Is globalization really good for public health? General considerations and implications for the Arab world

Tausch, Arno

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Arno Tausch

Adjunct Professor of Political Science at Innsbruck University
Associate Professor of Economics, Corvinus University, Budapest

Universitätsstraße 15, 2. Stock West
A-6020 Innsbruck
E-mail: Arno.Tausch@uibk.ac.at; Arno.Tausch@yahoo.de
personal academic website: http://uibk.academia.edu/ArnoTausch (academia.edu)

ABSTRACT

Background: A positive assessment of the role of globalization as a driver of a good public health performance has been the result of major new studies in the field. But the present re-analysis shows that neo-liberal globalisation has resulted in increasing inequality, which in turn negatively affects global health performance. This conclusion is valid on a global level but it also holds for the majority of the Arab countries, which are currently undergoing very dramatic political and social transformations, which have fundamental repercussions for the Western world.

Methods: Standard IBM/SPSS OLS regressions and partial correlations with cross-national and time series aggregate, freely available data. The article also re-analysed the data, provided by Mukherjee N. and Krieckhaus J. **Globalization and Human Well-Being.** *International Political Science Review,* March 2012; vol. 33, 2: pp. 150-170.

Results: We can show that different types of globalization processes affect public health performance differently. The absence of restrictions (direct effects on the availability of pharmaceuticals) and the free flow of information (direct effects on the availability of scientific information in medicine and the free movement for members of the medical profession) have the biggest impact on infant mortality reduction, while actual foreign capital flows and personal contacts have less influence on reducing infant mortality rates. The "de-composition" of the available data suggests that for most of the time period of the last four decades, globalization inflows even implied an aggregate deterioration of public health, quite in line with recent prominent public health research studies by Cornia, de Vogli, and other studies, referred to in this article.

Conclusions: Globalization leads to increased inequality, and this, in turn, to a deteriorating public health performance. This is relevant for the health planners in the Middle Eastern region as well. The region witnessed a sharp increase in globalization in recent years. We show the validity of our conclusion also with an annual time series data analysis for 99 countries. In only 19 of 99 nations (i.e. 19.1%) globalization actually preceded an improvement in the public health performance. Far from falsifying the globalization critical research, our essay shows the basic weaknesses of the new "pro-globalization" literature in the public health profession.

Keywords: Globalization, Infant Mortality, Inequality, Arab countries

Background

Persistent research interest in child mortality characterized quantitative, cross-national research in the public health discipline and in the social sciences in recent years. [1] [2] The tendency to link public health performance to variables, generally associated with the domain of the social sciences, is of course not new. Recent methodological developments in the field included the use of time lag analysis techniques, already very well established in economics. [3] Indeed, such a cross-temporal perspective has now become possible and desirable also for public health research and data for such time series analyses are now easily available. [4]

A new, positive assessment of the role of globalization as a driver of a good public health performance has been the net result of the major new studies published so far, which all used pooled data analysis techniques. [5] [6] [7] [8] [9] [10] These new studies came to the conclusion that

[1] Bryce J, Victora CG, Black RE. **The unfinished agenda in child survival.** *Lancet.* **2013** Sep 21; 382 (9897): 1049-59. doi: 10.1016/S0140-6736(13)61753-5.

[2] Goldberger N. and Ziona Haklai Z. **Mortality rates in Israel from causes amenable to health care, regional and international comparison.** *Israel Journal of Health Policy Research,* **2012**, 1:41 (25 October 2012).

[3] Hanf M., Nacher M, Guihenneuc C., Tubert-Bitter P., Chavance M. **Global determinants of mortality in under 5s: 10 year worldwide longitudinal study.** *British Medical Journal, BMJ* **2013**; 347: f6427.

[4] The annual time series data for this analysis are, apart from the database by Mukherjee N. and Krieckhaus, the **KOF Index of Globalization** (http://globalization.kof.ethz.ch/); **World Bank Data** (http://data.worldbank.org/indicator) and **The University of Texas Inequality Project** (http://utip.gov.utexas.edu/).

[5] Mukherjee N. and Krieckhaus J. **Globalization and Human Well-Being.** *International Political Science Review,* March **2012**; vol. 33, 2: pp. 150-170.

[6] Martens P., Akin SM., and Mohsin R. **Is globalization healthy: a statistical indicator analysis of the impacts of globalization on health.** *Global Health,* **2010**; 6: 16, Published online Sep 17, 2010. doi: 10.1186/1744-8603-6-16, available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2945333/

[7] Sapkota J. B. **Globalization and Human Aspect of Development in Developing Countries: Evidence from Panel Data.** *Journal of Globalization Studies.* Volume 2, Number 1/May **2011**, available at http://www.socionauki.ru/journal/articles/132655/

[8] Bergh A. and Nilsson Th. **Good for Living? On the Relationship between Globalization and Life Expectancy.** *World Development,* Vol. 38, No. 9, pp. 1191–1203, **2010**. doi:10.1016/j.worlddev.2010.02.020.

[9] Mihalache-O'Keef, A and Li, QA. **Modernization vs. Dependency Revisited: Effects of Foreign Direct Investment on Food Security in Less Developed Countries**. *International Studies Quarterly,* **2011**, 1(55): 71 – 93, DOI 10.1111/j.1468-2478.2010.00636.x.

globalization is good for public health, third world food security and overall social development. Is this then a real new watershed in the international debate in global public health research, given that the statistical and data quality of the new studies (pooled time series analyses from 100+ countries since the 1970s) by far exceed earlier attempts on the subject? And given the fact that mainstream Western economics would tend to focus on these issues pretty much the same way? [11]

The relevance of these questions is evident for the health planners of any country, not just the Middle East region, who are confronted today by a multiplicity of possible future health risks, including climatic conditions.[12] In addition, the 22 Arab countries, which are undergoing so many political and economic upheavals in recent years, experienced a considerable increase in their globalization, as the data, presented in this article, show in great detail. Can the policy planners of the health systems in the region thus reasonably expect positive long-run health system tendencies, or is the contrary to be expected? [13] Or is there no effect at all?

An important paradigmatic shift in public health research already started in 1992, when studies about the effects of inequality on public health performance became popular. [14] Since then, inequality plays a major role in cross-national public health sector performance accounting.

Let us recall that the issue of globalization and public health has been treated repeatedly in the leading journals of the profession, [15] with a special emphasis given to the WHO Commission on Social Determinants of Health (CSDH). In a 2008 article in *"The Lancet",* we could read:

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[10] Tracy M., Kruk, ME, Harper C., Galea S. **Neo-liberal economic practices and population health: a cross-national analysis, 1980-2004.** *Health Economics, Policy and Law.* **2010**, 5(2): 171 – 199. DOI 10.1017/S1744133109990181.

[11] Dollar D. **Is globalization good for your health?** *Bulletin of the World Health Organization,* **2001**, 79, 9: 827-833. The main argument is that the higher growth that accompanies globalization in developing countries generally benefits poor people.

[12] Green M. S., Pri-or N.G., Capeluto G., Epstein Y. and Paz S. **Climate change and health in Israel: adaptation policies for extreme weather events.** *Israel Journal of Health Policy Research,* **2013**, 2:23 doi:10.1186/2045-4015-2-23.

[13] Arab writers recently dealt at length with what they perceive to be a basic *"intelligence failure"* on the part of Israel in predicting the course of events in Egypt since February 11, 2011. See: Muhareb M. *Israel and the Egyptian Revolution.* Arab Center for Research and Policy Studies (ACRPS) (Doha, Qatar), available at http://english.dohainstitute.org/release/35d3de00-35bf-4b6c-be54-323828feec50. It is not the task of this article to assess the veracity of such statements, but it is certain that for the policy planners in Western democracies, neighboring the region, like Israel and the southern member countries of the European Union and NATO, it is important also to be able to predict future developments in the public health and in the social policy domain.

[14] Wilkinson RG. **For Debate – Income Distribution and Life Expectancy.** *British Medical Journal,* 304, 6820, 165-168 (Jan 18 **1992**).

[15] Schrecker T, Laobonté R. and de Vogli R. **Globalisation and health: the need for a global vision.** *The Lancet,* Volume 372, Issue 9650, Pages 1670 - 1676, 8 November **2008** doi:10.1016/S0140-6736(08)61691-8.

"We consider and reject the presumption that globalisation will yield health benefits as a result of its contribution to rapid economic growth and associated reductions in poverty."

But as yet, the major medical journals of the world have not yet reacted to the important new studies, mentioned at the beginning of this article.

Typically for the apparently emerging new pro-globalization consensus, Mukherjee and Krieckhaus, writing for the official scientific journal of the *International Political Science Association,* work with a pooled analysis of Child Mortality, Infant Mortality, and Life Expectancy in up to 139 countries, based on five year interval observations of the dependent variables and an all-encompassing indicator of globalization, the so-called KOF Index of Globalization, designed by economists at the ETH Zurich in Switzerland.[16]

The message of the Mukherjee and Krieckhaus article for international organizations like the WHO, UNICEF and the UNDP would then be that in future they should encourage developing countries to incorporate themselves fully into the global system (economically, socially, and politically), which will also lead to better public health and child welfare in the long run. So is the wide-spread preoccupation about the detrimental effects of globalization, which was evident in so many earlier studies, clearly falsified and has it become a thing of the past? [17]

The optimism of mainstream Western economics on the subject notwithstanding, very disturbing empirical facts, based on large-scale empirical, cross-national statistical analyses about the relationship between multinational corporation penetration and long-term social and economic stagnation were already debated for years in the sociological profession. [18] More recent large-scale cross-national studies in the sociological research tradition highlighted the factor of the internal social cleavages of society and minority discrimination as intervening factors, which together with globalization explain a poor public health performance. [19] A higher degree of social division, especially ethnic and linguistic fractionalization, is significantly associated with greater child and maternal mortality rates. Even in democratic states greater social division will be associated with lower overall population access to healthcare and lesser expansion of health system infrastructure. Thus, research on public

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[16] Zinkana J. and Korotayev A. **Measuring globalization. Existing methods and their implications for teaching global studies and forecasting.** *Campus-Wide Information Systems,* Vol. 30 No. 5, **2013**, pp. 321-339. The time series of the Index and data descriptions and other materials are freely available from http://globalization.kof.ethz.ch/

[17] de Vogli R. **Neoliberal globalisation and health in a time of economic crisis.** *Social Theory & Health*, **2011**, 9, 4: 311-325.

[18] Bornschier, V., Chase-Dunn, Ch. K., Rubinson, R **Cross-National Evidence of the Effects of Foreign Investment and Aid on Economic Growth and Inequality: A Survey of Findings and a Reanalysis.** *American Journal of Sociology,* **1978**, 84(3), 651-683.

