# Globalization and Health: An Empirical Analysis Using Panel Data

**WORK IN PROGRESS!**


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*Abstract*

Globalization has received considerable attention in the past decade or so. Its effects are suggested to impact on most aspects of economic, political, and social life, including that of the health of populations. A possible causal effect running from globalization to population health may imply important policy effects, both at the national and at the international level. The aim of this paper is to explore the relationship between globalization and public health outcomes. First, we define the two concepts and suggest possible measures. We then outline a simple analytical framework. A brief look at the recent literature is followed by a quantitative assessment using aggregate level panel data for 123 countries in the period 1975-2000. A positive (seemingly non-linear) correlation can be detected between a composite measure of globalization and population health as measured by life expectancy at birth. Finally, we discuss possible extensions of the empirical analysis and suggest a number of future research options.



**Key words**: Health, Globalization, Trade, Economic integration

JEL classification: F02; I18



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## Introduction

There would appear to be few other terms or concepts more used and abused in the current debate than the word 'globalization'. While the meaning of the word appears to vary by the immediate needs of the current user, we would in general be referring to some political, economic, and/or social process with global, i.e. universally encompassing, effects and consequences. Such processes may be difficult to identify in some fields; many possible candidates are not global but regional or merely local at closer inspection. In economics, however, many processes are truly global in scope and it is, indeed, in international economics that the term has been most widely used in the global debate of, say, the past 10 to 15 years.

While much narrower in scope and context, also health has received considerable attention at the international level in recent years. Perhaps the most concrete manifestation of this renewed interest in health at the aggregate level is the Report of the Commission on Macroeconomics and Health (WHO/CMH, 2001). The report identifies ill health as an obstacle to further economic growth and development in many low- and middle-income countries (LMICs). Health is, fundamentally, highly personal, indeed, even embodied in the individual, but there are aspects of health that would appear to be decidedly global. For example, few corners of the world appear to be unaffected by the AIDS pandemic, and, as noted in the CMH-report, the disease is rapidly getting worse in some of the most populous and rapidly emerging economies of the world with possibly difficult macroeconomic consequences in its course. Further, we note that many different and inter-connected behavioral, environmental, and socio-political aspects determine the health of the population.

The purposes of this paper are to, firstly, assess whether a correlation at the aggregate level exists between some measure of globalization and population health, secondly, estimate the strength of a possible relation, and, thirdly, to propose some possible channels through which the eventual effect may work. A possible causal effect from globalization on the health of the population may have important policy implications both at the country level and at the level of international policy making in several areas including trade and public health.

The organization of the paper is as follows. The next section defines the concept of globalization by drawing on current definitions and usages in the literature. We also, briefly, discuss the issue and measurement of population health and identify some of the main determinants thereof. The main part of the section is devoted to outlining a theoretical framework of how and why the health of a population may be affected by forces of economic globalization. Section three briefly reviews the literature on the subject of health and globalization. We note that while the body of work to date is small but growing, much of it has been devoted to descriptive discussions of certain parts (sub-sections) of globalization and its possible effect on health (e.g. trade in pharmaceuticals and access to drugs in LMICs). Section 5 looks at the empirical picture by trying to establish possible correlations between measures of globalization and population health. A discussion of future research areas and questions finalizes the paper.

## Globalization and Health: definitions, measures, and a proposed analytic framework

*Definition of globalization*

There does not appear to exist a generally accepted definition of the term globalization. Indeed, in the present debate the exact meaning of the term is often taken for granted or seem to vary by the current user of the word. The broad dictionary definition of the word is "To make global or worldwide in scope or application"[1] suggesting that we are talking about processes of an economic, political, social, and cultural nature that are all-encompassing in the sense that no country or region would, in principle, be immune to it. This, in turn, implies that boundaries that

[1] www.webster.com.

have traditionally separated humans from each other are gradually becoming of less importance. In particular, spatial (geographic), temporal, and cognitive barriers are changing (Lee et al, 2002). The consequences for empirical analysis of this are challenging, to say the least; indeed, one would like to compare the extent and impact of globalization on planet Earth with that of other planets in the universe.[2] While interesting, this paper will not take this approach, partly due to data limitations and time restraints.

A somewhat more narrow definition of globalization in the field of economics would refer to a process of increasing *economic integration*. In particular, we would be looking at increased levels of international *trade* in goods and services, and enlarged *capital flows* between markets.[3] Put differently, trade and financial integration can be viewed as sub-sets of the larger set of economic integration, which, in turn, is a sub-set of "globalization". We emphasize that globalization may take on other meanings within the realms of other social science disciplines, such as political science, sociology, or social anthropology, and, moreover, that the impact on population health from these differently defined sub-sets of globalization may be just as important. [4]

Regardless of the choice of definition of the term globalization, there seems to be at least two important background factors that may explain much of today's focus on the extent and implications of on-going processes of economic, political, and social integration between countries and regions, namely *technological advancement* and *institutional/policy change*. The first refer for example to the wide spread of new technologies, enabling individuals and organizations to implement and undertake actions and business enterprises that were practically impossible to do

[2] I owe this point to two seminar participants at the Department for Community Medicine at Lund University.
[3] See, for example, Dollar (2001) and Rodrik (1998) and the references therein.
[4] Notwithstanding the above, even economists (or writers of economics) seem to take a very wide approach towards globalization indeed; under the heading of "The dark side of globalisation", *The Economist* describes vividly, but seemingly without a trace of irony, the predatory behavior of imported alien species, including the American bull frog, on indigenous ones in Northern Scotland (The Economist, Jan. 18th 2003, p. 35).

only, say, 15 to 20 years ago. One of the most obvious examples of recent technological change is information and communication technologies (ICTs) and its related innovations. Other examples in the area of biotechnologies with direct effects on health can also be given.

