures of democracy is clearly more due to

the impact of various environmental factors than to national IQ. However, because ID-10 is moderately correlated with national IQ, I added it to the group of final dependent variables and excluded FH-variables, which are more weakly correlated with national IQ.

Corruption

Just like in the case of democracy, there are enormous disparities between countries in the extent of corruption. It is reasonable to assume that people would prefer to live in a country of a low level of corruption rather than in a highly corrupted country. Because nations of high intelligence may be able to control corruption more effectively than nations of low intelligence, it can be hypothesized that the level of corruption tends to be lower in countries of high national IQs than in the countries of low national IQs. This hypothesis can be tested by data on the Corruption Perceptions Index (CPI) 2010 calculated by Transparency International.

(20) Corruption Perceptions Index 2010 (Transparency International).

A country score "indicates the perceived level of public sector corruption on a scale of 0-100, where 0 indicates that a country is perceived as highly corrupt and 100 means that a country is perceived as very clean." Corruption is generally defined as the misuse of public power for private benefit. The CPI "is a composite index, a combination of surveys and assessments of corruption, collected by a variety of reputable institutions" (Transparency International, internet, 2013b). It is based only on perceptions because there is no meaningful way to assess absolute levels of corruption on the basis of hard empirical data. It should be noted that the CPI is limited in scope. It concerns only administrative and political corruption, not corruption in the private sector. The data on CPI in 2010 cover 167 countries of this study. Data are missing from the Bahamas, Belize, Equatorial

Guinea, Fiji, North Korea, Mauritius, Micronesia, St. Lucia, St. Vincent & the Grenadines, and Suriname. The CPI data scores are missing from these countries because of insufficient survey information.

The CPI 2010 is correlated positively with national IQ. The correlation between CPI-10 and national IQ is 0.595 in this group of 167 countries. The explained part of variation rises to 35 percent. Most of the variation in CPI seems to be due to various environmental factors, but national IQ may be the strongest single explanatory factor.

However, I decided to exclude this variable from the final analysis principally for the reason that data on this variable are not based on any material evidence as in the cases of other variables; data are only perceptions of investigators. Their estimations may be more or less correct, but they may also include significant errors. Outsiders do not have any means to check their estimations by comparing them to empirical source material.

Conclusion

The above examination of global inequality from nine different perspectives disclosed that great disparities in human conditions continue in the world and that at least some disparities may be growing rather than decreasing. It was also found that all kinds of disparities in human conditions are moderately or even strongly correlated with the level of national IQ, which is used to measure the impact of human diversity on the differences in human conditions. The 20 variables introduced and explored preliminarily in this chapter provided material to construct a combined index of global inequality in human conditions (IGI). The problem was to select the most appropriate measures of human conditions for this combined index, which will be used to indicate the average level of global inequality in the 178 countries of this study. It can be assumed that the average level of global inequality is lower for the more intelligent nations than for the less intelligent nations. Six of these 20 variables were selected to be used in the final analysis as the components of IGI: (1) PPP/GNI

per capita 2010; (2) Tertiary education 2010, gross enrollment ratio; (3) Under-five mortality rate per 1,000 live births 2010; (4) Life expectancy 2010; (5) Access to improved sanitation facilities 2010; and (6) Index of Democratization (ID) 2010. Together these six variables measure global inequality in human conditions from clearly different and important perspectives.

Chapter 2

Theoretical Explanations

1. Contemporary Theoretical Explanations

2. Human Diversity as the Ultimate Explanatory Factor

In the previous chapter, I referred to several contemporary studies of economic development and global inequality, and especially to studies of poverty. Many of them provide explanations for unequal economic development and for the persistence of global inequality and poverty. It is characteristic for these theoretical explanations that causal factors have been sought merely from different environmental circumstances, geographical, cultural, and institutional factors as well as from governmental policies. References to possible impact of human nature or other evolutionary factors have been rare, although all phenotypic phenomena are always affected both by genetic and environmental factors. Social scientists seem to assume that environmental factors are enough to explain global disparities in economic development and poverty. I agree that differences in environmental circumstances are important and that they can explain a significant part of global disparities in human conditions, but my central argument is that human diversity provides the most important and systematic explanation for the

persistence of many kinds of global inequalities. It should be taken into account because economic and social inequalities and poverty are phenotypic phenomena. Human diversity has not been taken into account in contemporary studies because it has been assumed, implicitly, that there cannot be any significant differences in the innate abilities of nations. This axiomatic assumption has led to the conclusion that enormous inequality in human conditions is in some way unnatural and that it would be possible to equalize human conditions by appropriate policies. My intention is to challenge this axiomatic environmental starting point based on an erroneous worldview. I begin by reviewing the nature of theoretical explanations provided and discussed in some contemporary studies.

1. Contemporary Theoretical Explanations

The existence of many kinds of global disparities and inequality in human conditions is a known fact of life. The problem is to seek a theoretical explanation for the emergence and persistence of such disparities. The World Bank's *World Development Reports* and *World Development Indicators,* as well as UNDP's *Human Development Reports,* inform annually on the extent of many kinds of global inequalities in human conditions. The global statistical data presented in these and in some other publications provide the necessary material basis to explore the extent of contemporary global disparities in human conditions from different perspectives. It is unclear whether global inequality has increased or decreased during the last decades. Some aspects of global inequality (for example, in literacy and life expectancy) have diminished, but some others may have increased. In any case, disparities in all aspects of human conditions reported in these publications have persisted at least since World War II. Researchers have explored the problems of uneven economic development and inequality and discussed the causes of these

phenomena, but they have not been able to agree on any coherent and testable theoretical explanation.

Modernization theory and dependency theory are two traditional theories which try to explain economic development, global inequality and poverty. According to the modernization theory, global inequality is related to differing levels of technological development and to cultural differences between societies. Until the Middle Ages all people in the world were poor. Economic development started from cities during the Middle Ages and from the Industrial Revolution, which lifted the living standards of many societies. Modernization theorists believe that all societies are converging on one general form, the convergence taking place through four general stages as W.W. Rostow explained: (1) the traditional stage, (2) the take-off stage, (3) the drive of technological maturity stage, and (4) the high mass consumption stage (see Macionis and Gerber, 2012; Rostow, 1990/2008). It seems to me that the modernization theory does not explain why economic development started principally in Europe and earlier in east Asia and not in all parts of the world at the same time. My argument is that significant differences in national IQs explain, to some extent, the beginning of economic development in east Asia and later in Europe.

Dependency theory claims that global poverty historically stems from the exploitation of poor societies by rich societies. It is assumed that before European colonialism poor societies were better off than they are now. The central argument of the dependency theory is that economic positions of the rich and poor societies are interdependent and that the prosperity of high-income countries has increased at the expense of low-income countries. Wallerstein's world-system theory argues that the world economy, a global system, is no longer controlled by traditional nations, it is dominated by capitalism. The rich nations are at the core of this world system, which perpetuates poverty in the rest of the world by maintaining the dependency of poor nations (see

Macionis and Gerber, 2012; Frank, 1969/2008). I think that these theories fail to explain the origins of dependency relationships and the division between the core and periphery countries. Why did European countries subjugate sub-Saharan African, Latin American and many Asian countries and not the opposite? This question refers to some causal factors which are not taken into account in dependency and world-system theories.

Mitchell A. Seligson and John T. Passé-Smith, the editors of *Development and Underdevelopment: The Political Economy of Global Inequality* (2008), say that their book concerns "the international gap in wealth between rich and poor nations and the domestic gap in wealth between rich and poor people. When did those gaps begin? What is their cause? How can they be narrowed?" (Seligson and Passé-Smith, 2008, p xi). These are excellent questions. The editors promise their reader answers to all these questions. In fact, there are some answers, but they tend to be different ones, and the book does not provide any coherent theoretical explanation, although it emphasizes the significance of institutions.

Seligson reviews the major arguments presented in their book on the extent and causes of the gap between rich and poor countries and rejects most of the previous explanations. He notes that the Marshall Plan for rebuilding Europe produced the expected results rapidly. The same happened in Japan. Consequently, many believed that similar success would be achieved in the developing world, but in most cases such efforts have failed to stimulate growth, or the results have fallen far below expectations (Seligson, 2008a, p. 3). I would like to argue that the reason for this failure is due to the fact that the average intelligence of most developing nations is much lower than the intelligence in Germany and Japan.

In the concluding chapter Seligson notes that inequality in income is failing to disappear or even diminish. This fact falsifies classical economic theory, which predicted that all countries

would evolve toward universal prosperity. Cultural theories have also failed to explain the Third World's underdevelopment. These theories no longer dominate the field, and as a result, other theories have emerged to provide better explanations. According to the "inverted U curve" of development, "developing nations are likely to experience a widening internal gap before they see the gap narrow in the later phases of industrialization" (Seligson, 2008b, p. 406). Dependency and world-system theories do not believe that the gaps will ultimately narrow because they are seen as a function of the world capitalist economic system. This issue has still not been solved, but like "the culture paradigm before it, dependency and world-system thinking no longer seem to offer *the* explanation for the gaps between rich and poor." Seligson emphasizes that "the current attention is focused on the role of institutions, policies, and the state." He refers to the contrast between North Korea and South Korea as an example on the significance of institutions and policies. The difference between these two countries cannot be due to culture, history, or resources; not even to national IQ, which is the same for both countries. The difference is completely due to political systems and the policies they make. Seligson comes to the conclusion that "there is little reason to believe that the international income gap is narrowing" (Seligson, 2008b, pp. 407, 411).

The causes of global inequality and poverty are explored in many other studies, although most of them are more interested in the means to reduce inequality than in their causes. In the following, I refer to some of these studies in order to illustrate the nature of explanations.

Nathan Rosenberg and L.L. Birdsell explained in their book *How the West Grew Rich* the economic development in the West principally by appropriate economic and political institutions and policies. They emphasized the significance of capitalist institutions like free markets, private property, freedom to organize economic enterprises, and so on, as well as the

importance of political institutions and education. According to them, the "West's achievement was not the abolition of poverty but the reduction of its incidence from 90 percent of the population to 30 percent, 20 percent, or less, depending on the country and one's definition of poverty" (Rosenberg and Birdsell, 1986, p. 6). They say that the "immediate sources of Western growth were innovations in trade, technology, and organization, in combination with accumulation of more and more capital, labor, and applied natural resources" (Rosenberg and Birdsell, 1986, p. 20). They came to the conclusion that a knowledge "of the origins of Western wealth may help us to understand what economic, political, and social policies are likely to lead to the continuance of Western economic growth, what policies are likely to help less-developed countries grow, and what policies are likely to stop growth or lead to a decline" (Rosenberg and Birdsell, 1986, p. 302). Their analysis of the significance of environmental variables is fine. However, I would like to add that the level of national IQ in Western countries belongs to the highest in the world, whereas it is much lower in less-developed countries, and that this difference may explain why less-developed countries have not been able to follow the example of the West.

Jared Diamond's explanation for the West's economic success is quite different. He rejects emphatically the idea that differences in innate abilities (intelligence) of people might explain the fact that European societies became disproportionately powerful and innovative. He claims that sound "evidence for the existence of human differences in intelligence that parallel human differences in technology is lacking" and he assumes that "in mental ability New Guineans are probably genetically superior to Westerners" (Diamond, 1998, pp. 19, 21). Diamond's central idea is that geographical differences between Eurasia and other parts of the world combined with continental differences in domesticable plants and animals explain the start of economic development in Eurasia. The east-west axis of Eurasia made the diffusion of

animals, plants, ideas, technology, and people easier than in the Americas, where its north-south axis retarded their diffusion. Food production was delayed in sub-Saharan Africa, compared with Eurasia, by paucity of domesticable native animal and plant species, and its north-south axis, which retarded the spread of food production and inventions. His conclusion is that "the striking differences between the long-term histories of peoples of different continents have been due not to innate differences in peoples themselves but to differences in their environments" (Diamond, 1998, pp. 398, 405). A problem with Diamond's theory is that it has not been possible to operationalize his theoretical concepts and to test his theory by empirical evidence.

David S. Landes' (1998) book *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor* is another highly interesting historical analysis of the unequal distribution of wealth and poverty in the world. He notes that the gap in wealth that separates rich and poor is the greatest single problem and danger facing the world of the third Millennium. He traces this gap to various geographical and other environmental factors, for example, to the climatic differences: "the rich countries lie in the temperate zones, particularly in the northern hemisphere; the poor countries, in the tropics and semitropics" (Landes, 1998, pp. 5, 9, 14). Economic development has been easier in the temperate zones than in the tropics, where heat, parasites, and tropical diseases make living difficult. For example, even today, the density of tsetse flies "makes large areas of tropical Africa uninhabitable by cattle and hostile to humans." Briefly stated, life "in poor climes, then, is precarious, depressed, brutish." In addition to the nature's unfairness, Landes pays attention to the impact of inventions and technologies developed in Europe, continental institutional differences, and to various other environmental factors, but his final conclusion from the history of economic development is that "culture makes all the difference." However, he does not tell us how it might be possible to test his

theoretical explanation by empirical evidence. It seems to be difficult to operationalize his numerous explanatory factors. In any case, his rich historical analysis indicates that "rich and poor do not seem to be growing closer" (Landes, 1998, pp. 516, 518).

Jeffrey Sachs says that his book *The End of Poverty* (2005) is about ending poverty in our time. He believes it to be possible because the present inequality in wealth is due only to temporary historical factors, not to differences in the innate abilities of nations. According to his interpretation, two centuries of modern economic growth in the richest countries explains the existing gap between rich and poor countries. The poorest countries did not begin their economic development until decades later, and they did it under tremendous obstacles, including the brutal exploitation of dominant colonial powers and geographical barriers related to climate, food production, disease, energy resources, and proximity to world markets. In addition, they made "disastrous choices in their own national policies, often until the past decade" (Sachs, 2005, p. 50). Sachs thinks that all these barriers can be removed, which makes possible similar economic development as in the richest countries of the world. He does not take into account the fact that the existing differences in per capita income between rich and poor countries correlate moderately or strongly with the differences in national IQs. He assumes that the extreme poverty could be removed if high-income countries were willing to give 0.7 percent of GNP as foreign assistance to the poorest countries (Sachs, 2005, pp. 301-302; see also Sachs, 2008). I think that Sachs' hope is unrealistic for the reason that most poor countries would be unable (because of their lower national IQs) to follow the example of high-income countries in their economic policies.

The United Nations' report *The Inequality Predicament* (2005), as noted in Chapter 1, describes different aspects of international inequality and poverty and suggests some strategies to reduce inequality, but it does not present any theoretical

explanation for the emergence and persistence of inequality. The report illustrates the extent of inequality noting that the wealthiest 20 percent of the planet accounts for 86 percent of all private consumption and the poorest 20 percent for just above 1 percent. This imbalance is not decreasing: "In spite of the compelling case for redressing inequality, economic and non-economic inequalities have actually increased in many parts of the world, and many forms of inequality have become more profound and complex in recent decades" (*The Inequality Predicament,* 2005, p. 2).

Robert J. Barro's study *Determinants of Economic Growth* (1999) focuses on the causes of economic growth and prosperity for the people of the world. He uses numerous economic and other environmental variables to explain economic growth and argues that the growth depends on many factors, but all of them are environmental factors. The most important determinants of economic growth concern government policies, political rights, level of life expectancy, the quality of education, and the distribution of income and wealth. He does not refer to the possibility that the unexplained part of the variation in economic growth might be due to the impact of human diversity (see Barro, 1999).

Tim Allen and Alan Thomas' book (2000) provides a lot of information and analysis on poverty and development, but it does not offer any coherent theoretical explanation for the causes of poverty and global inequality. The variables which have been used to explain various aspects of poverty are environmental ones. Consequently, they differ from each other from case to case. Any attempt has not been made to take into account the genetic component of all phenotypic phenomena. It is implicitly assumed that environmental factors are sufficient to explain the variation in global poverty and development (see Allen and Thomas, 2000).

Surjit S. Bhalla (2002) does not offer any theoretical explanation for the emergence of inequality and poverty, but he argues very strongly that globalization is the most effective way to

diminish poverty and inequality. According to his prediction, by the end of the first decade of the 21st century, "the level of inequality is likely to be equal to that prevailing 100 years ago" (Bhalla, 2002, p. 1). Further, "Zero $2 poverty is likely in all parts of the world in 2015, except in sub-Saharan Africa" (Bhalla, 2002, p. 172). He predicts the convergence in economic development and claims that the prime beneficiaries of this convergence are poor nations and poor people in poor nations. He admits the deviating position of sub-Saharan Africa, but assumes that "there is no reason why the positive forces of globalization should not also catch up with Africa" (Bhalla, 2002, p. 190). I think that there is one powerful reason which makes it difficult for sub-Saharan African nations to catch up with the more developed parts of the world: national IQs of sub-Saharan African countries are lower than the national IQs in other parts of the world. Bhalla does not take into account the impact of human diversity measured by national IQ and, for that reason, it is highly probable that his predictions will not become true.

Glenn Firebaugh's (2003) argument is that global income inequality has started to decline as a consequence of the spread of industrialization to the world's poor regions. According to his interpretation, "the enormous growth in global inequality occurred during the period of Western industrialization," and that today, during the period of Asian industrialization, global inequality is no longer growing. Thus industrialization is the crucial explanatory factor in his analysis. It caused the remarkable growth in the world's average income, but it benefitted disproportionately different regions of the world, and as "a result global income inequality has worsened dramatically since the early nineteenth century" (Firebaugh, 2003, p. 6). He rejects the World Bank's claim made in the *World Development Report 2000/2001* that "income inequality between countries has increased sharply over the past 40 years" and argues that "global income inequality almost certainly declined over this period" (Firebaugh, 2003, pp.

xi, 15). Global income inequality is no worse today than it was in the 1960s and 1970s, but it is shifting from inequality across nations to inequality within nations. Firebaugh's spreading-industrialization explanation of inequality focuses on the consequences of industrialization. He does not attempt to explain industrialization itself, the causes of Industrial Revolution. He does not explain why it benefitted disproportionately different regions of the world. He has not noticed that significant differences in national IQs could help to solve this problem. It is quite probable that early industrialization is strongly correlated with the level of national IQs.

Alastair Craig et al.'s book *Challenging Global Inequality* concerns the gap between rich and poor countries and attempts to bridge this gap through developmental policies. They do not present any theoretical explanation for the emergence of this gap, but they describe the extent and history of this gap from many perspectives. They seem to believe that ultimately it would be possible to challenge global inequality and to end it through appropriate developmental policies (see Craig et al., 2007). However, they have not taken into account the impact of human diversity (differences in national IQ) on inequality and poverty. The significant correlation between national IQ and per capita income implies that it would be difficult and probably impossible to equalize economic conditions between countries.

The book on *Global Inequality*, edited by David Held and Ayse Kaya, also describes inequality and poverty from many perspectives, but it does not include any theoretical explanation for the causes and persistency of inequality, although it links globalization to global inequality. Globalization in this book is understood "as the increased interdependence of the world primarily via openness to trade and investment, although some authors also emphasize the movement of people as a component of globalization" (Held and Kaya, 2007/2011, p. 14). One author (David Dollar) "finds globalization to be associated with higher

growth rates and poverty reduction," whereas some other authors argue that globalization supports inequality. Robert H. Wade notes that global institutions "serve themselves and the interests of the powerful, who are over-represented in them in the first place." Thomas W. Bogge links "globalization and inequality by demonstrating that globalization is not neutral: as a matter of fact, it favours the rich" (Held and Kaya, 2007/2011, p. 15). The editors come to the conclusion that the debate over globalization and inequality "is about how the benefits of globalization can be spread to greater populations" (Held and Kaya, 2007/2011, p. 23).

Nora Lustic et al. discuss the problem of poverty reduction in Latin American and Caribbean countries. They do not try to explain the causes of poverty in those countries; they focus on the means to reduce poverty. Their main argument is that economic growth would be the most effective way to reduce poverty and inequality, but the problem is how to generate economic growth (see Lustic et al., 2002).

Timothy Besley and Robin Burgess (2003) emphasize the significance of economic growth in poverty reduction, but they note that economic growth by itself is not enough to cut the poverty rate in half in much of the world. Institutional reforms are also needed. It would be necessary to identify policy and institutional changes that could reduce poverty. They emphasize that responsibility "for achieving the goal of cutting global poverty rates in half lies firmly at the door of domestic government" (Besley and Burgess, 2003, p. 19). Foreign aid cannot play a major role in poverty reduction. They pay attention to the great difference between east Asia and sub-Saharan Africa. The poverty rate in east Asia has dropped dramatically, whereas "poverty rates in sub-Saharan Africa have remained stagnant, moving from 47.6 percent in 1990 to 46.3 percent in 1998." Consequently, we have "an African tragedy to contrast with the east Asian miracle." The situation in south Asia is intermediate (Besley and Burgess, 2003, p. 6). I would like to add that clear

differences in national IQs between east Asia, south Asia, and sub-Saharan Africa provide an excellent explanation for the emergence of this regional pattern, and because national IQs are the lowest for sub-Saharan African countries, we cannot expect the disappearance of poverty in sub-Saharan Africa.

Paul Collier (2007/2008) explains the failure of economic development in poor countries by the fact that they are stuck in one or another of the four developmental traps: "the conflict trap, the natural resources trap, the trap of being landlocked with bad neighbors, and the trap of bad governance in a small country" (Collier, 207/2008, p. 5). However, these traps are not inescapable. Economic development presupposes that a country is able to escape its trap(s). Collier describes the nature of each trap and considers by what means external forces could help poor countries of the bottom billion to escape their traps. He separates our instruments of help: aid, military intervention, laws and charters, and trade policy for reversing marginalization. Aid alone is not enough. He notes that "the urgent matter is now to bring on the other three instruments: security, trade, and standards. These three were already neglected relative to aid even before aid was doubled" (Collier, 2007/2008, p. 189). Collier stresses the importance of foreign interventions. I wonder whether the countries of the bottom billion would be able to carry out and maintain the necessary reforms without continual external support and interventions. Until now most of them have not been able to break their traps by their own efforts.

Daron Acemoglu and James A. Robinson (2012) in their book *Why Nations Fail: The Origins of Power, Prosperity and Poverty* reject geographical and cultural explanations of inequality and poverty and emphasize the crucial importance of economic and political institutions. They make a fundamental difference between extractive and inclusive economic and political institutions. Extractive economic institutions "are structured to extract resources from the many by the few and that fail to protect

property rights or provide incentives for economic activity" (Acemoglu and Robinson, 2012, p. 430). Inclusive economic institutions "allow and encourage participation by the great mass of people in economic activities that make best use of their talents and skills and that enable individuals to make the choices they like." Further, to be inclusive, "economic institutions must feature secure private property, an unbiased system of law, and a provision of public services that provides a level playing field in which people can exchange and contract; it also must permit the entry of new businesses and allow people to choose their careers" (Acemoglu and Robinson, 2012, pp. 74-75).

The contrast between inclusive and extractive political institutions is as sharp. Inclusive political institutions distribute political power widely in a pluralistic manner and establish law and order, the foundations of secure property rights, and an inclusive market economy, whereas extractive political institutions "concentrate power in the hands of a few, who will then have incentives to maintain and develop extractive economic institutions for their benefit and use the resources they obtain to cement their hold on political power" (Acemoglu and Robinson, 2012, p. 430). According to their theory, the prosperity or poverty of a country depends on the nature of its economic and political institutions. Any country can become prosperous by establishing inclusive institutions, or remain poor by selecting extractive institutions. They illustrate the crucial importance of institutions by many historical examples, especially by comparing South and North Korea. The enormous gap in their levels of prosperity is a consequence of the selection of different political and economic institutions after the partition of Korea in 1948. The nature of institutions certainly matters also in many other cases, but they do not take into account the possibility that all countries are not equally able to establish any kinds of economic and political institutions.

Jerry Muller notes that inequality is increasing almost everywhere in the postindustrial capitalist world. According to his theoretical explanation, "Inequality is an inevitable product of capitalist activity, and expanding equality of opportunity only increases it because some individuals and communities are simply better able than others to exploit the opportunities for development and advancement that capitalism affords" (Muller, 2013, p. 30). This is an interesting argument. He emphasizes that the inequality that exists today derives less from the unequal availability of opportunity "than it does from the unequal ability to exploit opportunity." He continues that unequal ability "stems from differences in the inherent human potential that individuals begin with and in the ways that families and communities enable and encourage that human potential to flourish." He does not connect "unequal ability" to differences in intelligence, but he uses terms like "human capital" and "cognitive ability," which are not far away from intelligence. Besides, he refers to "hereditary endowments" and to "differential group performance" between communal groupings based on religion, race and ethnicity. His central argument is that in today's environment "human capital is more important than ever in determining life chances" (Muller, 2013, pp. 33, 40, 44-45).

The above review of contemporary theoretical explanations reveals that there are many kinds of theories intended to explain economic development, global inequality, and poverty. The list of explanations includes modernization theory, dependency and world-system theories, the impact of institutions (Seligson; Rosenberg & Birdsell; Acemoglu & Robinson), geographical differences (Diamond; Landes), culture (Landes), historical factors (Sachs), convergence theory (Bhalla), industrialization (Firebaugh), development policies (Craig et al.; Collier), globalization (Held & Kaya), and economic growth (Besley & Burgess). It is quite probable that each of these factors affects global inequality and poverty to some extent in particular

cases and places, but none of those theories provide a general explanatory factor which could be applied to all countries of the world. Most of those explanations are more or less locally limited. Besides, the difficulties in operationalizing their hypothetical concepts or the lack of data from many countries has made it impossible to test and compare their explanatory powers in the total world group of countries. In fact, these theories do not provide any systematic statistical data which could be used to test their ability to explain differences in various measures of human conditions. I agree that they help to explain some aspects of the variation in global inequality and poverty, although we cannot measure that part by statistical data. As explained above, phenotypic phenomena are always affected both by environmental factors and by genetic components. It is characteristic for the explanations provided in the studies reviewed above that all explanatory factors are environmental ones. My intention is to show that they cannot provide a satisfactory explanation for the variation in phenotypic phenomena like global inequality and poverty because they do not take into account the other explanatory component of phenotypic phenomena - the impact of genetic factors.

2. Human Diversity as the Ultimate Explanatory Factor

It is remarkable that in the numerous studies reviewed above many kinds of geographical, cultural, institutional and other environmental factors have been used to explain global inequality and poverty, but they (except Muller, 2013) do not take into account the possibility that there might be significant causal connections between human diversity and various disparities in human conditions both between countries and within societies. All studies of development seem to be based on the implicit assumption that it is not necessary to pay any attention to human diversity because there cannot be any significant differences in the

innate abilities of nations. In other words, it is assumed that human diversity is insignificant from the perspective of studies on economic development and global inequality.

Anthony Giddens, for example, says that "little evidence has been found to demonstrate that genetic inheritance controls complex forms of human activity" (Giddens, 1995, p. 36). He says that psychologists have debated for many years "whether a single human ability which can be called *intelligence* actually exists, and, if so, how far it rests on innately determined differences" (Giddens, 1995, p. 441). Further, he refers to Arthur Jensen's claim that IQ differences between American black and white are partly due to genetic variations and says that most have rejected Jensen's views: "We do not know whether IQ tests measure constant abilities, let alone whether such abilities are inherited." He comes to the conclusion that differences "in average IQ scores between black and whites are almost certainly the results of social and cultural influences, not of differences in genetic inheritance" (Giddens, 1995, p. 442).

Many other social scientists have presented similar arguments against hereditarian theories of IQ. Pilar N. Ossorio (2013) rejects hereditarian theories of IQ and notes that although people in lower socioeconomic brackets, on average, score lower IQ tests than people in higher socioeconomic brackets, it does not mean that low IQ causes poverty: "It could be that poverty causes low IQ, or that something else causes both outcomes" (Ossorio, internet, 2013, p. 9). She also rejects the claim that current racial differences in mean IQ scores are caused by racially distinctive patterns of genetic variation and argues that "IQ scores are influenced by environmental factors that are pervasively and systematically patterned along racial lines in the U.S." She comes to the conclusion that, taken together, "the evidence suggests that differences in IQ scores are the *results* of social inequality rather than its cause" (Ossorio, internet, 2013, p. 13).