[19] Powell-Jackson T., Basu S., Balabanova D., McKee M., and Stuckler D. **Democracy and growth in divided societies: A health-inequality trap?** *Social Science & Medicine,* **2011**, 1(73): 33-41. DOI 10.1016/j.socscimed.2011.04.013.

health and inequality should focus in future on the **societal drivers of inequality.**[20][21][22] Some research traditions in economics also critically focused on the connections between globalization measured by foreign capital penetration and the general role of oligopolies in contemporary market economies.[23][24][25] If anything, globalization will increase the oligopolistic power of transnational corporations in the "global value chain".[26]

Methods

Apart from re-analysing one particularly important new study, the Mukherjee/Krieckhaus article, we demonstrate possible general causal mechanisms between globalization, inequality and public health. In the process, we assume with most literature on the subject that the natural logarithm of GDP per capita (and its square) is an important control variable for any analysis of the effects of independent variable on standard public health indicators, like infant mortality or life expectancy. We also assume that it is important to control for the fact, whether or not a country was a stable Western democracy already by around 1960, or whether it is a former European communist nation, or whether the country in question belongs to the Organization of Islamic Cooperation. In addition, it is necessary to introduce a dummy variable for India and China, which in between them share 2/5 of the global population.

These control variables are necessary, because it can be assumed that the world political realities of our globe at around 1970, i.e. the real existing divisions between the West and the Eastern bloc on the one hand, and the developing countries on the other hand might still have a fundamental importance for the way that globalization affected public health. Further research might still distinguish between different regions of the developing countries. For our

[20] Shandra JM., Nobles JE., London B., Williamson JB., **Multinational Corporations, Democracy and Child Mortality: A Quantitative, Cross-National Analysis of Developing Countries**. *Social Indicators Research,* **2005**. 73(2), 267-293.

[21] Shandra JM., Nobles J., London B., and Williamson JB. **Dependency, Democracy, and Infant Mortality: A Quantitative, Cross-National Analysis of Less Developed Countries.** *Social Science & Medicine,* **2004**. 59(2), 321-333.

[22] Hawkes C. **Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases.** *Globalization and Health,* **2006,** 2(4); DI 10.1186/1744-8603-2-4.

[23] Steindl J. *Maturity and Stagnation in American Capitalism.* Oxford: Basil Blackwell, 1952

[24] Kalecki M. *The Last Phase in the Transformation of Capitalism.* New York: Monthly Review Press, 1972

[25] Tausch A. **A globalization-oriented perspective on health, inequality and socio-economic development.** *International Journal of Health Planning and Management,* **2012,** 27(1): 2–33.

[26] This point was taken up recently by UNCTAD. 2013. *World Investment Report 2013. Global Value Chains: Investment and Trade for Development.* Geneva: UNCTAD. Available at: http://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=588

purpose, the subdivision into India and China on the one hand and the Muslim nations on the other hand might suffice for the time being.

In Figure 1 we highlight the possible theoretical connections between globalization and public health performance, compatible with the hypothesis, expressed by de Vogli, 2011 that neo-liberal globalisation has not only resulted in reduced gains in life expectancy and increasing mortality in sub-Saharan Africa and the former USSR, but also in widening health inequalities between and within countries. The reasons for the negative trade-offs, shown in Figure 1 will be precisely the policies of the Washington Consensus, associated with higher poverty rates, poorer health outcomes, and behavioural risk factors such as smoking and obesity.

Figure 1: the assumed connection between globalization, inequality and infant mortality reduction
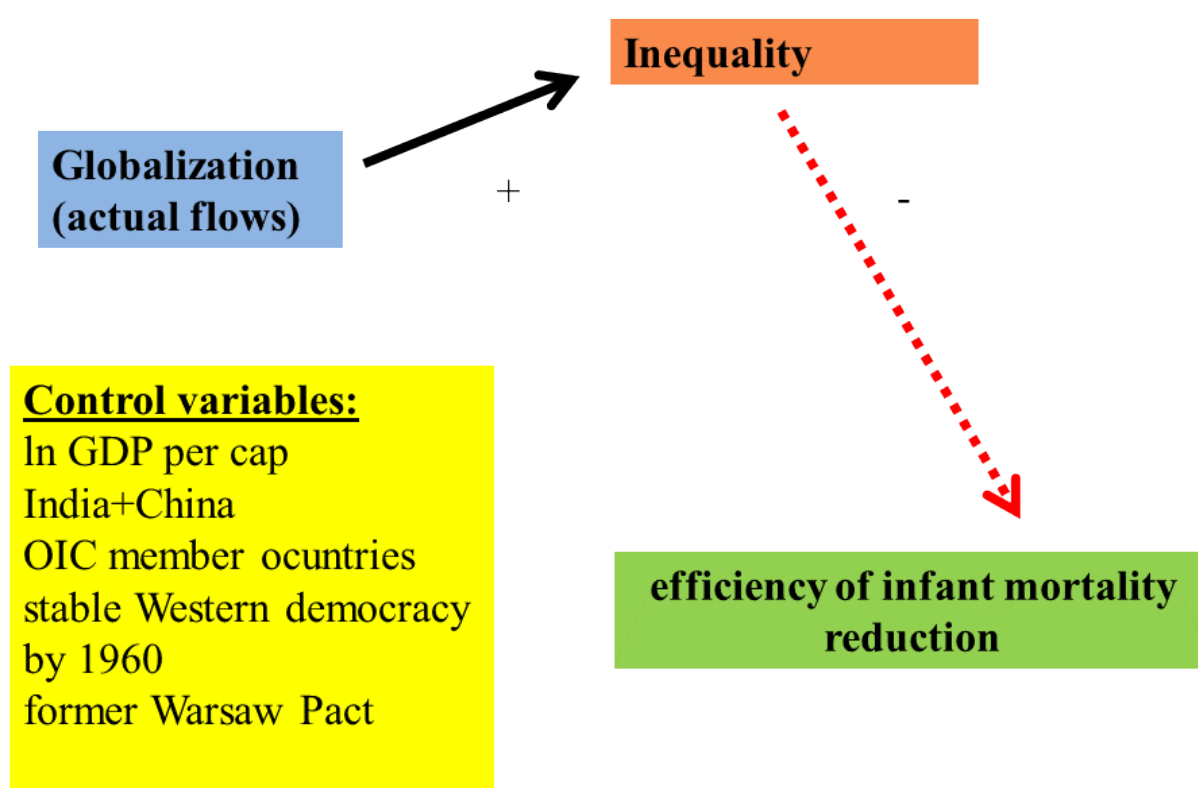
Our analysis thus will attempt to replicate the basic message of social scientific theories, generally associated with Latin American *"dependency theory"*, which assumed that globalization and foreign capital penetration in the countries of the periphery will lead to short-term spurts of economic growth, but that inequality and other social deformations will be the long-lasting results of "periphery capitalism." [27] Globalization, without question, can lead to a certain initial dynamism in most societies around the world, but in the long run, increasing inequality is a consequence of the process, and it becomes finally a blockade against a satisfactory public health performance. This would be also a very plausible synthesis between recent globalization & public health thinking and earlier research on inequality & public health.

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[27] The Brazilian social scientist and later President of his home country, Fernando Henrique Cardoso, provided especially valuable insights on this subject, see: Cardoso F. H. and Faletto E. *Dependency and development in Latin America.* Berkeley: University of California Press, 1979.

In our essay, we will also analyse how **different components** of globalization affect public health performance. We will also analyse whether the effects of globalization flows on infant mortality change over time. Finally, we show with advanced cross-correlation analyses - a technique developed in the economic discipline - that in most countries of the world, globalization only went hand in hand, but did not precede improved public health performance.

The KOF-Index of globalization, which was used by several of the mentioned studies, including Mukherjee and Krieckhaus, is available on an annual basis, and renders itself for such kind of studies, and is arguably the most complete data series of the economics profession for this variable in the world, and is composed in the following way:

A.   Economic Globalization   [36%]
B.   Social Globalization   [37%]
C.   Political Globalization   [26%]

In our article, we analyse **annual** time series relationships between KOF globalization, the overcoming of infant mortality [28] and inequality [29] in up to 99 countries of the world with available annual data with the standard statistical package, the IBM/SPSS, version 21. This exercise in time series analysis will be in addition to the **re-analysis of the pooled data** set of the original Mukherjee and Krieckhaus article from the *"International Political Science Review",* which analyses developments at 5 year intervals. [30] For the purposes of our analysis, the KOF data on **actual flows of foreign capital** will be much more adequate indicators of globalization than the KOF Index itself, which is also about openness of culture, measured by translations of foreign language books; travel; and telephone contacts with abroad; and other generally positively viewed self-evident aspects of 21st Century global society, like the possibility to send letters abroad. Map 1 shows the extent of KOF actual inflows in the world system by around 2010:
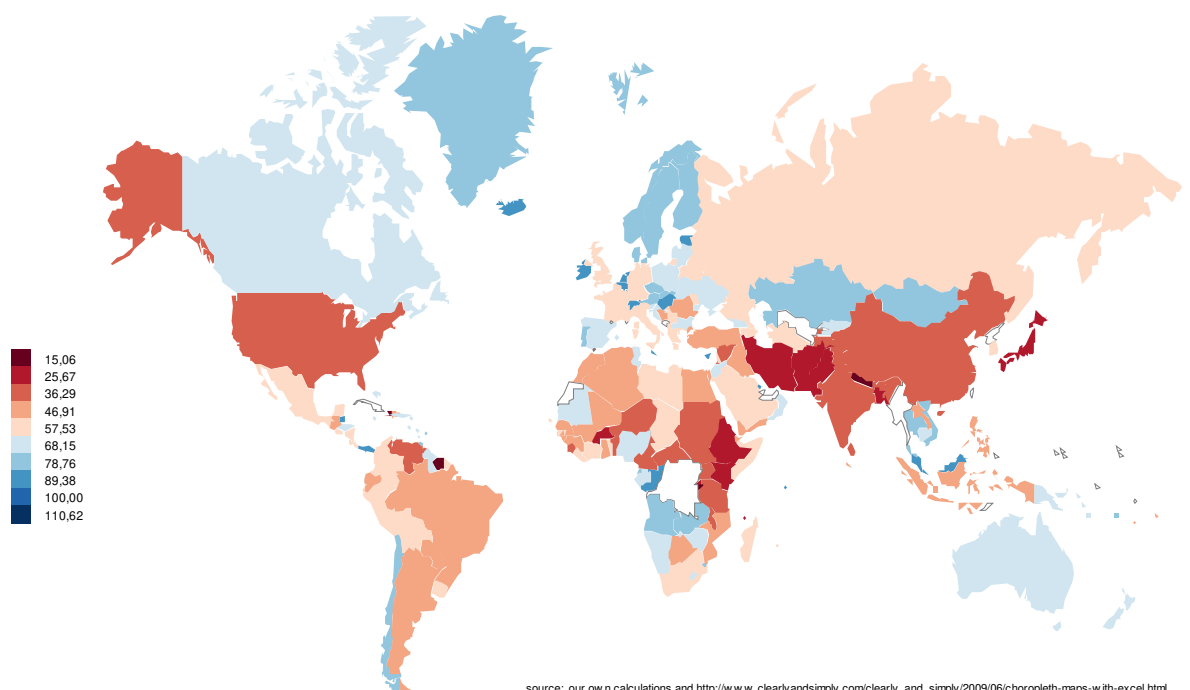
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[28] Based on a UNDP-type of Index for the overcoming of infant mortality across time since 1970 through to 2012, based on http://data.worldbank.org/indicator/all