Institutional and policy change and reform is the other important factor that lies behind much of what we today call globalization. At one level, this can be seen most evidently in the almost universal rule of liberalized and deregulated markets for goods and services. Examples like foreign exchange markets, utilities and intellectual property rights can be noted. While some general lessons may be drawn from these policy or institutional changes, it is difficult to claim any specific direction of causality regarding the effect on health. Bayliss (2002) argues, however, that privatization (of, for example, utilities) in low-income countries has been found to worsen poverty through the loss of employment and income, and reduced access to basic services.

Measures of globalization logically mirror one's definition of the term. A narrow definition focusing on economic globalization would normally take a quantitative measure of country inter action such as levels of world trade, foreign direct investments, or financial capital flows. A broader definition of globalization reflecting the wide scope of the term would make use of a composite measure or index of globalization. Various such measures have been suggested and we will make use of one such index in our empirical exercise below.

*Definition of population health*

As with globalization, health is a highly elusive notion that may take on different meanings to different people across regions and over time. The World Health Organization (WHO) defines health as " …a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".[5] Also economists have been found to note that health is an integral part of human well-being (Sen, 1999 and

[5] From the preamble of the constitution of the WHO in 1946, see www.who.int.

the references therein; Wei and Wu, 2002). While no exact single measure of population health exists, various proxies or indicators thereof have been used in the literature, including life expectancy at birth and infant, child, and maternal mortality ratios. Here, we will make use of life expectancy at birth (LEB) as our measure of population health and the outcome of which we seek to explain empirically.

Even if the ultimate objective of the analysis or policy action may be that of the health of the whole population, a more fruitful approach might be to look at the determinants of (population) health. These are many and include behavioral, environmental, and socio-economic dimensions. Examples of health determinants are smoking and alcohol consumption levels, pollution exposure (including water and sanitation), and access to preventive and curative care, including pharmaceuticals. Also, in our empirical analysis we will try to control for some of these determinants in view of focusing on the impact of globalization as measured.

**Globalization and Health: A simple analytical framework**

The overall hypothesis posed in the literature on globalization and health is that some defined aspect of globalization has an effect on health either directly on the health of the individual or indirectly through one or more of the determinants of population health. It should be noted that at this point we do not make any claim as to the nature of these possible effects as these are subject to empirical analysis. Given the wide definitions of globalization and the multitude of population health determinants, the scope for a wide and complex set of correlations and chains of effect is, of course, wide open. Moreover, the existence of multiple and dual relationships should not be ruled out. Figure 1, below, is an attempt to illustrate in a simple and straightforward way the channels through which what we term globalization may have an effect on the health of the population of any country.

[Figure 1, about here]

The top level identifies technological change and institutional and policy reforms as the two fundamental forces behind globalization as discussed above. Of course, possible interaction between the two is not only possible but also most likely to actually occur. The third level (after "Globalization") identifies the three dimensions of globalization, namely economic, political, and socio-cultural integration.[6] These, in turn, affect levels and patterns of economic growth and development. Economic and political integration also dictate the rules and institutions by which, for example, trade is conducted. Important examples here are the WTO agreements on trade related property rights, the recognition of professional qualifications and licenses, and the portability of health insurance.

The bottom half of the figure identifies some of the main determinants of population health and the arrows indicate the direction of influence and how the identified dimensions of globalization connect.

We emphasize that the figure is naïve in the sense that the relations are complex and, also, that the forces work through more levels than are indicated by the figure. For example, the possibilities that social and cultural integration leads to changes in individual life-styles and health related behaviors probably goes through among other things workplace conditions as well as through leisure environments. Also, economic development as such (through enhanced individual consumption possibilities) may lead to changes in the health related behaviors of individuals.

**Globalization and Health: a brief review of the literature**

This section contains a brief review of a selection of the available literature on the subject of globalization and health. In addition to this particular topic, we will attempt to broaden the horizon somewhat and also look at some of the contributions on globalization and poverty,

[6] Cultural or socio-cultural integration may also be included.

income distribution, and growth, as these are all of relevance to population health as indicated above. We have not performed a systematic search for articles and papers, but rather concentrated our efforts to obtain the most recent and relevant contributions. The current review will briefly convey the main content of the papers, its methods, and the main findings and conclusions. Appendix B summarizes the contributions.

A recent source of work on globalization and health is the September 2001 Special theme issue of the Bulletin of the World Health Organization, which is almost entirely dedicated to globalization and health with a total of nine separate contributions on this issue. Dollar (2001)[7] defines and measures globalization in terms of "economic integration" and looks largely at the indirect effect on health. He concludes that economic integration is good for national income growth (which, in turn, is good for population health), that there is no evidence (at the macro level) that socio-economic inequalities widen as a result of opening up the economy to trade and foreign direct investments (FDIs), that some forms of economic integration can be harmful for health (for example, the spread of HIV/AIDS through traveling and tourism), and, finally, that international rules and institutions need to be more beneficial to poor countries (for example, on the issue of trade related intellectual property rights, TRIPs[8]).

Cornia (2001) also looks at the impact of increased economic integration on health, but sees somewhat different effects. The author suggests that globalization has been favorable to a handful of fast growing economies, notably in Asia, but much less favorable to other economies, including African, East European, and Latin American. In these regions, deregulations and market liberalizations have led to unequal patterns of

[7] David Dollar is a World Bank macroeconomist who has written extensively on, among other issues, trade, growth, and poverty. This contribution is largely based on World Bank (2002), which he co-authored.
[8] Trade Related Intellectual Property Rights (TRIPs) govern, among other things, the right to trade in drugs and vaccines, in turn, affecting poor countries' access to such goods as inputs in their production of health care.

growth and sluggish health development. He proposes that countries should be only gradually incorporated into the global economy and that asymmetries in global markets are removed.