As explained above, nearly all studies of global inequality have been based on the implicit axiomatic assumption that it is not necessary to pay any attention to human diversity because there cannot be any significant differences in the innate abilities of nations. I have to say that such an axiomatic starting point is strange and highly problematic for the simple reason that the evolved human diversity, which extends from the levels of individuals to the levels of nations and populations, is a biological fact of life. Because of our sexual reproduction system, all individuals are to some extent genetically different. There are genetic differences also between populations as Cavalli-Sforza et al. have indicated in their book *The History and Geography of Human Genes*. Human diversity reflects the endless diversity of life (see Dobzhansky et al., 1977; Mayr, 1982; Wilson, 1992; Cavalli-Sforza and Cavalli-Sforza, 1995; Cavalli-Sforza et al., 1996; Jensen, 1998). Ossorio admits that although "humans are quite genetically similar, no two people are genetically identical unless they are monozygotic (identical) twins." She stresses that, according to contemporary geneticists, any two unrelated humans are about 99.8 percent or 99.9 percent genetically identical, but because "the human genome contains approximately 3 billion nucleotides (DNA building blocks), a 0.1 percent or 0.2 percent difference translates into millions of sites at which two people will have a different nucleotide" (Ossorio, 2013, p. 3).

Because genetic differences certainly affect morphological differences between individuals and populations, it is reasonable to assume that they affect also the mental abilities of individuals and populations, and that these differences are to some extent in causal relationship to the success of individuals and nations in the struggle for scarce resources and existence. The idea that the innate mental abilities of populations would have remained the same throughout the evolution history of our species is incomprehensible and without any scientific evidence. The failure of development studies to provide any coherent theoretical

explanation for the emergence and persistence of global inequality seems to be due to this failure to take into account the impact of genotypic component on the variation in human conditions. My idea is to formulate an explanatory theory in which human diversity measured by national IQ constitutes the ultimate explanatory factor.

Malthusian theory of population

The English economist Thomas Malthus (1766-1834) was the first researcher who invented a biological explanation for the persistence of poverty, hunger, and misery in the world. He published his theory of population in "An essay on the principle of population" in 1798. He argued that, because of the natural human urge to reproduce, a constant pressure towards population growth exists in the world. This pressure was counteracted by "positive checks" that limited population growth by increasing death through war, famine, and disease. Food shortages, in particular, were inevitable because population could grow geometrically (2, 4, 8, 16...), whereas food production could grow only arithmetically (2, 3, 4, 5...) (see Malthus, 1960, pp. 8-17; Rosenberg, 2007, p. 1; "Thomas Mathus views on population," 2013). Consequently, population would soon outstrip available food resources. Thus population growth, if unchecked, would lead to starvation, which means that poverty is inescapable and will continue in the world. Malthus suggested preventive checks to limit population growth. They include marrying at a later age, abstaining from procreation, birth control, and homosexuality. However, if they are not enough to keep population growth in balance with the available food production, the nature will re-establish balance by cruel means to increase death rate. These "positive checks" include disease, war, misery, and finally famine (see Malthus, 1960, pp. 29-38; Rosenberg, 2007, p. 1). Malthus regarded sexual passion to be the biological factor which

maintains population growth, and poverty and famine to be natural outcomes of too high population growth.

Darwin's theory of natural selection

Charles Darwin tells in his autobiography that Malthus' theory of population provided him a theory by which to work. He expressed his gratitude to Malthus in his autobiography:

"In October 1838, that is, fifteen months after I had begun my systematic inquiry, I happened to read for amusement Malthus on Population, and being well prepared to appreciate the struggle for existence which everywhere goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances favourable variants would tend to be preserved, and unfavourable ones to be destroyed. The results of this would be the formation of a new species. Here, then I had at last got a theory by which to work". (quoted in Mayr, 1982, pp. 477-478; "Thomas Malthus (1766-1834)," 2013, p. 1).

Dobzansky et al. note on the impact of Malthus' theory on Darwin that "Darwin saw that the potentiality for exponential population growth is quite universal in the living world. Yet most of the time populations of most species remain approximately constant in numbers. It follows that only a part of the progeny survive, and the rest are eliminated by death." Darwin realized that survival is not a matter of chance alone. It depends also on the strength of surviving individuals. "The offspring of the stronger are more likely to be represented among the following generations than the offspring of weaker individuals" (Dobzhansky et al., 1977, p. 97). The result of this differential survival is natural selection. However, Mayr emphasizes that Darwin's debt to Malthus is limited. According to his analysis, the eight components of Darwin's theory are not from Malthus' essay. Mayr asks: "Why then did the reading of Malthus comment on the

potential geometric increase of populations have such an impact on Darwin? The answer is that Darwin read him at a moment when some of his other thinking had matured to a point where high fertility had acquired a new meaning" (Mayr, 1882, p. 492).

Darwin's theory of evolution through natural selection explains why the continual struggle for scarce resources and existence is inevitable everywhere in the living nature. The following slightly shortened Mayr's summary of Darwin's theory explains why the struggle for existence is inevitable in nature. Darwin's theory consists of three inferences based on five facts:

Fact 1: All species has such great potential fertility that their population size would increase exponentially if all individuals would again reproduce successfully.
Fact 2: Except for minor fluctuations, population normally displays stability.
Fact 3: Natural resources are limited, and they remain relatively constant in a stable environment.

Inference 1: Since more individuals are produced than can be supported by the available resources but population size remains stable, it means that there must be a fierce struggle for existence among the individuals of a population.

Fact 4: No two individuals are exactly the same; rather, every population displays enormous variability.
Fact 5: Much of this variation is heritable.

Inference 2: Survival in the struggle for existence is not random but depends in part on the hereditary constitution of the surviving individuals.

Inference 3: Over the generations this process of natural selection will lead to a continuing gradual change of populations, that is, to

evolution and to the production of new species (Mayr, 1982, pp. 479-485; cf. Darwin, 1859).

Mayr's excellent summary of the central components of Darwin's theory helps us to understand that the struggle for scarce resources and existence is inevitable and that the success and failure in this struggle depends partly on differences between competitors.

The significance of human diversity

Biological sciences have revealed that all individuals differ genetically to some extent from each other and that there are genetic differences also between populations. It is justified to assume that because of the evolved genetic diversity of individuals there must be some differences also in their innate abilities (including intelligence). It would be strange if the innate abilities of humans had remained the same throughout the long history of human evolution. Because intelligence is an ability which has certainly helped people to survive in the struggle for scarce resources, it can be assumed that it explains a part of disparities and poverty both within societies and between countries.

My central argument in this study is that poverty and global inequality in human conditions will continue because their evolutionary roots can be traced to the inevitable struggle for scarce resources and to the evolved human diversity (cf. Lynn and Vanhanen, 2004; 2012b; Vanhanen, 2012a. Both of these factors are important. According to Darwin's theory (inference 1), there must be a fierce struggle for existence among individuals of a population because more individuals are produced than can be supported by the available resources. On the other hand, survival in the struggle for existence is not random but depends in part on the hereditary constitutions of the surviving individuals (inference 2), in other words, on human diversity. The contradiction between

the number of people and the scarcity of resources leads to a fierce struggle for existence, and those who are a little better adapted to the environmental conditions have better chances to survive than those who are not as well adapted to prevailing circumstances.

It should be noted that there would be no need to compete for scarce resources if there were enough resources to satisfy the needs of all individuals and groups. In such circumstances people and nations might be able to live in permanent peace and remain relatively equal because all individuals and populations could satisfy their needs without any competition or struggle, but we know that such circumstances do not exist and have not ever existed. We are living in the world of permanent scarcity because the sexual urge to reproduce produces continually more progeny than what available resources can support. The scarcity of resources makes competition and struggle inevitable and leads to an uneven distribution of resources because all people and nations are not equally capable to succeed in this competition. Consequently, the roots of global inequality in human conditions can be traced to human diversity. But how to measure human diversity?

The variation in mental abilities of individuals and nations indicates human diversity, but it has been difficult to measure such variation. However, intelligence as an aspect of human diversity has been measured since 1904. It has been measured by intelligence quotient (IQ). It is justified to assume that intelligence has always been used in the struggle for scarce resources and existence. More intelligent individuals and populations have usually been able to establish and maintain better living conditions than less intelligent individuals and nations. Because there are not enough resources to satisfy everybody's needs, it has been necessary for individuals and nations to struggle for scarce resources and existence. However, because they have not been equal in their abilities to succeed in that struggle, resources have

become unevenly distributed and there are many inequalities in human conditions. I want to emphasize that "human diversity" is a more extensive concept than "intelligence," which indicates only one aspect of human diversity, but it is the only aspect which has been measured. From the perspective of global inequality, it is probably the most important aspect of human diversity.

As noted above, the intelligence of individuals has been measured since 1904, but differences in the average intelligence of nations have been measured only since 2002 when Richard Lynn and I published our first book *IQ and the Wealth of Nations*. We used national IQ to measure differences in the average intelligence of nations. Differences in the intelligence of individuals and nations are partly based on genetic differences but partly also on differences in environmental factors because "intelligence" is a phenotypic phenomenon. It is not possible to know exactly to what extent differences in intelligence are due to genetic and to what extent to environmental components. I assume that at least 50 percent of the differences in the average intelligence of nations are due to genetic components of intelligence, but opinions on the shares of genetic and environmental components differ extensively (for this discussion, see, for example, McGrath, 2013; "Intelligence Genetic and Environmental Factors Essay," 2013).

Anyway, because of significant differences in national IQs, all nations have not been equally able to succeed in the continuing struggle for scarce resources, which explains the persistence of poverty and inequality in human conditions. We assumed that there must be a significant causal relationship between the variation in mental abilities measured by national IQ and the uneven success in the struggle for scarce resources and that this relationship provides an explanation for the emergence of various forms of inequality both within societies and between nations. This kind of argumentation led us to hypothesize that

there must be a significant positive relationship between national IQ and per capita income.

We found in our 2002 book that national IQ explains approximately half or nearly half of the variation in per capita income and in some other indicators of human conditions (see also Lynn and Vanhanen, 2012b; 2006, 2012a). These findings support our hypothesis and imply that previous development studies had not been aware of the most important explanatory factor, the evolved human diversity measured by national IQ. Contemporary studies of global poverty and inequality do not usually include any reference to the possible impact of human diversity. It has not been realized that poverty and inequality are phenotypic phenomena, which are dependent not only on environmental but also on genetic factors. Some studies include brief references to intelligence or innate mental abilities, but usually the purpose is only to indicate that there are not any significant differences in the innate abilities of nations.

Jared Diamond noted that in "the centuries after A.D. 1500, as European explorers became aware of the wide differences among the world's peoples in technology and political organization, they assumed that those differences arose from differences in innate ability." He continued that with the later rise of genetics, the explanations were recast in genetic terms: "Europeans became considered genetically more intelligent than Africans, and especially more so than Aboriginal Australians" (Diamond, 1997, pp. 18-199. Diamond claimed that sound "evidence for the existence of human differences in intelligence that parallel human differences in technology is lacking". He told that according to his observations, "modern ‘Stone Age’ peoples are on the average probably more intelligent, not less intelligent, than industrialized peoples" (Diamond, 1997, p. 19).

Jeffrey Sachs refers to the opinions of some prominent Enlightenment thinkers, who "believed in the essential equality of humanity, and of the ability of societies in all parts of the world to

share in economic progress" (Sachs, 2005, p. 351). Sachs itself seems to share the same belief that the mental abilities of all human populations are more or less equal and that all nations can achieve the same level of economic development. Therefore he expects the end of poverty. Most researchers have not thought it necessary to make any reference to intelligence or to possible impact of human diversity. For example, the books of Held and Kaya (2007), Seligson and Passé-Smith (2008), Collier (2007/2008), and Acemoglu and Robinson (2012) do not say anything about differences in the average intelligence of nations and their impact on inequality. I think that this universal silence on human diversity's impact on poverty and inequality in human conditions indicates a serious shortage in the field of development studies.

I think that it will never be possible to eradicate poverty because more people are born continually than what the available resources can support. This is basically Malthus' argument. Because of human differences, some people stay at the minimum level of existence, or they drop below it. The competition for scarce resources between unequal competitors produces different kinds of inequality in human conditions. They are natural consequences of the competition between unequal competitors.

My central argument and theory

My central argument is that the ultimate explanation for poverty and many other disparities in human conditions can be traced to human diversity and to permanent scarcity of important resources. Together these two factors explain the persistence of poverty and many other forms of inequality in human conditions. I try to explain why it is so. First, if there were enough resources to satisfy the needs of everybody, there would not be any poverty, and the emergence of significant global inequality would be improbable. Second, if the innate mental abilities of all individuals and populations were approximately equal, all competitors would

be equally capable to succeed in the struggle for scarce resources, and we could expect only temporary and minor local differences in poverty and other human conditions. Briefly stated, both the permanent scarcity of resources and the evolved differences in intelligence are needed to explain the emergence and persistence of great disparities in human conditions. Both of these factors are needed. Together they produce global inequality in human conditions via the struggle for scarce resources. Further, because it is not possible to eradicate the genetic differences between individuals and populations, or to stop the continual struggle for scarce resources, it seems to be impossible to remove poverty, not even the extreme poverty, or to eliminate other global forms of inequality in human conditions, although it is always possible to mitigate some disparities by appropriate policies. We should understand that because of the evolved human diversity and the permanent scarcity of resources, we are bound to live in the world of great inequality and poverty.

This is my theory of the impact of human diversity on global inequality in human conditions via the struggle for scarce resources. Because my intention is to use national IQ as the operationalize measure of human diversity, it is reasonable to ask whether this study differs in any way from our previous studies in which national IQ has been used as the explanatory factor. I think that the theoretical basis of this study differs from our previous studies in one respect. I emphasize that the evolved human diversity is the ultimate explanatory factor. It includes various components, including intelligence. It is true that intelligence is the only measurable aspect of human diversity, but it does not cover all aspects of human diversity, which is a more extensive concept than intelligence. Besides, there is an important difference in the nature of human diversity and intelligence. "Human diversity" is a biological fact based on undisputed genetic differences between individuals and also between populations, whereas "intelligence" is a disputed concept. Nobody can deny the

existence of human diversity, which extends from the level of individuals to the level of populations, whereas many critics have argued that there does not exist any differences in the average intelligence of nations, or that it is not possible to measure them reliably. In fact, I am able to measure human diversity only by imperfect measures of IQ and national IQ, but this does not lead to the denying of the existence of human diversity.

Human diversity is measured only by national IQ, and my basic assumption is that more intelligent nations are usually able to establish and maintain better living conditions than less intelligent nations. Consequently, it is reasonable to hypothesize that national IQ is positively correlated with various indicators that measure the quality of human conditions. However, I want to emphasize that I do not expect complete correlations between national IQ and indicators of human conditions for the reason that human conditions are phenotypic phenomena which are always affected both by environmental and genotypic factors. Therefore, a correlation of 0.7 would support the hypothesis strongly because it indicates that national IQ (human diversity) explains a half of the variation in that indicator. The rest of the variation would be due to various environmental factors and probably also to measurement errors. Besides, it should be noted that the strength of correlations between national IQ and measures of human conditions may vary significantly depending on the extent to which an indicator is affected by genotypic and environmental variables.

My argument is that the two evolutionary factors Ð the permanent scarcity of important resources and human diversity measured by national IQ Ð explain a significant part of the variation in poverty and in many other aspects of human conditions, but yet only a part. The rest of the variation in these phenotypic phenomena is due to various environmental and accidental factors. I am trying to explore the explanatory power of human diversity (national IQ), but I will make some references

also to relevant environmental factors. I assume that human diversity explains the regularities and persistence in the relationships between national IQ and various measures of human conditions, whereas environmental variables explain deviations from the average relationship between national IQ and an indicator of human conditions. If national IQ explains a significant part of the variation in a particular relationship, it implies that it would be difficult to eliminate such a relationship because its roots are partly in genetic differences between individuals and populations.

How to test the theory?

The above formulated theory of the impact of human diversity on global inequality in human conditions can be tested by correlation and regression analyses because the theoretical concepts of human diversity and some aspects of human conditions can be replaced by operationalized variables. The variables needed to test the theory by empirical evidence were already preliminary reviewed in Chapter 1, and six measures of human conditions were selected to be used in the final and more detailed analysis. These six indicators of global inequality and disparities in human conditions are combined into the Index of Global Inequality (IGI) in Chapter 3. That index is intended to show the average level of global inequality in human conditions in different countries of this study and to indicate the relative differences between countries. It should be noted that this study is limited to test the theory at the level of countries, not within societies. The comparison group covers 178 contemporary independent countries (including Taiwan), whose population in 2010 was clearly higher than 100,000 inhabitants. Non-independent territories and small countries below 100,000 inhabitants were excluded, including Dominica, Grenada, Kiribati, and Seychelles, whose populations are around 100,000 (see *The CIA World Factbook 2013).*

According to my central research hypothesis, IGI and its components are expected to be positively correlated with national IQ. The strength of correlations indicates to what extent empirical evidence supports or contradicts the research hypothesis. The correlations should be relatively strong. Opposite or weak correlations would falsify the research hypothesis. The correlation analyses will be complemented by regression analyses, which show to what extent the average relationship between national IQ and a measure of global inequality applies to single countries and which countries deviate greatly from the regression line and contradict the hypothesis. The examination of highly deviating countries may provide hints about the nature of environmental factors, which have caused these countries to deviate from the average relationship. Thus it is possible to get some evidence on the nature of relevant environmental factors.

Chapter 3

Variables

1. National IQ

2. Six Measures of Global Inequality

3. Statistical Data on Variables for 178 Countries

4. Index of Global Inequality (IGI)

The idea of this study is to explore to what extent human diversity measured by national IQ can explain the variation in various indicators of global inequality in human conditions in the group of 178 contemporary countries. Alternative indicators of global inequality in human conditions were preliminary reviewed in Chapter 1. The review covered 20 different indicators, which measure human conditions from different perspectives. Six of those indicators were selected to be used in the final test of the research hypothesis. Data on these variables should be available from all 178 countries of this study. In fact, the preliminary analysis in Chapter 1 indicated that the principal source provided data for all 178 countries only in one case - Index of Democratization (ID) 2010. In this chapter, my intention is to complement data from some alternative sources and to combine

the six indicators into an Index of Global Inequality (IGI), which is intended to indicate the average level of global inequality based on the values of the six single indicators. This index will be used as the principal measure of global inequality. The six single variables and their combined index IGI will be used as dependent variables in the test of the research hypothesis, and national IQ as a measure of human diversity will be the explanatory variable. In the next chapter, the research hypothesis will be tested by these variables.

1. National IQ

As noted above, national IQ is the only available measure of human diversity. It is justified to assume that it measures the most important aspect of human diversity from the perspective of this study. According to Richard Lynn's and my theory, the level of average national intelligence affects significantly various measures of global disparities in human conditions because more intelligent nations are usually able to create better living conditions for their members than less intelligent nations. Therefore it is reasonable to hypothesize that national IQ correlates positively with the measures of human conditions.

Three slightly different datasets of national IQs are available from Richard Lynn and my books *IQ and the Wealth of Nations* (2002), *IQ and Global Inequality* (2006) and *Intelligence: A Unifying Construct for the Social Sciences* (2012a). The three national IQ datasets given in these books are extremely strongly intercorrelated (from 0.959 to 0.988), although national IQs of many countries differ to some extent from each other in the three datasets. I want to emphasize that all national IQs may include measurement errors, not only estimated national IQs but also those based on intelligence tests. I decided to use in this study as "national IQ" the mean of national IQs given in our 2006 and

2012 datasets. The calculation of the mean national IQs (2006 and 2012 datasets) is based on the idea that the average of two national IQs might be slightly more correct than national IQs given in either of the two different datasets. So the national IQs given in Table 3.1 are the means of the 2006 and 2012 national IQs. The correlation between the mean national IQ and the 2006 national IQ is 0.986 and between the mean national IQ and 2012 national IQ it is 0.988. Thus I have a new dataset of national IQs calculated for the purposes of this study. It differs only slightly from the datasets presented in our 2006 and 2012 books. The calculations of the 2006 and 2012 national IQs are explained and documented in our books (see Lynn and Vanhanen, 2006 and 2012a). Data on national IQs are available from all 178 countries of this study.

As noted above, all national IQs may include some measurement errors. For the purposes of this study, I corrected slightly two national IQs which may be based on measurement errors. According to 2006 and 2012 datasets, national IQ is 82 for Madagascar. It is probably too high. A part of Madagascar's population are of Malayo-Polynesian origin (see *The CIA World Factbook 2013*), whose national IQs are above 80, but a large majority are black Africans, whose national IQs are around 70 (Mozambique 67, Tanzania 73, Botswana 73). Therefore I decided to reduce Madagascar's national IQ to 75. It is still one of the highest in sub-Saharan Africa.

On the other hand, St. Lucia's national IQ 62 seems to be too low compared to the national IQs of its neighboring Caribbean countries (Barbados 80, Grenada 73, St. Vincent & the Grenadines 71, and Jamaica 71). Blacks constitute a large majority of the population in all these countries (see *The CIA World Yearbook 2013*). Therefore the difference of approximately ten IQ points between St. Lucia and other Caribbean countries seems to be based on measurement errors. I think that it is

justified to raise St. Lucia's national IQ to 70. It is still the lowest one in the Caribbean region.

Cambodia is the third country whose national IQ is not the mean of 2006 and 2012 data. According to Richard Lynn's new data, national IQ for Cambodia is 84.0, not 91.5 (see Lynn, 2013). This new national IQ will be used in statistical analyses. For the other 175 countries, national IQ is the arithmetic mean of our 2006 and 2012 data.

2. Six Measures of Global Inequality

The preliminary review of different indicators of global inequality in human conditions (Chapter 1) covered 20 variables. It was not self-evident in advance which of these variables would be most suitable to be used as components of the Index of Global Inequality (IGI). My intention was to find out a group of variables which measure different and important aspects of global inequality in human conditions and for which data are available from all or nearly all 178 countries of this study. Six variables were selected for this purpose. They will be introduced in the following sections.

PPP/GNI per capita 2010

Of the three indicators of global income inequality reviewed in Chapter 1, PPP/GNI per capita 2010 was selected to be used as a component of the Index of Global Inequality (IGI). Data on this variable are available for 174 countries from *World Development Indicators 2012* (WDI-12) (tables 1.1 and 1.6). Data were missing from four countries (the Bahamas, Bhutan, Cuba, and North Korea). The missing data were complemented by data on GDP-per capita (PPP) given in *The CIA World Factbook 2013* (CIA-13). Data on this variable are given and documented in Table 3.1. They vary from 320 dollars (Democratic Republic of

Congo) to 102,700 dollars (Qatar).

PPP/GNI per capita is a frequently used measure of the level of economic development and also of income inequality. It can be hypothesized that PPP/GNI per capita correlates positively with national IQ because more intelligent nations are usually able to produce a higher level of per capita income than less intelligent nations. However, because many environmental variables affect the level of economic development and per capita income independently from national IQ, correlations between national IQ and PPP/GNI per capita may be only moderate.

Tertiary education, gross enrollment ratio 2010

In the preliminary review of variables in Chapter 1, three variables were used to measure differences in the extent of education: Adult literacy rate (Literacy), Gross secondary enrollment ratio (Secondary), and Gross tertiary enrollment ratio (Tertiary). All three indicators are correlated with national IQ moderately or strongly. Tertiary was selected for the final analysis because it varies more in the group of 178 countries than Literacy and Secondary variables.

It is hypothesized that Tertiary correlates positively with national IQ because it can be assumed that more intelligent nations are able to establish and maintain more extensive institutions of higher education than less intelligent nations. However, this variable takes into account only the relative number of students at the third level of education. It does not take into account differences in the quality of education provided by those institutions. Besides, there may be significant national differences in the definitions of the institutions of higher education.

Data on Tertiary are available for 112 countries from WDI-12 (Table 2.12). The number of missing data is large, but fortunately it was possible to complement the dataset by data from other sources. Data are complemented in 44 cases by similar data

given in UNDP's *Human Development Report 2011* (HDR-11, Table 13): Albania, Belize, Benin, Bhutan, Bolivia, Botswana, Brunei, Canada, Cape Verde, Comoros, Costa Rica, Cote d'Ivoire, Djibouti, Dominican Republic, Equatorial Guinea, Fiji, Greece, Guatemala, Guinea-Bissau, Guyana, Iceland, Iraq, Kuwait, Lesotho, Libya, Malta, Mozambique, Myanmar, Nepal, Nicaragua, Nigeria, Peru, St. Lucia, Samoa, Sao Tome & Principe, Sierra Leone, Suriname, Swaziland, Togo, Tonga, Trinidad & Tobago, the United Arab Emirates, Vanuatu, and Yemen. Further, data were complemented from *Human Development Report 2013* (Table 8) in the following eight cases: Barbados, Liberia, Luxembourg, Micronesia, Montenegro, Singapore, Sudan, and Zambia, and from HDR-10 in the cases of Gabon and Papua New Guinea. Data were complemented from *Encyclopedia of Nation*s (internet) in the following nine cases: the Bahamas, Bahrain, Germany, Haiti, North Korea, Maldives, South Africa, Syria, Turkmenistan (*Encyclopedia of Nations,* internet, 2013). Finally, the value of Tertiary was estimated to be 19 for St. Vincent & the Grenadines (St. Lucia 18), for the Solomon Islands 8 (Tonga 8), and for Taiwan 59 (Japan 59). Statistical data on Tertiary are given and documented in Table 3.1. They vary from 0 (Maldives) to 100 (South Korea).

Under-five mortality rate per 1,000 live births (U-five)

There are several variables that could be used to measure global disparities in health conditions. In the preliminary analysis I used for this purpose two variables: (1) Under-five mortality rate per 1,000 live births 2010 (U-five) and (2) Maternal mortality ratio per 100,000 live births. It is reasonable to hypothesize that both of these indicators are negatively correlated with national IQ because the countries of high national IQ can be expected to produce better health conditions than the countries of low national IQ. Of course, many kinds of environmental factors affect health

conditions independently from national IQ. I selected the U-five variable to be used in the final empirical analysis because data on that variable are available from all 178 countries. Because the value of U-five variable rises with the under-five mortality rate, this variable is expected to correlate negatively with national IQ.

Data on the U-five variable are available for 151 countries from WDI-2012 (tables 1.2 and 2.23). Missing data were complemented by data on infant mortality rate per 1,000 live births given in CIA-13 in the following 26 cases: the Bahamas, Barbados, Belize, Bhutan, Brunei, Cape Verde, Comoros, Djibouti, Equatorial Guinea, Fiji, Guyana, Iceland, Luxembourg, Maldives, Malta, Micronesia, Montenegro, St. Lucia, St. Vincent & the Grenadines, Samoa, Sao Tome & Principe, Solomon Islands, Suriname, Taiwan, Tonga, and Vanuatu. Montenegro's value is the same as for Serbia (7).

The complemented data cover all 178 countries of this study, and they are given and documented in table 3.1.The values of U-five variables vary from 3 (Finland, Japan, Norway, Slovenia, and Sweden) to 176 (Burkina Faso).

Life expectancy

Life expectancy at birth 2010 (Life-10) is another indicator of health conditions. The better living conditions are, the longer people can live. It is justified to assume that more intelligent nations are usually able to establish better living conditions, including health conditions, for their members than less intelligent nations. Consequently, this variable should correlate positively with national IQ.

Statistical data on life expectancy are in 177 cases from WDI-11 (tables 1.6 and 2.22). In the case of Taiwan, data are from CIA-13. The values of this variable vary from 47 years in Lesotho to 83 years in Japan.

Sanitation

As noted in the preliminary review, global disparities in sanitation conditions are enormous. Two variables were used to measure access to clean water and sanitation: (1) Access to improved sanitation facilities, % of population, 2010, and (2) Access to an improved water source, % of population, 2010. It is reasonable to expect that these variables are positively correlated with national IQ. In fact, the correlation was found to be moderate in the case of the Water variable and strong in the case of the Sanitation variable, but data on both variables are available only from 145 countries (WDI-12, Table 2.18). The Sanitation variable was selected to be used in the final analysis because it is more strongly correlated with national IQ than the Water variable. The data on Sanitation were missing from 33 countries, but it was possible to find data for most of the missing cases from other sources.