[29] Based on figures for the GINI Index of Household Inequality, based on the University of Texas Inequality Project, EHII data series: http://utip.gov.utexas.edu/data.html

[30] By courtesy of colleagues Mukherjee and Krieckhaus

Map 1: KOF actual inflows, 2010

source: our own calculations and http://www.clearlyandsimply.com/clearly_and_simply/2009/06/choropleth-maps-with-excel.html
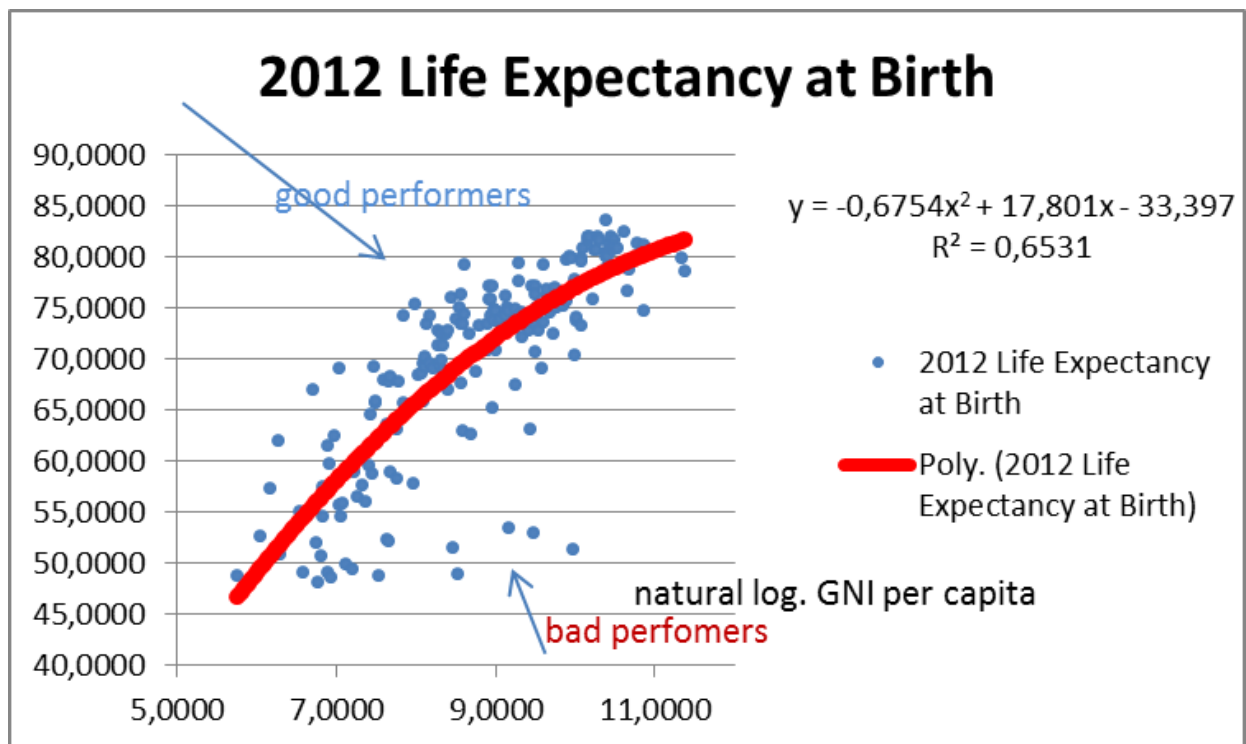
To make our statistical analysis relevant, it is particularly important to recall here that a long and well-established tradition in the social sciences presents the trade-off between basic human needs and development levels in the form of a Plateau Curve of Basic Human Needs.[31]

As Figure 2 and Figure 3 show, such a function explains almost 70% of public health performance, measured by life expectancy or infant mortality.

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[31] Goldstein J. S. Basic human needs: **The plateau curve.** *World Development,* Volume 13, Issue 5, May **1985**, Pages 595–609.

Figure 2: the Plateau Curve of Basic Human Needs – Life Expectancy

2012 Life Expectancy at Birth

$y = -0.6754x^2 + 17.801x - 33.397$
$R^2 = 0.6531$

good performers

bad performers

natural log. GNI per capita

- 2012 Life Expectancy at Birth
- Poly. (2012 Life Expectancy at Birth)

Figure 3: the Plateau Curve of Basic Human Needs – Infant Mortality
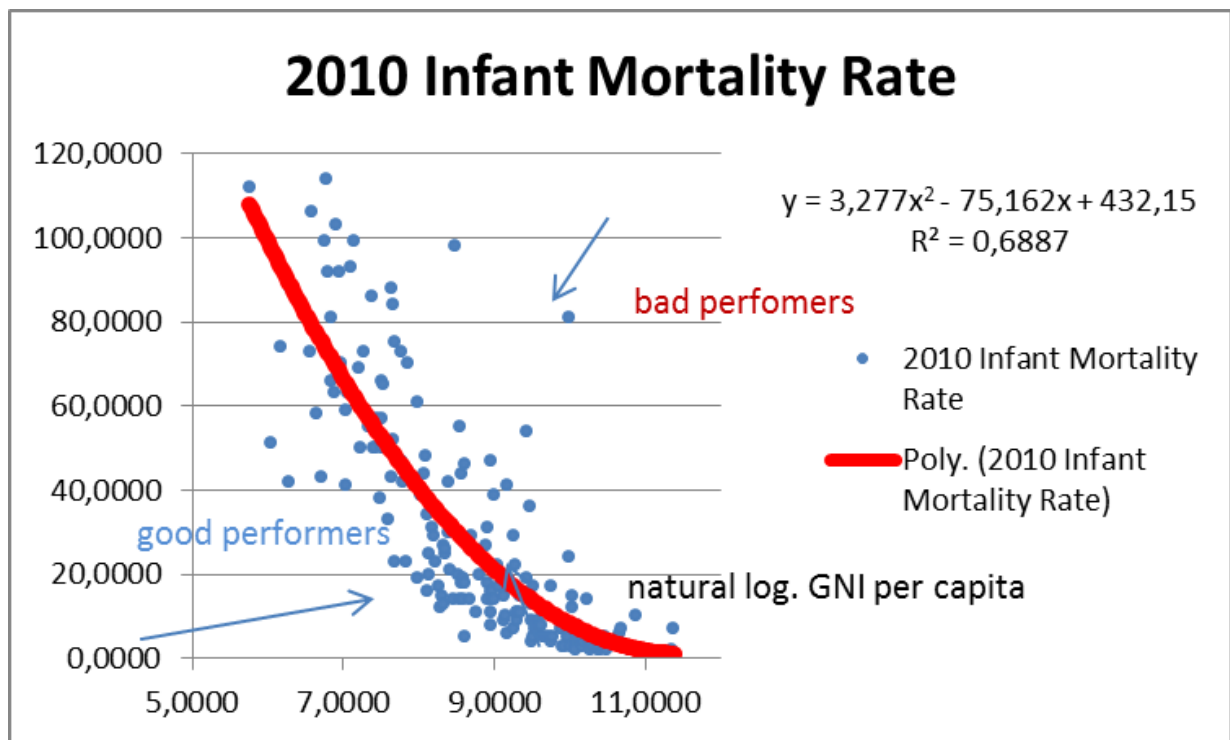
These functions render themselves for an analysis of "development efficiency" of basic human needs provision independent from the development levels reached by a given country.

Map 2 provides the data about the residuals from Figure 2. A similar map could be presented with the data from Figure 3. Since both maps look very similar, we do not present it here for reasons of space.

Map 2: Life expectancy performance, considering the Plateau Curve of Basic Human Needs

source: our own calculations and http://www.clearlyandsimply.com/clearly_and_simply/2009/06/choropleth-maps-with-excel.html
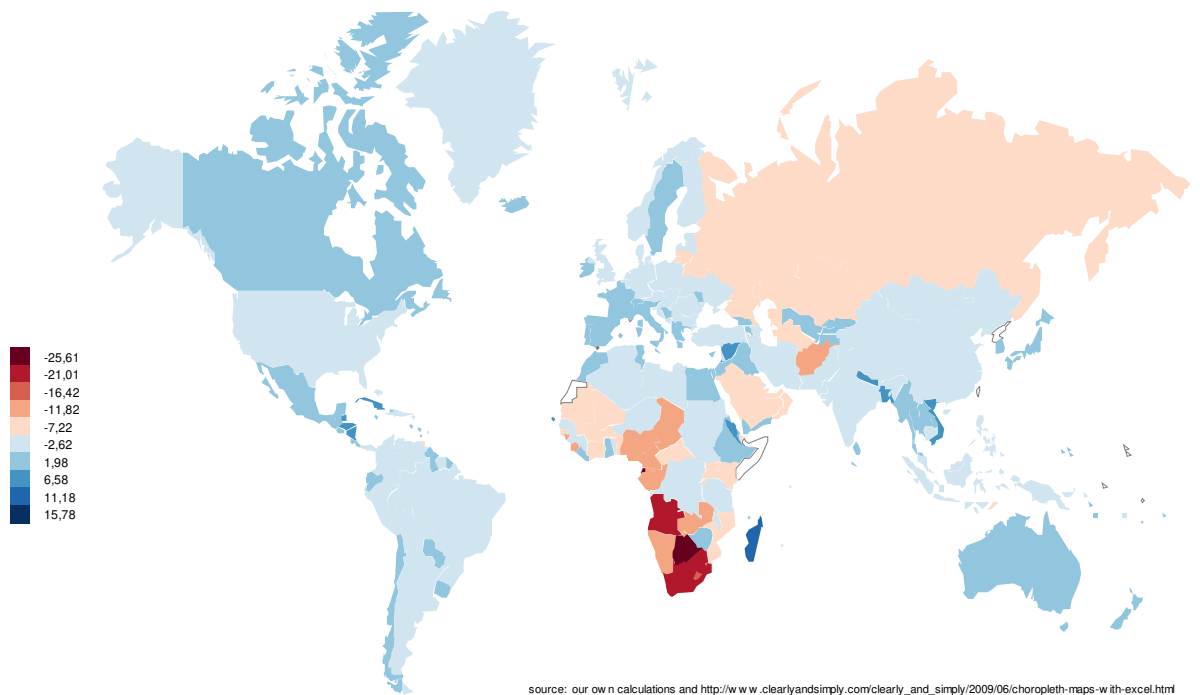
In the multivariate annual time series analysis, we measure globalization by a UNDP type of annual country globalization performance index, based on the KOF component "actual flows" for the countries of the world with complete data since 1970. Highest global inflows are 1.00; lowest global inflows are 0.0.[32] Our measurement of the efficiency of infant mortality reduction is based on World Bank infant mortality data [33] and the construction of a UNDP type **annual** country infant mortality reduction performance index (lowest global infant mortality rate = 1.0; highest global infant mortality rate = 0.0). The natural logarithm of GDP per capita [34] was one control variable. As already mentioned, additional control variables included dummies for India and China, for the member countries of the Organization of Islamic Cooperation, [35] for the stable Western democracies by around 1960, [36] and for the former countries of the Warsaw Pact. [37]

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[32] http://globalization.kof.ethz.ch/

[33] http://data.worldbank.org/indicator/all

[34] http://data.worldbank.org/indicator/all

[35] http://www.oic-oci.org/oicv2/

[36] In our sample the stable democracies by 1960 were: Australia; Austria; Belgium; Canada; Denmark; Finland; France; Germany; Iceland; Ireland; Italy; Japan; Luxembourg; Netherlands; New Zealand; Norway; Sweden; Switzerland; United Kingdom; United States

[37] In our sample: Bulgaria, Hungary, Poland and Romania

It is clear that a pooled research design for, say, 100 countries, with observation points in every 5th year since 1970 until 2010 produces 800 observations instead of the usual 100 cross-sectional observations. [38]

A final word on the statistical procedures: our country to country analyses of the **cross-correlation** for the global sample are based on the standard **IBM/SPSS CCF algorithm**, which is based on Bartlett, 1946; [39] Box and Jenkins, 1976; [40] Cryer, 1986; [41] and Quenouville, 1949. [42] Else, we rely on the standard canon of cross-national and time series statistical analysis, as universally known by IBM/SPSS users.