Chandrasekhar and Ghosh (2001) in their Bulletin article bring up the issue of the potential of new information and communication technologies (ICTs) to improve health in poor countries. They suggest that ICTs can improve health in at least three ways: (i) as an instrument for continuing education of health staff, (ii) improve health care delivery in remote areas and in disaster situations, and (iii) improve the transparency and efficiency of governance. The authors also give examples of these effects in India.[9]

Evans et al (2001) in a case study from Tonga look at the potential effects from liberalized trade in food and its eventual effect on food consumption patterns and nutritional intake. By means of a questionnaire, the authors found that food harmful to health was consumed regardless of perceptions of its nutritional quality. The authors suggest that further liberalization of trade may have a negative effect on the possibility to keep such food at bay, which, in turn, presents an important challenge to public health.

Loewenson (2001) discusses globalization and occupational health with examples from South Africa. The author claims to see a pattern of reduced workplace conditions, in turn affecting employers, which require public health policies to focus on social protection of the affected individuals.

In the contribution by Woodward et al (2001), a framework for analysis is proposed intended to assist policy makers and researchers in focusing on the relevant aspects of the issue. The framework identifies both direct and indirect effects of globalization and the health status of populations. In addition, the paper suggests a set of actions that ought to be taken to

[9] Note that Kenny (2003) challenges the view that bridging the digital divide will bring large rewards.

mitigate the downside effects of globalization and to harness the positive aspects.

Kaul and Faust (2001) recognize the important role that internationally coordinated health policies can have in addressing many of the global health issues that are facing the international community. In particular, they pertain to international cooperation as a global public good, adequate national and international financing of health interventions, international cooperation on health research, and, finally, the need to appoint special managers for particularly important international health issues.

Diaz-Bonilla et al (2002) survey the issues of health opportunities and risks for the poor in relation to globalization. They outline four broad issues linking the two concepts: (i) level and nature of the economic growth, (ii) access to health care inputs, (iii) food security, and (iv) general economic, social, political, and environmental aspects of the interface between globalization and health. While there are certainly many risks involved, the authors see several opportunities for all countries in the on-going process of integration.

An interesting contribution to the literature on globalization and health is Wei and Wu (2002). They define globalization as economic integration and uses trade levels (to GDP) and tariff rates to explain health as measured by LEB and child mortality. They use a panel set of 125 countries over the period 1962-1997.[10] The authors report findings to suggest that trade measures do have a positive and significant impact on health controlling for income and other determinants of health.

A large number of studies have dealt with globalization (by various measures) and other issues than health. In what follows, is a brief summary of a selection of these studies that deal with issues that have a bearing on the health of populations.

[10] Actual number of countries included in models ranges from 26 to 98, with most around 70.

Frankel (2000) discusses the extent to which globalization of trade and finance impacts upon economic growth, equality, and the environment. The author concludes that the world is not so globalized that people (non-economists at least) seem to think looking back a hundred years[11], and that globalization is not the most important obstacle to efforts to address concerns related to the growth, distribution, and sustainability of economic resources.

Lindert and Williamson (2001) argue that the world has become more unequal over the past 200 years almost entirely due to widening gaps between countries (and not from within country inequalities). At the same time, the world has become considerably more integrated suggesting a relationship between these two processes. The authors argue that countries that have adopted policies to open up their economies have experienced less inequality compared to the non-participants, and, moreover, that globalization reduced inequalities between participating countries. The effect of globalization has been too small in any case to explain the large increase in global inequality.

The extent to which globalization may hurt the poor is tested empirically by Agénor (2002). As indicators of globalization, the author uses measures of trade openness and financial integration. An important part of the analysis is the possibilities of nonlinearities in the relationship. Cross-country regressions are then used to estimate the effect of trade on poverty.[12] The main finding of the analysis is, indeed, the suggestion that a nonlinear relationship appear to exist indicating that globalization (as measured and defined) at low levels does hurt the poor while the opposite is true at higher levels of globalization.

[11] Indeed, as the author notes, measured by net financial flows (current account imbalances in relation to GDP) the world is less globalized today than some 70-80 years ago, and, also, trade flows in relation to GDP are not higher today than they were before the First World War.
[12] The actual sample size is only 11, principally, middle-income countries.

Finally, Dreher (2002) uses a broad composite index of globalization covering economic, social, and political integration. Using a panel data set for 123 countries over the period 1970-2000, the effect of globalization on economic growth is assessed. He concludes that globalization has a positive effect on economic growth, but not sufficiently so to reduce poverty.[13]

From the above, admittedly small and somewhat superficial, review of a selection of the current evidence base on the effects of globalization on health, poverty, distribution, and growth, we conclude that the picture is very mixed in the sense that seemingly contradicting results are found and, more importantly, different measures of globalization have been used in empirical work, some of which appear to be exceedingly narrow.

**Globalization and Health: a panel data analysis**

This section will make use of international aggregated data on a selection of relevant indicators and measures of globalization and of population health, respectively. [14] In particular, the data include life expectancy at birth, GDP per capita, and a set of composite globalization index for the years 1975-2000. Data description and definitions are found in Appendix A and further details are found in Dreher (2002). The overall globalization index in turn consists of three sub-indices measuring economic, political, and social integration, respectively. The weights for the sub-indices have been calculated using the method of principal components analysis (PCA), which, roughly speaking, is a method to substitute a very large set of variables with a smaller set that best summarizes the larger group.[15] The purpose of the exercise is to try to detect any existing systematic pattern at this level of analysis, and, also, to quantify the strength of the pattern if it exists. The particular research question that we would ask ourselves in a cross-section time-series

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[13] We will use part of this set to empirically assess the relation between health and globalization in the next section.
[14] The data set was kindly made available by Dr. Alex Dreher upon request.
[15] See, for example, Agénor (2002) for a more detailed explanation of the methodology.

analysis such as this is the extent to which countries that are more globalized exhibit better population health.