In six cases (Comoros, Iceland, Luxembourg, Montenegro, Sao Tome & Principe, and Tonga) data were complemented from UNDP's *Human Development Report 2010* (Table 7). For 20 countries Sanitation % is from *NationMaster.com* (internet): the Bahamas, Barbados, Belize, Bhutan, Cape Verde, Djibouti, Equatorial Guinea, Fiji, Guyana, Lebanon, Maldives, Malta, St. Lucia, St. Vincent & the Grenadines, Samoa, Saudi Arabia, Solomon Islands, Suriname, Vanuatu, and Venezuela (*NationMaster.com,* internet, 2013). New Zealand's Sanitation % is from *OECD Library* (internet), 2013*,* and Micronesia's Sanitation value is from *Index mundi* (internet) (*Index mundi,* internet, 2013). Finally, Sanitation % had to be estimated for five countries on the basis of similar neighboring countries: Bahrain (United Arab Emirates 98%), Brunei (Malaysia 96%), Italy (Greece 98%), Lithuania (Poland 90%), and Taiwan (Japan 100%). The values of the Sanitation variable vary from 13% in Benin to 100% in many countries.

Index of Democratization (ID-10)

The nature of a country's political system affects human conditions in many ways. It is reasonable to assume that a democratic system provides a more favorable framework for human life and activities than any autocratic system. Democracy makes it possible for people to take part in political decision-making through elections and to use their political rights and freedoms. It is justifiable to assume that more intelligent nations are usually able to establish and maintain more democratic systems than less intelligent nations. Consequently, the level of democracy (ID-10) is expected to correlate positively with national IQ.

It is problematic to measure the level of democracy, but there are various datasets on the measures of democracy. In the preliminary review of variables, two datasets on democracy were compared: my Index of Democratization 2010 (ID-10) and Freedom House's combined ratings of political rights and civil liberties 2010 (FH-10). Both datasets are correlated with national IQ as hypothesized, but ID-10 is more strongly correlated with national IQ than FH-10. Consequently, I selected ID-10 to be used in the final analysis as a measure of the level of democracy.

Data on ID-10 are available for all 178 countries from *FSD1289 Measures of Democracy, 1810-2010.* The values of ID-10 vary from 0 (several countries) to 46 index points (Iceland).

3. Statistical Data on Variables for 178 Countries

Now I have six indicators of human conditions to be used as components of IGI. The purpose was to find variables which measure some important aspects of global disparities in human conditions from different perspectives. I think that these six indicators take into account some important aspects of global disparities and inequalities. They measure global inequality in

human conditions from the perspectives of the level of economic development and income inequality (PPP/GNI per capita 2010), education (Tertiary), health conditions (Under-five mortality rate), general living conditions (Life expectancy), sanitation facilities (Sanitation), and democracy (ID-10). As the preliminary review of variables in Chapter 1 indicated, there would be other relevant indicators of human conditions and global inequality, but the problem with most of them is that statistical data on them are not available from all or nearly all of the 178 countries of this study. The use of incomplete and biased samples of countries might seriously damage the results of statistical analyses. Therefore I am satisfied to limit the test of hypotheses to these six variables on which data and some estimates are available from all of the 178 countries. The purpose is to correlate each variable separately with national IQ, but also to combine all variables into the Index of Global Inequality (IGI) because I assume that a combination of the six measures would indicate the average differences between countries more reliably than any of the six variables alone. The values of national IQ and of the six indicators of global inequality in human conditions are presented in Table 3.1.

Table 3.1. The values of national IQ and of the six measures of global inequality for 178 countries.

	Country	National IQ	PPP/GNI 2010	Tertiary 2010	U-five 2010	Life 2010	Sanitation	ID 2010
1	Afghanistan	79.5	1060	3	149	48	37	8
2	Albania	86.0	8520	19[1]	18	77	94	21
3	Algeria	83.6	8100	31	36	73	95	11
4	Angola	69.5	5410	4	161	51	58	10
5	Argentina	92.9	15570	71	14	76	90	25
6	Armenia	93.6	5660	52	20	74	90	24
7	Australia	98.6	36910	76	5	82	100	36
8	Austria	99.5	39790	60	4	80	100	42
9	Azerbaijan	85.9	9270	19	46	71	82	9

	Country	National IQ	PPP/GNI 2010	Tertiary 2010	U-five 2010	Life 2010	Sanitation	ID 2010
10	Bahamas	84.0	24800[1]	25[4]	13[1]	75	100[2]	23
11	Bahrain	84.4	24710	30[4]	10	75	98[5]	1
12	Bangladesh	81.5	1810	11	48	69	56	23
13	Barbados	80.0	19000	66[2]	12[1]	75	100[2]	25
14	Belarus	96.0	13590	83	16	70	93	14
15	Belgium	99.1	38290	67	4	80	100	43
16	Belize	80.4	6200	11[1]	21[1]	76	50[2]	15
17	Benin	70.5	1590	6[1]	115	56	13	14
18	Bhutan	79.0	5600[1]	7[1]	42[1]	67	70[2]	3
19	Bolivia	87.0	4640	38[1]	54	66	27	17
20	Bosnia & Herzegovina	91.6	8910	36	8	75	95	25
21	Botswana	73.4	13700	8[1]	48	53	62	13
22	Brazil	86.3	11000	36	19	73	79	39
23	Brunei	90.0	4990	17[1]	11[1]	78	96[5]	0
24	Bulgaria	93.1	13440	53	13	74	100	33
25	Burkina Faso	69.0	1250	3	142	50	46	4
26	Burundi	70.5	400	3	142	50	46	4
27	Cambodia	91.5	2080	8	51	63	31	11
28	Cameroon	64.0	2270	11	136	51	49	7
29	Canada	99.7	38370	62[1]	6	81	100	26
30	Cape Verde	76.0	3820	15[1]	26[1]	74	71[2]	19
31	Cent. African Republic	64.0	790	3	159	48	34	8
32	Chad	67.0	1220	2	173	49	13	11
33	Chile	89.9	14640	59	9	79	96	20
34	China	105.4	7640	26	18	73	64	0
35	Colombia	83.5	9060	39	22	73	77	8
36	Comoros	77.0	1090	5[1]	69[1]	61	36[1]	7
37	Congo, Dem. Republic	66.5	320	6	170	48	24	15
38	Congo, Rep.	68.5	3220	6	93	57	18	7
39	Costa Rica	87.5	11270	25[1]	10	79	95	22
40	Côte d'Ivoire	70.0	1810	8[1]	123	55	24	9
41	Croatia	93.9	18890	49	6	76	99	27
42	Cuba	85.0	9900[1]	95	6	79	91	0
43	Cyprus (Greek)	91.4	30300	52	4	79	100	39
44	Czech Rep.	98.5	22910	61	4	77	98	34
45	Denmark	97.6	41100	74	4	79	100	45
46	Djibouti	71.5	2460	4[1]	53[1]	58	91[2]	1

	Country	National IQ	PPP/GNI 2010	Tertiary 2010	U-five 2010	Life 2010	Sanitation	ID 2010
47	Dominican Republic	82.0	9030	33[1]	27	73	83	20
48	Ecuador	88.0	7880	40	20	75	92	23
49	Egypt	81.8	6060	30	22	73	95	3
50	El Salvador	79.0	6550	23	16	72	87	18
51	Eq. Guinea	64.0	23760	3[2]	75[1]	51	53[2]	3
52	Eritrea	71.7	540	2	61	61	14	0
53	Estonia	99.3	19810	63	5	75	95	30
54	Ethiopia	66.2	1040	5	106	59	21	3
55	Fiji	85.0	4510	15[1]	11[1]	69	43[2]	0
56	Finland	99.9	37070	92	3	80	100	37
57	France	98.0	34750	55	4	81	100	26
58	Gabon	66.5	13180	7[3]	74	62	33	8
59	Gambia	64.0	1300	4	98	58	68	5
60	Georgia	90.3	4990	28	22	73	95	14
61	Germany	98.9	38100	48[4]	4	80	100	35
62	Ghana	70.3	1660	9	74	64	14	19
63	Greece	92.6	27630	91[1]	4	80	98	36
64	Guatemala	79.0	4650	18[1]	32	71	78	10
65	Guinea	66.7	1020	9	130	54	18	13
66	Guinea-Bissau	68.0	1180	3[1]	150	48	20	12
67	Guyana	84.0	6450	11[1]	36[1]	70	87[2]	19
68	Haiti	67.0	1180	1[4]	165	62	17	11
69	Honduras	81.0	3770	19	24	73	77	11
70	Hungary	98.0	19550	62	6	74	100	25
71	Iceland	99.8	28270	74[1]	3[1]	81	100[1]	46
72	India	82.1	3400	16	63	65	34	24
73	Indonesia	86.4	4200	23	35	69	54	28
74	Iran	84.8	11490	43	26	73	100	2
75	Iraq	87.0	3370	16[1]	39	68	73	28
76	Ireland	93.4	33540	61	4	80	99	29
77	Israel	94.8	27660	62	5	82	100	33
78	Italy	99.0	31810	66	4	82	98[5]	35
79	Jamaica	71.0	7310	29	24	73	80	15
80	Japan	104.6	34610	59	3	83	100	33
81	Jordan	85.3	5800	42	22	73	98	1
82	Kazakhstan	89.5	10770	41	33	68	97	4
83	Kenya	73.2	1680	4	85	56	32	17
84	Korea, North	105.3	1800[1]	98[4]	33	69	80	0

	Country	National IQ	PPP/GNI 2010	Tertiary 2010	U-five 2010	Life 2010	Sanitation	ID 2010
85	Korea, South	105.3	29110	100	5	81	100	21
86	Kuwait	85.8	40700	19[1]	11	75	100	1
87	Kyrgyzstan	82.4	2070	49	38	69	93	24
88	Laos	89.0	2460	13	54	67	63	1
89	Latvia	96.9	16380	60	10	73	78	29
90	Lebanon	83.3	14090	54	22	72	99[2]	19
91	Lesotho	66.7	1960	4[1]	85	47	26	11
92	Liberia	67.5	340	19[2]	103	56	18	14
93	Libya	84	16880	56[1]	17	75	97	0
94	Lithuania	92.6	18060	77	7	73	90[5]	24
95	Luxembourg	97.5	61240	10[2]	4[1]	80	100[1]	24
96	Macedonia	90.7	10920	40	8[1]	75	88	21
97	Madagascar	75.0	960	4	62	66	15	0
98	Malawi	64.5	850	1	92	53	51	11
99	Malaysia	91.8	14220	40	6	74	96	16
100	Maldives	81.0	8110	0[4]	26[1]	77	56[2]	25
101	Mali	69.2	1030	6	178	51	22	5
102	Malta	96.1	24660	32[1]	4[1]	81	100[2]	36
103	Mauritania	75.0	1910	4	111	58	26	12
104	Mauritius	88.5	13960	25	15	73	89	25
105	Mexico	87.9	14340	27	17	77	85	23
106	Micronesia	84.0	3490	14[2]	24[1]	69	25[4]	22
107	Moldova	94.0	3360	38	19	69	85	24
108	Mongolia	100.5	3670	53	32	68	51	15
119	Montenegro	86.0	12770	48[2]	7[2]	74	92[1]	23
110	Morocco	83.2	4600	13	36	72	70	3
111	Mozambique	66.7	930	2[1]	135	50	18	5
112	Myanmar	86.0	1950	11[1]	66	65	76	2
113	Namibia	70.2	6420	9	40	62	32	10
114	Nepal	78.0	1210	6[1]	50	68	31	23
115	Netherlands	100.0	41810	63	4	81	100	39
116	New Zealand	98.9	28100	83	6	81	100[3]	31
117	Nicaragua	83.5	2790	18[1]	27	74	52	25
118	Niger	69.5	720	1	143	51	31	8
119	Nigeria	70.1	2170	10[1]	143	54	9	0
120	Norway	98.6	58570	74	3	81	100	37
121	Oman	83.7	25190	24	9	73	99	0
122	Pakistan	84.0	2790	5	87	65	48	13
123	Panama	82.0	12770	45	20	76	69	19
124	Papua N. G.	83.2	2420	2[3]	61	62	45	28

	Country	National IQ	PPP/GNI 2010	Tertiary 2010	U-five 2010	Life 2010	Sanitation	ID 2010
125	Paraguay	84.0	5080	37	25	72	71	15
126	Peru	84.6	8930	35[1]	19	74	71	23
127	Philippines	86.0	3980	29	29	68	74	20
128	Poland	97.5	19160	71	6	76	90	23
129	Portugal	94.7	24950	62	4	79	100	29
130	Qatar	79.0	102700	10	8	78	100	0
131	Romania	92.5	14290	64	14	73	72	23
132	Russia	96.8	19240	76	12	69	70	17
133	Rwanda	73.0	1150	5	91	55	55	6
134	St. Lucia	70.0	10520	18[1]	12[1]	74	89[2]	22
135	St. Vincent & Grenadines	71.0	10870	18[5]	14[1]	72	96[2]	30
136	Samoa	88.0	4250	7[1]	22[1]	72	99[2]	19
137	Sao Tome & Principe	67.0	1930	4[1]	52[1]	64	26[1]	16
138	Saudi Arabia	81.8	22750	37	18	74	100[2]	0
139	Senegal	68.2	1910	8	75	59	52	13
140	Serbia	89.6	11090	49	7	74	92	24
141	Sierra Leone	64.0	830	2[1]	174	47	13	14
142	Singapore	107.5	55790	71[2]	3	82	100	9
143	Slovakia	97.0	22920	54	8	75	100	24
144	Slovenia	96.8	26530	87	3	79	100	26
145	Solomon Is.	83.5	2220	8[6]	17[1]	67	34[2]	27
146	South Africa	71.8	10360	15[4]	57	52	79	12
147	Spain	97.3	31800	73	5	82	100	45
148	Sri Lanka	79.0	5010	15	17	75	92	16
149	Sudan	74.2	2030	6[2]	103	61	26	7
150	Suriname	89.0	7680	12[1]	29[1]	70	93[2]	29
151	Swaziland	71.7	5430	4[1]	78	48	57	0
152	Sweden	98.9	39730	71	3	81	100	46
153	Switzerland	100.6	49960	51	5	82	100	43
154	Syria	82.5	5120	15[4]	16	76	95	7
155	Taiwan	104.8	37900	59[7]	5[1]	78[1]	100[5]	23
156	Tajikistan	83.5	2140	20	63	67	94	11
157	Tanzania	72.5	1430	2	92	57	10	14
158	Thailand	90.4	8190	48	13	74	96	15
159	Timor-Leste	86.0	3600	17	81	62	47	18
160	Togo	70.0	890	5[1]	103	57	13	14
161	Tonga	86.0	4580	8[1]	19[1]	72	96[1]	2
162	Trinidad & Tobago	85.7	24050	12[1]	27	70	9	30

	Country	National IQ	PPP/GNI 2010	Tertiary 2010	U-five 2010	Life 2010	Sanitation	ID 2010
163	Tunisia	84.2	9060	34	16	75	85	6
164	Turkey	89.7	15350	46	18	74	90	19
165	Turkmenistan	83.5	7490	19[4]	56	65	98	6
166	Uganda	72.3	1250	4	99	54	34	11
167	Ukraine	95.6	6620	79	13	70	94	30
168	U.A.E.	85.5	50580	30[1]	7	77	98	0
169	U.K.	99.5	35840	59	5	80	100	31
170	U.S.A.	97.7	47310	95	8	78	100	33
171	Uruguay	93.3	13620	63	11	76	100	31
172	Uzbekistan	83.5	3110	9	52	68	100	7
173	Vanuatu	84.0	4310	5[1]	46[1]	71	100[2]	34
174	Venezuela	83.7	12150	78	18	74	68[2]	16
175	Vietnam	94.0	3070	22	23	75	76	6
176	Yemen	82.7	2500	10[1]	77	65	53	6
177	Zambia	72.5	1380	2[2]	111	48	48	11
178	Zimbabwe	69.0	400	6	80	50	40	7

Sources:

PPP/GNI per capita 2010:
If not otherwise noted, the World Bank, *World Development Indicators 2012*, Table 1.1 and Table 1.6.
[1] *The CIA World Factbook 2013.*

Tertiary education, Gross enrollment ratio 2010:
If not otherwise noted, *World Development Indicators 2012,* Table 2.12.
[1] UNDP, *Human Development Report 2011,* Table 9, years 2001-2010.
[2] UNDP, *Human Development Report 2013,* Table 8, years 2002-2011.
[3] UNDP, *Human Development Report 2010,* Table 13, years 2001-2009.
[4] *Encyclopedia of the Nations*, 2013.

[5] Estimation for St. Vincent. The same as for St. Lucia (18).
[6] Estimation for the Solomon Islands. The same as for Tonga (8).
[7] Estimation for Taiwan. The same as for Japan (59).

Under-five mortality rate per 1,000 live births 2010:
If not otherwise noted, *World Development Indicators 2012,* Table 1.2 and Table 2.23.
[1] *The CIA World Factbook 2013.*

Life expectancy at birth 2010:
If not otherwise noted, *World Development Indicators 2012,* Table 2.23 and Table 1.6.
[1] CIA-13 (Taiwan).

Access to improved sanitation facilities, % of population 2010:
If not otherwise noted, *World Development Indicators 2012,* Table 2.18.
[1] *Human Development Report 2010,* Table 7. Population without access to improved sanitation (%), 2008. Inverse percentages.
[2] *NationMaster.com*, 2013.
[3] *OECD Library,* 2013. New Zealand.
[4] *Index mundi*, 2013. Micronesia.
[5] Sanitation % estimated on the basis of a similar neighboring country: Bahrain (United Arab Emirates 98%), Brunei (Malaysia 96%), Italy (Greece 98%), Lithuania (Poland 90%), and Taiwan (Japan 100%).

Index of Democratization (ID) 2010:
FSD1289 Measures of Democracy, 1810-2010.

Table 3.1 shows that the values of each variable vary extensively from country to country. This variation measures

global inequality in human conditions. In the countries with low values of indicators (except U-five), human conditions are poor compared to countries with high values of indicators. Table 3.1 also shows that all six indicators are not necessarily at the same level in each country. According to one variable, human conditions may be considerably better than according to some other indicators. The combination of the six indicators into the Index of Global Inequality is based on the idea that in the combined index high and low values of indicators level out to some extent and that, therefore, the index may indicate the average level of human conditions in a country more reliably than any single indicator. Consequently, it is reasonable to expect that the index correlates with national IQ more strongly than any single indicator.

4. Index of Global Inequality (IGI)

The problem is how to combine the six different measures of human conditions into the Index of Global Inequality (IGI). All indicators should have the same weight in the index. I think that the best strategy would be to transform all indicators into percentages that vary between 0 and 100 and then to calculate the arithmetic mean of the six percentages.

Of the six variables, the values of Tertiary and Sanitation are already percentages that vary between 0 and 100 and between 13 and 100 respectively. The other four indicators need some modifications in order to get them transformed into percentages that vary approximately as extensively between 0 and 100.

The original values of PPP/GNI per capita 2010 are dollars. They varied in 2010 between 320 (Democratic Republic of Congo) and 102,700 (Qatar). They are transformed into percentages by calculating the percentage of PPP/GNI per capita income from 50,000 dollars (PPP/GNI%). The upper limit of

50,000 dollars was selected in order to restrict the impact of some extremely high values of PPP/GNI on correlations. The PPP/GNI per capita income was in 2010 higher than 50,000 dollars in Brunei, Kuwait, Luxembourg, Norway, and Qatar. For all these countries, the percentage is 100. After this transformation, the values of the new PPP/GNI-2010% variable vary from 1 to 100.

The transformation of Under-five mortality rate per 1,000 live births (U-five) is a little more complicated. First, the values of this variable are transformed into percentages by calculating the percentage of U-five from 170. The limit of 170 is used purposely to restrict the impact of extremely deviating cases on correlations. The under-five mortality rate was 170 or higher per 1,000 live births only in Burkina Faso, Chad, Democratic Republic of Congo, Mali, and Sierra Leone. The percentage is 100 for these five countries. The percentages vary from 2 to 100. Secondly, national IQ is hypothesized to correlate negatively with the under-five mortality rate per 1,000 live births, whereas it is hypothesized to correlate positively with the other five variables. Therefore I changed this relationship positive by calculating the U-five variable's inversed percentages. The inversed percentage for Burkina Faso, Chad, Democratic Republic of Congo, Mali, and Sierra Leone is 0. The inversed U-five% is hypothesized to correlate positively with national IQ. The values of the inversed U-five% variable vary from 0 (five countries) to 98 in several countries.

The values of Life expectancy are years that vary between 47 and 83. Years could be used as percentages, but because the range is not more than 36 years, I decided to extend the variation of this variable by a simple modification formula: Modified life expectancy = (years of life expectancy - 40) x 2. This transformation of Life expectancy variable extends the variation from 14 to 86. The range of the transformed Life-2010% rises to 72.

Finally, the index points of ID-10 could be used as percentages in the same way as years of Life expectancy, but because the value of ID-10 varies only from 0 to 46, it is reasonable to extend the variation as in the case of Life expectancy. This has been done by multiplying the ID scores by 2. After this modification, the ID-10x2 values vary from 0 to 92, and the range of ID-10x2 rises to 92.

After these transformations, I have six variables (PPP/GNI-10%, Tertiary, Inversed U-five%, Life-10%, Sanitation, and ID-10x2 whose values vary between 0 and 100. Data on transformed variables are given in Table 3.2. Statistical data on these variables are available from all 178 countries of this study. However, all data are not from the same principal source. The missing data were complemented by data from other sources, and in some cases, lacking any data, it was necessary to estimate the variable's value on the basis of some neighboring countries as indicated in Table 3.1. The complementation of data from different sources may slightly reduce the comparability and reliability of data.

Finally, the values of the two original variables (Tertiary and Sanitation) and the four transformed variables are combined into the Index of Global Inequality (IGI) by calculating the arithmetic mean of the six percentages.

Table 3.2. The percentage values of the two original and four transformed components of IGI and their arithmetic mean (IGI) in the group of 178 countries.

	Country	**IGI**	**PPP/GNI%50.000 2010**	**Tertiary 2010**	**Inversed U-five% 2010**	**Life-10% 2010**	**Sanitation 2010**	**ID-10x2 2010**
1	Afghanistan	12.5	2	3	1	16	37	1
2	Albania	55.7	17	19	88	74	94	42
3	Algeria	51.0	16	31	76	66	95	22
4	Angola	19.2	11	4	0	22	58	20

	Country	IGI	PPP/GNI%50.000 2010	Tertiary 2010	Inversed U-five% 2010	Life-10% 2010	Sanitation 2010	ID-10x2 2010
5	Argentina	67.5	31	71	91	72	90	50
6	Armenia	59.3	11	52	87	68	90	48
7	Australia	83.8	74	76	97	84	100	72
8	Austria	83.5	80	60	97	80	100	84
9	Azerbaijan	44.8	19	19	69	62	82	18
10	Bahamas	63.8	50	25	92	70	100	46
11	Bahrain	57.0	49	30	93	70	98	2
12	Bangladesh	40.5	4	11	68	58	56	46
13	Barbados	69.5	38	66	93	70	100	50
14	Belarus	63.3	27	83	89	60	93	28
15	Belgium	84.5	77	67	97	80	100	86
16	Balize	43.8	12	11	88	72	50	30
17	Benin	17.5	3	6	23	32	13	28
18	Bhutan	32.5	11	7	47	54	70	6
19	Bolivia	37.3	9	38	64	52	27	34
20	Bosnia & Herzegovina	60.7	18	36	95	70	95	50
21	Botswana	36.2	27	8	68	26	62	26
22	Brazil	61.3	22	36	87	66	79	78
23	Brunei	49	10	17	95	76	96	0
24	Bulgaria	67.5	27	53	91	68	100	66
25	Burkina Faso	9.8	3	3	0	30	17	6
26	Burundi	13.8	1	3	5	20	46	8
27	Cambodia	29.5	4	8	66	46	31	22
28	Cameroon	18.3	5	11	9	22	49	14
29	Canada	78.2	77	62	96	82	100	52
30	Cape Verde	43.5	8	15	81	68	71	38
31	Cent. African Republic	10.0	2	3	0	15	34	16
32	Chad	7.8	2	2	0	18	13	22
33	Chile	66.0	29	59	94	78	96	40
34	China	43.2	15	26	88	66	64	0
35	Colombia	48.5	18	39	85	66	77	16
36	Comoros	21.7	2	5	31	42	36	14
37	Congo, Dem. Republic	12.8	1	6	0	16	24	30
38	Congo, Rep.	19.3	6	6	38	34	18	14
39	Costa Rica	59.7	23	25	93	78	95	44
40	Côte d'Ivoire	17.0	4	8	18	30	24	18
41	Croatia	68.0	38	49	96	72	99	54
42	Cuba	63.3	20	95	96	78	91	0

	Country	IGI	PPP/GNI%50.000 2010	Tertiary 2010	Inversed U-five% 2010	Life-10% 2010	Sanitation 2010	ID-10x2 2010
43	Cyprus (Greek)	77.7	61	52	97	78	100	78
44	Czech Rep.	74.0	46	61	97	74	98	68
45	Denmark	86.8	82	74	97	78	100	90
46	Djibouti	29.2	5	4	37	36	91	2
47	Dominican Rep.	53.7	18	33	82	66	83	40
48	Ecuador	58.5	16	40	87	70	92	46
49	Egypt	49.0	12	30	85	66	95	6
50	El Salvador	52.0	13	23	89	64	87	36
51	Eq. Guinea	22.5	48	3	3	22	53	6
52	Eritrea	19.7	1	2	59	42	14	0
53	Estonia	70.8	40	63	97	70	95	60
54	Ethiopia	16.8	2	5	29	38	21	6
55	Fiji	35.5	9	15	88	58	43	0
56	Finland	86.3	74	92	98	80	100	74
57	France	76.0	70	55	97	82	100	52
58	Gabon	29.5	26	7	51	44	33	16
59	Gambia	26.0	3	4	35	36	68	10
60	Georgia	52.0	10	28	85	66	95	28
61	Germany	78.5	76	48	97	80	100	70
62	Ghana	25.2	3	9	51	48	14	38
63	Greece	82.2	55	91	97	80	98	72
64	Guatemala	44.3	9	18	79	62	78	20
65	Guinea	16.0	2	9	13	28	18	26
66	Guinea-Bissau	10.8	2	3	0	16	20	24
67	Guyana	46.7	7	11	77	60	87	38
68	Haiti	14.3	2	1	0	44	17	22
69	Honduras	46.0	8	19	84	66	77	22
70	Hungary	69.2	39	62	96	68	100	50
71	Iceland	83.8	57	74	98	82	100	92
72	India	35.5	7	16	58	50	34	48
73	Indonesia	46.0	8	23	77	58	54	56
74	Iran	53.2	23	43	83	66	100	4
75	Iraq	47.0	7	16	74	56	73	56
76	Ireland	77.0	67	61	97	80	99	58
77	Israel	77.3	55	62	97	84	100	66
78	Italy	79.8	64	66	97	84	98	70
79	Jamaica	50.7	15	29	84	66	80	30
80	Japan	79.7	69	59	98	86	100	66

	Country	IGI	PPP/GNI%50.000 2010	Tertiary 2010	Inversed U-five% 2010	Life-10% 2010	Sanitation 2010	ID-10x2 2010
81	Jordan	50.8	12	42	85	66	98	2
82	Kazakhstan	50.3	22	41	78	56	97	8
83	Kenya	24.7	3	4	43	32	32	34
84	Korea, North	53.0	4	98	78	58	80	0
85	Korea, South	79.8	58	100	97	82	100	42
86	Kuwait	60.8	81	19	93	70	100	2
87	Kyrgyzstan	54.5	4	49	75	58	93	2
88	Laos	33.5	5	13	64	54	63	2
89	Latvia	64.7	33	60	93	66	78	58
90	Lebanon	61.3	28	54	85	64	99	38
91	Lesotho	18.8	4	4	43	14	26	22
92	Liberia	21.5	1	19	31	32	18	28
93	Libya	57.7	34	56	89	70	97	0
94	Lithuania	68.7	36	77	95	66	90	48
95	Luxembourg	71.7	100	10	92	80	100	48
96	Macedonia	59.2	22	40	93	70	88	42
97	Madagascar	22.0	2	4	59	52	15	0
98	Malawi	23.5	2	1	39	26	51	22
99	Malaysia	60.0	28	40	96	68	96	32
100	Maldives	48.2	16	0	91	74	56	50
101	Mali	10.3	2	6	0	22	22	10
102	Malta	71.7	49	32	95	82	100	72
103	Mauritania	20.0	4	4	26	36	26	24
104	Mauritius	58.0	28	25	90	66	89	50
105	Mexico	58.3	29	27	89	74	85	46
106	Micronesia	37.0	7	14	74	58	25	44
107	Moldova	52.8	7	38	87	58	85	48
108	Mongolia	46.0	7	53	79	56	51	30
119	Montenegro	62.3	26	48	94	68	92	46
110	Morocco	39.0	9	13	76	60	70	6
111	Mozambique	10.3	2	2	10	20	18	10
112	Myanmar	33.5	4	11	56	50	76	4
113	Namibia	31.8	13	9	73	44	32	20
114	Nepal	34.7	2	6	67	56	31	46
115	Netherlands	84.0	84	63	97	82	100	78
116	New Zealand	79.8	56	83	96	82	100	62
117	Nicaragua	46.0	6	18	82	68	52	50
118	Niger	7.3	1	1	5	28	9	0
119	Nigeria	14.7	4	10	5	22	31	16
120	Norway	88.0	100	74	98	82	100	74