Results and discussion: the direct re-analysis of the pro-globalization hypothesis

First, we have to treat our results of the 1:1 preliminary re-analysis of the Mukherjee/Krieckhaus article with great care. There are at least five very serious major methodological complications in such studies, [43] which are often overlooked and which have to be kept in mind when using such pooled data methodologies: first, errors tend to be not independent from a period to the next. Second, errors tend to be correlated across nations. Third, errors tend to have differing variances across ranges or sub-sets of nations. For example, the variance in employment rates will tend to be greater for bigger nations than for small, homogeneous nations. Fourth, errors may contain both temporal and cross-sectional components reflecting cross-sectional effects and temporal effects. Fifth, errors might be non-random across spatial and/or temporal units because parameters are heterogeneous across subsets of units.

Table 1 suggests at first that under the necessary specification of the non-linear trade-off between socio-development and public health performance (polynomial expression of the second order, based on natural logarithm of GDP per capita and natural logarithm of GDP per capita^{2}), the Mukherjee/Krieckhaus article really hit a bull's eye by maintaining that

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[38] See Potestà F. *Tecniche di analisi per la ricerca comparata trans-nazionale. [Techniques of Analysis for the Trans-National Comparative Research].* Milano: Franco Angeli (collana di Metodologia delle scienze umane), 2011

[39] Bartlett MS. **On the theoretical specification of sampling properties of autocorrelated time series.** *Journal of Royal Statistical Society,* **1946**, Series B, 8, 27–27.

[40] Box G. EP., and Jenkins GM. *Time series analysis: Forecasting and control,* Rev. ed. San Francisco: Holden-Day, 1976

[41] Cryer JD. *Time series analysis.* Boston, Mass.: Duxbury Press, 1986.

[42] Quenouville MH. **Approximate tests of correlation in time series.** *Journal of the Royal Statistical Society,* **1949**, Series B, 11, 68–68.

[43] Potestà F. *Recent Developments in Quantitative Comparative Methodology: The Case of Pooled Time-Series Cross-Section Analysis.* Università del Trento: http://www.unibs.it/sites/default/files/ricerca/allegati/1233pode202.pdf, 2002

globalization brings about an improvement in public health. The simple standard partial correlation coefficients, which we present here for reasons of simplicity instead of the more cumbersome, but largely equivalent multiple standard OLS regression analyses, neatly show that indeed, globalization should be good for public health.

Table 1: The effects of globalization on public health performance on a global scale, based on the pooled data analysis of 139 countries, 1970-2010: Constant: log GDP and log GDP^2

	KOF-Index		
	Partial Correlation	**Error p (two-tailed)**	**Degrees of freedom (df.)**
infant mortality	-0.398	0.000	1088
child mortality	-0.341	0.000	1088
life expectancy (total)	0.281	0.000	1088

Table 2 shows, however that different components of the KOF-Index affect the public health performance differently. Here we present standard OLS multiple regression results. The absence of restrictions (direct effects on the availability of pharmaceuticals) and the free flow of information (direct effects on the availability of scientific information in medicine and the free movement for members of the medical profession) have the biggest impact on infant mortality reduction, while other components of the KOF-Index, like actual flows and personal contacts, have less influence on reducing infant mortality rates or even have an infant mortality increasing effect.

Table 2: The effects of globalization on public health performance on infant mortality rates: standard OLS-regression results

	Regression Coefficient B	Standard error	T	Error p.
Constant	388.962	21.385	18.188	0.000
Actual flows (ai)	**0.049**	**0.056**	**0.864**	**0.388**
Restrictions (i.e. absence of restrictions against foreign trade and foreign capital) (aii)	-0.437	0.060	-7.280	0.000
Personal contact (bi)	-0.013	0.071	-0.176	0.860
Information flows (b ii)	-0.358	0.069	-5.218	0.000
Cultural proximity (biii)	-0.151	0.044	-3.432	0.001
log_gdppc_const	-67.730	5.636	-12.016	0.000
log_gdppc_const^2	3.659	0.363	10.069	0.000

Adj. R^2 = 72.1%, F = 287.695, df = 775; Durbin Watson test (DW) = 0.590. (ai), (aii) etc. are expressions from the KOF Index terminology.

The results present the problem that the Durbin Watson test is well below 2.0, the standard value, commonly assumed to be necessary to be able to interpret reasonably pooled time series data.

Since errors may contain both temporal and cross-sectional components reflecting cross-sectional effects and temporal effects, and errors might be non-random across spatial and/or temporal units because parameters are heterogeneous across subsets of units, we will now analyse in the following, whether the effects of globalization flows on infant mortality change over time. This methodology really provides new insights, and its research approach is more sophisticated than the one-catch-all single pooled time series analysis. [44] So, in accordance with current methodological literature, we will now attempt to show the trends of the relationship between globalization flows and public health performance from 1970 to 2005 at five year intervals.

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[44] For an ultimate critique of conventional pooled series analysis, see: Green D. P., Kim S. Y., Yoon D. H. **Dirty pool.** *International Organization.* **2001**, 55(2): 441–468.

Results and discussion: actual globalization flows and public health, decomposing the Mukherjee/Krieckhaus results with their original data for 5-year intervals, 1970-2005

In Table 3, we demonstrate that indeed there is a considerable change in the way how **actual globalization flows** affect infant mortality, under 5 child mortality and life expectancy over time. In our research design, we work with the original data set, friendly provided to us by Mukherjee/Krieckhaus. Although most effects are not significant according to standard statistical criteria (5% error level), it is clear that the **direction** of the effects for most of the time periods is quite **contrary** to what the current globalization-optimistic literature claims should be the case. Especially the years of the end of Communism in Eastern Europe and the former USSR brought about social upheavals, which a particular tradition of public health research described in all details. [45] The public health research and social scientific worldview, inherent in the works of authors like Giovanni Andrea Cornia would point out with justification that globalization policies contributed—through different pathways—to a slowdown in the pace of improvement of the social determinants of health, which, in turn, caused a corresponding deceleration (relative to the 1960-80 trends) in health gains in several, if not all, regions as well as globally.

Figures 4 to 6 show the dramatic current effects of globalization and the openings of markets on average life expectancies in some countries of the world on the basis of World Bank data. Without knowledge of such tendencies, our entire social scientific concept of globalization and public health performance is far from complete. The development reversals and development implosions, which we witness in Figures 4 to 6, are also part and parcel of the process of globalization – the marginalization of parts of Eastern Europe after the end of Communism, the crisis in Africa, and, finally, the devastating effects of the global economic crisis after 2008 in Europe.

In ex-Yugoslavia, this human catastrophe was compounded by the Yugoslav war. Figure 5 shows some other implosions of life expectancy development since 1989, not listed in Figure 4. In several African countries, the effects of the AIDS epidemic on life expectancy are clearly visible. Figure 6 shows the most recent decline in life expectancy in some European countries.

Figures 4-6 are a tale about the devastations, globalization can bring about to certain regions and at certain times. The life expectancy development shortfalls were often called "excess mortalities", and our Figures 4 - 6 show that at certain times and in certain places, the effects of globalization are not only positive, but indeed can bring a premature end to millions of human lives.
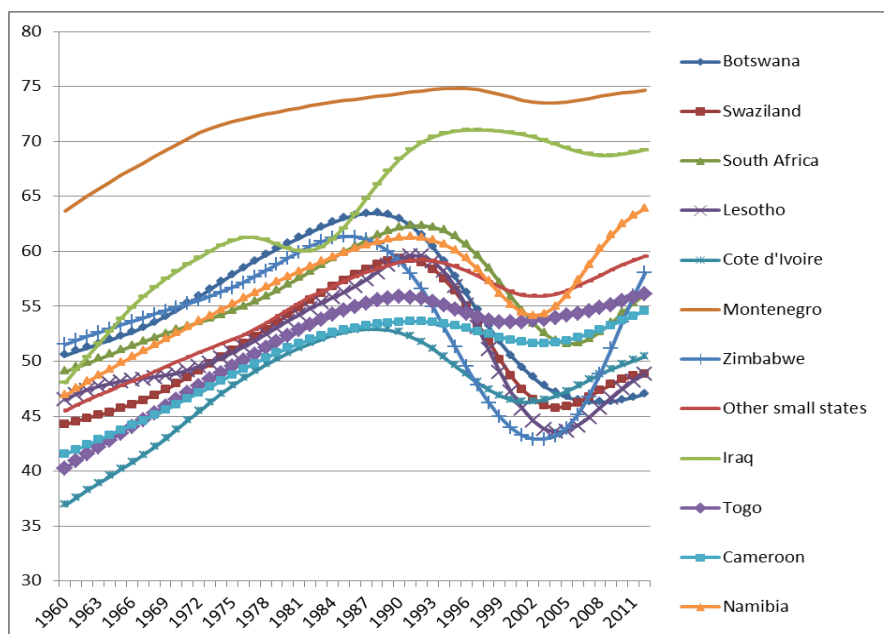
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[45] Cornia G. A..; Rosignoli S., Tiberti L. **Globalization and health: Impact pathways and recent evidence,** *Research paper / UNUWIDER,* No. 2008.74, ISBN 978-92-9230-128-6.

Figure 4: the effects of the end of communism and globalization on life expectancies in some countries of Eastern Europe in the 1990s.