We start, in Figure 2 below, by plotting globalization on the X-axis (from least globalized to most) against life expectancy at birth. The figure shows a clear positive relation between the compound globalization index and population health as measured by LEB. The relationship also appears to be non-linear.

[Figure 2, about here]

The positive relationship is confirmed in the table below, which shows a relatively high correlation coefficient between life expectancy at birth and globalization. The table also shows the correlation coefficients between a selection of other variables that we will be using.

[Table 1, about here]

Our basic model specification is the following.

$$L_{it} = \alpha_t + G_{it}\beta + X_{it}\gamma + C_i + \varepsilon_{it}, \qquad (1)$$

where L is the natural log of LEB in country $i$ at time $t$, $a$ is a time-specific constant, G is our measure of globalization, and X is a matrix of control variables. C captures country fixed-effects and $\varepsilon$ is a disturbance term. β and γ are coefficients to be estimated. Table 2 show the summary descriptive statistics of the variables used.

Our approach is the following. We will start with a narrow measure of globalization and gradually work our way to the broad overall index of globalization. In the process, we will control for variables that also may explain population health, like, most notably, national income and education.

Table 3 summarizes the results from a number of alternative specifications. As can be seen, our measure of population health (the natural log of life expectancy at birth) regressed on different measures of globalization suggest that the impact varies. Columns (1) – (3) indicate that the sub-indices of globalization do not have a significant effect on LEB when controlling for national income and education. Column (4), on the other hand suggest a positive and statistically significant impact on the health of the population in this period controlling for the log of GDP per capita. This finding still holds when adding education in column (5) and also when looking at the dynamics of population health by adding the lagged value of the dependent variable in column (6).

In column (7) the overall globalization index retains its sign and is highly significant when including a time variable to capture processes that significantly improve population health. Interestingly the national income and education variables loose their impact on health. A similar pattern emerges when using a country-time interaction term in column (8). Finally, we add a measure of government consumption in an attempt to capture national health care expenditures. This variable is not significant, but the globalization index, national income, and the education variable retain their sign and significance.

**Conclusions**

This paper has attempted to explore the nature of the relationship between a measure of population health and an overall index of globalization. In particular, we have regressed the life expectancy at birth on various measures of globalization, both narrow and broad such measures, while controlling for other important determinants of the population health.

While several caveats regarding the findings of this work so far remain, there seems to be evidence in favor of globalization's positive impact on the health status of the population of these some 120 countries in the period 1975-2000. Most importantly, we need to extend the analysis to ascertain the real direction of causality. In this process we would most likely also be interested in controlling for other important determinants of population health, including indicators of quality and access to health care, nutrition intake, and other life-style indicators.

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*Figure 1: Globalization and Health: A tentative illustration of the relationship*