	Country	IGI	PPP/GNI%50.000 2010	Tertiary 2010	Inversed U-five% 2010	Life-10% 2010	Sanitation 2010	ID-10x2 2010
121	Oman	55.2	50	24	94	66	99	0
122	Pakistan	29.5	6	5	42	50	48	26
123	Panama	56.2	26	45	87	72	69	38
124	Papua N. G.	35.2	5	2	59	44	45	56
125	Paraguay	49.2	10	37	83	64	71	30
126	Peru	54.2	18	35	87	68	71	46
127	Philippines	48.0	8	29	81	56	74	40
128	Poland	68.8	38	71	96	72	90	46
129	Portugal	74.0	49	62	97	78	100	58
130	Qatar	63.5	100	10	95	76	100	0
131	Romania	61.3	29	64	91	66	72	46
132	Russia	61.3	38	76	92	58	70	34
133	Rwanda	23.8	2	5	39	30	55	12
134	St. Lucia	54.5	21	18	87	68	89	44
135	St. Vincent & Grenadines	57.0	22	18	92	64	96	60
136	Samoa	50.3	9	7	85	64	99	38
137	Sao Tome & Principe	27.0	4	4	48	48	26	32
138	Saudi Arabia	56.5	46	37	88	68	100	0
139	Senegal	29.7	4	8	50	38	52	26
140	Serbia	66.0	22	49	95	68	92	70
141	Sierra Leone	9.8	2	2	0	14	13	28
142	Singapore	78.5	100	71	98	84	100	18
143	Slovakia	68.5	46	54	95	70	100	48
144	Slovenia	78.0	53	87	98	78	100	52
145	Solomon Is.	38.3	4	8	76	54	34	54
146	South Africa	37.5	21	15	62	24	79	24
147	Spain	84.7	64	73	97	84	100	90
148	Sri Lanka	51.3	10	15	89	70	92	32
149	Sudan	20.5	4	6	31	42	26	14
150	Suriname	51.8	15	12	83	60	93	58
151	Swaziland	22.7	11	4	48	16	57	0
152	Sweden	87.0	79	71	98	82	100	92
153	Switzerland	86.3	100	51	97	84	100	86
154	Syria	49.2	10	15	89	72	95	14
155	Taiwan	75.7	76	59	97	76	100	46
156	Tajikistan	42.0	4	20	58	54	94	22
157	Tanzania	19.3	3	2	39	34	10	28
158	Thailand	54.8	16	48	91	48	96	30

	Country	IGI	PPP/GNI%50.000 2010	Tertiary 2010	Inversed U-five% 2010	Life-10% 2010	Sanitation 2010	ID-10x2 2010
159	Timor-Leste	32.8	7	17	46	44	47	36
160	Togo	19.8	2	5	31	34	13	28
161	Tonga	44.7	9	8	87	64	96	4
162	Trinidad & Tobago	59.0	48	12	82	60	92	60
163	Tunisia	51.3	18	34	89	70	85	12
164	Turkey	60.2	31	46	88	68	90	38
165	Turkmenistan	42.8	15	19	63	50	98	12
166	Uganda	20.8	3	4	34	28	34	22
167	Ukraine	66.2	13	79	91	60	94	60
168	U.A.E.	66.2	100	30	95	74	98	0
169	U.K.	78.3	72	59	97	80	100	62
170	U.S.A.	87.8	95	95	95	76	100	66
171	Uruguay	69.5	27	63	93	72	100	62
172	Uzbekistan	41.7	6	9	65	56	100	14
173	Vanuatu	52.2	9	5	69	62	100	68
174	Venezuela	59.8	24	78	89	68	68	32
175	Vietnam	45.2	6	22	85	70	76	12
176	Yemen	29.8	5	10	49	50	53	12
177	Zambia	19.5	3	2	26	16	48	22
178	Zimbabwe	21.3	1	6	47	20	40	14

The six variables could be combined into the Index of Global Inequality (IGI) in several ways depending on how single components are weighted. Because I regard them to be equally important, each of them should have the same weight in the combined index. This was done by calculating the arithmetic mean of the six variables. The mean of the six variables is the combined Index of Global Inequality. The index values for 178 countries are given in Table 3.2.

IGI measures national differences in the global inequality of human conditions on the basis of the six separate indicators. Human conditions are the better and global inequality the smaller, the higher the value of the Index of Global Inequality. Therefore it is hypothesized that the index points of IGI should be positively

correlated with national IQ. The values of IGI are expected to rise with the scores of national IQ. Consequently, positive residuals produced by a regression analysis indicate that human conditions in a country are better and inequality smaller than expected on the basis of the regression analysis of IGI on national IQ, and negative residuals indicate that the level of inequality in human conditions is greater than expected on the basis of the average relationship between national IQ and IGI.

Part 2

The Hypothesis Tested by Empirical Evidence

Chapter 4

Test of the Hypothesis: the Six Components of IGI

1. Intercorrelations of Variables

2. The Hypothesis Tested by the Six Components of IGI

Correlation analysis will be used in this chapter to test the hypothesis on the positive relationship between national IQ and dependent variables, but first it is useful to check to what extent the six indicators of human conditions are intercorrelated. They should be positively correlated with each other because all of them are assumed to measure the same phenomenon, the quality of human conditions, although from different perspectives. However, intercorrelations should not be too high. The use of the six indicators is based on the idea that they measure human conditions from clearly different perspectives. Extremely high correlations between two or three variables would show that they measure more or less the same phenomenon. In such a case the use of two or three separate variables would be questionable because one of those variables could be enough to measure that phenomenon. On the other hand, low correlations would imply that indicators do not measure the same phenomenon, the quality of human conditions, but some quite different phenomena. In this study the six dependent variables are intended to measure the

level of economic development and income inequality, the extent of higher education, health conditions, living conditions, the level of sanitation, and the level of democratization in 178 countries. They measure human conditions from quite different perspectives. The measurements were combined into the Index of Global Inequality (IGI), as explained in Chapter 3. The index is assumed to show the relative differences in global inequality of human conditions between the 178 countries more reliably than any of the single components of IGI.

1. Intercorrelations of Variables

We can start the correlation analysis by exploring to what extent the six components of IGI are intercorrelated with each other. Because they were selected to measure differences in the quality of human conditions from different perspectives, they should not be too strongly or weakly intercorrelated with each other. Moderate intercorrelations would be ideal. It is also interesting to see to what extent different components of IGI are correlated with the combined index. The intercorrelations of the six components of IGI are given in Table 4.1. It should be noted that two of these components are original indicators (Tertiary and Sanitation) and that the four others are transformed versions of the original indicators (PPP/GNI-10%, inversed U-five%, Life-10%, and ID-10x2). The values of these variables for single countries are given in Table 3.2. However, the correlations between the four original indicators and their transformed versions are almost complete. They vary from 0.966 (PPP/GNI-10 and PPP/GNI-10%) to 0.997 in the case of Life-10 and Life-10%).

Table 4.1 shows that the six components of IGI are at least moderately correlated with each other, which means that they measure the same phenomenon but from clearly different perspectives. Most intercorrelations are moderate, from 0.414 (between ID-10% and Sanitation) to 0.694 (Tertiary and Life-

10%), but some correlations above 0.700 are strong. They include correlations between Inversed under-five mortality rate and Life-10% (0.919), between Inversed U-five and Sanitation (0.815), as well as between Life-10% and Sanitation (0.796). The strong correlations between Inversed U-five, Life-10% and Sanitation indicate that these three variables measure national differences in health conditions but to some extent from different perspectives.

Further, Table 4.1 shows that all components of IGI have affected the values of the index. The correlations between the six indicators and IGI are relatively strong. They vary from 0.682 (ID-10%) to 0.915 (Life-10%). Thus the combined index reflects to some extent the contributions of all its six components. I assume that it indicates the relative differences between countries in the level of human conditions more reliably than any of its six components separately. Consequently, it is reasonable to assume that it correlates with national IQ more strongly than any of its six components.

Table 4.1. The intercorrelations of IGI and its six components in the group of 178 countries.

Variable	PPP/GNI-per capita	Tertiary	Inversed U-five	Life-10%	Sanitation	ID-10x2	IGI
PPP/GNI-10%	1.000	.629	.586	.665	.631	.513	.804
Tertiary		1.000	.679	.694	.652	.539	.839
Inversed U-five%			1.000	.919	.815	.491	.899
Life-10%				1.000	.796	.537	.915
Sanitation					1.000	.414	.870
ID-10x2						1.000	.682
IGI							1.000

2. The Hypothesis Tested by the Six Components of IGI

The hypothesis on the relationship between different indicators of global disparities in human conditions and national IQ has been tested by correlating national IQ with single indicators and their combined index IGI. Because it is assumed that more intelligent nations are usually able to establish and maintain better human conditions for their members than less intelligent nations, it was hypothesized that all indicators of human conditions are positively correlated with national IQ. The strength of correlations tests the explanatory power of national IQ. Positive correlations are expected to be relatively strong. Negative and zero correlations would falsify the hypothesis, and a weak positive correlation would indicate that national IQ does not explain any significant part of the variation in a dependent variable. Correlations are given in Table 4.2.

Table 4.2. National IQ correlated with the six components of IGI and with the Index of Global Inequality in the group of 178 countries.

Variable	Correlation
PPP/GNI per capita 20100, % of 50,000 dollars (PPP/GNI-10%)	.646
Tertiary education, gross enrolment ratio, % of relevant age group, 2010	.787
Under-five mortality rate per 1000 live births, inversed % of 170, 2010	.795
Life expectancy 2010, modified life expectancy (Life-10%)	.815
Access to improved sanitation facilities, percent of population, 2010	.725
Index of Democratization (ID), scores multiplied by 2, 2010 (ID-10x2)	.556
Index of Global Inequality (IGI)	.864

The results of correlation analysis reported in Table 4.2 show that all correlations between national IQ and dependent variables are positive as hypothesized and that the strength of correlations is in most cases strong. Thus the results of the correlation analysis support the hypothesis strongly. The explained part of variation in the six components of IGI varies from IDx2's 31 percent to 66 percent in the case of Life-10% expectancy. Human diversity measured by national IQ explains a significant part of the variation in all indicators of the quality of human conditions.

The correlation between national IQ and the Index of Global Inequality is 0.864, which means that the explained part of variation in IGI rises to 74.6 percent. The correlations between IGI and the 2006 national IQ (0.840) and the 2012 national IQ (0.843) are slightly weaker. National IQ explains more of the variation in human conditions than any other explanatory variable, but a part of the variation is always due to the impact of various environmental factors.

Because a significant part of the variation in different measures of human conditions remains unexplained by national IQ, it means that the average relationship between national IQ and a dependent variable does not apply equally well to all countries. Many countries deviate from the average relationship to positive or negative direction and contradict the hypothesis. It would be interesting to see what countries deviate most from the average relationship. The examination of them could provide hints about the nature of important environmental factors. This can be done on the basis of regression analysis. The detailed results of all regression analyses for single countries will not be reported, but the countries with large positive or negative residuals will be mentioned as well as the sizes of residuals produced by the regression analyses. Also, figures summarize the results of regression analyses. Large residuals will help to discover at least some of the environmental factors, which have caused those

countries to deviate from the regression lines. Let us first explore the relationships between national IQ and the six components of IGI at the level of single countries.

PPP/GNI per capita 2010, % of 50,000 dollars

PPP/GNI per capita % of 50,000 dollars is moderately correlated with national IQ. The explained part of variation in PPP/GNI-10% rises to 41 percent. The correlation between national IQ and the original data of PPP/GNI per capita in dollars is somewhat weaker (0.578). The use of the upper limit of 50,000 dollars has strengthened the correlation and the explained part of variation by 9 percentage points. It is obvious that various environmental variables explain more of the variation in PPP/GNI-10% than national IQ, but national IQ may explain more of this variation than any single environmental variable could explain independently from national IQ. Many kinds of environmental factors certainly affect the level of per capita income, including geographical, historical, political, institutional, and temporary factors, but most of them are probably local factors, which are important only in some parts of the world. Human diversity measured by national IQ is a universal explanatory factor which affects the level of per capita income in all countries of the world and over time. It maintains the persistence of global disparities in the level of per capita income and the enormous gap between rich and poor countries.

Figure 4.1 summarizes the results of regression analysis of PPP/GNI-10% on national IQ. It shows that the relationship between the two variables is clearly curvilinear. With some exceptions, the level of per capita income rises only a little below the national IQ level of 90, but above 90 it starts to rise steeply. Most countries deviate only moderately from the regression line, but there are also many countries which deviate greatly from the regression line to positive or negative direction. Some of the most deviating countries are named in the figure.They have reduced the

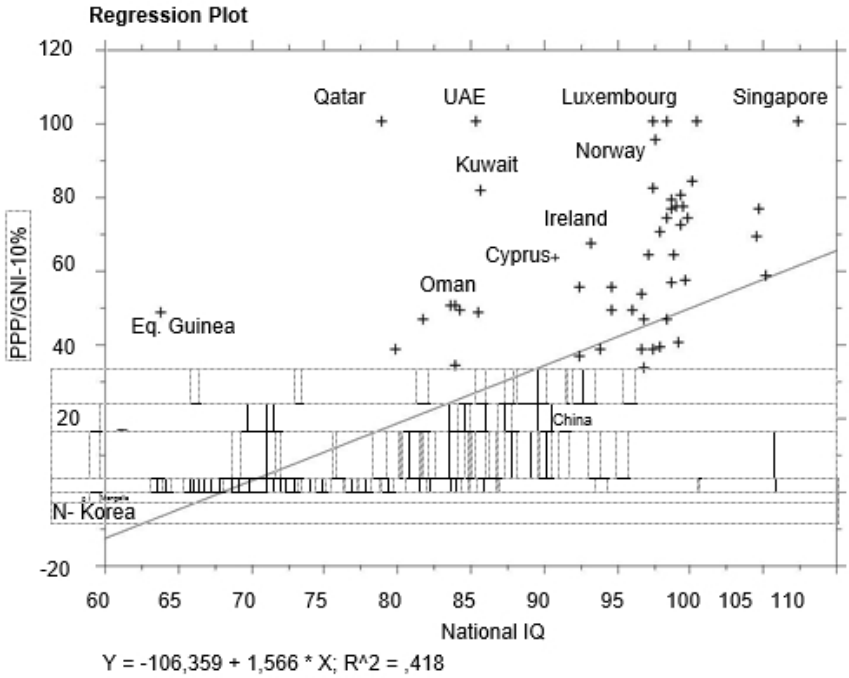

Figure 4.1. The results of regression analysis of PPP/GNI-10% on national IQ in the group of 178 countries.

correlation between national IQ and PPP/GNI-10% significantly. When the four largest outliers (Qatar, the United Arab Emirates, China, and North Korea) are excluded, the correlation between national IQ and PPP/GNI-10% rises to 0.711 and the explained part of variation to 50 percent. The most deviating countries provide hints about the exceptional environmental factors which have caused them to deviate from the regression line.

Therefore, let us explore the lists of large positive and large negative outliers. We can use a residual ±23 to separate large outliers from moderate and small deviations. This criterion is a little higher than one standard deviation of residual PPP/GNI-10% (±20.6).

The group of large positive outliers includes the following 25 countries: Australia (residual 26), Austria (31), the Bahamas (25), Bahrain (23), Belgium (28), Canada (27), Cyprus (24), Denmark (36), Equatorial Guinea (54), Finland (23), Gabon (28), Germany (28), Ireland (27), Kuwait (53), Luxembourg (54), the Netherlands (33), Norway (52), Oman (25), Qatar (83), Saudi Arabia (24), Singapore (38), Sweden (31), Switzerland (49), the United Arab Emirates (73), and the United States (49).

The group of large negative outliers includes the following 11 countries: Armenia (-29), Brunei (-24), China (-45), Georgia (-25), North Korea (-54), Laos (-28), Moldova (-34), Mongolia (-44), Myanmar (-24), Ukraine (-30), and Vietnam (-35).

It is easy to see that there are significant differences in the characteristics of large positive and large negative outliers. Of the 25 countries with large positive residuals, 15 are economically highly developed Western democracies, and eight others (Bahrain, Equatorial Guinea, Gabon, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) are oil producing countries. Their much higher than expected level of per capita income is in the case of Western democracies due to their exceptionally high level of socio-economic development, and in the case of oil producing

countries to their exceptionally high oil incomes. The Bahamas is one of the Caribbean tourist countries which have benefitted tourist industries established by the help of foreign investments. Singapore belongs to the same group of economically highly developed Western countries, although it is not a fully developed democracy.

Of the 11 countries with large negative residuals, nine are contemporary or former socialist countries (Armenia, China, Georgia, North Korea, Laos, Moldova, Mongolia, Ukraine, and Vietnam). It is obvious that socialist economic and political systems have been less capable of further economic development than inclusive market economies and democracies (cf. the arguments of Acemoglu and Robinson, 2012). Myanmar has suffered from serious ethnic or other civil wars (see Vanhanen, 2012b, pp. 162, 175-176). It is obvious that civil wars and other wars hamper economic development. I do not have any special explanation for the large negative residual of Brunei (-24), except that it seems to be due to the lack of democracy and to the absolute hegemony of the Malay community. The comparison of large positive and negative residuals indicates that they are due to the impact of quite different environmental factors.

The extent of tertiary education

Tertiary education is more strongly correlated with national IQ (0.787) than PPP/GNI-10%. The explained part of variation in Tertiary rises to 62 percent, which means that environmental factors explain only 38 percent of the variation independently from national IQ. The strong positive relationship between national IQ and the enrolment ratio in tertiary education seems to be relatively stable. Great global differences in the extent of tertiary education depend crucially on the level of national IQ. It would probably be impossible to find out any environmental factor which could explain a significant part of global differences in the extent of higher education independently from national IQ,

although various environmental factors taken together explain 38 percent of the variation independently from national IQ. Relevant environmental factors may include cultural differences, historical traditions, differences in school systems, the role of foreign aid, political factors, the impact of important persons, but also measurement errors and significant differences in the definitions of tertiary education.

Figure 4.2 illustrates the relationship between national IQ and Tertiary in the group of 178 countries. It shows that the relationship is slightly curvilinear. The level of tertiary education remains low below the national IQ level of 80, but it starts to rise above that IQ level and especially above the IQ level of 90. Figure 4.2 also shows that the number of extremely deviating countries is smaller than in the case of PPP/GNI-10%. Some of the largest outliers are named in the figure. It will be interesting to see to what extent the countries with large residuals are the same or different than in the case of PPP/GNI-10%. A residual of ±19 can be used to separate large outliers. This criterion is a little higher than one standard deviation of Tertiary residual (±16.7).

The group of large positive outliers includes the following 20 countries: Argentina (residual 23), Barbados (42), Belarus (29), Cuba (62), Finland (31), Greece (44), Jamaica (23), North Korea (26), South Korea (28), Kyrgyzstan (21), Lebanon (24), Liberia (19), Libya (25), Lithuania (29), New Zealand (24), Russia (21), Slovenia (32), Ukraine (26), the United States (38), and Venezuela (47).

The group of large negative residuals includes the following 21 countries: Afghanistan (residual -20), Brunei (-26), Cambodia (-37), China (-46), Guyana (-20), Iraq (-21), Laos (-28), Luxembourg (-47), Maldives (-25), Malta (-22), Myanmar (-24), Pakistan (-26), Papua New Guinea (-28), Samoa (-32), Solomon Islands (-22), Suriname (-29), Tonga (-27), Trinidad and Tobago (-22), Uzbekistan (-21), Vanuatu (-26), and Vietnam (-28).

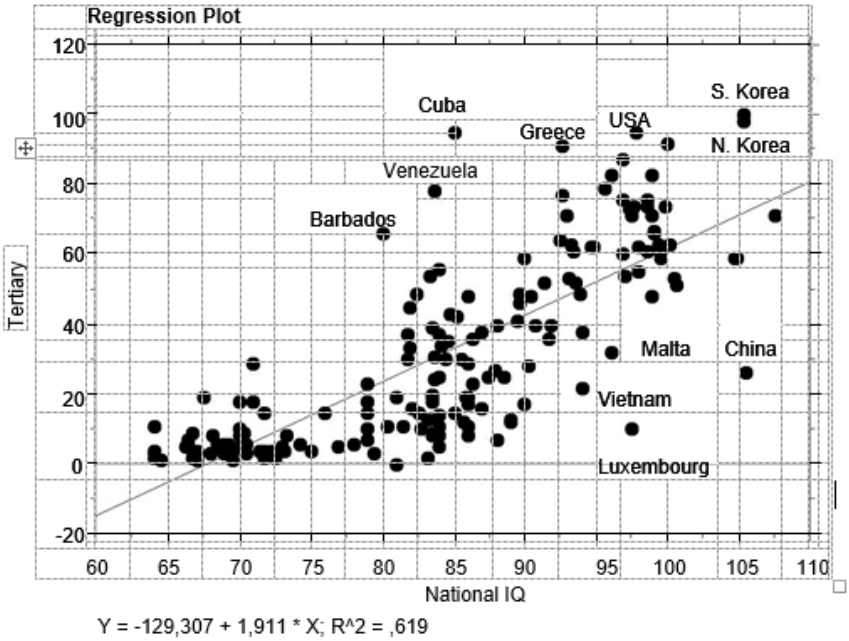

Figure 4.2. The results of regression analysis of Tertiary education on national IQ in the group of 178 countries.

The examination of the lists of large positive and negative outliers discloses that they do not differ from each other as clearly as in the case of PPP/GNI-10%. The fact that only a few of the large positive and negative residuals on the basis of Tertiary are the same as in the case of PPP/GNI-10% emphasizes the differences between these two measures of human conditions. Of the 20 large positive outliers only three (Australia, Finland, and USA) are large outsiders also on the basis of PPP/GNI-10%, whereas of the 21 large negative residuals five are the same (Brunei, China, Laos, Myanmar, and Vietnam). Most of them are socialist countries around China or countries which have suffered seriously from ethnic and other civil wars.

Economically highly developed Western democracies constitute a large coherent group of positive outliers, but this subgroup includes only five European and European offshoot countries (Finland, Greece, New Zealand, Slovenia and the United States) and South Korea from Asia. Eight contemporary or former socialist countries constitute another clearly different subcategory of large positive outliers (Belarus, Cuba, North Korea, Kyrgyzstan, Lithuania, Russia, Slovenia, and Ukraine). The other six positive outliers (Argentina, Barbados, Jamaica, Lebanon, Libya, and Venezuela) are dispersed around the world. Various environmental factors have caused these countries to deviate significantly from the regression line, but I am not able to indicate any common environmental factors which could explain their deviations.

Four contemporary or former socialist countries (China, Laos, Uzbekistan, and Vietnam) constitute a coherent group of large negative outliers, but it is much smaller than in the case of PPP/GNI-10%. Besides, because eight contemporary or former socialist countries are large positive outliers, a socialist economic and political system is not always negatively related to this measure of global inequality. The group of countries which have

suffered from serious ethnic and other civil wars is the larger one. It comprises at least five countries (Afghanistan, Cambodia, Iraq, Myanmar, and Pakistan). The small size of population and isolated geographical position may have lowered the extent of tertiary education in small island countries like Brunei, Maldives, Malta, Papua New Guinea, Samoa, Solomon Islands, Tonga, Trinidad & Tobago, and Vanuatu.

I cannot specify any common factor which could explain large negative residuals for Guyana, Luxembourg, and Suriname, but Luxembourg's very large negative residual may be due to a measurement error. Luxembourg's Tertiary value (10) is much lower than for any other European country.

The above indicated environmental factors which are connected with various groups of large positive and negative outliers are quite different, and it would be difficult to disclose any environmental factor which could explain both positive and negative deviations independently from national IQ. To some extent large positive and negative outliers may be due to the differences in definitions of "tertiary education". For example, it is difficult to believe that the enrolment ratio in tertiary education would be several times higher in Cuba (95%) than in Luxembourg (10%). Significant differences in the definitions of "tertiary education", as well as measurement errors, have certainly affected the extent of tertiary education. In other words, empirical data on tertiary education are to some extent inaccurate for the reason that the concept of tertiary education varies to some extent from country to country, but I have to work with the data as they are given in sources. There is, in any case, a strong positive correlation between national IQ and the enrolment ratio in tertiary education, which implies that we cannot expect the disappearance of such disparities.

Under-five mortality rate

Inversed U-five% measuring the under-five mortality rate per 1,000 live births is as strongly correlated with national IQ (0.795) as Tertiary. The explained part of variation in the U-five% variable rises to 63 percent. Under-five mortality rate per 1,000 live births indicates enormous variation in the level of health conditions among the 178 countries of this study. It is obvious that health conditions are much better in countries of high national IQs than in countries with low national IQs. The difference between countries of high and low national IQs is so extensive that it would be extremely difficult and probably impossible to equalize health conditions between the countries of high and low national IQs, although it is always possible to reduce the under-five mortality rates in particular cases.

Figure 4.3 illustrates the strong and principally linear relationship between Inversed U-five% and national IQ, but it also shows that there is no significant relationship between national IQ and Inversed U-five% in the category of countries below the national IQ level of 75. In this category of national IQ, the distance between extreme cases is 70-80 percentage points. It may be partly due to measurement errors, especially in the under-five mortality rate per 1,000 live births.

A residual ±21 can be used to separate large deviations from moderate and small ones (one standard deviation of Inversed U-five% is ±18.2). Using this criterion, the group of large positive outliers (residual +21 and over) includes 18 countries: the Bahamas (residual 22), Bahrain (22), Barbados (31), Belize (25), Cape Verde (28), Cuba (23), El Salvador (29), Jamaica (41), Maldives (27), Namibia (32), Oman (24), Qatar (35), St. Lucia (47), St Vincent (49), Saudi Arabia (22), Sri Lanka (29), Syria (22), and the United Arab Emirates (21).

The group of large negative residuals includes 24 countries: Afghanistan (-60), Angola (-39), Burkina Faso (-38), Burundi (-36), Central African Republic (-28), Chad (-34), China

(-28), Comoros (-24), Democratic Republic of Congo (-33), Cote d'Ivoire (-22), Equatorial Guinea (-25), Guinea-Bissau (-36), Haiti (-34), North Korea (-38), Mali (-39), Mauritania (-25), Mongolia

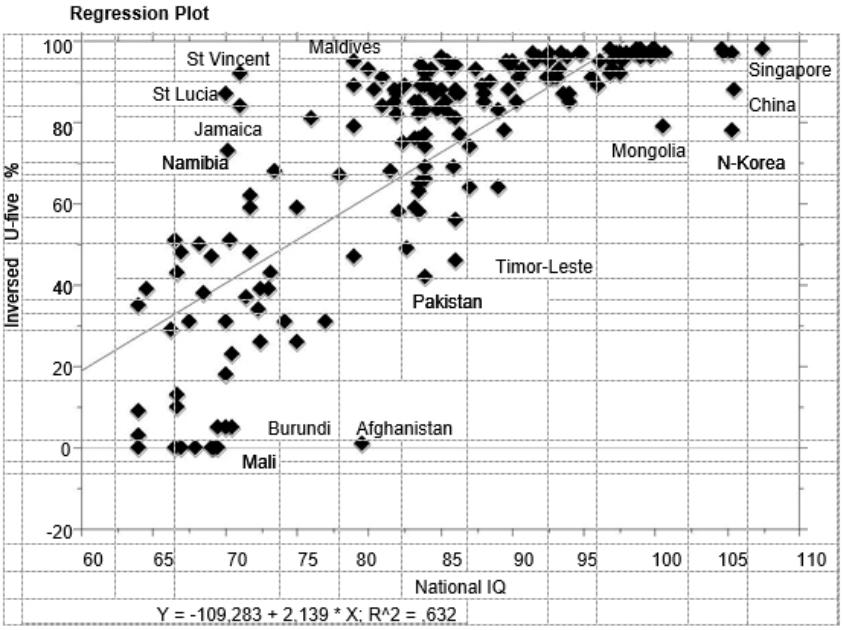

Figure 4.3. The results of regression analysis of inversed U-five % on national IQ in the group of 178 countries.