Calculated from: http://data.worldbank.org/indicator/SP.DYN.LE00.IN
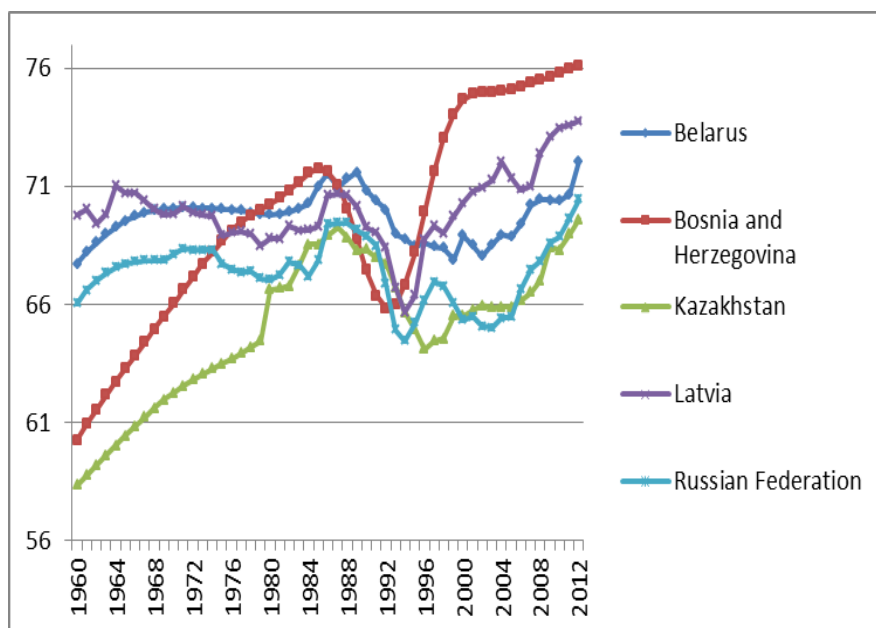
Figure 5: other implosions of life expectancy development 1989-2012 in the world system

Calculated from: http://data.worldbank.org/indicator/SP.DYN.LE00.IN

Figure 6: Life expectancy decline in European Union countries with at least some instances of a diminishing life expectancy over time during the current world economic crisis, 2008-2014

Calculated from: http://data.worldbank.org/indicator/SP.DYN.LE00.IN
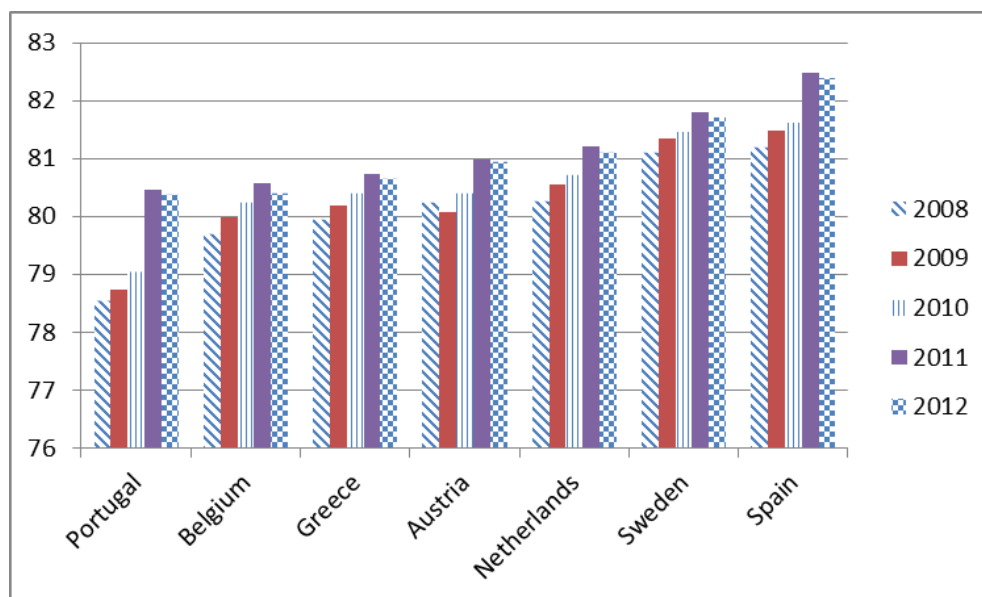
Precisely the research tradition of Cornia and associates, particularly linked to UNICEF, and other international organizations of the United Nations family, highlighted that under present increasingly restrictive rules of access to the international market, further liberalization and globalization hardly would help poor countries to improve their market position, economic efficiency and health status.[46][47] Neoliberal globalization policies, the argument runs, generated larger economic and health gaps between and within countries.

So, the "de-composition" of the data from the Mukherjee/Krieckhaus study suggests that for most of the time period of the last four decades, cross-national data suggest that for a good part of the period under scrutiny, **globalization inflows even implied an aggregate deterioration of public health,** quite in line with the globalization critical studies referred to above. And in addition, under certain circumstances, globalization, economic crises and the AIDS epidemic in Africa can even lead to absolute declines in life expectancies. So this is a far cry from the generalized hypothesis that globalization only brings about well-being and good health.

Table 3 shows the cross-sectional results (based on partial correlation with pairwise deletion of missing values) since 1970. It still might be that on the aggregate level, the pooled analysis suggests a positive relationship between globalization and public health performance, but this relationship conceals the fact that during the period of the end of communism and its

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[46] See for example Cornia G. A. **Globalization and health: results and options.** *Bulletin of the World Health Organization,* 2001, 79 (9), available at: http://www.who.int/bulletin/archives/79(9)834.pdf (accessed: March 10, 2014).

[47] de Vogli. **Neoliberal globalisation and health in a time of economic crisis.** *Social Theory & Health*, **2011**, 9, 311-325. doi:10.1057/sth.2011.16.

aftermath in Europe, there was even a significant a positive relationship between globalization inflows and infant mortality/child mortality.

Table 3: partial cross-national correlations of actual flows with public health performance, 1970-2005 (constant: natural logarithm GDP per capita, natural logarithm GDP per capita^2)

		KOF-Index actual flows							
		1970	1975	1980	1985	1990	1995	2000	2005
partial corr.	infant mortality	0.001	0.036	0.051	0.071	0.075	0.163	0.016	0.005
partial corr.	child mortality	0.012	0.121	0.071	0.151	0.088	0.194	0.026	-0.005
partial corr.	life expectancy	-0.050	-0.027	-0.124	-0.125	-0.060	-0.105	-0.073	-0.067
error p.	infant mortality	0.995	0.719	0.585	0.441	0.395	0.053	0.855	0.953
error p.	child mortality	0.905	0.224	0.451	0.097	0.316	0.023	0.767	0.954
error p.	life expectancy	0.627	0.852	0.184	0.172	0.499	0.214	0.389	0.435
Df.	infant mortality	96	100	114	119	129	139	139	136
Df.	child mortality	96	100	114	119	129	136	132	136
Df.	life expectancy	96	50	114	119	129	140	141	136

The negative partial effect of globalization inflows on life expectancy is strongest during the world economic crises of 1980/85 and again around 1995.

Results and discussion: pooled time series analysis – annual data

In the following, we will perform a **path-analysis** of the annual pooled data about globalization, inequality and public health performance. The research design corresponds to Figure 1. To perform a path analysis, we have to work with a set of complete data, i.e. 99 countries. Figure 7 shows the results of our investigation. Tables 4 and 5 provide the necessary statistical background for interested readers. For the stable Western democracies and the countries of the former Warsaw Pact, there is a considerable inequality reducing effect, while – *ceteris paribus* – Muslim nations tend towards higher inequality, even we keep income levels constant. Globalization leads towards a significant increase in inequality levels (GINI Income Inequality, as documented by the UTIP data base), and the entire equation explains almost 59% of the GINI Inequality. The infant mortality reduction performance is determined to almost 75% by our variables: inequality reduces the infant mortality reduction performance, as do income levels and the status of a country as a former communist nation in Eastern Europe. There is no "separate logic" for the two global population giants, India and China, while – *ceteris paribus* – both the Western democracies and the Muslim nations, independent from their income levels, and levels of inequality, find it more difficult to find efficient models of infant mortality reduction than other countries of the world. However we

should advise our readers about the relatively low values for the Durbin Watson test. This reminds as again about the intricate methodological problems of pooled time series analysis, already highlighted above.

Figure 7: The globalization → inequality → public health nexus, emerging from time series analysis of the world system since 1970 to 2012
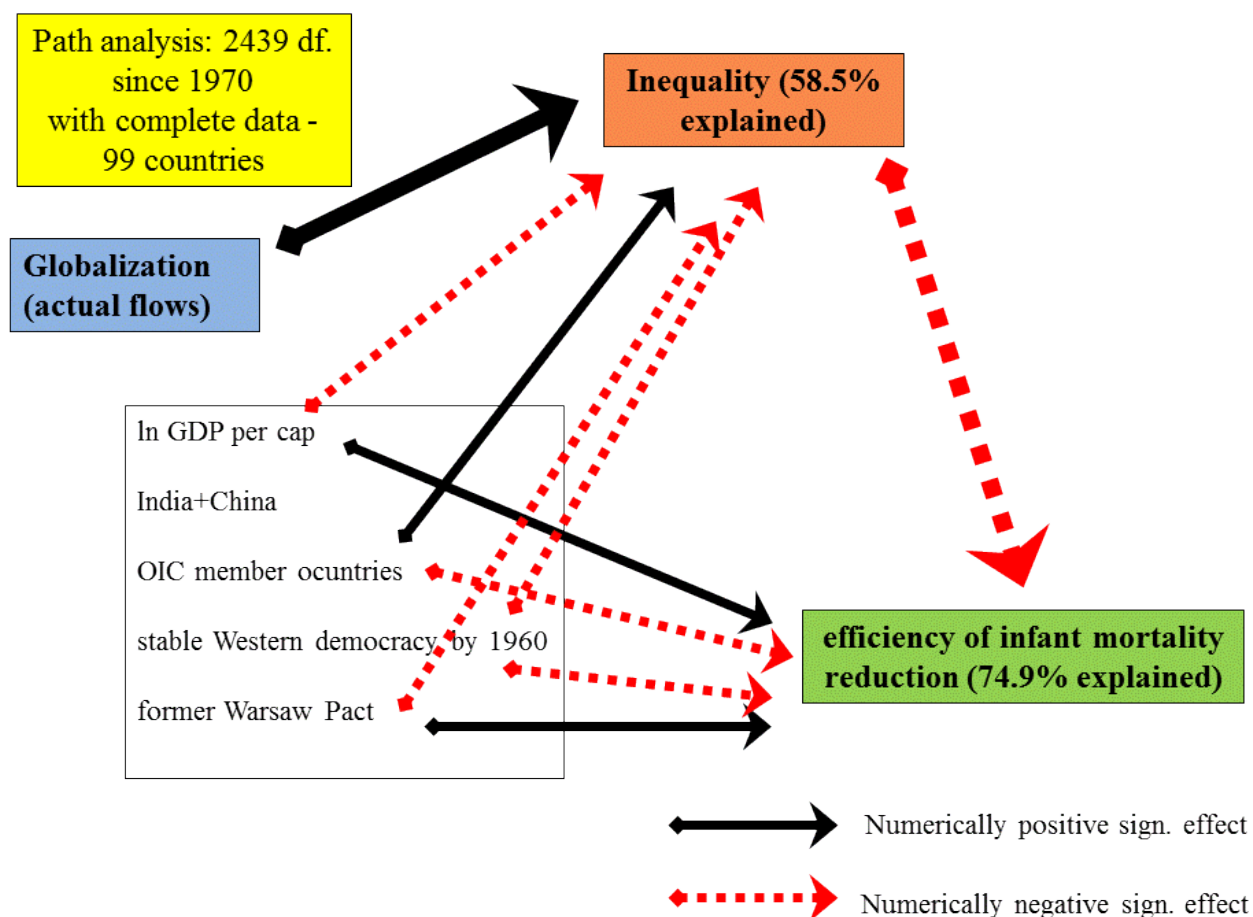
Table 4: explaining inequality (OLS-regressions, based on time series data in the world system from 1970 to 2012)