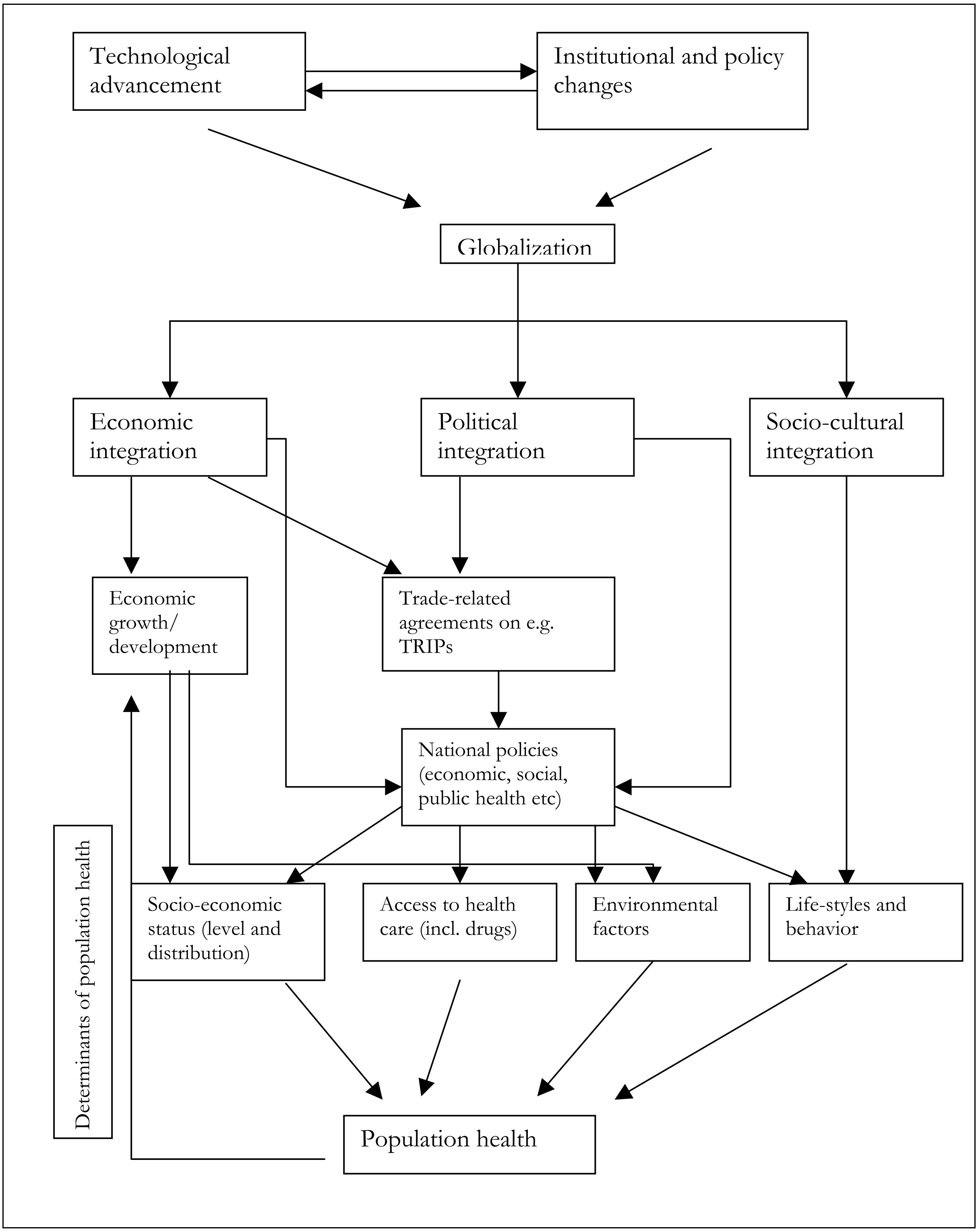

Figure 2: Scatterplot of LEB and the globalization index (2000)

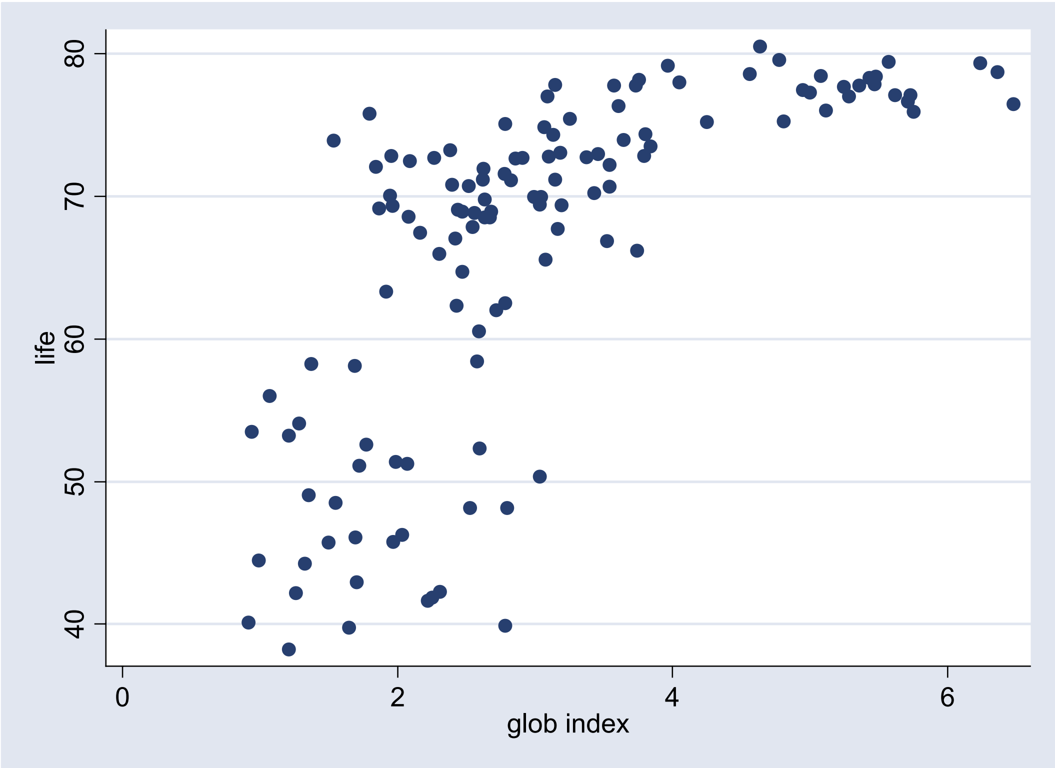


Table 1: Correlation LEB and globalization

| | LEB | Globalization |
|---|---|---|
| LEB | 1.0 | 0.6904** |
| globalization | 0.6904** | 1.0 |

**Significant at 0.01-level (2-tailed).

Table 2: Summary descriptive statistics of variables

[To be added]

Table 3: Panel regression ln(life expectancy at birth), 1975-2000

| Explanatory variables | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Indx ec intgr | 0.009<br>(0.001)** | | | | | |
| log of gdp_pc | 0.021<br>(0.045)* | 0.024<br>(0.030)* | 0.026<br>(0.015)* | 0.071<br>(0.000)** | 0.021<br>(0.046)* | 0.023<br>(0.033)* |
| Education | 0.002<br>(0.000)** | 0.002<br>(0.000)** | 0.002<br>(0.000)** | | 0.002<br>(0.000)** | 0.002<br>(0.000)** |
| Indx soc intgrn | | 0.004<br>(0.298) | | | | |
| Indx pol engmnt | | | -0.000<br>(0.928) | | | |
| Indx glbzn | | | | 0.023<br>(0.000)** | 0.011<br>(0.019)* | 0.011<br>(0.021)* |
| Lagged LEB | | | | | | -0.000<br>(0.418) |
| Constant | 3.824<br>(0.000)** | 3.832<br>(0.000)** | 3.817<br>(0.000)** | 3.534<br>(0.000)** | 3.829<br>(0.000)** | 3.830<br>(0.000)** |
| Observations | 662 | 664 | 663 | 664 | 684 | 664 |
| No. of Country | 122 | 122 | 122 | 122 | 122 | 122 |
| R-squared | 0.290 | 0.278 | 0.277 | 0.284 | 0.147 | 0.284 |