(-27), Mozambique (-23), Niger (-34), Nigeria (-36), Pakistan (-28), Sierra Leone (-28), Singapore (-23), and Timor-Leste (-29).

The large positive and negative outliers based on Inversed U-five% differ significantly from the large outliers based on PPP/GNI-10% and Tertiary education. Economically highly developed European democracies are not represented in this group of large negative outliers, and only three contemporary or former socialist countries have large negative residuals (China, North

Korea, and Mongolia). In fact, 16 of the 24 large negative outliers are African countries and seven others are Asian countries. Haiti is the only country from the other parts of the world.

Large positive deviations are more widely dispersed around the world. Nearly all Caribbean tourist countries (the Bahamas, Barbados, Belize, Jamaica, St. Lucia, St. Vincent & the Grenadines) as well as the Middle Eastern oil-producing countries (Bahrain, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) have large positive residuals. Of the other seven positive outliers three are African (Cape Verde, Maldives, and Namibia) and two Latin American (Cuba and El Salvador) countries. Sri Lanka and Syria are Asian countries.

As already noted, there does not seem to be any correlation between the two variables in the category of countries below the national IQ level of 75, and the relationship is weak also at the national IQ level of 75-85. In fact, nearly all large positive and negative outliers are below the national IQ level of 85. Of the 42 countries with large residuals, 16 are African countries. This observation on the concentration of large residuals into the category of low national IQ countries implies that data from low national IQ countries may be less reliable than data from higher national IQ countries. In other words, the great dispersion of data on under-five mortality rate in low national IQ countries may be partly due to measurement errors. There are only few countries with large residuals above the national IQ level of 85 (China, North Korea, Mongolia, Singapore, and Timor-Leste).

Life expectancy (Life-10%)

Life expectancy is strongly correlated with national IQ. The explained part of variation in Life-10% rises to 66 percent, which means that only 34 percent of the variation is due to the impact of various environmental factors independently from national IQ. Life expectancy can be regarded to be another measure of health and general living conditions. It is extremely

strongly correlated with Inversed U-five% (0.919). It is justified to assume that environmental factors that explain a part of the variation in Life-10% independently from national IQ are various local factors which have improved or damaged living conditions in particular countries.

Figure 4.4 illustrates the strong linear relationship between Life-10% and national IQ. The life expectancy tends to rise systematically with the level of national IQ. Life expectancy is much longer in the countries above the national IQ level of 80 than in the countries below the national IQ level of 75. However, Figure 4.4 also discloses that many countries at all levels of national IQ deviate significantly from the regression line to positive or negative direction. I assume that such deviations have been caused by some exceptional environmental factors. The examination of large positive and negative outliers may disclose something of the nature of such exceptional environmental factors. Let us use a residual ±14 or higher as the criterion to separate large deviations from the countries that are closer to the regression line. One standard deviation of Life-10% residual is ±11.4.

Using this criterion (+14 or higher), the group of large positive outliers includes 15 countries: Barbados (residual 18), Belize (20), Cape Verde (22), Costa Rica (15), Cuba (19), Jamaica (27), Maldives (21), Panama (17), Qatar (25), St. Lucia (31), St. Vincent (25), Sao Tome & Principe (15), Sri Lanka (20), Syria (17), and the United Arab Emirates (14).

The group of countries with large negative residuals (-14 or higher) includes 23 countries: Afghanistan (residual -35), Angola (-15), Belarus (-15, Botswana (-16), Burundi (-18), Chad (-15), China (-22), Democratic Republic of Congo (-16), Guinea-Bissau (-18), North Korea (-30), Lesotho (-19), Mali (-14), Mongolia (-25), Nigeria (-16), Russia (-18), Sierra Leone (-15), South Africa (-16), Swaziland (-24), Thailand (-19), Timor-Leste (-16), Ukraine (-14), Zambia (-25), and Zimbabwe (-16).

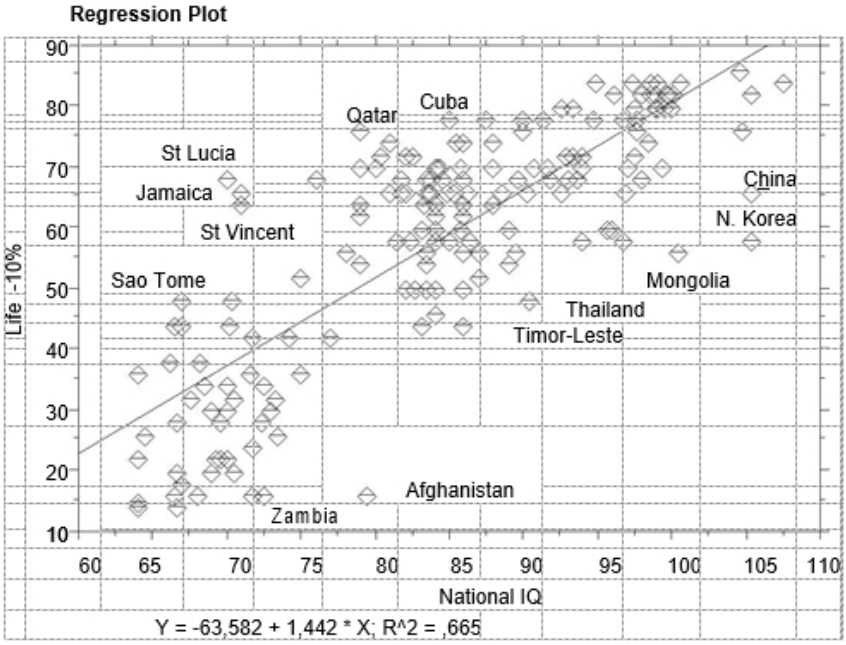

Figure 4.4. The results of regression analysis of Life expectancy (Life-10%) on national IQ in the group of 178 countries.

The five Caribbean tourist countries (Barbados, Belize, Jamaica, St. Lucia, and St. Vincent & the Grenadines) constitute the largest coherent sub-category of countries with large positive residuals. Tourism seems to be the local environmental factor which has improved living conditions in these countries and increased life expectancy. Qatar and the United Arab Emirates are the two oil-producing countries among large positive outliers. High oil incomes have improved general living conditions in these countries. I do not have any special explanation for the large positive residuals for the other eight countries. Cape Verde, Maldives, and Sao Tome & Principe are exceptional sub-Saharan

African countries; Costa Rica, Cuba, and Panama are Latin American countries, and Sri Lanka and Syria are Asian countries. The category of large negative outliers is dominated by 14 poor sub-Saharan African countries (Angola, Botswana, Burundi, Chad, Democratic Republic of Congo, Guinea-Bissau, Lesotho, Mali, Nigeria, Sierra Leone, South Africa, Swaziland, Zambia, and Zimbabwe). Many of these countries have suffered from ethnic and other civil wars, which have impaired general living conditions in these countries. These countries are also among the poorest countries of the world. Poverty and HIV seem to be local factors which have reduced life expectancy in sub-Saharan Africa. Belarus, China, North Korea, Mongolia, Russia, and Ukraine are contemporary or former socialist countries with large negative residuals. Their lower than expected life expectancy is in some way related to the heritage of their socialist socioeconomic system. Ethnic civil wars have damaged general living conditions especially in Afghanistan, which is the most extreme negative outlier. I do not have any special explanation for the large negative residuals in two other countries (Thailand and Timor-Leste).

The clearest difference in the characteristics of large positive and negative outliers is in the fact that 14 of the 23 large negative outliers are poor sub-Saharan African countries, whereas five of the 14 large positive outliers are economically much more successful Caribbean countries. Because these two groups of countries are approximately at the same level of national IQ, the extensive difference in life expectancy between these two groups of countries must be entirely due to the impact of environmental factors.

Sanitation facilities

Sanitation is also strongly correlated with national IQ. The explained part of variation in Sanitation rises to 52.5 percent. The rest of the variation is due to the impact of exceptional local

factors and probably also to measurement errors. National IQ may explain more of the sanitation conditions than any environmental factor, but the correlation (0.725) leaves a lot of room to the impact of environmental variables.

Figure 4.5 illustrates the linear relationship between national IQ and Sanitation and indicates that the relationship is considerably weaker than in the cases of Tertiary, Inversed U-five%, and Life-10% variables. Many countries deviate extensively from the regression line and weaken the correlation. There are large deviations at all levels of national IQ. They are due to various local factors. The examination of the largest negative and positive outliers may help to localize some of those factors. We can use a residual ±24 to separate large outliers from smaller ones (one standard deviation of residual Sanitation is ±20.7).

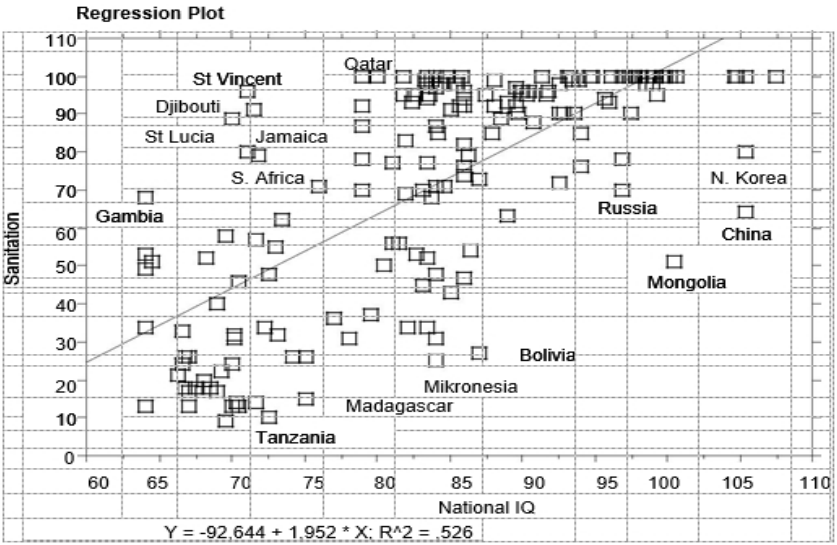

Figure 4.5. The results of regression analysis of Sanitation on national IQ in the group of 178 countries.

Using this criterion, the group of large positive outliers includes 26 countries: Algeria (residual 24), the Bahamas (29), Bahrain (26), Barbados (36), Djibouti (44), Egypt (28), El Salvador (25), Gambia (36), Iran (27), Jamaica (34), Jordan (-24), Kuwait (25), Kyrgyzstan (25), Lebanon (29), Libya (26), Oman (28), Qatar (38), St. Lucia (45), St. Vincent (50), Saudi Arabia (33), South Africa (31), Sri Lanka (30), Syria (27), Turkmenistan (28), Uzbekistan (30), and Vanuatu (29).

The group of large negative outliers includes 25 countries: Afghanistan (-26), Benin (-32), Bolivia (-50), Burkina Faso (-25), Cambodia (-40), Chad (-25), China (49), Eritrea (-33), Fiji (-30), Ghana (-31), India (-34), North Korea (33), Madagascar (-39), Mauritania (-28), Micronesia (-46), Mongolia (-53), Nepal (-29), Niger (-34), Papua New Guinea (-25), Russia (26), Solomon Islands (-36), Sudan (-26), Tanzania (-39), Timor-Leste (-28), and Togo (-31).

Eight oil-producing countries (Algeria, Bahrain, Iran, Kuwait, Libya, Oman, Qatar, and Saudi Arabia) and five Caribbean tourist countries (the Bahamas, Barbados, Jamaica, St. Lucia, and St Vincent) constitute two coherent groups of large positive outliers. It is obvious that in these countries a part of oil incomes and incomes from tourism has been used to improve sanitation facilities. Kyrgyzstan, Turkmenistan, and Uzbekistan are former Soviet republics, in which sanitation conditions are significantly better than expected on the basis of the regression equation. The ten other large positive outliers do not seem to have any common characteristics which could explain their deviations from the regression line. Jordan, Lebanon, Sri Lanka, Syria, and Vanuatu are Asian and Pacific countries, Djibouti, Egypt, Gambia, and South Africa) are African countries, and El Salvador is a lonely Latin American country. It is remarkable that this category does not include any European countries.

Eleven poor sub-Saharan African countries (Benin, Burkina Faso, Chad, Eritrea, Ghana, Madagascar, Mauritania,

Niger, Sudan, Tanzania, and Togo) constitute the largest coherent group of large negative outliers. Extreme poverty may explain their inability to improve sanitation facilities. Four contemporary or former socialist countries (China, North Korea, Mongolia, and Russia) constitute another coherent group of large negative outliers. It is common for five Pacific countries (Fiji, Micronesia, Papua New Guinea, Solomon Islands, and Timor-Leste) that they are isolate island countries. Between the five other five countries (Afghanistan, Bolivia, Cambodia, India, and Nepal) of this category, it is difficult to see any common characteristics, which could explain their large negative residuals.

Index of Democratization (ID) 2010

The correlation between ID-10x2 (the level of democratization) and national IQ (0.556) is the weakest of the six correlations between national IQ and the components of IGI. The explained part of variation is not higher than 31 percent. The level of democratization tends to rise with the level of national IQ, but many kinds of environmental factors diminish this relationship. Such environmental factors may include historical and cultural traditions, political and ideological factors, and especially institutional factors (presidential vs. parliamentary system, proportional vs. majoritarian electoral system, and two-party vs. multiparty system). In addition to them, various temporary and accidental factors may affect the value of the Index of Democratization. In other words, the level of democratization measured by IDx2 is dependent also on many environmental factors independently from national IQ. If institutional political structures were more or less similar in all countries of the world, the correlation between national IQ and ID would probably be much stronger than what it is now. Any way, it is remarkable that despite the impact of many local and environmental factors, national IQ explains 31 percent of the global variation in the Index of Democratization. This relationship has been sufficiently strong

to maintain clear differences in the level of democratization between high and low national IQ countries.

Figure 4.6 illustrates the relatively weak positive relationship between national IQ and ID-10x2. The level of ID is much lower in the countries of low national IQ than in the countries of high national IQ, but many countries deviate from the regression line to both directions at all levels of national IQ and weaken the relationship between national IQ and ID-10x2. The examination of large outliers provides hints about the nature of environmental factors which have increased or decreased the values of ID independently from national IQ, especially so in the cases of large negative outliers. Let us use residual ±23 to separate large deviations from moderate and small deviations (one standard deviation of residual ID-10% is ±20).

The group of large positive outliers includes 16 countries: Austria (residual 31), Belgium (33), Brazil (41), Cyprus (34), Denmark (39), Greece (27), Iceland (38), the Netherlands (24), St. Lucia (26), St. Vincent (41), Serbia (29), Spain (39), Sweden (39), Switzerland (31), Trinidad & Tobago (23), and Vanuatu (33).

The group of large negative deviations includes 24 countries: Bahrain (-33), , Brunei (-42), China (-60), Cuba (-36), Egypt (-26), Fiji (-36), Iran (-32), Jordan (-34), Kazakhstan (-33), North Korea (-60), Kuwait (-35), Laos (-39), Libya (-35), Madagascar (-24), Mongolia (-24), Morocco (-28), Myanmar (-33), Oman (-34), Qatar (-29), Saudi Arabia (-32), Singapore (-45), Tonga (-33), the United Arab Emirates (-36), and Vietnam (-35).

The group of large positive outliers is dominated by 11 socioeconomically highly developed European countries. Their higher than expected level of democratization is related to their high level of per capita income but probably also to the historical heritage of democratic institutions and market economies (cf. Acemoglu and Robinson, 2012). Of the other large positive outliers, St. Lucia, St. Vincent & the Grenadines, and Trinidad & Tobago are economically successful Caribbean tourist countries.

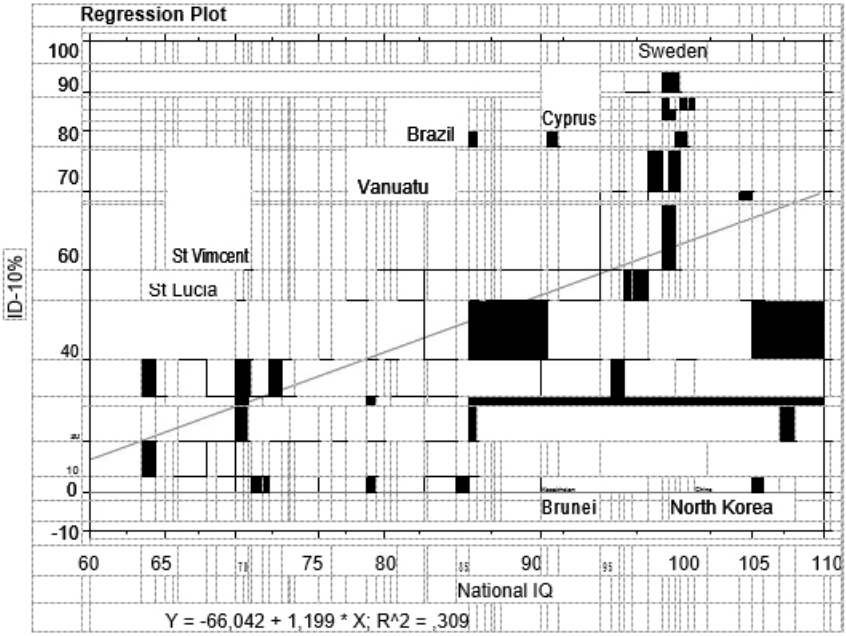

Figure 4.6. The results of regression analysis of the Index of Democratization (ID-10%) on national IQ in the group of 178 countries.

The stabilization of democracy in these countries is due to their economic success as tourist countries but probably also to their British heritage of democratic institutions. Brazil's and Vanuatu's large positive residuals seem to be principally due to their fragmented party systems. It is remarkable that the category of large positive outliers does not include any sub-Saharan, Latin American (except Brazil), and Asian countries.

The category of large negative outliers includes seven contemporary or former socialist countries (China, Cuba, Kazakhstan, North Korea, Laos, Mongolia, and Vietnam). The historical heritage of autocratic and extractive political and economic institutions explains at least partly their low levels of democratization. Nine oil-producing countries (Bahrain, Brunei, Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) constitute another coherent sub-category of large negative outliers. The governmental control of oil resources and incomes has supported the survival of an autocratic system in most oil-producing countries, but some of them have already established democratic institutions. Of the eight other large negative outliers, Bhutan, Egypt, Morocco, Jordan, Tonga, and Tunisia have been traditional autocracies. The historical tradition of autocratic political system has made it difficult to establish and stabilize democratic institutions in these countries. Fiji and Myanmar were ruled by military governments in 2010. Madagascar and Singapore were partly democratized in 2010 (cf. *Freedom in the World 2010*).

A summary of large positive and negative residuals

The results of correlation analyses indicate that human diversity measured by national IQ explains a significant part of the variation in all six indicators of global inequality in human conditions. More intelligent nations seem to have been able to establish and maintain better living conditions in their countries than less intelligent nations. Some disparities between countries

are enormous. The equalization of human conditions or even a significant reduction of national disparities seems to be almost impossible for the reason that differences in average national IQs are partly based on genetic differences between nations. This means that global inequality in human conditions is natural and inevitable consequence of the evolved human diversity. We should learn to accept this biological fact of life and to formulate a new worldview based on the acceptation of this fact of life.

However, a significant part of the variation in dependent variables remained unexplained in all six cases. Because the human conditions measured by the six indicators are phenotypic phenomena affected both by environmental and genetic factors, national IQ can explain only a part of the variation in these indicators of human conditions. This study is focused on to explore the explanatory power of human diversity measured by national IQ, but I have also attempted to indicate some clearly causal environmental factors, although it has not been possible to measure them. Anyway, the examination of large outliers has disclosed many kinds of environmental factors which seem to explain a part of the variation in dependent variable independently from national IQ. According to my observations, all such environmental factors are principally local factors limited to some particular countries or regions of the world. There does not seem to be any universal environmental factor which could explain the deviations of countries from the average relationship between national IQ and a dependent variable (regression line) to positive and negative direction in all countries of the world. However, most environmental factors affecting human conditions are, and remain, unknown. Human diversity measured by national IQ is a unique explanatory factor which applies to all countries of the world.

On the basis of the six regression analyses, the countries with large positive and negative residuals were separated from the countries closer to the regression line into categories of large

positive and large negative outliers. The total number of large positive residuals rises to 120 and the number of large negative residuals to 128. Of course, the number of large residuals depends on the criteria used to separate large residuals from smaller ones. There is not any natural and self-evident borderline between large and small residuals. Large residuals of this study are not equally distributed among the 178 countries, which indicates that some countries are better adapted to the average relationships between national IQ and the six components of IGI than some other countries. In fact, there are great differences between countries in this respect.

The examination of large positive and negative residuals indicates that 51 countries are without any large residual and that 56 countries have only one large positive or negative residual. National IQ explains relatively well the level of the six indicators of human conditions in all these countries. Various unknown local environmental factors have caused these countries to deviate a little or only moderately from the regression lines. So these 107 countries support the hypothesis strongly. An interesting question is, to what extent these countries are evenly distributed around the world or concentrated to particular regions of the world or to certain kinds of countries.

It is remarkable that most former socialist countries are without any large residuals. This group covers the following 15 former socialist countries in Europe and Asia: Albania, Azerbaijan, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Macedonia, Montenegro, Poland, Romania, Slovakia, and Tajikistan. Of the Western European countries, only four are without any large residual: France, Italy, Portugal, and the United Kingdom. Of the Latin American countries, 11 are without any large residuals (Chile, Colombia, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, and Uruguay). Eleven African countries (Cameroon, Republic of Congo, Ethiopia,

Guinea, Kenya, Malawi, Mauritius, Rwanda, Senegal, Tunisia, and Uganda) are without any large residual. They represent a relatively small minority of all African countries. The same concerns the 10 Asian countries without any large residual (Bangladesh, Bhutan, Indonesia, Israel, Japan, Malaysia, Philippines, Taiwan, Turkey, and Yemen).

The 56 countries with only one positive or negative large residual are more evenly dispersed around the world than the countries of the first category. This category includes eight former socialist countries (Armenia, Georgia, Kazakhstan, Lithuania, Moldova, Serbia, Slovenia, and Turkmenistan); nine Latin American countries (Argentina, Bolivia, Brazil, Costa Rica, Guyana, Haiti, Panama, Suriname, and Venezuela), 22 African countries (Algeria, Benin, Botswana, Central African Republic, Comoros, Cote d'Ivoire, Djibouti, Eritrea, Gabon, Gambia, Ghana, Lesotho, Liberia, Morocco, Mozambique, Namibia, Sao Tome & Principe, Sudan, Swaziland, Tanzania, Zambia, and Zimbabwe); eight Asian and Pacific countries (India, Iraq, South Korea, Micronesia, Nepal, Samoa, Thailand, and Tonga), and nine European and European offshoot countries (Australia, Canada, Germany, Iceland, Ireland, Malta, New Zealand, Norway, and Spain).

The nine countries with one large positive and one large negative residual (Belarus, Egypt, Equatorial Guinea, Iran, Jordan, Luxembourg, South Africa, Trinidad & Tobago, Uzbekistan) are dispersed around the world, and they do not have any clear direction.

The other 62 countries with two or more large positive or negative residuals contradict the hypothesis more significantly. They can be divided into four sub-categories on the basis of the nature of their large residuals (positive or negative). The first sub-category covers 15 countries with two large positive residuals (Austria, Belgium, Belize, Cape Verde, Cyprus, Denmark, El Salvador, Finland, Greece, Kyrgyzstan, Lebanon, the Netherlands,

Sweden, Switzerland, and the United States) and the second sub-category covers 17 countries with two large negative residuals (Angola, Burkina Faso, Burundi, Cambodia, the Democratic Republic of Congo, Fiji, Guinea-Bissau, Madagascar, Mali, Mauritania, Niger, Nigeria, Pakistan, Papua New Guinea, Sierra Leone, Solomon Islands, and Togo). There is a clear difference in the nature of countries with large positive and negative residuals. Ten of the 15 countries of the first sub-category are wealthy European and European offshoot countries, whereas ten of the 17 countries with two large negative residuals are poor African and Asian countries.

The third sub-category of countries with three or more large positive residuals (one of which may be a large negative residual) includes 17 countries (the Bahamas, Bahrain, Barbados, Cuba, Jamaica, Kuwait, Libya, Maldives, Oman, Qatar, St. Lucia, St. Vincent & the Grenadines, Saudi Arabia, Sri Lanka, Syria, the United Arab Emirates, and Vanuatu). The group includes two coherent groups of countries: five Caribbean countries and seven oil-producing countries. Their position as positive outliers is due to their economic success. The other five countries are dispersed around the world: Cuba in Latin America and Maldives, Sri Lanka, Syria, and Vanuatu in Asia. It is remarkable that the group does not include any European or sub-Saharan African countries, or former socialist countries.

The fourth sub-category with three or more large negative residuals (one of which may be a large positive residual) includes 13 countries (Afghanistan, Brunei, Chad, China, North Korea, Laos, Mongolia, Myanmar, Russia, Singapore, Timor-Leste, Ukraine, and Vietnam). Seven of these countries are contemporary or former socialist countries (China, North Korea, Laos, Mongolia, Russia, Ukraine, and Vietnam). As noted previously in several connections, socialist economic and political system has retarded socio-economic development. Of the other six countries, Afghanistan, Chad, Myanmar, and Timor-Leste have

suffered from serious ethnic and other civil wars, which have hampered socio-economic development. I do not have any special explanation for Brunei's large negative residuals, whereas Singapore's large negative residuals may be due to the fact that Singapore's national IQ is the highest in the world.

All the countries with two and more large residuals contradict the hypothesis in the cases of two or more components of IGI, but the comparison of large positive and negative residuals indicates that there are significant differences in the nature of large positive and large negative outliers. It is characteristic for the countries with two large positive residuals that most of them are wealthy European and European offshoot countries, whereas most of the countries with large negative residuals are poor African and Asian countries. Wealthy countries have been able to improve human conditions more than expected on the basis of regression equations, whereas in poor countries many aspects of human conditions have remained worse than expected on the basis of regression equations.

The third and fourth sub-groups of countries with three and more large positive and negative residuals differ even more from each other. Most of the countries with three and more large positive residuals are economically successful Caribbean tourist countries and oil-producing countries, whereas most of the countries with large negative residuals are contemporary or former socialist countries and countries seriously damaged in ethnic and other civil wars. China and North Korea are the most deviating cases.

The examination of the countries with two or more large positive residuals indicates that the combination of market economy and democracy and successful tourist industries are two exceptional environmental factors which have helped most of these countries to deviate from the regression line to positive direction. On the other hand, the poverty of sub-Saharan African countries, the heritage of socialist economic and political system,

and the stress of civil wars are exceptional environmental factors which have caused most of the countries with two or more large negative residuals to deviate from the regression line and to contradict the hypothesis. It will be interesting to see to what extent similar environmental factors are behind the large positive and negative outliers on the basis of the regression analysis of IGI on national IQ. The results of this regression analysis will be presented and analyzed in the next chapter.

Chapter 5

The Index of Global Inequality (IGI)

1. The Results of Regression Analysis for Single Countries

2. Extreme Outliers (residuals ±20.0 and higher)

3. Large Deviations (residuals from ±12.0 to ±19.9)

4. Moderate Deviations (residuals from ±8.0 to ±11.9)

5. Summary

The six indicators of the global inequality in human conditions were combined into the Index of Global Inequality (IGI) on the basis of the idea that a combination of six indicators might measure the relative differences between countries in the average global inequality more reliably than any of the single components. The six components of IGI measure the global variation in human conditions from the perspectives of the level of per capita income, the extent of tertiary education, under-five mortality rate per 1,000 live births, life expectancy, improved sanitation facilities, and democratization. They represent quite different aspects of human conditions, but all of them are moderately or strongly correlated with national IQ.