	Regression Coefficient	Standard error	Beta	T	Error p.
Constant	52.155	0.592		88.161	0.000
globalization (KOF Index, actual flows)	0.902	0.442	0.031	2.039	0.042
ln GDP per cap	-1.052	0.089	-0.245	-11.874	0.000
India+China	-0.034	0.623	-0.001	-0.055	0.956
OIC member countries	1.305	0.238	0.077	5.487	0.000
stable Western democracy by 1960	-7.995	0.291	-0.517	-27.439	0.000
former Warsaw Pact	-10.286	0.458	-0.301	-22.473	0.000

Adj. R^2 = 58.5%. df. = 2439; F = 575.013. error p =.000; DW =.200

Table 5: explaining overcoming of infant mortality (OLS-regressions, based on time series data in the world system from 1970 to 2012)

	Regression Coefficient	Standard error	Beta	T	Error p.
Constant	0.152	0.033		4.570	0.000
inequality	-0.007	0.001	-0.203	-12.876	0.000
ln GDP per cap	0.123	0.002	0.812	54.839	0.000
India+China	0.002	0.017	0.001	0.142	0.887
OIC member countries	-0.073	0.007	-0.121	-11.020	0.000
stable Western democracy by 1960	-0.106	0.009	-0.194	-11.681	0.000
former Warsaw Pact	0.032	0.014	0.026	2.301	0.021

Adj. R^2 = 74.9%, df. = 2439; F = 1214,478, error p =.000; DW =.180

Results and discussion: re-analysis of the country to country evidence, based on cross-correlation time series analysis

To further test the propositions under scrutiny here, we also performed analyses of **cross-correlation** for the global sample, which were based on the standard **IBM-SPSS CCF algorithm**. Only 19 of the 99 nations tested in our analysis (i.e. 19.1%) corresponded to the hypothesis of globalization having the effect of a subsequent **significant** improvement in the public health performance.

In the following map, we visualize our time series analysis results:

+ 2: globalization led to a subsequent better public health performance,

+ 1: globalization was concomitant with a better public health performance,

+-0: no effect is certain, [48]

- 1: globalization was concomitant with a decreased public health performance, and

– 2: globalization led to a subsequent worse public health performance

Map 3: Visualizing the time-series results about globalization and public health performance

source: our own calculations and http://www.clearlyandsimply.com/clearly_and_simply/2009/06/choropleth-maps-with-excel.html
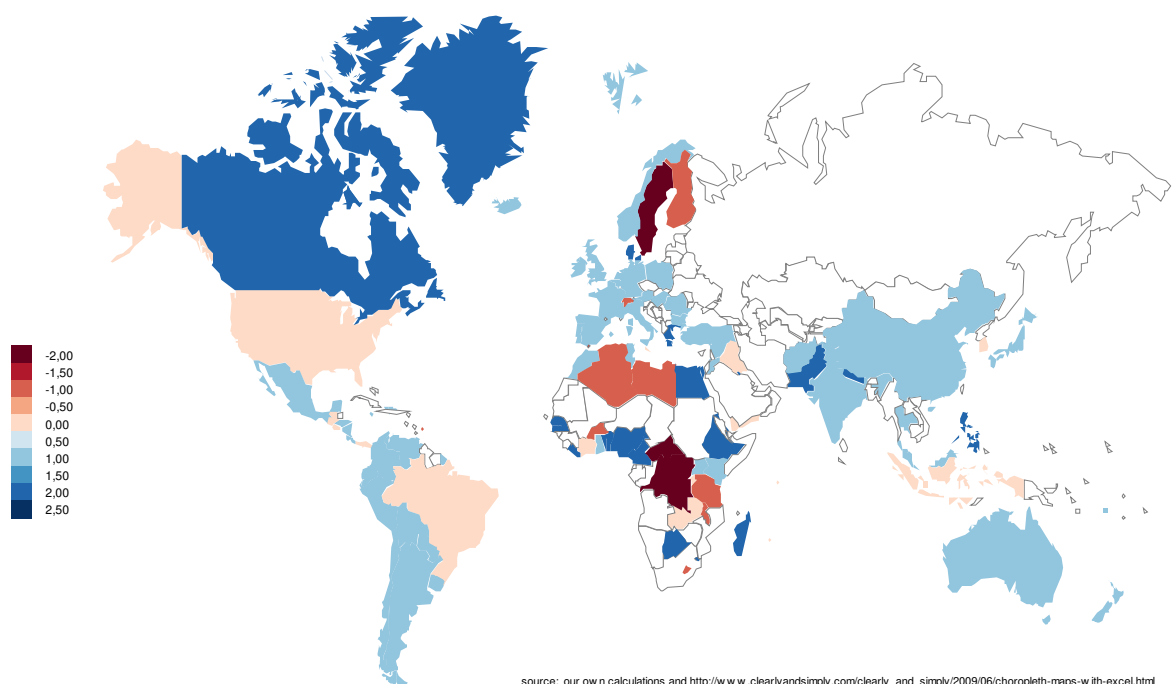
In our map, it again clearly emerges that Canada and much of Pacific Latin America is characterized by positive spill-overs from the globalization process on public health development, just as China and India, Australia and several Southeast Asian and South Asian countries. The United States, Brazil, several European countries and especially several countries in Africa and the Middle East do not correspond to this pattern. Indonesia's time series results also do not correspond to the expectations of pro-globalization neo-liberal public health research.

Results and discussion: the experience of the Arab countries

Quantitative estimates about the real likely effects of current political and social changes in the Arab world on its health systems are still hardly available. [49] Whatever happened on the

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[48] lag structure analysis suggests insignificant effect dependent variable-->globalization; lag structure analysis suggests significant effect dependent variable-->globalization; no real tendency emerges; subsequent insignificant improvement.

political level in these 22 countries: [50] they witnessed a sharp increase in overall globalization, as measured by the KOF-Index of globalization (see appendix). [51] Recent social science and public health literature on the subject [52] [53] [54] as yet did not present multivariate quantitative estimates of the problems to be confronted in this context. [55] Will globalization wield a positive effect for the region's health systems? In Table 6, we highlight the results from our preliminary analyses of cross-correlation based on the standard IBM/SPSS 21 CCF algorithm. Applying this sophisticated and readily available tool of statistical time series analysis, we can make some better-grounded statements about the real effects of globalization on infant mortality reduction and inequality on the social and public health system of each country in the region. Table 6 contains the evidence for the Arab countries with complete data. **Not a single country of the region met the optimistic expectations of those who believe that globalization leads towards a better health and a levelling of income inequality over time, as mainstream economic theory would suggest.** [56] Rather, as it was already suggested in Map 3, **the region as a whole seems to be a global focal point of the contradiction between globalization and social development (public health improvements + levelling of income inequality over time). Only Morocco and Jordan somehow could correspond to the expectations of neoliberal economic theory**, i.e. improvements of the infant mortality reduction performance coinciding with globalization and a levelling of income inequality. Compatible with the findings of social science literature on the subject, already Table 4 and 5 of this article highlighted the independent, quantitative effect of Muslim societies on

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[49] Coutts A., Stuckler D., Batniji R., Ismail S., Maziak W., McKee M. **The Arab Spring and health: Two years on.** *International Journal of Health Services,* Volume 43, Issue 1, 1 January **2013**, Pages 49-60.

[50] Not to forget the humanitarian consequences of civil wars and armed conflicts in the region, see: Guzansky Y. and Striem E. **The "Arab Spring" and Refugees in the Middle East.** *INSS Insight* No. 496, December 12, **2013**. [Institute for National Security Studies (Israel)], available at http://www.inss.org.il/index.aspx?id=4538&articleid=6173.

[51] On neoliberal economic policies in the Arab countries, see Bogaert K. **Contextualizing the Arab Revolts: The Politics behind Three Decades of Neoliberalism in the Arab World.** *Middle East Critique,* Volume 22, Issue 3, **2013,** Pages 213-234.

[52] Byman D. **Israel's pessimistic view of the Arab spring.** *Washington Quarterly,* Volume 34, Issue 3, August **2011**, Pages 123-136.

[53] Bellin E. **Reconsidering the robustness of authoritarianism in the middle east: Lessons from the Arab spring.** *Comparative Politics,* Volume 44, Issue 2, January **2012**, Pages 127-149.

[54] Anderson L. **Demystifying the Arab spring.** *Foreign Affairs,* Volume 90, Issue 3, May **2011**.

[55] Rashad H. **Will the Arab Spring bring better health to Egyptians?** *Bull World Health Organ* [online]. **2011,** vol.89, n.11, pp. 786-787. ISSN 0042-9686. http://dx.doi.org/10.1590/S0042-96862011001100007.

[56] Dollar D. **Is globalization good for your health?** *Bulletin of the World Health Organization,* **2001**, 79, 9: 827-833. The main argument is that the higher growth that accompanies globalization in developing countries generally benefits poor people.

inequality (i.e. they have a higher inequality rate than, *ceteris paribus,* other societies), and the negative effect of Muslim societies on infant mortality reduction performances. [57]

Table 6: The results from country-wise time series analysis for the countries of the Arab League

	globalization->overcoming infant mortality	globalization->inequality
Algeria	subsequent significant deterioriation	subsequent significant improvement
Egypt, Arab Rep.	subsequent significant improvement	subsequent significant deterioriation
Iraq	lag structure analysis suggests insignificant effect dependent variable-->globalization	no real tendency emerges
Jordan	coinciding in time: significant improvement	subsequent significant improvement
Kuwait	subsequent significant improvement	coinciding in time: significant deterioration
Libya	subsequent significant deterioriation	coinciding in time: insignificant improvement
Morocco	coinciding in time: significant improvement	subsequent insignificant improvement
Syrian Arab Republic[58]	coinciding in time: significant improvement	coinciding in time: significant deterioration
Tunisia	coinciding in time: significant improvement	subsequent significant deterioriation
Yemen, Rep.	lag structure analysis suggests significant effect dependent variable-->globalization	no real tendency emerges

Conclusions

One very prominent research tradition, particularly linked to UNICEF, and other international organizations of the United Nations family highlighted that under present increasingly restrictive rules of access to the international market, further liberalization and globalization hardly would help poor countries to improve their market position, economic efficiency and health status. Neoliberal globalization policies, the argument runs, generated larger economic and health gaps between and within countries. By contrast, several recent articles in public health and social science journals questioned the hypothesis that globalization is bad for health outright, and contended even the contrary. Far from refuting the globalization critical research, which characterized much of public health writing in recent years, this article lends cautious support for the hypothesis that globalization increases inequality, which in turn blocks a positive public health performance. Far from falsifying globalization critical research in the traditions of Giovanni Andrea Cornia and Roberto de Vogli, our essay has shown the basic weaknesses of the new "pro-globalization" literature in the public health profession.

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[57] Alvi H. **The Human Rights of Women and Social Transformation in the Arab Middle East.** *MERIA Journal* Volume 09, Number 02 (Jun **2005**).