p values in parentheses
* significant at 5%; ** significant at 1%

Table 3 (contd.): Panel regression ln(life expectancy at birth), 1975-2000

| Explanatory variables | (7) | (8) | (9) |
|---|---|---|---|
| | | | |
| indx glbzn | -0.012 | -0.012 | 0.011 |
| | (0.009)** | (0.011)* | (0.028)* |
| log of gdp_pc | 0.010 | 0.011 | 0.022 |
| | (0.294) | (0.261) | (0.041)* |
| Education | 0.000 | 0.000 | 0.002 |
| | (0.062) | (0.065) | (0.000)** |
| Year | 0.004 | | |
| | (0.000)** | | |
| Country*time | | 0.000 | |
| | | (0.000)** | |
| Government consumption expenditure | | | 0.000 |
| | | | (0.535) |
| Constant | -4.017 | -3.971 | 3.815 |
| | (0.000)** | (0.000)** | (0.000)** |
| Observations | 664 | 664 | 655 |
| Number of Country | 122 | 122 | 122 |
| R-squared | 0.449 | 0.447 | 0.283 |

p values in parentheses: * significant at 5%; ** significant at 1%

## Appendix A: Data description and sources (from Dreher, 2002)

| Variable | Range | Quelle | Definition |
|---|---|---|---|
| GDP per capita growth (annual %) | 1970-2000 | WDI (2002) | Annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes a |
| GDP growth (annual %) | 1970-2000 | WDI (2002) | Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 1995 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any s |
| Gini Koeffizient | 1970-2000 | Deininger and Squire (1996), ergänzt mit WDI (2002) | Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages |
| School enrollment, secondary (% gross) | 1970, 75, 80, 85, 90-98 | WDI (2002) | 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. Secondary education completes the provision of basic education that began at the pr |
| Life expectancy at birth, total (years) | 1970-2000 (not all years) | WDI (2002) | Life expectancy at birth indicates 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. |
| Fertility rate, total (births per woman) | 1970-2000 | WDI (2002) | Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with prevailing age-specific fertility rates. |
| General government final consumption expenditure (% of GDP) | 1970-2000 | WDI (2002) | General government final consumption expenditure (general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defens |
| Terms of Trade | 1970-1999 | Global Development Network Growth Database, http://econ.worldbank.org/ | 1995=100, Wachstumsrate gegenüber dem Vorjahr: (1990-1989)/1989 |
| Inflation, consumer prices (annual %) | 1970-2000 | WDI (2002) | Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyre |
| Democracy Index | 1970-1999 | Polity IV | |
| Regional dummies | | WDI (2002) | Sub-Saharan Africa, Latin America, East Asia |
| Population, total | 1970-2000 | WDI (2002) | Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the popula |
| GDP per capita (constant 1995 US$) | 1970-2001 | WDI (2002) | GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated |
| Gross Domestic Investment (percent of GDP) | 1970-1999 | Global Development Network Growth Database, http://econ.worldbank.org/ | IMF: Directions of Trade (for investment data); Global Development Finance & World Development Indicators (for GDP per capita growth) |
| Assasinations | 1970-1993 | Arthur S. Banks Cross National Time-Series Data Archive, http://econ.worldbank.org/ | The number of any politically motivated murder or attempted murder of a high government official or politician. |
| Strikes | 1970-1993 | Arthur S. Banks Cross National Time-Series Data Archive, http://econ.worldbank.org/ | The number of any strike of 1,000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies or authority. |

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| Guerrilla Warfare | 1970-1993 | Arthur S. Banks Cross National Time-Series Data Archive, http://econ.worldbank.org/ | The number of any armed activity, sabotage, or bombings carried on by independent bands of citizens or irregular forces and aimed at the overthrow of the present regime. |
| Crisis | 1970-1993 | Arthur S. Banks Cross National Time-Series Data Archive, http://econ.worldbank.org/ | The number of any rapidly developing situation that threatens to bring the downfall of the present regime - excluding situations of revolt aimed at such overthrow. |
| Riots | 1970-1993 | Arthur S. Banks Cross National Time-Series Data Archive, http://econ.worldbank.org/ | The number of any violent demonstration or clash of more than 100 citizens involving the use of physical force. |
| Revolutions | 1970-1993 | Arthur S. Banks Cross National Time-Series Data Archive, http://econ.worldbank.org/ | The number of any illegal or forced change in the top governmental elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central government. |
| Political Instability | 1970-1993 | | Zusammengesetzter Index (assassinations, strikes, guerrilla warfare, crisis, riots, revolutions), Gewichte mittels Principal Components Analyse (Basisjahr 1993): (0,0770179610961238*assassination!B30+0,10229571915377 *strikes!B30+0,247475330115008*'guerril |
| Rule of Law | 1970,75,80,85,90,95,2000 | Gwartney et al. (2002) | Legal System & Property Rights, PRS Group, International Country Risk Guide |
| War | 1970-1994 | Bruno and Easterly Data Set (1998), Inflation Crises and Long-Run Growth | Dummy for war taking place on national territory (Source: Ruth L. Sivard. 1993. World Military and Social Expenditure 1993. 15th ed. Leesburg, Va: WMSE Publ. and The Center for Defence Information. 1996. 1995 CDI Military Almanac, Washington DC) |
| Political Rights | 1972-1999 | Freedom House, http://www.freedomhouse.org/ | The Survey rates political rights, 1 representing the most free and 7 the least free.<br><br>Political Rights Checklist<br>1.Is the head of state and/or head of government or other chief authority elected through free and fair elections?<br>2.Are the legislative |
| Civil Liberties | 1972-1999 | Freedom House, http://www.freedomhouse.org/ | The Survey rates civil liberties on a seven-category scale, 1 representing the most free and 7 the least free.<br><br>The Civil Liberties Checklist<br><br>A.Freedom of Expression and Belief<br>1.Are there free and independent media and other forms of cultural expressi |
| Private Credit by Deposit money banks to GDP | 1970-1997 | A New Database on Financial Development and Structure, Thorsten Beck, Asli Demirgüç-Kunt, and Ross Levine (June 1999) | Measures the Activity of Financial Intermediaries. Claims on the private sector by deposit money banks divided by GDP. It measures isolate credit issued to the private sector as opposed to credit issued to governments and public enterprises. Furthermore, |
| Stock Market Capitalization | 1976-1997 | A New Database on Financial Development and Structure, Thorsten Beck, Asli Demirgüç-Kunt, and Ross Levine (June 1999) | As indicator of the size of the stock market we use the stock market capitalization to<br>GDP ratio which equals the value of listed shares divided by GDP. Both numerator and denominator are deflated appropriately, with the numerator equaling the average of |
| Liquid Liabilities to GDP | 1970-1997 | A New Database on Financial Development and Structure, Thorsten Beck, Asli Demirgüç-Kunt, and Ross Levine (June 1999) | Liquid Liabilities to GDP equals currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by<br>GDP. This is the broadest available indicator of financial intermedation, since it includes all three financial s |
| Total debt service (% of GNI) | 1970-2000 | WDI (2002) | Total debt service is the sum of principal repayments and interest actually paid in foreign currency, goods, or services on long-term debt, interest paid on short-term debt, and repayments (repurchases and charges) to the IMF. |
| Central government debt, total (% of GDP) | 1970-2000 | WDI (2002) | Total debt is the entire stock of direct, government, fixed term contractual obligations to others outstanding at a particular date. It includes domestic debt (such as debt held by monetary authorities, deposit money banks, nonfinancial public enterprises |