1. The Results of Regression Analysis for Single Countries

My intention is to carry out the final analysis of the impact of human diversity measured by national IQ on the average level of global inequality in human conditions on the basis of this combined index. We can see from Table 4.1 that IGI is strongly correlated with all its six components, which means that all of them have contributed to the values of the index. Further, we can see from Table 4.2 that IGI is correlated with national IQ (0.864) clearly more strongly than any of its components. The explained part of variation in IGI rises to 74.6 percent, which indicates an extremely high level of explanation. It should be noted that because phenotypic phenomena are always affected by both environmental and genetic factors, it would not be reasonable to expect that national IQ could explain the variation in IGI completely. In this case only 26 percent of the variation remains unexplained. It is due to the impact of various environmental factors independently from national IQ. Because of the strong positive relationship between national IQ and IGI, countries are not as widely dispersed around the regression line as in the cases of the six components of IGI. Figure 5.1 illustrates the strong linear relationship between national IQ and IGI and discloses the most deviating countries.

Figure 5.1 shows that there are several extremely deviating countries with large positive and negative residuals. They contradict the hypothesis, but most countries are relatively close to the regression line. They support the hypothesis on the positive relationship between national IQ and the Index of Global Inequality (IGI). It is remarkable that the relationship between the two variables is perfectly linear; the values of IGI rise systematically with the level of national IQ. Some of the large outliers are named in Figure 5.1. The examination of the characteristics of large outliers will provide hints about the nature

of environmental factors that have caused those countries to deviate from the regression line in a positive or negative direction.

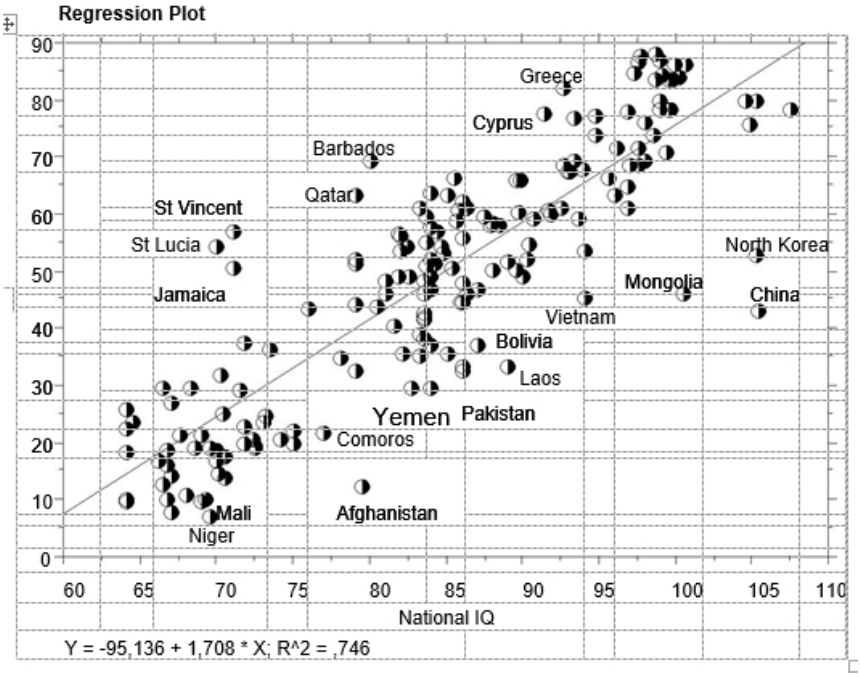

Figure 5.1. The results of regression analysis of the Index of Global Inequality (IGI) on national IQ in the group of 178 countries.

The detailed results of the regression analysis of IGI on national IQ for single countries are presented in Table 5.1. Because data on the national IQs used in this study are arithmetic means of the 2006 and 2012 national IQs (Lynn and Vanhanen, 2006 and 2012a), the original data on national IQs in 2006 and 2012 are presented before their means in Table 5.1. It should be

noted that the three datasets of national IQs are extremely strongly intercorrelated as indicated in Chapter 3.

Table 5.1. The results of regression analysis of IGI on national IQ (the mean of 2006 and 2012 national IQs) for 178 countries.

	Country	National IQ 2006	National IQ 2012	National IQ mean	IGI	Residual IGI	Fitted IGI
1	Afghanistan	84	75.0	79.5	12.5	-28.1	40.6
2	Albania	90	82.0	86.0	55.7	4.0	51.7
3	Algeria	83	84.2	83.6	51.0	3.4	47.6
4	Angola	68	71.0	69.5	19.2	-4.4	23.6
5	Argentina	93	92.8	92.9	67.5	4.0	63.5
6	Armenia	94	93.2	93.6	59.3	-5.4	64.7
7	Australia	98	99.2	98.6	83.8	10.6	73.2
8	Austria	100	99.0	99.5	83.5	8.7	74.8
9	Azerbaijan	87	84.9	85.9	44.8	-6.8	51.6
10	Bahamas	84	84.0	84.0	63.8	15.5	48.3
11	Bahrain	83	85.9	84.4	57.0	8.0	49.0
12	Bangladesh	82	81.0	81.5	40.5	-3.5	44.0
13	Barbados	80	80.0	80.0	69.5	28.0	41.5
14	Belarus	97	95.0	96.0	63.3	-5.5	68.8
15	Belgium	99	99.3	99.1	84.5	10.4	74.1
16	Belize	84	76.8	80.4	43.8	1.6	42.2
17	Benin	70	71.0	70.5	17.5	-7.8	25.3
18	Bhutan	80	78.0	79.0	32.5	-7.3	39.8
19	Bolivia	87	87.0	87.0	37.3	-16.1	53.4
20	Bosnia & Herzegovina	90	93.2	91.6	60.7	-0.6	61.3
21	Botswana	70	76.9	73.4	36.2	6.0	30.2
22	Brazil	87	85.6	86.3	61.3	9.1	52.2
23	Brunei	91	89.0	91.0	49.0	-9.6	58.6
24	Bulgaria	93	93.3	93.1	67.5	3.6	63.9
25	Burkina Faso	68	70.0	69.0	9.8	-12.9	22.7
26	Burundi	69	72.0	70.5	13.8	-11.5	25.3
27	Cambodia	91	92.0	91.5	29.5	-18.8	48.3
28	Cameroon	64	64.0	64.0	18.3	4.1	14.2
29	Canada	99	100.4	99.7	78.2	3.1	75.1
30	Cape Verde	76	76.0	76.0	43.5	8.8	34.7
31	Cent. African Republic	64	64.0	64.0	10.0	-4.2	14.2
32	Chad	68	66.0	67.0	7.8	-11.5	19.3

	Country	National IQ 2006	National IQ 2012	National IQ mean	IGI	Residual IGI	Fitted IGI
33	Chile	90	89.8	89.9	66.0	7.6	58.4
34	China	105	105.8	105.4	43.2	-41.7	84.9
35	Colombia	84	83.1	83.5	48.5	1.0	47.5
36	Comoros	77	77.0	77.0	21.7	-14.7	36.4
37	Congo, Dem. Republic	65	68.0	66.5	12.8	-5.6	18.4
38	Congo, Rep.	64	73.0	68.5	19.3	-2.5	21.8
39	Costa Rica	89	86.0	87.5	59.7	5.4	54.3
40	Côte d'Ivoire	69	71.0	70.0	17.0	-7.4	24.4
41	Croatia	90	97.8	93.9	68.0	2.8	65.2
42	Cuba	85	85.0	85.0	63.3	13.3	50.0
43	Cyprus (Greek)	91	91.8	91.4	77.7	16.7	61.0
44	Czech Repub.	98	98.9	98.5	74.0	0.9	73.1
45	Denmark	98	97.2	97.6	86.8	15.3	71.5
46	Djibouti	68	75.9	71.5	29.2	2.2	27.0
47	Dominican Republic	82	82.0	82.0	53.7	8.8	44.9
48	Ecuador	88	88.0	88.0	58.5	3.4	55.1
49	Egypt	81	82.7	81.8	49.0	4.4	44.6
50	El Salvador	80	78.0	79.0	52.0	12.2	39.8
51	Eq. Guinea	59	69.0	64.0	22.5	8.3	14.2
52	Eritrea	68	75.5	71.7	19.7	-7.6	27.3
53	Estonia	99	99.7	99.3	70.8	-3.6	74.4
54	Ethiopia	64	68.5	66.2	16.8	-1.1	17.9
55	Fiji	85	85.0	85.0	35.5	-14.5	50.0
56	Finland	99	100.9	99.9	86.3	10.8	75.5
57	France	98	98.1	98.0	76.0	3.8	72.2
58	Gabon	64	69.0	66.5	29.5	11.1	18.4
59	Gambia	66	62.0	64.0	26.0	11.8	14.2
60	Georgia	94	86.7	90.3	52.0	-7.1	59.1
61	Germany	99	98.8	98.9	78.5	4.7	73.8
62	Ghana	71	69.7	70.3	25.2	0.3	24.9
63	Greece	92	93.2	92.6	82.2	19.2	63.0
64	Guatemala	79	79.0	79.0	44.3	4.5	39.8
65	Guinea	67	66.5	66.7	16.0	-2.8	18.8
66	Guinea-Bissau	67	69.0	68.0	10.8	-10.2	21.0
67	Guyana	87	81.0	84.0	46.7	-1.6	48.3
68	Haiti	67	67.0	67.0	14.3	-5.0	19.3
69	Honduras	81	81.0	81.0	46.0	2.8	43.2
70	Hungary	98	98.1	98.0	69.2	-3.0	72.2
71	Iceland	101	98.6	99.8	83.8	8.5	75.3

	Country	National IQ 2006	National IQ 2012	National IQ mean	IGI	Residual IGI	Fitted IGI
72	India	82	82.2	82.1	35.5	-9.6	45.1
73	Indonesia	87	85.8	86.4	46.0	-6.4	52.4
74	Iran	84	85.6	84.8	53.2	3.5	49.7
75	Iraq	87	87.0	87.0	47.0	-6.4	53.4
76	Ireland	92	94.9	93.4	77.0	12.6	64.4
77	Israel	95	94.6	94.8	77.3	10.5	66.8
78	Italy	102	96.1	9.0	79.8	5.5	73.9
79	Jamaica	71	71.0	71.0	50.7	24.6	26.2
80	Japan	105	104.2	104.6	79.7	-3.8	83.5
81	Jordan	84	86.7	85.3	50.8	0.3	50.5
82	Kazakhstan	94	85.0	89.5	50.3	-7.4	57.7
83	Kenya	72	74.5	73.2	24.7	-5.2	29.9
84	Korea, North	106	104.6	105.3	53.0	-31.7	84.7
85	Korea, South	106	104.6	105.3	79.8	-4.9	84.7
86	Kuwait	86	85.6	85.8	60.8	9.4	51.4
87	Kyrgyzstan	90	74.8	82.4	54.5	8.9	45.6
88	Laos	89	89.0	89.0	33.5	-23.4	56.9
89	Latvia	98	95.9	96.9	64.7	-5.6	70.3
90	Lebanon	82	84.6	83.3	61.3	14.2	47.1
91	Lesotho	67	66.5	66.7	18.8	0.0	18.8
92	Liberia	67	68.0	67.5	21.5	1.4	20.1
93	Libya	83	85.0	84.0	57.7	9.4	48.3
94	Lithuania	91	94.3	92.6	68.7	5.7	63.0
95	Luxembourg	100	95.0	97.5	71.7	0.3	71.2
96	Macedonia	91	90.5	90.7	59.2	-0.6	59.8
97	Madagascar	82	82.0	75.0	22.0	-10.9	32.9
98	Malawi	69	60.1	64.5	23.5	8.5	15.0
99	Malaysia	92	91.7	91.8	60.0	-1.6	61.6
100	Maldives	81	81.0	81.0	48.2	5.0	43.2
101	Mali	69	69.5	69.2	10.3	-12.7	23.0
102	Malta	97	95.3	96.1	71.7	2.7	69.0
103	Mauritania	76	74.0	75.0	20.0	-12.9	32.9
104	Mauritius	89	88.0	88.5	58.0	2.0	56.0
105	Mexico	88	87.8	87.9	58.3	3.3	55.0
106	Micronesia	84	84.0	84.0	37.0	-11.3	48.3
107	Moldova	69	92.0	94.0	53.8	-11.6	65.4
108	Mongolia	101	100.0	100.5	46.0	-30.5	76.5
119	Montenegro	89	85.9	86.0	62.3	10.6	51.7
110	Morocco	84	82.4	83.2	39.0	-7.9	46.9
111	Mozambique	64	69.5	66.7	10.3	-8.5	18.8
112	Myanmar	87	85.0	86.0	33.5	-18.2	51.7

	Country	National IQ 2006	National IQ 2012	National IQ mean	IGI	Residual IGI	Fitted IGI
113	Namibia	70	70.4	70.2	31.8	7.1	24.7
114	Nepal	78	78.0	78.0	34.7	-3.4	38.1
115	Netherlands	100	100.4	100.2	84.0	8.0	76.0
116	New Zealand	99	98.9	98.9	79.8	6.0	73.8
117	Nicaragua	81	84.0	83.5	46.0	-1.5	47.5
118	Niger	69	70.0	69.5	7.3	-16.3	23.6
119	Nigeria	69	71.2	70.1	14.7	-9.9	24.6
120	Norway	100	97.2	98.6	88.0	14.7	73.0
121	Oman	83	84.5	83.7	55.2	7.4	47.8
122	Pakistan	84	84.0	84.0	29.5	-18.8	48.3
123	Panama	84	80.0	82.0	56.2	11.3	44.9
124	Papua New G.	83	83.4	83.2	35.2	-11.7	46.9
125	Paraguay	84	84.0	84.0	49.2	0.9	48.3
126	Peru	85	84.2	84.6	54.2	4.9	49.3
127	Philippines	86	86.1	86.0	48.0	-3.7	51.7
128	Poland	99	96.1	97.5	68.8	-2.6	71.4
129	Portugal	95	94.4	94.7	74.0	7.4	66.6
130	Qatar	78	80.1	79.0	63.5	23.7	39.8
131	Romania	94	91.0	92.5	61.3	-1.5	62.8
132	Russia	97	96.6	96.8	61.3	-8.9	70.2
133	Rwanda	70	76.0	73.0	23.8	-5.7	29.5
134	St. Lucia	62	62.0	70.0	54.5	30.1	24.5
135	St. Vincent & Grenadines	71	71.0	71.0	57.0	30.9	26.1
136	Samoa	88	88.0	88.0	50.3	-4.8	55.1
137	Sao Tome & Principe	67	67.0	67.0	27.0	7.7	19.4
138	Saudi Arabia	84	79.6	81.8	56.5	11.9	44.6
139	Senegal	66	70.5	68.2	29.7	8.4	21.3
140	Serbia	89	90.3	89.6	66.0	8.1	57.9
141	Sierra Leone	64	64.0	64.0	9.8	-4.4	14.2
142	Singapore	108	107.1	107.5	78.5	-9.9	88.4
143	Slovakia	96	98.0	97.0	68.8	-1.7	70.5
144	Slovenia	96	97.6	96.8	78.0	7.8	70.2
145	Solomon Is.	84	83.0	83.5	38.3	-9.2	47.5
146	South Africa	72	71.6	71.8	37.5	10.0	27.5
147	Spain	98	96.6	97.3	84.7	13.7	71.0
148	Sri Lanka	79	79.0	79.0	51.3	11.5	39.8
149	Sudan	71	77.5	74.2	20.5	-11.1	31.6
150	Suriname	89	89.0	89.0	51.8	-5.1	56.9
151	Swaziland	68	74.5	71.7	22.7	-4.6	27.3
152	Sweden	99	98.6	98.9	87.0	13.2	73.8

	Country	National IQ 2006	National IQ 2012	National IQ mean	IGI	Residual IGI	Fitted IGI
153	Switzerland	101	100.2	100.6	86.3	9.6	76.7
154	Syria	83	82.0	82.5	49.2	3.4	45.8
155	Taiwan	105	104.6	104.8	75.7	-8.1	83.8
156	Tajikistan	87	80.0	83.5	42.0	-5.1	47.5
157	Tanzania	72	73.0	72.5	19.3	-9.4	28.7
158	Thailand	91	89.9	90.4	54.8	-4.4	59.2
159	Timor-Leste	87	85.0	86.0	32.8	-18.9	51.7
160	Togo	70	70.0	70.0	18.8	-5.6	24.4
161	Tonga	86	86.0	86.0	44.7	-7.0	51.7
162	Trinidad & Tobago	85	86.4	85.7	59.0	7.8	51.2
163	Tunisia	83	85.4	84.2	51.3	2.6	48.7
164	Turkey	90	89.4	89.7	60.2	2.1	58.1
165	Turkmenistan	87	80.0	83.5	42.8	-4.7	47.5
166	Uganda	73	71.7	72.3	20.8	-7.5	28.3
167	Ukraine	97	94.3	95.6	66.2	-1.9	68.1
168	U.A.E.	84	87.1	85.5	66.2	15.3	50.9
169	U.K.	100	99.1	99.5	78.3	3.5	74.8
170	U.S.A.	98	97.5	97.7	87.8	16.1	71.7
171	Uruguay	96	90.6	93.3	69.5	5.3	64.2
172	Uzbekistan	87	80.0	83.5	41.7	-5.8	47.5
173	Vanuatu	84	84.0	84.0	52.2	3.9	48.3
174	Venezuela	84	83.5	83.7	59.8	12.0	47.8
175	Vietnam	94	94.0	94.0	45.2	-20.2	65.4
176	Yemen	85	80.5	82.7	29.8	-16.3	46.1
177	Zambia	71	74.0	72.5	19.5	-9.2	28.7
178	Zimbabwe	66	72.1	69.0	21.3	-1.4	22.7

Table 5.1 indicates the countries which are close to the regression line and support the research hypothesis as well as the countries which deviate clearly from the regression line and contradict the hypothesis. It is useful to explore outlying countries in greater detail because they may disclose the exceptional environmental factors which have caused those countries to deviate from the average relationship between national IQ and IGI. There does not seem to exist any general environmental factor, which could apply to all countries of the world. It is more

probable that environmental explanatory factors are local ones and that their significance is limited to particular groups of countries. In this respect they differ crucially from national IQ, which applies to all countries of the world.

A problem is which criterion should be used to separate large outliers from the countries close to the regression line. As noted earlier, there is no self-evident criterion for this purpose. All criteria are arbitrarily selected. One standard deviation of residual of IGI (±11.1) provides a criterion. However, because some positive and negative residuals are extremely large (see Figure 5.1), it is sensible to divide the most deviating countries into three sub-categories on the basis of the size of residuals. The first sub-category (extreme outliers) covers countries with residuals ±20 or higher (N=11); the second sub-category (large deviations) covers countries with residuals from ±12 to ±19.9 (N=25); and the third sub-category (moderate deviations) includes countries with residuals from ±8 to ±11.9 (N=45). The rest of the countries (N=97) are around the regression line. The correlations between national IQ and IGI values in different sub-categories of countries are given in Table 5.2.

Table 5.2. The correlations between national IQ and IGI values in different sub-categories of countries.

Sub-category of countries	N	Correlation
Extreme outliers, residual ± 20.0 and over	11	-0.180
Other countries below ± 20.0	167	0.926
Large residuals from ± 12.0 to 19.9	25	0.896
Moderate residuals from ± 8.0 to 11.9	45	0.910
Other countries below ± 8.0	97	0.973

Table 5.2 shows that the extreme outliers (11) contradict the research hypothesis completely. There is no positive

correlation between IGI and national IQ in this sub-category of 11 countries, and the negative correlation is near zero (-0.180). This means that national IQ does not help to explain the IGI values of extreme outliers. Exceptional environmental factors have determined them. The comparison of positive and negative extreme outliers provides hints about the nature of those environmental factors. On the other hand, Table 5.2 shows that when the extreme outliers are excluded, the correlation between national IQ and IGI rises to 0.926 in the group of 167 remaining countries, and the explained part of variation in IGI rises to 86 percent. The impact of environmental variables independently from national IQ is limited to 14 percent in the remaining group of 167 countries.

Further, we can see from Table 5.2 that the correlation in the sub-category of 25 large residuals is 0.896, and the explained part of variation is 80 percent. The impact of exceptional environmental factors is not more than 20 percent. The examination of the countries with large positive or negative residuals may disclose at least some of the environmental factors which have caused these countries to deviate significantly from the regression line. However, the detection of such factors will be more difficult than in the case of extreme outliers.

Finally, the correlation between national IQ and IGI is 0.910 in the sub-category of 45 countries with moderate residuals, and the explained part of variation in IGI rises to 83 percent. The impact of environmental variables has decreased to 17 percent. In the remaining group of 97 countries below residuals ±8.0, the correlation between national IQ and the Index of Global Inequality is 0.973 and the explained part of variation 94.6 percent. This means that national IQ explains nearly completely the variation of IGI values in more than half of the 178 countries.

In the next sections, the results of the regression analysis of IGI on national IQ will be analyzed in different sub-categories of countries. The purpose is to find out what kinds of exceptional

environmental factors have caused some countries to deviate significantly from the regression line and to contradict the hypothesis.

2. Extreme Outliers (residuals ±20.0 and higher)

Using the above defined criteria, the group with extremely large positive residuals includes five countries (Barbados, Jamaica, St. Lucia, St. Vincent & the Grenadines, and Qatar), and the group of extremely large negative outliers includes six countries: Afghanistan, China, Laos, Mongolia, North Korea, and Vietnam. What kinds of exceptional environmental variables could explain these extreme outliers?

Four of the extremely large positive outliers (Barbados, Jamaica, St. Lucia, and St. Vincent & the Grenadines) are Caribbean tourist countries. Their positive residuals are the highest in the world. How to explain them? Their exceptional economic success as tourist countries, compared to their low national IQs, seems to be due to several environmental factors as noted previously in the connection of some components of IGI. First, to their favorable geographical position between rich North American and Western European countries and to their favorable climatic conditions. Second, their large positive residuals are due to the fact that American and European tourist industries promoted tourism in these countries. My point is that investors and enterprises from countries of higher national IQ provided crucial financial, technological and management help to establish tourist industries in the small Caribbean island states. The establishment of extensive tourist industries increased per capita income in these countries to levels several times higher than in sub-Saharan African countries at the same levels of national IQ. Tourism made it necessary to improve other human conditions, too. Literacy became universal and health conditions and sanitation facilities were improved. Democratic institutions were

established and stabilized to provide a peaceful framework for the development of international tourism. Residuals based on Inversed U-five% and Sanitation are large and positive for all four countries. In other words, health and living conditions are much better in these Caribbean countries than in the sub-Saharan African countries at the same level of national IQ.

Qatar is an oil-producing country with an extremely large positive residual. It is common for oil-producing countries that their higher than expected level of IGI is principally due to the utilization of their oil and gas reserves and oil export with the help of foreign oil companies, investments, technologies, and management. Qatar's per capita income is the highest in the world, but the values of Inversed U-five% and Sanitation variables are also extremely high. On the other hand, the low level of Tertiary education and the lack of democracy have lowered the average level of IGI. My point is that the country's large oil reserves and the crucial foreign help in the utilization of them are the principal environmental factors which explain Qatar's large positive residual. In this respect the Caribbean tourist countries and Qatar are similar cases. They have exceptional natural resources, but foreign help was needed to utilize them.

The six countries with large negative residuals are quite different cases. Five of these countries are contemporary or former socialist countries (China, Laos, Mongolia, North Korea, and Vietnam). It is obvious that the common explanatory factor for their very large negative residuals is the socialist political and economic system or its heritage, which seems to have hampered socioeconomic development compared with other countries at the same level of national IQ. The fact that residuals are negative also for most other former socialist countries and that there is no socialist country with large positive residuals (except Cuba) supports the argument about the socialistic system's negative impact on socioeconomic development. However, this factor's impact is limited to socialist and former socialist countries; it is

not a general explanatory factor. Besides, in each country some local environmental factors independent from the economic and political system may have hampered development and increased negative residuals.

Despite its strong economic growth, **China** is still the country with the highest negative residual in the world. It can be argued that its long tradition of autocratic political systems interrupted scientific and economic development for centuries. Consequently, China dropped from its earlier place among the most developed countries. It takes time to establish better economic and political structures and to raise the quality of human conditions, but the values of most components of IGI are rising except the level of democratization. China's communist political system with extensive control organizations has hampered socioeconomic development by restricting the freedom to invent and experiment (cf. the arguments of Acemoglu and Robinson, 2012). The country's large population constitutes another local factor that hampers socioeconomic development. However, it is reasonable to expect that China's negative residual will decrease in the future (c. Beech, 2013). It should be noted that South Korea and Taiwan at the same level of national IQ are not deviating countries, although their residuals are slightly negative.

North Korea is a similar extreme outlier to China. It contradicts my hypothesis. It is difficult to understand how its highly intelligent population remains under the absolute control of an extremely autocratic political system. I think that the ability of the ruling Communist Party to establish and maintain such an economic and political system has been the exceptional local factor which explains North Korea's large negative residual. However, its negative residual is smaller than for China for the reason that the value of Tertiary education variable is extremely high (98), one of the highest in the world. It may be that North Korea has exaggerated the extent of higher education.

Laos is still under the control of its communist party. Its geographical position as a landlocked country constitutes an additional local factor which retards economic development and trade with other parts of the world.

Mongolia is one of the largest negative outliers in the world. Its hard climatic conditions and its landlocked geographical position are serious environmental factors which have kept the country's level of socioeconomic development low. The dismantling of socialist political and economic structures and the establishment of democratic institutions did not change these unfavorable environmental factors. However, Mongolia's extensive mineral deposits have recently attracted foreign investors, and the country is undergoing an economic transformation through its mining boom (see *The CIA World Factbook 2013,* 2012, p.492).

Vietnam is another socialist country with an extremely large negative residual. It is a poor country, but the values of the Inversed U-five% and Sanitation variables are high, which indicates the improvement of health conditions. The centrally-planned economy remains dominated by the state-owned enterprises, which still produce 40% of GDP, but the government is committed to economic liberalization and international integration (see CIA-13, p. 794). The bloody war between North Vietnam and South Vietnam (and USA) in the 1960s demolished the country and retarded socioeconomic development. Besides, its too-large population is a local factor which supports the persistence of poverty. It will be difficult for Vietnam to raise its per capita income.

Afghanistan has suffered for tens of years from ethnic and other civil wars and from wars with foreign troops. As a consequence, per capita income in Afghanistan is one of the lowest in the world, the level of tertiary education is low, under-five mortality rate is one of the highest in the world, life expectancy (44 years) is one of the lowest, and Sanitation

facilities are lacking for most people. However, the economy has improved significantly with the help of international assistance since the fall of the Taliban regime in 2001 (see CIA-13, p. 3), and the country has rudimentary democratic institutions. Afghanistan's example shows that war is a local environmental factor which may cause a country to deviate greatly from the regression line to negative direction.

The examination of the 11 countries with the highest positive and negative residuals in the world shows that it is possible to indicate powerful local environmental factors which explain at least partly their deviations from the regression line. In the case of countries with large positive residuals two environmental factors - the existence of important natural resources and their utilization with the help of foreign investments, technologies, and management - are sufficient to explain most of their deviations from the regression line. In the case of the countries with large negative residuals two different environmental factors - the heritage of the socialist economic and political system and serious civil wars - seem to explain most of their deviations from the regression line, but, in addition to them, various local environmental factors have lowered the level of human conditions in these seven countries.

3. Large Deviations (residuals from ±12.0 to ±19.9)

The second sub-category of countries with large residuals includes 13 countries with large positive residuals from +12 to +19.9 and 12 countries with large negative residuals from -12 to -19.9. In the following, large positive and negative outliers will be discussed separately. The purpose is to find out exceptional environmental factors which may have caused these countries to deviate significantly from the regression line. As Table 5.2 shows, the IGI values of extreme outliers are completely due to the impact of environmental factors, whereas national IQ explains 80 percent of

the variation of IGI values in this sub-category of 25 large deviations. In other words, only 20 percent of the variation in IGI seems to be due to the impact of environmental factors in this sub-category of countries.

Countries with large positive residuals

The sub-category of countries with large positive residuals includes the following 13 countries: the Bahamas, Cuba, Cyprus, Denmark, El Salvador, Greece, Ireland, Lebanon, Norway, Spain, Sweden, the United Arab Emirates, and the United States. What kinds of environmental factors might explain the large positive residuals of these countries?