[58] Currently suspended from Arab League membership.

Only 19 of the 99 nations tested in our analysis (i.e. 19.1%) corresponded to the hypothesis of globalization having the effect of a subsequent **significant** improvement in the public health performance.

Competing interests

The author declares that he/she has no competing interests.

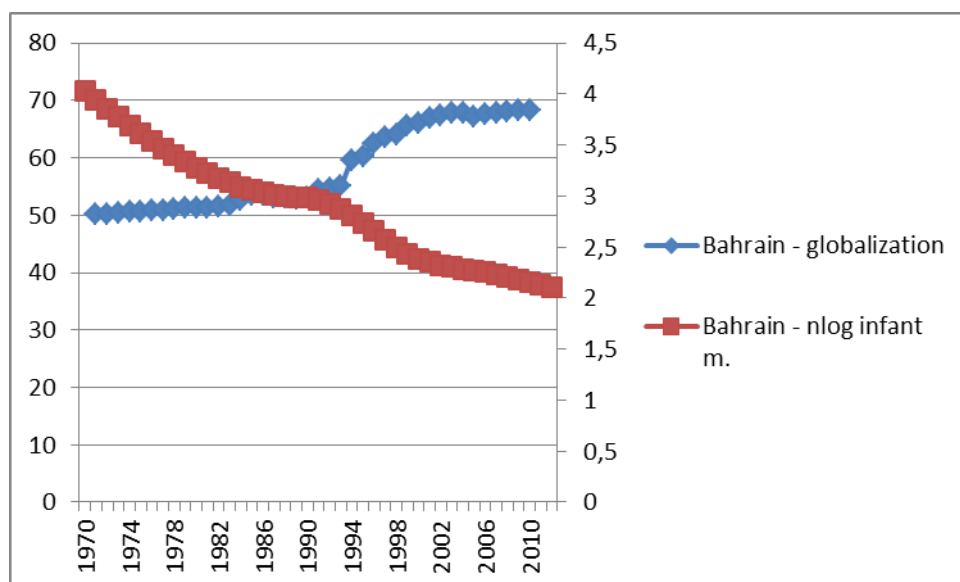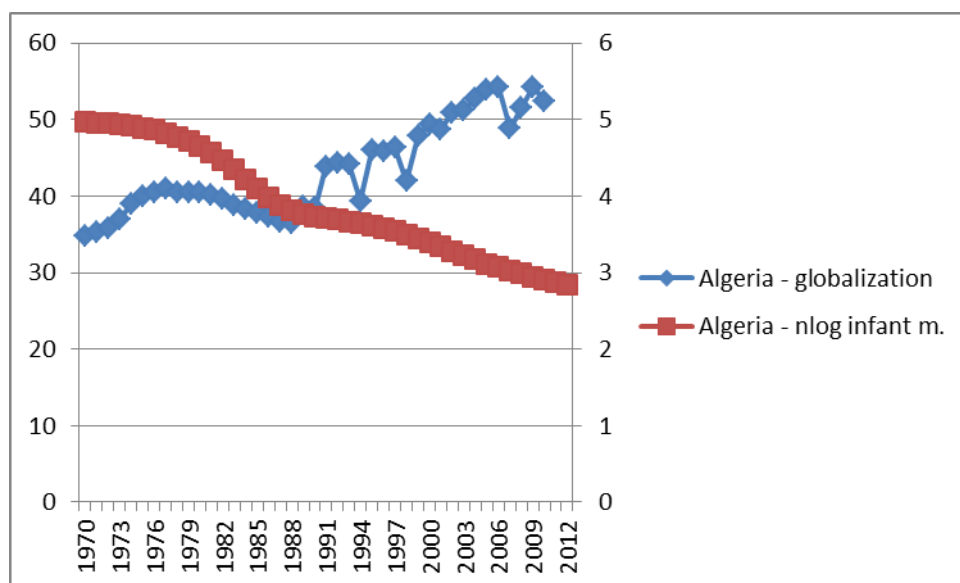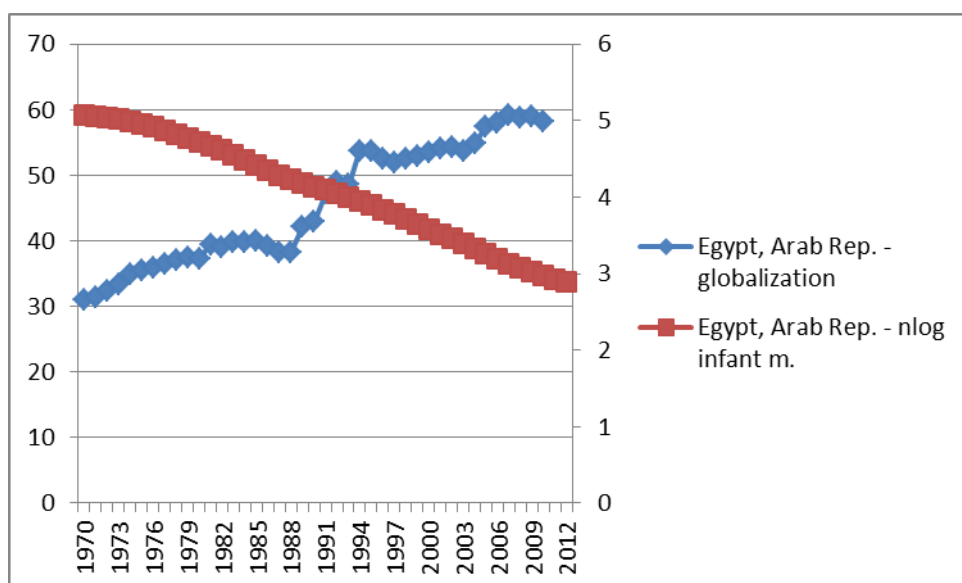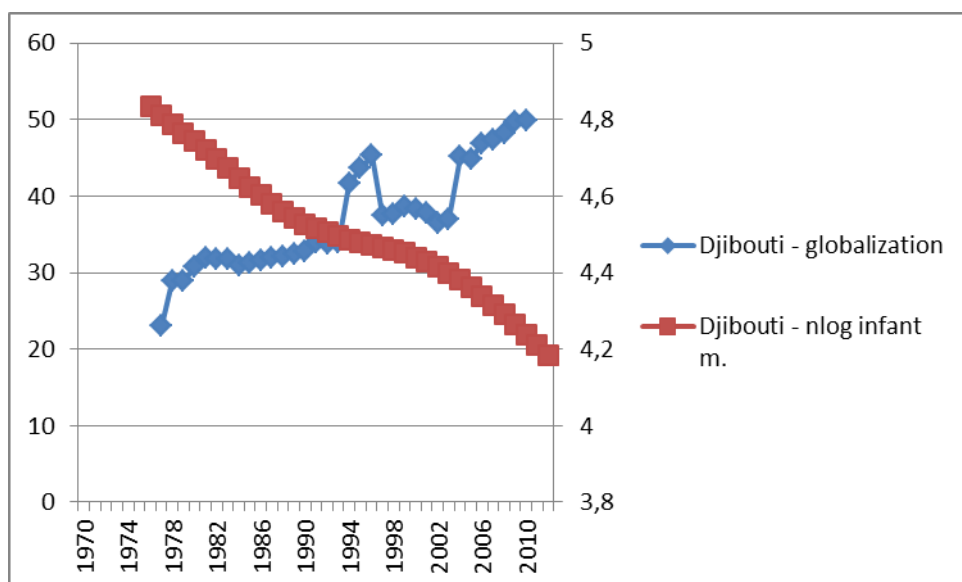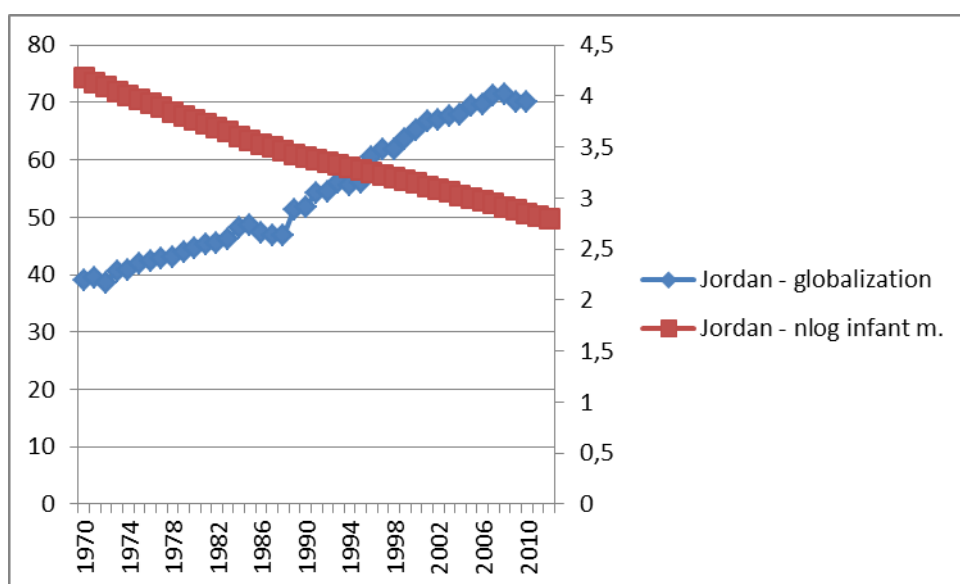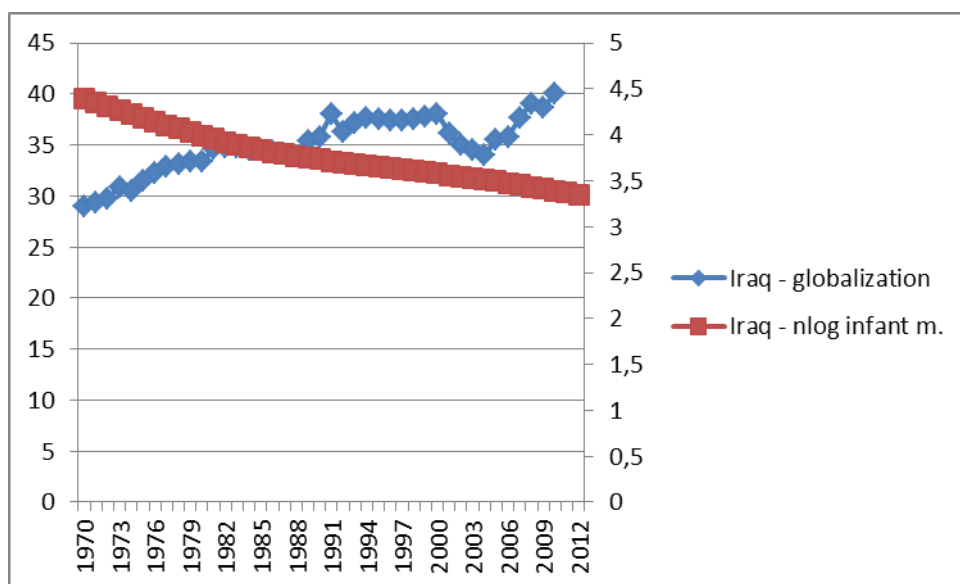## Acknowledgements