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| Overall budget balance, including grants (% of GDP) | 1970-2000 | WDI (2002) | Overall budget balance, including grants (% of GDP) |
| Short-term debt (% of total external debt) | 1970-2000 | WDI (2002) | Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. |
| Theil-Index | 1970-2000 | University of Texas Inequality Project, University of Texas at Austin, http://utip.gov.utexas.edu/web/world_theils.htm. | The Theil inequality index is a weighted geometric average of income relatives. Exakte Definition: http://www.wiwiss.fu-berlin.de/w3/w3collie/SOCPOLY/TEACHING/Intro/Intro99/Theil.PDF |
| Government Fractionalization | 1975-1997 | Thorsten Beck, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. (2001). "New Tools in Comparative Political Economy: The Database of Political Institutions," World Bank Economic Review. 15(1), 165-176. | Chance that two random draws will produce legislators from different parties. |
| **Index Variable** | | | **Definition** |
| **Data on economic integration** | | | |
| i) actual flows | | | |
| Trade (% of GDP) | 1970-2000 | Worldbank, WDI | Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. |
| Foreign direct investment, gross inflows (% of GDP) | 1970-2000 | Worldbank, WDI | Gross foreign direct investment is the sum of the absolute values of inflows and outflows of foreign direct investment recorded in the balance of payments financial account. It includes equity capital, reinvestment of earnings, other long-term capital, and short-term capital. This indicator differs from the standard measure of foreign direct investment, which captures only inward investment. The indicator is calculated as a ratio to GDP in U.S. dollars. |
| Portfolio investment, bonds (PPG + PNG) (NFL, current US$) | 1970-2000 | Worldbank, WDI | Portfolio investment assets (78bfd) and portfolio investment liab., n.i.e. (i.e. portfolio investment liabilities) (78bgd) include transactions with nonresidents in financial securities of any maturity (such as corporate securities, bonds, notes, and money market instruments) other than those included in direct investment, exceptional financing, and reserve assets. |
| Portfolio investment Assets (current flows (million) US$) | 1970-2001 | IFS, Juli 2002 | Portfolio investment flows are net and include non-debt-creating portfolio equity flows (the sum of country funds, depository receipts, and direct purchases of shares by foreign investors). Data are in current (million) U.S. dollars. |
| Portfolio investment Liabilities (current flows (million) US$) | 1970-2001 | IFS, Juli 2002 | Portfolio investment flows are net and include non-debt-creating portfolio equity flows (the sum of country funds, depository receipts, and direct purchases of shares by foreign investors). Data are in current (million) U.S. dollars. |
| Income receipts (BoP, current US$) | 1970-2000 | Worldbank, WDI | Income receipts refer to employee compensation paid to resident workers working abroad and investment income (receipts on direct investment, portfolio investment, other investments, and receipts on reserve assets). Income derived from the use of intangible assets is excluded from income and recorded under business services. Data are in current U.S. dollars. |
| Taxes on international trade (% of current revenue) | 1970-2000 | Worldbank, WDI | Taxes on international trade include import duties, export duties, profits of export or import monopolies, exchange profits, and exchange taxes. Current revenue includes all revenue from taxes and nonrepayable receipts (other than grants) from the sale of land, intangible assets, government stocks, or fixed capital assets, or from capital transfers from nongovernmental sources. It also includes fines, fees, recoveries, inheritance taxes, and nonrecurrent levies on capital. Data are shown for central government only. |
| ii) restrictions | | | |
| Hidden import barriers | 1995, 2000 | Gwartney et al. (2002) | Skala von 0-10: No barriers other than published tariffs and quotas.<br>Source: World Economic Forum (2001), Global Competitiveness Report 2001-2002 (Oxford: Oxford Univ. |