It is obvious that not all large residuals are due to the impact of the same environmental factors. First, it is clear that these 13 countries do not constitute a random sample from the 178 countries of this study. Eight of these countries are European and European offshoot countries. The United Arab Emirates is an oil-producing country, and the Bahamas is a Caribbean tourist country. Three others are isolated Latin American (Cuba and El Salvador) and Asian countries (Lebanon) without any common characteristics. It is remarkable that the group is dominated by European and European offshoot countries and that the group does not include any sub-Saharan African country.

European and European offshoot countries (Cyprus, Denmark, Greece, Ireland, Norway, Spain, Sweden, and the United States) constitute the largest coherent sub-group of large positive deviations. All of them are socioeconomically highly developed market economies and democracies. Their IGI values are much higher than expected on the basis of the regression equation. Why? I think that their large positive residuals are due to the fact that Western Europe was the core region of scientific inventions, industrialization, economic development, and higher education in the world. These countries have succeeded in retaining their leading position, although industrialization and

higher education have spread to other parts of the world, too. This argument is supported by the fact that residuals are positive, although smaller than 12 IGI points, and also for all other Western European and European offshoot countries (see Table 5.1).

Explanatory factors behind the large positive residual of an oil-producing country - the **United Arab Emirates -** are the same as in the case of Qatar. It is common for these countries that their higher than expected level of IGI is principally due to the utilization of their oil and gas reserves and oil export with the help of foreign oil companies, investments, and technologies. The level of per capita income is much higher than expected in these two countries, and the under-five mortality rate is much lower than expected. On the other hand, these countries are stabilized autocracies like Qatar. Political and economic power is in the hands of the ruling families, which control oil industries and the use of oil incomes. Because of oil revenues, the ruling families are economically independent from the population, which makes democratization difficult. Besides, residuals are positive also for most other oil-producing countries (Algeria, Bahrain, Equatorial Guinea, Iran, Kuwait, Libya, Oman, and Saudi Arabia). Most of these countries are autocracies, in which the concentration of the control of oil and natural gas reserves and export revenues in the hands of the governments supports the survival of autocratic systems and makes democratization very difficult. My point is that the much higher than expected level of IGI in oil-producing countries is due to the crucial technological help and investments from the countries of higher national IQs.

The Bahamas is a similar case to the four Caribbean countries with extremely large positive residuals. The ability to attract foreign business and investment constitutes the crucial difference between exceptional Caribbean nations and many other economically less successful nations at the same level of national IQ. The favorable geographical position is probably the most important exceptional local factor which helps to explain the

economic success of small Caribbean island states in the era of mass tourism.

The three other countries with large positive residuals do not seem to have any common characteristics which could explain their much higher than expected level of IGI. I think that some exceptional local factors explain their large positive residuals. Therefore it is reasonable to explore each country separately.

Cuba is the only socialist country with a large positive residual. How to explain its exceptional position? Cuba is not a democracy, and it has a large negative residual based on ID-10x2. Its level of per capita income is not higher than expected, but it has large positive residuals based on Tertiary, Inversed U-five%, and Life-10% variables. Cuba's socialist government has succeeded in improving human conditions to some extent, but the values of Tertiary and Inversed U-five% variables may be somewhat exaggerated, especially the claim that the gross enrollment ratio in tertiary education is 95 percent, one of the highest in the world. It is possible that Cuba's definition of "tertiary education" is more extensive than in most other countries of the world (cf. Gasperine, internet. 2000). Cuba would not have a large positive residual if the value of its Tertiary variable were the same as in Dominican Republic and other Caribbean countries (approximately 30). In other words, Cuba's status as a large positive outlier may be based on some measurement errors.

El Salvador is another Latin American country with a large positive residual. I have not found any particular environmental factor which could explain its much higher than expected level of IGI. However, its high level of IGI is principally due to the high values of Inversed U-five% (89) and Sanitation (87) variables.

Lebanon's large positive residual is principally based on its low value of under-five mortality rate and on extremely high value of Sanitation (99%). Without these two measures of human conditions Lebanon would not have large positive residuals. It is

possible that Lebanon's democratic political system has helped the country to improve health conditions.

The examination of the 13 countries with large positive residuals shows that in some cases it is possible to indicate exceptional environmental factors which have caused those countries to deviate from the regression line and to contradict the hypothesis. The position of Western Europe as the core region of scientific inventions, industrialization, and socioeconomic development is the exceptional environmental factor which has caused the Western European and European offshoot countries to deviate greatly from the average relationship between national IQ and IGI to positive direction. Oil and gas reserves and their utilization has been the exceptional environmental factor which explains the high positive residuals in the cases of the deviating oil producing countries. Favorable geographical position and climatic conditions have had positive impact on socioeconomic development of the Caribbean tourist countries. Such environmental factors attracted foreign business and investments to these countries. It is remarkable that all these exceptional environmental factors are local ones which are relevant only for particular countries or groups of countries. None of them can be used to explain the variation of IGI in the total world group of countries. These observations support my hypothesis on the crucial and universal impact of human diversity measured by national IQ on the combined index of IGI.

Countries with large negative residuals

This sub-category of countries with large negative residuals includes the following 12 countries: Bolivia, Burkina Faso, Cambodia, Comoros, Fiji, Mali, Mauritania, Myanmar, Niger, Pakistan, Timor-Leste, and Yemen. This sub-category does not include any Western European or European offshoot country and not more than one Latin American country (Bolivia). It is dominated by African and Asian countries. We can separate two

coherent groups of large negative deviations: (1) five sub-Saharan African countries (Burkina Faso, Comoros, Mali, Mauritania, and Niger) and (2) five Asian countries which have suffered from serious civil wars (Cambodia, Myanmar, Pakistan, Timor-Leste, and Yemen). Some of the sub-Saharan African countries have also suffered from ethnic and other civil wars, especially Mali, Mauritania, and Niger. Let us explore what kinds of exceptional environmental factors might explain the negative deviations of these countries.

Sub-Saharan African countries are characterized by extreme poverty. Contrary to the countries with large positive residuals, the values of Inversed U-five% variable are very low for all five countries as well as the values of Sanitation. This indicates that health conditions are poor in those countries. They are without natural resources, which could attract investments from developed countries of the world. There does not seem to be any particular environmental factor, which could explain their large negative residuals, but I think that poverty and the lack of natural resources are the most significant local factors behind their large negative residuals. Because of these persistent environmental factors, the values of IGI are for those countries even lower than expected on the basis of the regression equation.

The category of countries which have suffered from serious ethnic and other civil wars comprises countries from different parts of Asia and also from Africa. It can be argued that war is a common environmental factor, which has retarded socioeconomic development and maintained poverty in such countries. However, wars have been different in each of these countries.

Cambodia suffered from a long civil war in the 1970s. Communist Khmer Rouge forces captured the capital Phnom Penh, established their dictatorship, and evacuated all cities and towns. At least 1.5 million people died from execution, enforced hardship and starvation during the Khmer Rouge regime.

Vietnamese invasion in 1978 drove the Khmer Rouge into the countryside. After the Vietnamese occupation, the Paris Peace Accord in 1991 ended the civil war and made possible to establish democratic institutions. Cambodia's economy has recovered since the 1990s, and its mineral deposits have attracted foreign investors (see CIA-13, pp. 123-125), but the values of the all six components of IGI are still low, and Cambodia's negative residual is large. The destruction caused by the Khmer Rouge regime was an important local factor which lowered the level of human conditions.

In **Mauritania,** there is an unresolved ethnic conflict between the dominating Moors and the subjugated blacks. The values of all components of IGI are much lower than expected. Mauritania's large negative residual is due not only to ethnic conflict, but probably also to its unstable political institutions and to its barren soil and arid climate. The unfavorable geographical conditions constitute a permanent environmental factor, which limits economic development and maintains poverty.

Myanmar is an ethnically seriously divided society, although Burmese constitute a large majority of the population. The country has suffered from ethnic civil wars between the dominating Burmese majority and numerous ethnic minority nations since 1962, when a military junta usurped power. The military government attempted to isolate the country from the world, which stagnated economic development for decades. The country remained poor, and the values of all components of IGI, except of Sanitation, are much lower than expected. Finally, in the beginning of the 2010s, the military government started to liberalize its economic policies and to introduce democratic institutions (see CIA-13, p. 114; *Freedom in the World 2012*, 2011, pp. 118-123). In the case of Myanmar, in addition to ethnic civil wars, its autocratic military regime constituted an additional local factor which slowed down socioeconomic development.

In **Pakistan**, language divides the population into several clearly different ethnic groups. Punjabis constitute the largest ethnic group (45%). Other significant ethnic groups include Sindhi in the southern province of Sind, Baluch and several other ethnic groups in Baluchistan, and Mujahirs principally in Karachi. Political conditions have remained unstable because of continual ethnic conflicts. The country remains poor, and the values of all components of IGI are lower than expected, especially the levels of tertiary education and Inversed U-five%. According to CIA-13, "Decades of internal political disputes and low levels of foreign investment have led to slow growth and underdevelopment of Pakistan" (CIA-13, p. 554). The mistakes of the political leadership constitute an additional local factor which has retarded socio-economic development in Pakistan and maintained poverty.

In **Timor-Leste** Indonesian troops and anti-independence militias devastated most of East Timor's infrastructures before the country's independence in 2002. In 2006 internal tension led to new violence. Australian-led peace-keeping troops were needed to end the violence (CIA-13, p. 724). Since then Timor-Leste's economy has recovered, and democratic institutions have to some extent become stabilized, but the values of most components of IGI are still much lower than expected on the basis of the regression equation.

Yemen has also suffered from long civil wars since 1967 when South Yemen was established. The two countries were formally unified in 1990 as the Republic of Yemen, but the conflict between northern Yemenis and southern secessionists continued. Yemen has remained as the poorest Arab country. It depends on declining oil resources and revenues. Petroleum accounts for roughly 25% of GDP (CIA-13, p. 813). The values of all components of IGI are lower than expected. Yemen's isolated geographical position may be an additional environmental factor which has hampered socioeconomic development.

The fact that residuals tend to be negative also for nearly all other ethnically heterogeneous countries with a high scale of ethnic conflicts (EEC scores 4-5) supports the hypothesis on the negative impact of ethnic conflicts on the Index of Global Inequality (IGI) (see Vanhanen, 2012b, Appendix 1).

Of the two other countries with large negative residual, **Fiji** is an isolated Pacific country. Its isolated geographical position is a common factor which partly explains large negative residuals for most Pacific countries. **Bolivia** is an ethnically highly heterogeneous Latin American country. Ethnic conflicts may have hampered socioeconomic development, but it should be noted that other ethnically heterogeneous Latin American countries do not have large negative residuals. Therefore I do not have any special explanation for Bolivia's large negative residual.

The above review of large negative outliers shows that in many cases it is possible to indicate some exceptional environmental factors which may have caused those countries to deviate from the regression line to negative direction. Such exceptional local factors include at least the negative impact of the heritage of socialist political and economic systems on the components of IGI; the negative impact of serious ethnic conflicts and civil wars on socioeconomic development; the negative impact of unfavorable geographical factors (landlocked countries, isolated island countries) on the components of IGI. In several cases particular local factors or historical heritages have restrained socioeconomic development, but in some cases it was not possible to indicate any special environmental factors which might be responsible for the emergence of large negative residuals. As in the case of large positive residuals, all disclosed environmental factors are more or less local factors whose impact is limited to particular countries or groups of countries.

4. Moderate Deviations (residuals from ±8.0 to±11.9)

The sub-category of countries with moderate positive or negative residuals includes 45 countries, 27 countries with positive and 18 countries with negative residuals. It is more difficult than in the cases of the two previous sub-categories to find particular and common environmental factors which have caused these countries to deviate from the regression line. However, it is reasonable to expect that relevant environmental factors will be more or less similar, as in the two previous sub-categories. The correlation between national IQ and IGI is 0.910 in this sub-category of 45 countries (see Table 5.2), and the explained part of variation in IGI is 83%. This means that environmental factors explain only a relatively small part of the variation in IGI independently from national IQ.

Countries with moderate positive residuals

The group of countries with moderate positive residuals includes the following 27 countries: Australia, Austria, Bahrain, Belgium, Brazil, Cape Verde, Dominican Republic, Equatorial Guinea, Finland, Gabon, Gambia, Iceland, Israel, Kuwait, Kyrgyzstan, Libya, Malawi, Montenegro, the Netherlands, Panama, Saudi Arabia, Senegal, Serbia, South Africa, Sri Lanka, Switzerland, and Venezuela. This group includes countries from all parts of the world, although only a few from Asia.

From these 27 countries, we can separate two similar coherent groups of countries as in the previous sub-categories. Nine European and European offshoot countries constitute the largest sub-group (N= 9). Their somewhat higher than expected IGI values can be assumed to be due to similar environmental factors as in the previous sub-category of large deviations. Israel can be added to the same group. The six oil-producing countries (Bahrain, Equatorial Guinea, Gabon, Kuwait, Libya, and Saudi Arabia) constitute a similar group of deviating countries as in the

two previous sub-categories. Their higher than expected IGI values are due to similar environmental factors as in the categories of extreme outliers and large deviations.

I have not discovered any common environmental factors which could explain the higher than expected IGI values in the remaining 11 countries. Five of them are sub-Saharan African countries (Cape Verde, Gambia, Malawi, Senegal, and South Africa), four are Latin American countries (Brazil, Dominican Republic, Panama, and Venezuela), and two Asian (Kyrgyzstan and Sri Lanka) countries. Let us explore these countries. Various local environmental factors explain their higher than expected IGI values, although most of those factors remain unknown.

Cape Verde is an exceptionally peaceful sub-Saharan African country. There is no information on any serious ethnic conflicts, although the population is divided into two slightly different ethnic groups: Creoles 71% and Africans 28%. The country has succeeded establishing and maintaining stabilized democratic institutions. These two environmental factors may explain its slightly higher than expected level of IGI.

In **Gambia**, the values of most components of IGI are low or only moderate, but the value of Sanitation is relatively high (67). It should be noted that tourism has helped socioeconomic development in Gambia in a similar way as in the Caribbean tourist countries: "The Gambia's natural beauty and proximity to Europe has made it one of the larger markets for tourism in West Africa, boosted by government and private sector investments in eco-tourism" (CIA-13, p. 271). Therefore it may be possible for Gambia to remain as a positive outlier. Foreign investments in tourist industries are important

Malawi has avoided serious ethnic conflicts just like Cape Verde, although its population is divided into several ethnic groups. Numerous interethnic marriages have blurred tribal boundaries. Regional tribal cleavages are reflected in the country's multiparty system. Ethnic competition has taken place through

elections, and democratic institutions are relatively well stabilized. Ethnic peace and democracy are two local factors which help to explain the country's positive residuals.

Senegal is also an ethnically heterogeneous sub-Saharan African country with moderate positive residuals. All tribal groups are minorities, but Wolofs (43%) have had a dominant role in politics. The territory of Gambia separates the Diola region in the south geographically from the other parts of the country, which has generated separatist strivings in Casamance. Low-scale violence continues in Casamance, but it has not endangered democratic institutions (see Vanhanen, 2012b, pp. 158-159).

South Africa is a similar case. Despite the country's deep racial and other ethnic cleavages, ethnic relations have remained more or less peaceful, and democratic institutions function. Ethnic competition takes place through the multiparty system and democratic institutions.

The examination of the five sub-Saharan African countries implies that two local environmental factors - democratic political institutions and ethnic peace - may be the crucial local factors which have helped socioeconomic development in these countries and produced moderate positive residuals. Similar environmental factors seem to have helped some Latin American countries to produce moderate positive residuals.

Brazil is a racially and ethnically deeply divided country. Whites constitute a small majority (55%). The rest of the population are racially mixed people and blacks. Whites dominate in politics and economy, and blacks are still discriminated against. However, blacks have their own interest groups which try to improve the position of Afro-Brazilians. Violent clashes between whites and blacks have been rare. The extensive racial mixing may be the most important local environmental factor which has diminished violent ethnic conflicts and helped socioeconomic development in the framework of a democratic political system (see Vanhanen, 2012b, p. 117).

Dominican Republic is also a racially divided country (whites 16% and mulattos (70%). The black minority, including black Haitian migrants, comprises the rest of the population. Extensive racial mixing seems to have reduced ethnic conflicts and supported ethnic peace, although there have been clashes with black Haitians. In addition, democratic institutions have become stabilized. These environmental factors have probably furthered socioeconomic development (see Vanhanen, 2012b, p. 221).

Panama's positive residual is principally based on high values of Inversed U-five% and Sanitation variables. The control of the Panama Canal may be an exceptional local factor which has helped to stabilize democracy and to further social conditions in the country. The country's population is ethnically mixed. Mestizos, mulattos, and whites constitute the dominant majority (69%). Amerindians and blacks are the most important minority groups, but there have not been any serious ethnic conflicts.

Venezuela's population is racially mixed. Mestizos and mulattos seem to constitute a majority of the population. The blacks and the remaining Amerindians are marginalized. Extensive racial mixing between whites, indigenous peoples and blacks has blurred ethnic boundaries and decreased ethnic conflicts (see Vanhanen, 2012, p. 110).Venezuela's pattern of the components of IGI is similar to Cuba's, except that Venezuela's political system is democratic. The values of Inversed U-five% and Sanitation as well as of Tertiary are high. Its Tertiary value 78 is two times higher than for most other Latin American countries (Bolivia 38, Brazil 36, Colombia 39, and Peru 35). Therefore it is possible that Venezuela's position as a large positive outlier is due to an exaggerated value of Tertiary.

The examination of these African and Latin American countries indicates that a combination of two environmental factors - ethnic peace and democratic institutions - has supported socioeconomic development and the emergence of moderate positive residuals in these countries.

Kyrgyzstan, a former Soviet republic in Central Asia, is a different case. There have been serious ethnic conflicts between the Kyrgyz majority (65%) and the Uzbek minority (14%) in the southern parts of the country. Thousands of people have been killed in ethnic conflicts (see Vanhanen, 2012b, p. 129). However, despite deep ethnic cleavages, the country has moderate positive residuals because of high values of Inversed U-five%, Sanitation, and ID-10x2 variables.

Sri Lanka is an exceptional South Asian country with a moderate positive residual. Despite the long civil war between the Tamil minority and the Sinhalese majority, social conditions seem to have remained better than expected on the basis of the regression equation. The long tradition of democratic political system may be the original local factor which explains relatively good socioeconomic development in Sri Lanka. As in the previous cases, the large positive residual of Sri Lanka is principally due to the extremely high values of Inversed U-five% (89) and Sanitation (92) variables.

Countries with moderate negative residuals

The group of countries with moderate negative residuals (from -8.0 to -11.9) includes the following 18 countries: Brunei, Burundi, Chad, Guinea-Bissau, India, Madagascar, Micronesia, Moldova, Mozambique, Nigeria, Papua New Guinea, Russia, Singapore, Solomon Islands, Sudan, Taiwan, Tanzania, and Zambia. Nine sub-Saharan African countries (Burundi, Chad, Guinea-Bissau, Madagascar, Mozambique, Nigeria, Sudan, Tanzania, and Zambia) constitute the largest coherent group of countries. Moldova and Russia are former socialist countries, Sudan has suffered from serious ethnic conflicts, and Micronesia, Papua New Guinea, and Solomon Islands are isolated Pacific islands countries. The rest of the 18 countries - Brunei, India, and Singapore - are separate cases without any connection to previous sub-groups of negative outliers.

The moderate negative residuals of the nine sub-Saharan African countries can be assumed to be due to similar environmental factors as in the case of large negative deviations, in other words, to poverty and the lack of natural resources. However, **Burundi** has suffered also from disastrous ethnic civil wars. The power-sharing agreement between Hutu and Tutsi factions made in 2003 paved the way for the establishment of some democratic institutions, but Burundi is still a landlocked, resource-poor, and extremely densely populated country in which agriculture employs more than 90% of the population (see CIA-13, pp. 119-120). Its population is too large compared to the available scarce resources. This is an additional environmental factor which explains the persistence of a moderate negative residual.

Chad's population is not only tribally but also racially divided. Arabs constitute nearly half of the population and various African tribal groups the rest. Arabs are Muslims, whereas most Africans are Christians or animists. Racial and other ethnic divisions have provided a natural social basis for political organizations. In fact, ethnically based political and militant groups have struggled for power since the beginning of independence in 1960. There were no power-sharing institutions to accommodate ethnic interest conflicts. The longstanding cultural, religious, and ethnic divide between southern Chad and the rest of the country has continued as the most important dividing line in politics (see Vanhanen 2012b, pp. 119-120).

Sudan has suffered from serious ethnic civil wars as the countries in the two previous sub-categories. Sudan was one of the ethnically most heterogeneous countries in the world before the secession of South Sudan in 2011. Arabs dominated in the north and blacks in the south. African tribal groups in the south and some other ethnic groups rebelled against the Arab-dominated central government since Sudan's independence in 1956. It is estimated that at least two million people were killed in the civil

war, and other millions had to flee from their homes. Political parties are organized along ethnic lines. Finally, in January 2005 the government and the Sudanese People's Liberation Movement made a peace agreement, which allowed the south to vote on independence in 2011. The south selected independence (see Vanhanen, 2012b, pp. 192-193). It is obvious that the long civil war had slowed socioeconomic development in Sudan

The moderate negative residuals of **Russia** and **Moldova** can be assumed to be due to similar environmental factors as in the case of the extreme negative outliers, in other words, to the heritage of the socialist economic and political system, which has retarded socioeconomic development. Moldova as a former Soviet republic is still one of the poorest countries in Europe. It enjoys a favorable climate and good farmland but has no important mineral deposits. Consequently, its economy depends on agriculture (see CIA-13, p. 486). After independence, socialist economic structures were dismantled and replaced partially with market economic structures, but Moldova's isolated geographical position remained the same. The level of per capita income is still very low, but the values of Tertiary, Inversed U-five% and Sanitation variables have risen considerably. Moldova and Russia have democratic political institutions. It is reasonable to expect that their negative residuals will decrease in the future.

Micronesia, Papua New Guinea, and **Solomon Islands** are democratic Pacific island states. Their remote and isolated geographical position and the lack of important natural resources are common environmental factors, which have slowed socioeconomic development in these island states and which may explain their moderate negative residuals.

Finally, Brunei, India, and Singapore are separate cases without any common explanatory factors. **Brunei** is an absolute monarchy ruled by the Sultan's government without any democratic institutions. Its wealth is based entirely on the petroleum industry, which is controlled by the Sultan's family.

Residuals are positive for most other oil-producing countries, but negative for Brunei despite the high values of Inversed U-five% and Sanitation variables. The fact that national IQ is significantly higher (90.0) for Brunei than for any other oil-producing country may explain the difference in residuals. Brunei would not have a moderate negative residual if its national IQ were not higher than 85. **India** is an ethnically deeply divided society, in which socioeconomic development has been regionally uneven and in which various ethnic conflicts, especially between the Hindu majority and the Muslim minority, continue from year to year. As a consequence, not only the level of per capita income but also the values of Tertiary, Inversed U-five% and Sanitation variables are relatively low. The values of all components of IGI, except ID-10x2, are high for **Singapore**, but the residual is moderately negative because its national IQ is the highest in the world.

The examination of the 81 extreme, large, and moderate outliers has disclosed that the assumed exceptional environmental factors behind their deviations are quite different for positive and negative outliers. Further, it was found out that most of the 81 outliers belong to more or less coherent groups of countries characterized by particular environmental factors and that such sub-groups are repeated in all three sub-categories of deviating countries, or at least in two of them.

Socioeconomically highly developed European and European offshoot countries constitute the largest coherent group of large positive deviations in the sub-categories of large and moderate deviations. Caribbean tourist countries constitute another clearly different group, and oil-producing countries form the third sub-group, which extends from extreme outliers to moderate positive residuals. The rest of the positive outliers are distributed around the world and do not seem to have any special explanatory environmental factors.

Contemporary or former socialist countries, countries that suffered from serious ethnic and other civil wars, and poor sub-

Saharan African countries constitute the three largest sub-groups of extreme, large, and moderate negative deviations. The rest of the negative outliers are more or less separate cases without any common explanatory environmental factors. Various local factors explain these countries' deviations from the regression line.

5. Summary

In Chapter 4, national IQ was correlated with the six components of the Index of Global Inequality, and the results of the regression analyses were examined at the level of single countries in order to find out which countries contradicted the hypothesis by deviating clearly from the regression line. It was found that 51 countries do not have any large positive or negative residuals on the basis of any component of IGI. For these 51 countries national IQ predicted quite well the values of the six measures of human conditions. Further, 56 other countries have only one large positive or negative residual. They do not contradict the hypothesis seriously, so the number of countries for which two or more residuals are large decreased to 71.

Of these 71 countries, nine have one large positive and one large negative residual. So these nine countries contradict the hypothesis to some extent, but not systematically to positive or negative direction. The remaining 62 countries with two or more large residuals contradict the hypothesis more seriously. They were divided into four sub-categories on the basis of the direction of deviations and of the number of large residuals. The first sub-category includes 15 countries with two large positive residuals; the second sub-category includes 17 countries with two large negative residuals; the third sub-category includes 17 countries with three or more large positive residuals, of which one may be negative; and the fourth sub-category includes 13 countries with three or more large negative residuals, of which one may be positive. The 30 countries of the third and fourth sub-categories

contradict the hypothesis most seriously. Now it is interesting to see to what extent these 30 countries are overlapping with the 36 countries with extreme and large positive (18) and negative (18) residuals on the basis of the regression analysis of IGI on national IQ carried out in this chapter. It should be noted that these two groups of outliers are not fully comparable with each other for the reason that the definitions of large deviations are based on to some extent different criteria.

Core groups of the most deviating countries

Let us start the comparison of the two lists of the most deviating countries by examining the correspondence of the two lists at the level of single countries (Table 5.3).

It is interesting to note that only eight of the largest positive outliners and seven of the largest negative outliners are in both lists. It indicates that different methods to determine the most significant deviations do not produce exactly the same results. However, all of these countries can be regarded as belonging to the core groups of the most deviating countries, which contradict the hypothesis. The two lists are overlapping in 15 out of 36 cases, and they differ in 21 cases, but the results of the two analyses do not contradict each other in any case. The residuals are positive or negative in all cases. The 15 countries for which the results of the two analyses are overlapping, constitute the core category of the most highly and systematically deviating countries, but the whole group of 36 countries can be divided into six coherent sub-groups: (1) the countries which have suffered from serious ethnic and other civil wars (Afghanistan, Cambodia, Laos, Myanmar, Pakistan, and Timor-Leste), (2) contemporary or former socialist countries (China, Laos, Mongolia, North Korea, Ukraine, and Vietnam), (3) Caribbean countries (China, Laos, Mongolia, North Korea, Ukraine, and Vietnam), (4) Caribbean tourist countries (the Bahamas, Barbados, Jamaica, St. Lucia, and St. Vincent & the Grenadines) (5) European and European offshoot countries

(Cyprus, Denmark, Greece, Ireland, Norway, Spain, Sweden, and the United States), and (6) poor sub-Saharan African countries (Burkina Faso, Chad, Comoros, Mali, Mauritania, and Niger). Fiji, El Salvador, and Lebanon are separate cases without any common characteristics.

Table 5.3. The core groups of the most deviating countries (countries appearing in both lists are underlined) according to Chapter 4 and Chapter 5.

(1) The countries with three or more large residuals (Chapter 4)		**(2) The extreme and large deviations (Chapter 5)**	
Positive	**Negative**	**Positive**	**Negative**
Bahamas	Afghanistan	Bahamas	Afghanistan
Bahrain	Brunei	Barbados	China
Barbados	Chad	Cuba	Bolivia
Cuba	China	Cyprus	Burkina Faso
Jamaica	Korea, North	Denmark	Cambodia
Kuwait	Laos	El Salvador	Comoros
Libya	Mongolia	Greece	Fiji
Maldives	Myanmar	Ireland	Korea, North
Oman	Russia	Jamaica	Laos
Qatar	Singapore	Lebanon	Mali
St. Lucia	Timor-Leste	Norway	Mauritania
St. Vincent & G.	Ukraine	Qatar	Mongolia
Saudi Arabia	Vietnam	St. Lucia	Myanmar
Sri Lanka	-	St. Vincent & G.	Niger
Syria	-	Spain	Pakistan
U.A.E.	-	Sweden	Timor-Leste
Vanuatu	-	U.A.E.	Vietnam
-	-	U.S.A.	Yemen

The environmental factors which have caused these countries to deviate significantly from the regression line and to contradict the hypothesis are different for each sub-group. Ethnic and other civil wars seem to be enough to explain the negative

residuals of the countries in the first sub-group. The socialist economic and political system or its heritage explains the large negative residuals of the countries in the second sub-group. Extensive foreign investments in the tourist industries of the Caribbean island states explain their large positive residuals. The high level of socioeconomic development seems to explain the large positive residuals of European and European offshoot countries, and extreme poverty may explain large negative residuals of poor sub-Saharan African countries.