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| | | | Press). |
| mean tariff rate | 1975,80,85,90,95,00 | Gwartney et al. (2002) | |
| capital account restrictions | 1970,75,80,85,90,95,00 | Gwartney et al. (2002) | Kombinierter Gwarteny-Index zwischen 0 (starke Kontrollen)-10 (keine Kontrollen) aus:<br>i Access of citizens to foreign capital markets and foreign access to domestic capital markets.<br>Source: World Economic Forum (2001), Global Competitiveness Report 2001-2002 (Oxford: Oxford Univ. Press).<br>ii Restrictions on the freedom of citizens to engage in capital market exchange with foreigners<br>index of capital controls among 13 IMF categories.<br>The IMF reports on 13 different types of capital controls. This component is based on the number of capital controls levied. The 0-to-10 rating is constructed by taking 13 minus the number of capital controls divided by 13 and multiplied by 10.<br>Source: International Monetary Fund, Annual Report on Exchange Arrangements and Exchange Restrictions (various issues). |
| **Data on personal contact** | | | |
| International telephone traffic | | International Telecommunications Union, Yearbook of Statistics und International Telecommunications Union, World Telecommunication Indicators Database | |
| International telecom, outgoing traffic | 1970, 1975-2000 | Worldbank, WDI | Outgoing traffic refers to the telephone traffic, measured in minutes per subscriber, that originated in the country with a destination outside the country. |
| Current transfers, receipts (BoP, current US$) | 1970-2000 | Worldbank, WDI | Current transfers (receipts) are recorded in the balance of payments whenever an economy receives goods, services, income, or financial items without a quid pro quo. All transfers not considered to be capital are current. Data are in current U.S. dollars. |
| Net current transfers from abroad (BoP, current US$) | 1970-2000 | Worldbank, WDI | Net current transfers are recorded in the balance of payments whenever an economy provides or receives goods, services, income, or financial items without a quid pro quo. All transfers not considered to be capital are current. Data are in current U.S. dollars. |
| International tourism, arrivals | 1980-2000 | Worldbank, WDI | International inbound tourists are the number of visitors who travel to a country other than that where they have their usual residence for a period not exceeding 12 months and whose main purpose in visiting is other than an activity remunerated from within the country visited. |
| International tourism, departures | 1980-2001 | Worldbank, WDI | International outbound tourists are the number of departures that people make from their country of usual residence to any other country for any purpose other than a remunerated activity in the country visited. |
| Telephone average cost of call to US (US$ per three minutes) | 1996-2000 | Worldbank, WDI | Cost of international call to U.S. is the cost of a three-minute peak rate call from the country to the United States. |
| Foreign population (% of total population) | 1984-2000 | Worldbank, WDI | Foreign (or foreign-born) population is the number of foreign or foreign-born residents in a country. |
| **Data on technology** | | | |
| Telephone Mainlines | 1970, 1975-2000 | Worldbank, WDI | Telephone mainlines are telephone lines connecting a customer's equipment to the public switched telephone network. Data are presented per 1,000 people for the entire country |
| Internet Hosts | 1995-2000 | International Telecommunications Union, Yearbook of | |

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| | | Statistics und International Telecommunications Union, World Telecommunication Indicators Database | |
| Secure Internet Servers | 1996-2000 | Secure Server Survey, 1996-2001 | |
| **Data on information flows** | | | |
| Internet Users | 1995-2000 | Worldbank, WDI | Internet users are people with access to the worldwide network. |
| Cable Television | 1970-2000 | Worldbank, WDI | Cable television subscribers are households that subscribe to a multichannel television service delivered by a fixed line connection, per 1,000 people. Some countries also report subscribers to pay television using wireless technology or those cabled to community antenna systems. |
| Daily Newspapers | 1970-2000 | Worldbank, WDI | Daily newspapers refer to those published at least four times a week, per 1,000 people. |
| Radios (per 1,000 people) | 1970, 1975-2000 | Worldbank, WDI | Radios refer to radio receivers in use for broadcasts to the general public, per 1,000 people. |
| **Data on political engagement** | | | |
| Embassies in country | 1970, 75,80,95,2000 (85 und 90 fehlt noch) | Europa World Yearbook | |
| Membership in international (inter-governmental) organisations | 1975-2000 | Union of international associations (Yearbook of international organizations) und Central Intelligence Agency, The World Factbook | |
| Participation in U.N. Security Council Missions | 1970-2000 | Department of Peacekeeping Operations, UN und http://www.uno.de/frieden/frieden/50Jahre/dpi2004/index.htm | |
| **Data on Cultural Proximity** | | | |
| Number of McDonald's Restaurants | 1996 (for 1995), 2002 (for 2000) | www.mcdonalds.com | |

**Appndix B: Summary of literature on Globalization**

| Reference | Focus | Result | Comment |
|---|---|---|---|
| Dollar (2001) | Economic integration and growth | Positive | Indirect health effects; criticized by Rodrik and others |
| Cornia (2001) | Economic integration and growth | Mixed | |
| Chandrasekhar and Ghosh (2001) | Effect and role of ICTs on health (care) | Positive | Replicability? |
| Evans et al (2001) | Trade and diet | Mixed | Case-study |
| Loewenson (2001) | Occupational health | "reduced workplace conditions" | South Africa case |
| Woodward et al (2001) | Analytical discussion | Mixed | Inconclusive? |
| Kaul and Faust (2001) | Global public goods (for health) | Need for global governance | |
| Diaz-Bonilla (2002) | Health opportunities and risks for the poor | (i) level and nature of the economic growth, (ii) access to health care inputs, (iii) food security, and (iv) general economic, social, political, and environmental aspects | |
| Frankel (2000) | Growth, distribution, and environment | Globalization is over-emphasized | |
| Lindert and Williamson (2001) | More inter-country inequality and integration past 200 years | Less inequality in globalized economies | |
| Agénor (2002) | Economic integration and poverty | A positive non-linear relationship | Empirical analysis |
| Dreher (2002) | Compound index and growth | Positive relationship but not enough to off-set poverty | Panel data (123, 1970-2000) |
| Wei and Wu (2002) | Trade and health | Positive impact | Panel data (125, 1962-1997) |