A central finding of this study is the observation that the exceptional environmental factors which seem to explain significant deviations from the regression line are different local factors that are relevant only to particular groups of countries, not to all countries of this study. My point is that there does not seem to exist any general environmental factor which could explain any deviations from the regression line and to compete with national IQ as an explanatory factor; there are only locally relevant environmental factors.

In the total group of 178 countries, national IQ explains 74 percent of the variation in the Index of Global Inequality (IGI). The rest of the variation is due to the impact of environmental factors and probably also to measurement errors. However, as Table 5.2 shows, the significance of the environmental factors is not the same at all levels of deviation. In the sub-category of extreme outliers (N=12), environmental factors are enough explain all variation of IGI, whereas in the sub-category of countries around the regression line (residuals ±8.0 and below) the impact of environmental factors has decreased to 6 percent. These are significant findings. We should not expect the importance of environmental factors to remain the same at all levels of deviation. In fact, for most of the 178 countries, national IQ explains much more than 74 percent of the variation in IGI values.

I think that the results of this study support strongly my theoretical argument on the crucial impact of human diversity

measured by national IQ on the extent of global inequality in human conditions. I wonder if anybody could find out an alternative explanatory variable capable of explaining a significant part of the variation in global inequality independently from national IQ. However, despite the powerful empirical evidence provided in this study, it will be difficult for many researchers to accept my argument that the persistence of global inequality in human conditions is ultimately due to human diversity measured by national IQ. But if my argument is not acceptable, how to interpret the results of this study; the fact that there is a very strong positive correlation between national IQ and the combined measure of global inequality in human conditions measured from six quite different perspectives? Is this relationship only accidental? How to explain the strong positive correlation between national IQ and the Index of Global Inequality?

Chapter 6

The New Phenotypic Worldview

1. Contradictory Worldviews

2. A Theory on the Impact of Human Diversity on Global Inequality

3. The Hypothesis Tested by Empirical Evidence

4. Conclusion

The basic idea of this study has been to formulate and introduce a new worldview on the causes of global inequality in human conditions. The prevalent environmental worldview on the causes of global inequality is based on the perception that global inequality is merely due to various environmental factors, not to any significant extent to human nature or human diversity, whereas the new phenotypic worldview formulated in this study argues that global inequality in human conditions is a natural consequence of the evolved human diversity. These two contradictory worldviews lead to quite different conclusions on the chances to eliminate or reduce global inequality in human conditions. If the prevalent environmental worldview is correct, it would be ultimately possible to remove global inequality and to equalize human conditions by changing relevant environmental

factors, whereas this would not be possible if the new phenotypic worldview outlined in this study is true because the evolved human diversity is partly based on persistent genetic differences between populations.

1. Contradictory Worldviews

First it is necessary to define the concept of a worldview and to explain how it is assumed to affect our interpretations of global inequality in human conditions. There are many definitions of "worldview" or *Weltanschauung*. According to Ken Funk, "A worldview is the set of beliefs about fundamental aspects of Reality that ground and influence all one's perceiving, thinking, knowing, and doing" (Funk, 2001, p.3). It is also called one's philosophy of life, mindset, or formula for life. Jerry Solomon refers to various definitions of the concept. According to one definition, "A world view is a set of presuppositions (or assumptions) which we hold (consciously or subconsciously) about the basic makeup of our world." Another definition says that "A world view provides a model of world which guides its adherents in the world." Jerry Solomon emphasizes that an incorrect worldview may be dangerous (Solomon, 2013, p. 1).

Funk emphasizes that our worldview may not be explicit. In fact few people take the time to thoroughly think out their worldview, but nevertheless our worldview is implicit in, and can be at least partially inferred from, our behavior (Funk 2001). This is an important point. The prevailing worldview, accepted by most experts consciously or subconsciously, concerning the causes of global inequality in human conditions, is implicit more than clearly articulated.

The prevailing implicit worldview concerning the enormous global disparities in many kinds of human conditions seems to be based on the assumption that there cannot be any significant differences in innate abilities of nations because

humans are genetically quite similar and because there is more genetic variation within any group than between human groups. Therefore genes are unlikely to explain average differences in IQ test scores of different national or racial groups (see Ossorio, 2013). Such differences are assumed to be completely due to the impact of various environmental factors, which means that the innate mental abilities of all nations are regarded to be more or less the same. Consequently, all nations are assumed to be able to establish approximately similar living conditions for their members. The existing enormous global inequalities in human conditions are due to some unfavorable environmental factors which keep the living conditions of some nations much lower than of some other nations. Such differences in living conditions are regarded to be unjustified, and they should be removed by appropriate development policies. The target of development aid and policies is to equalize the living conditions of all nations in order to create a fair world. From the perspective of the prevailing worldview, such a target is possible to achieve because the innate abilities of all nations are assumed to be approximately the same. The target can be achieved by changing environmental factors that have been responsible for the emergence of contemporary global inequality in human conditions.

The environmental worldview described above has guided development thinking and policies at least since World War II, but significant global inequality in human conditions still persist, and it is questionable whether inequality has increased or diminished during the last decades (see Chapter 1). This failure to equalize the global living conditions of people implies that the prevailing environmental worldview is in some way erroneous and that it may never be possible to achieve the target to equalize living conditions of people throughout the world. It seems to me that this failure is due to the erroneous assumption that there are not and cannot be any significant differences in the average innate abilities of nations. Such an assumption is not based on any scientific

evidence, except the fact that all human populations are closely related to each other and that "any two unrelated humans are about 99.8 percent or 99.9 percent genetically similar" (Ossorio, 2013, p. 399). However, the fact that 0.2 or 0.1 percent difference includes millions of sites at which two people will have a different nucleotide means that there is plenty of room in human genomes for the emergence of different innate abilities and behavioral dispositions. It is remarkable that, as far as I know, no researcher has attempted to test the assumption on the similarity of the average innate mental abilities of nations by empirical evidence. It has been accepted as an axiomatic starting point. I think that it is an erroneous axiomatic starting point.

The new worldview outlined in this study is based on the idea that there are significant differences in the average innate mental abilities (intelligence) of nations and that global inequality in human conditions is an inevitable consequence of the evolved human diversity measured by national IQ. The assumption on the significant differences in the average intelligence of nations is derived from the results of intelligence tests since 1904, which have continually indicated that the intelligence of individuals measured by IQ varies considerably and that there are differences in the average intelligence of nations, too. In other words, extensive empirical evidence supports the assumption on the national differences in the average intelligence of nations. Richard Lynn and Tatu Vanhanen have measured those differences in their books by national IQs, which are based on hundreds of intelligence tests carried out in many countries around the world (see Lynn and Vanhanen, 2002, 2006, 2012a). As indicated above, many researchers do not accept the assumption that differences in the average intelligence of nations are based on differences in the innate abilities of nations. They claim that such differences are entirely due to the impact of various environmental factors.

My argument is that because evolution has already changed many other characteristics of individuals and groups, it

would be highly improbable that one important characteristic, intelligence, would have remained the same among all human populations throughout the evolutionary history of our species. Because intelligence has been used in the continual struggle for scarce resources and existence, it has been under serious selection pressure, which explains the emergence of some differences in the average intelligence of populations. Intelligence has helped people and their groups to improve their living conditions. Consequently, more intelligent nations have usually been able to establish for their members better living conditions than less intelligent nations, which difference has produced global disparities in human conditions, although, of course, such disparities are partly due to the impact of environmental factors, too. From the perspective of this transformed worldview, it is not possible to remove global inequality and to equalize human conditions by changing environmental factors because such inequality is causally related to the average intelligence of nations. Thus the transformed worldview leads to the conclusion that global inequality in human conditions is a natural consequence of the evolved human diversity and that it reflects the diversity of life. Ultimately, the biological mixing of all racial and other ethnic groups would provide the most effective and durable means to equalize national IQs and reduce global disparities in human conditions, but it is a slow process.

In this study I have attempted to show that the new worldview on the chances to remove global inequality and to equalize human living conditions reflects reality more correctly than the prevailing environmental worldview, which does not take into account the impact of the average intelligence of nations on the persistence of global inequality. In this concluding chapter I attempt to summarize my theoretical arguments and the results of empirical analyses that support those arguments.

2. A Theory on the Impact of Human Diversity on Global Inequality

The observation on the persistence of global inequality and disparities in many kinds of human conditions despite great international efforts to reduce those disparities and to equalize human conditions throughout the world led me to seek a theoretical explanation for the failure to remove global inequality. I noticed that all development theories as well as explanations of poverty are based on an axiomatic assumption that various environmental factors are enough to explain global inequality in human conditions. According to those theories, it is not necessary to take into account the possible impact of human nature on global inequality because, according to an implicit assumption, there cannot be any significant differences in the innate mental abilities of nations. These observations led me to the conclusion that such axiomatic assumptions had to be erroneous because Richard Lynn's and my studies as well as many previous studies had disclosed that the level of national IQ may vary considerably from country to country. Besides, it was easy to note that there are systematic differences in the level of national IQs between major racial and continental groups. It would be difficult to explain such differences by environmental factors, although they affect the level of national IQ to some extent. It is more reasonable to assume that clear differences in national IQs between major racial and continental groups are principally due to differences in innate mental abilities of populations and nations. Further, because more intelligent nations are usually able to create better living conditions for their members than less intelligent nations, it is reasonable to argue that global inequality in human conditions is principally due to the evolved human diversity measured by national IQ.

At this point it is justifiable to ask, how is national IQ assumed to affect the level of human conditions measured by

various indicators? What is the mechanism by which human diversity measured by national IQ can raise or decrease the level of human conditions? My argument is that this mechanism is connected with the struggle for scarce resources and existence as described in the Darwinian theory of evolution by natural selection. According to the Darwinian theory, all individuals and groups are bound to the continual struggle for scarce resources because available resources are not enough to satisfy the needs of all individuals and groups. The permanent scarcity of important resources makes the competition and struggle for those resources inevitable, but the struggle does not lead to an equal distribution of scarce resources. Some competitors are more successful than some others, which means that the scarce resources do not become equally distributed among competitors. The theory of evolution emphasizes that the success in this struggle is not random but depends in part on the hereditary constitution of the successful competitors (cf. Mayr, 1982, p. 480). Those who are a little better adapted to the circumstances and are a little more skillful have better chances to succeed than those who are less skillful and not as well adapted to the circumstances. Here we come to the impact of evolved human diversity on the struggle for scarce resources through intelligence and national IQs. Because intelligence is certainly used in the struggle for scarce resources, it is reasonable to assume that more intelligent individuals and groups (nations) have usually better chances to succeed than less intelligent individuals and groups. Consequently, national IQ should be positively correlated with the level of human conditions measured by various indicators.

Thus the evolutionary roots of global inequality and poverty can be traced to the inevitable struggle for scarce resources and to the evolved human diversity. Together these two evolutionary factors explain the emergence of global inequality in human conditions and their persistence. I want to emphasize that both of those factors are needed in the theoretical explanation of

global inequality in human conditions (see Chapter 2). The theory of evolution explains why the continual struggle for scarce resources is inevitable everywhere in nature and within the human societies as well as between them. The permanent scarcity of some important resources makes the struggle for them inevitable and continual. On the other hand, the evolved human diversity measured by IQ and national IQ explains why some individuals and nations tend to be more successful in this struggle than some others. Intelligence makes the difference. As already noted above in several connections, more intelligent nations tend to be more successful than less intelligent nations for the simple reason that intelligence helps them to succeed in this struggle. A consequence of the struggle for scarce resources between intellectually unequal competitors is an unequal distribution of scarce resources. This regular relationship is a constant, which explains the persistence of global inequality in human conditions as well as many failures to remove it, or even to reduce it significantly.

It should be noted, as explained in Chapter 2, that there would be no need to compete and struggle for scarce resources if there were enough resources to satisfy the needs of all individuals and nations. In such a world the emergence of global inequality in human conditions would be highly improbable. But we know that there has never been such an abundance of resources. We live in a world of scarcity in which the struggle for scarce resources is inevitable. On the other hand, if there were no significant differences in the innate mental abilities and in the average intelligence of nations, as the prevailing worldview implicitly assumes, the struggle for scarce resources would not necessarily produce any significant disparities in human conditions between nations because all nations would be equally capable of succeeding in this struggle. In such a world, there would probably be only temporary disparities in human conditions caused by accidental factors, but not any persistent global inequality. However, we know that such a world of equal nations has never

existed. Global inequality in many kinds of human conditions persists and has probably always existed because of the significant differences in the average intelligence of nations.

Both the permanent scarcity of important resources and the evolved differences in the average intelligence of nations are needed to explain the emergence and persistence of enormous disparities in human conditions. Together these two factors produce global inequality in human conditions through the struggle for scarce resources and make it impossible to equalize human conditions. We should learn to understand that because of the evolved human diversity and the permanent scarcity of important resources, we are living in a world of great inequality. Briefly stated, this is my theory on the impact of human diversity on the global inequality in human conditions via the struggle for scarce resources. From the perspective of this theory, the prevailing environmental worldview seems to be erroneous in its basic assumption that it would be possible to remove or at least to reduce significantly global inequality by correcting environmental factors which are assumed to be responsible for the existence of such disparities. Empirical evidence does not seem to support such a theory to any significant extent. Besides, it is not unambiguously clear whether global inequality in human conditions has decreased or increased since World War II. Some disparities may have decreased, but some others may have increased.

But what about my theory on the impact of evolved human diversity on global inequality in human conditions? Does empirical evidence support it and to what extent? In this study, I have tested the research hypothesis and through it the theory by extensive empirical evidence. The results of empirical analyses covering 178 contemporary countries (population above 100,000 inhabitants in 2010) answer this question. In the next section the central results of empirical analyses are summarized and interpreted.

3. The Hypothesis Tested by Empirical Evidence

The new phenotypic worldview on global inequality in human conditions formulated in this study is based on the theory of the impact of the evolved human diversity on global inequality. This theory can be tested by empirical evidence by replacing the theoretical concepts of "human diversity" and "global inequality" by appropriate empirical variables. The problem was to decide what empirical variables would be best suited to test the research hypothesis derived from the theory.

It was easy to decide that national IQ should be used as the explanatory variable because it is the only available measure of the evolved human diversity and because data on national IQs presented in Richard Lynn and Tatu Vanhanen's books cover practically all countries of the world.

It was much more difficult to select indicators which could be used to measure disparities in human conditions from some important perspectives. The preliminary review of alternative indicators of human conditions was carried out in Chapter 1. I introduced 20 variables that measure some aspects of global inequality in human conditions from nine different perspectives. The purpose was to find measures on which data are available from all 178 countries or from nearly all countries of this study in order to avoid the use of biased samples of countries. It was found that data on many variables are not available from all or nearly all countries of this study. I had to exclude variables based on biased samples of countries as well as closely related variables measuring the same phenomenon from slightly different perspectives. Finally, six variables were selected to measure global inequality in human conditions from six clearly different perspectives: PPP/GNI per capita income, 2010; Gross enrollment ratio in tertiary education, 2010; Under-five mortality rate per 1,000 live births, 2010; Life expectancy, 2010; Access to improved sanitation facilities, % of population, 2010; and the Index of

Democratization, 2010. These variables were introduced and described in Chapter 3 and combined into the Index of Global Inequality (IGI). In Chapter 4, each of these six components of IGI was correlated separately with national IQ in order to see to what extent empirical evidence on these six components of IGI supports the hypothesis on the positive relationship between national IQ and various measures of global inequality.

The results of correlation analyses show that each of these measures is moderately or strongly correlated with national IQ (see Table 4.2), which can be interpreted to mean that human diversity measured by national IQ explains a significant part of the various aspects of global inequality in human conditions. Regression analysis was used to disclose how well the average relationship between national IQ and a component of IGI applies to single countries and which countries contradict the hypothesis most clearly by deviating significantly from one or more regression lines.

The exploration of countries with large positive and negative residuals provided hints about some of the most obvious environmental factors that have caused several countries to deviate significantly from one or more regression lines and to contradict the hypothesis. It was found that environmental factors behind positive and negative outliers can be quite different for various components of IGI as well as for various sub-groups of positive and negative outliers.

The exploration disclosed that in the case of large positive outliers, four types of countries have tended to become large positive outliers: (1) highly developed Western democracies (especially in the IGI components of per capita income, tertiary education, and democratization), (2) contemporary or former socialist countries in the connection with tertiary education, (3) oil-producing countries (especially in the IGI components of per capita income, under-five mortality rate, life expectancy, and sanitation), and (4) Caribbean tourist countries in the connection

with under-five mortality rate, life expectancy, and democratization. It is obvious that these sub-groups of countries are more or less local ones, limited to particular countries. None of them can be used as a general worldwide explanatory factor. As explained earlier, the high level of socioeconomic development seems to be the principal explanatory environmental factor behind economically highly developed Western democracies. Higher education was favored is some socialist countries. In the case of oil-producing countries, their large oil and gas resources and their utilization with the help of investments and technologies from higher national IQ countries constitute exceptional environmental factors, which have helped them to produce large positive residuals. The favorable geographical position and foreign investments and technologies have helped the Caribbean island states to become successful tourist countries whose IGI level is much higher than expected.

In the case of large negative residuals, four sub-groups of countries were found to be connected with large negative residuals: (1) contemporary or former socialist countries in the connection with all components of IGI, (2) countries that suffered from serious ethnic and other wars (especially in the IGI components of per capita income, tertiary education, and life expectancy, (3) geographically isolated island countries, and (4) poor sub-Saharan African countries. In the case of contemporary or former socialist countries, the heritage of socialist economic and political systems seems to have retarded their socioeconomic development and produced large negative residuals. Ethnic and other wars constitute an exceptional environmental factor which has certainly hindered socioeconomic development in several countries which have suffered from serious ethnic and other civil wars. In the case of geographically isolated island states, their geographical isolation and small population are exceptional environmental factors which have kept the tertiary enrollment ratio much lower than expected and produced large negative

residuals. Extreme poverty is common for many sub-Saharan African countries. It can be assumed to be an exceptional environmental factor which has hampered socioeconomic development in those countries and decreased their IGI level significantly lower than expected.

These sub-groups of countries cover a little more than half of the large residuals. The rest of the countries with large residuals seem to be more or less separate cases without any clear common characteristics. Most of the relevant environmental explanatory factors remain unknown, especially so in the case of countries with small residuals, but their impact can be noted from the strength of correlations between national IQ and components of IGI. The unexplained part of variation is due to the impact of environmental factors. In the cases of the PPP/GNI-10% and ID-10x2 components of IGI (see Table 4.2), environmental factors explain more than half of the variation in PPP/GNI-10% (59%) and of the variation in ID-10x2 (69%).

The total importance of environmental factors is not the same from one component of IGI to another. As noted above, it varies according to the strength of correlation between national IQ and a component of IGI. The importance of environmental factors is the higher, the lower this correlation is. For example, when national IQ explains only 30 percent of the variation in a dependent variable, there is much more room for the impact of environmental factors than in the case in which national IQ explains 80 percent of the variation in a dependent variable. The most highly deviating countries (with largest residuals) provide the best empirical material to detect relevant environmental factors for the simple reason that the values of their dependent variables are much more dependent on environmental explanatory factors than the dependent variables of the countries with small residuals. Consequently, all conclusions on the nature of explanatory environmental factors made in this study are based on the large residuals of the most highly deviating countries. As

noted above, it was possible to detect only a few more or less coherent sub-groups of countries with large positive or negative residuals and environmental factors that explain their deviations from the regression line. Most of the environmental factors remain unknown.

Similar sub-groups of countries with large and moderate positive and negative residuals (±8.0 and higher) were detected in the examination of the results of the regression of IGI on national IQ. I want to emphasize that the purpose of this study has not been to detect all possible environmental factors that explain a part of the variation in IGI. The description of some coherent sub-groups of countries with large positive or negative residuals has been used only to illustrate the difficulty of finding out all important environmental factors and to show that the impact of various environmental factors is limited to particular groups of countries. There does not seem to be any general environmental factor which could explain variation in global inequality in all countries of the world and compete with national IQ as an explanatory factor. This is one of the crucial findings of this study: there is no general environmental factor capable of explaining global inequality to any significant extent independently from national IQ. It is a challenge to other researchers, who are not willing to accept the crucial importance of national IQ, to seek alternative environmental factors which would be capable of explaining global inequality in human conditions independently from national IQ.

4. Conclusion

The central purpose of this study has been to test by extensive empirical evidence the hypothesis on the ability of human diversity measured by national IQ to explain a significant part or most of the variation in global inequality in human conditions. Six variables and their combination, the Index of Global Inequality,

were used to measure global inequality in human conditions from different perspectives. As explained above, empirical evidence supports the hypothesis strongly. National IQ explains 74.6 percent of the variation in IGI in the total group of 178 countries. Only 26 percent of the variation in IGI seems to be due to the impact of environmental factors. All detected environmental factors seem to be limited to particular sub-groups of countries. So what to conclude on the basis of the results of these empirical analyses? I think that it is justifiable to make at least three major conclusions.

The results of this study indicate that global inequality in human conditions persists despite all efforts to remove or reduce it. The evolved human diversity measured by national IQ explains why it has been impossible and why it remains impossible to eliminate global inequality and to equalize human conditions throughout the world. The explanation is based on the phenotypic theory on the causes of global inequality in human conditions. According to this theory, we are bound to continual struggle for scarce resources and existence, in which struggle the competitors who are a little more skillful and better adapted to existing circumstances have usually better chances to succeed than less skillful competitors. Because national IQ measures differences in the average intelligence of nations, the nations with higher national IQs tend to succeed better than nations with lower national IQs in the struggle for scarce resources. The fact that differences in national IQs are partly based on genetic differences between populations maintains this regularity and makes it impossible to eliminate it.

Global inequality in human conditions is a phenotypic phenomenon, which is affected both by environmental and genetic factors. National IQ measures principally the impact of genotypic factors on global inequality (IGI) and explains 74.6 percent of IGI's variation. The rest of the variation is due to the impact of various environmental factors, but it was not possible to detect

any general environmental factor, which could explain at least a small part of the variation in global inequality in all countries of the world. The detected environmental factors are local ones. They explain global inequality only in particular sub-groups of countries, and in this respect they differ crucially from national IQ, which explains the variation of IGI in all countries of the world.

Extensive international efforts to remove poverty and global inequality in human conditions have been based on the prevailing environmental worldview, according to which there are not any significant genetic differences between populations or in the average intelligence of nations, which could prevent the equalization of human conditions or at least a significant reduction of global inequality. Consequently, it is assumed that global inequality has been caused merely by some unfavorable environmental circumstances or by wrong policies and that it would be possible to equalize human conditions by changing those environmental circumstances and wrong policies by appropriate social and political reforms and policies. However, until now such strategies have failed to produce the intended results because phenotypic phenomena are affected both by environmental and genetic factors. The prevailing environmental worldview does not pay any attention to the impact of genotypic factors like human diversity and differences in the average intelligence of nations. Besides, because the evolved human diversity is irrevocable and persistent, it explains the failure to equalize human conditions by manipulating environmental factors. Unfortunately international decision-makers and researchers have not yet realized that global inequality is an inevitable consequence of human diversity and that, therefore, we should be satisfied to pursue more modest targets. We should learn to accept the persistence of global inequality as a consequence of human diversity, which reflects the diversity of life from one perspective.

Here we come to the need to replace the prevailing and erroneous environmental worldview with a new phenotypic worldview, which takes into account the impacts of both environmental and genotypic factors on a phenotypic phenomenon like global inequality. The new phenotypic worldview outlined in this study is based on the idea that global inequality in human conditions can be traced to the evolved human diversity through the struggle for scarce resources, in which struggle the nations with higher average intelligence (national IQ) tend to have better chances to succeed than nations with lower average intelligence. The existing differences in the average intelligence of nations have been strong enough to produce enormous disparities in various living conditions of nations no matter how they are measured. Of course, human diversity measured by national IQ is not the only important explanatory factor. Various and mostly unknown environmental factors affect also the level of global inequality. We should understand that some degree of global inequality is an inevitable consequence of the evolved human diversity, but the degree and forms of global inequality are not fixed for the reason that phenotypic phenomena are always affected also by environmental factors that are to some extent under conscious human control. This provides an opportunity to reduce or increase some aspects of global inequality by appropriate policies and by institutional and other reforms.

However, we should understand that such policies can never lead to the disappearance of global inequality and to the equalization of human conditions for the reason that persistent human diversity explains more than half of the variation in global inequality. In this point the prevailing worldview, which does not pay any attention to the evolved human diversity, and the new phenotypic worldview introduced and tested in this study differ crucially from each other. According to the prevailing worldview, it is in principle possible to equalize human conditions by appropriate policies, whereas the new phenotypic worldview

accepts the persistence of global inequality as a natural consequence of human diversity, but it emphasizes that it is possible to reduce or increase some aspects of global inequality by appropriate policies. The extent of global inequality is not fixed. As far as I know, the arguments of the environmental worldview have never been properly tested by empirical evidence, whereas the arguments of this new worldview on the persistence of global inequality have been tested by extensive empirical evidence especially in this study and previously by Richard Lynn's and my studies on the impact of national IQ on various aspects of human conditions.

My central argument is that because of the evolved human diversity measured by national IQ, it has been and still is impossible to eradicate global inequality and to equalize human conditions in the world, but fortunately I can indicate one way to achieve this target to a significant extent sometime in the far-off future. The complete biological mixing of racial and other ethnic groups would make it possible. As a consequence of complete biological mixing, it would become impossible to classify people any longer into distinctive racial, ethnic and national groups. People all over the world would become more or less similar. Because differences in national IQs are primarily based on genetic differences between racial and other ethnic groups, extensive biological mixing would finally lead to the disappearance of genetic differences between populations and of differences in average intelligence of nations. However, I want to emphasize that in principle the complete biological mixing might ultimately lead to the disappearance of human diversity measured by national IQ and to the disappearance of global inequality, which is a consequence of human diversity as explained in this study, but in practice it would probably be impossible to carry out such a process of biological mixing. Many racial, ethnic, and national groups resist biological mixing with other groups. They want to retain their separate identity (cf. Salter, 2003). Therefore, it would

be extremely difficult and probably impossible for different racial and national groups to agree on the usefulness of biological mixing. Besides, geographical distances between continental populations would make the biological mixing of all people extremely difficult and probably impossible. Further, we do not know whether the genetic distances between human populations and differences in national IQs have diminished or increased during the last centuries and decades, whereas we know that human diversity has continually increased during the evolutionary history of our species. Therefore I do not expect the disappearance of global inequality in human conditions as a consequence of biological mixing of human populations, but it would be useful to discuss the matter. I have wanted to show that genetic mixing of all human populations would provide the most effective way to decrease genetic differences between human populations and global inequality and that the future is open.

The new phenotypic worldview emphasizes that it would be important for human populations and nations to accept the irrevocable human diversity and its social consequences and to learn to adapt the relations between nations to this fact of life. After all this small planet is our only dwelling place. We should not destroy it by resorting to an unlimited struggle for scarce resources and for hegemony. Some kind of human solidarity should be established to support the coexistence of diverse human populations.

Abbreviations

CIA = Central Intelligence Agency

CPI = Corruption Perceptions Index

EEC = the Estimated Scale of Ethnic Conflicts

FH = Freedom House

ID = Index of Democratization

IGI = Index of Global Inequality

Inversed U-five = Inversed under-five mortality rate per 1,000 live births

IQ = Intelligence quotient

HDR = UNDP, Human Development Report

MPI = Multidimensional Poverty Index

PPP/GNI = Purchasing power parity / Gross national income

UNDP = United Nations Development Program

WDI = World Bank, World Development Indicators

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