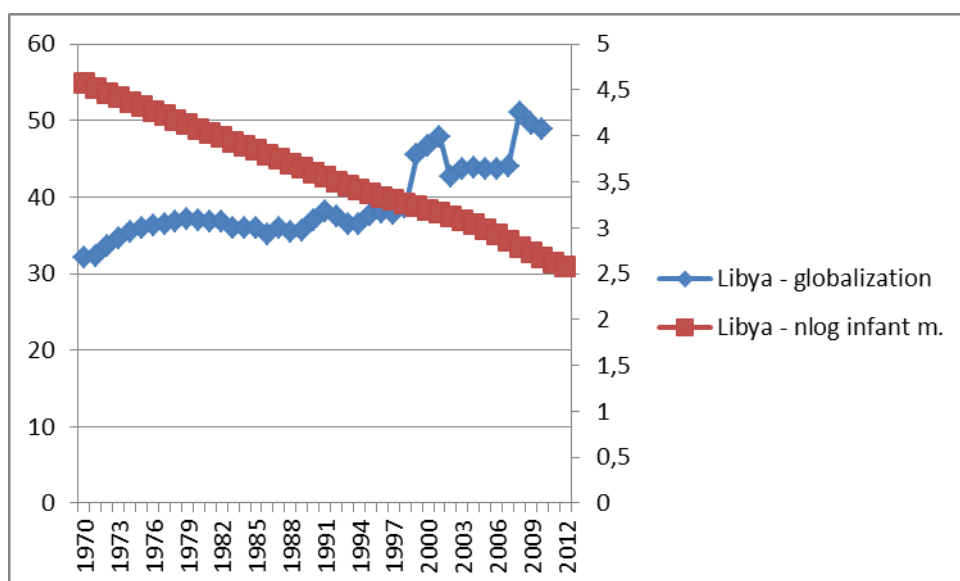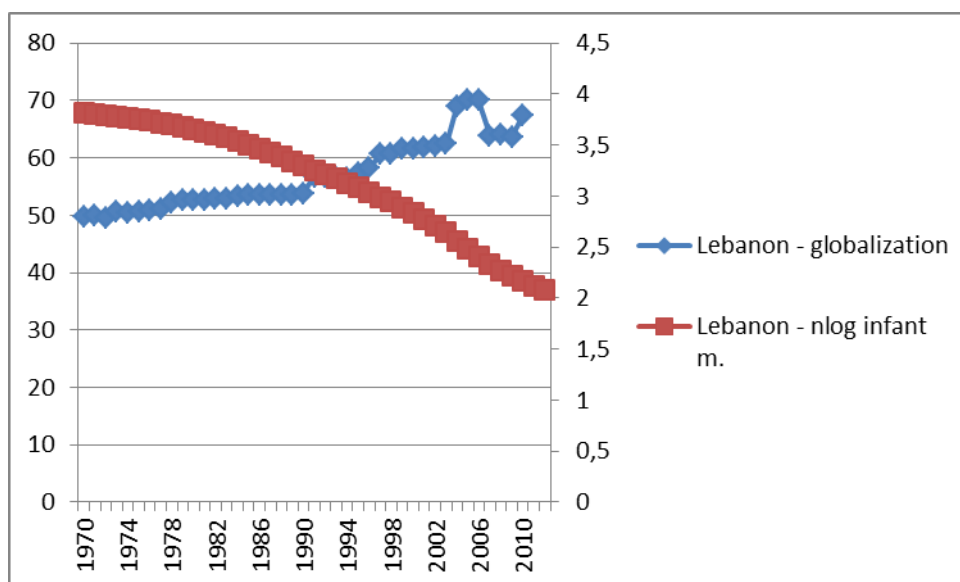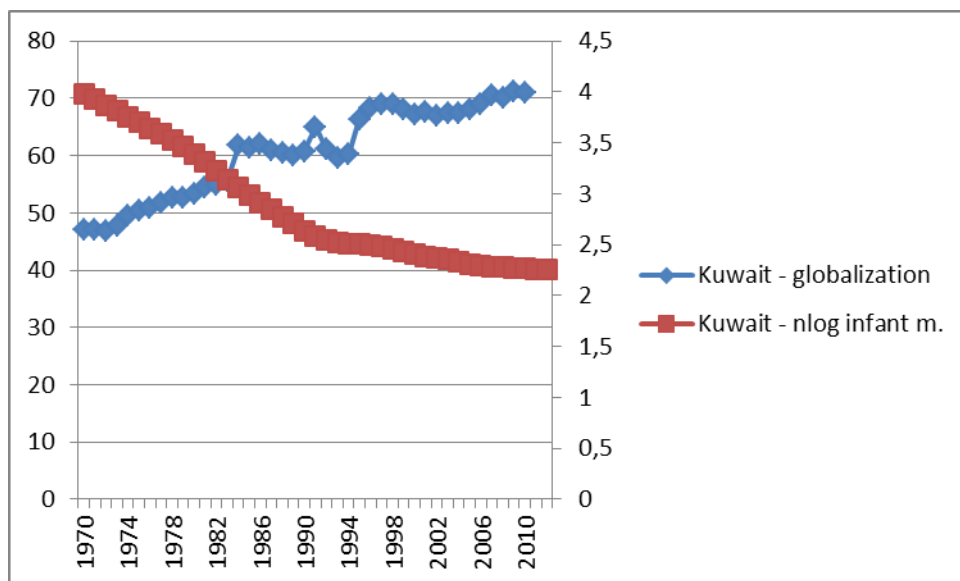# Globalization and infant mortality reduction in the countries of the Arab League

Left-hand scale: KOF Index of Globalization rate (calculated from
http://www.kof.ethz.ch/en/indicators/globalisation-index/)

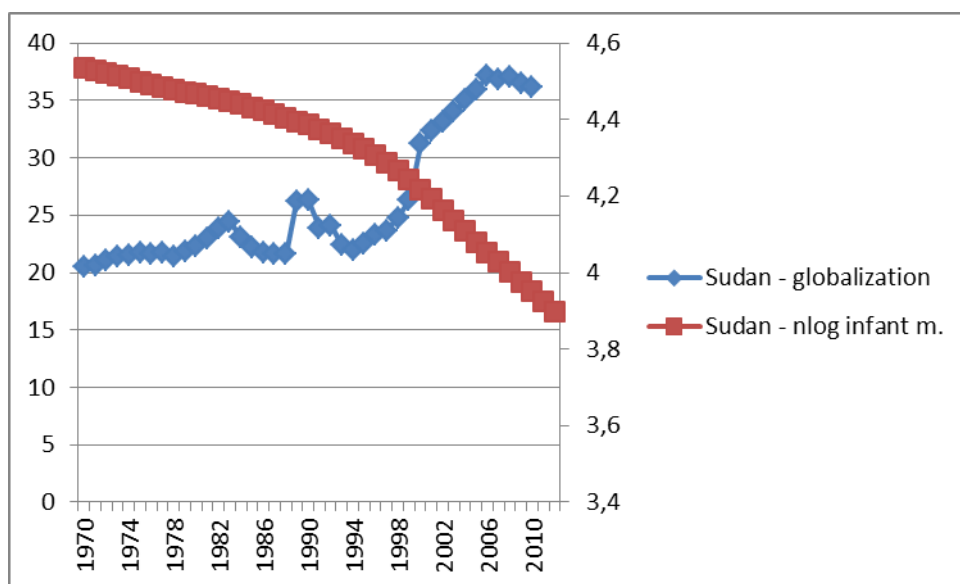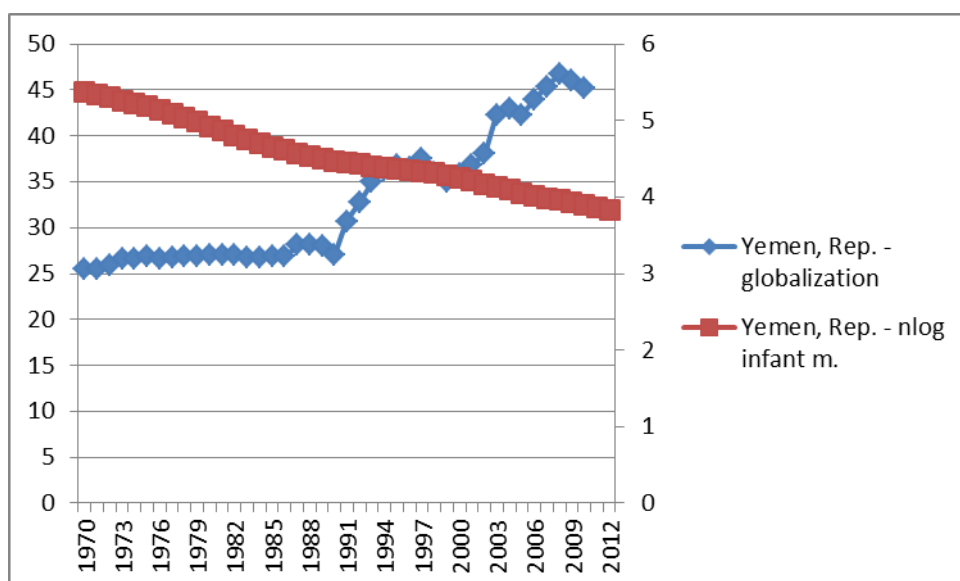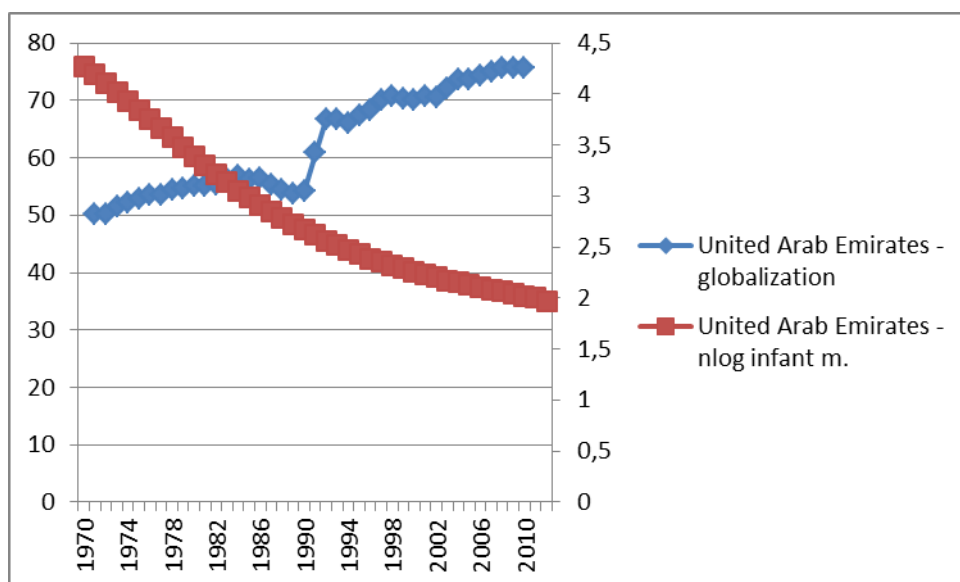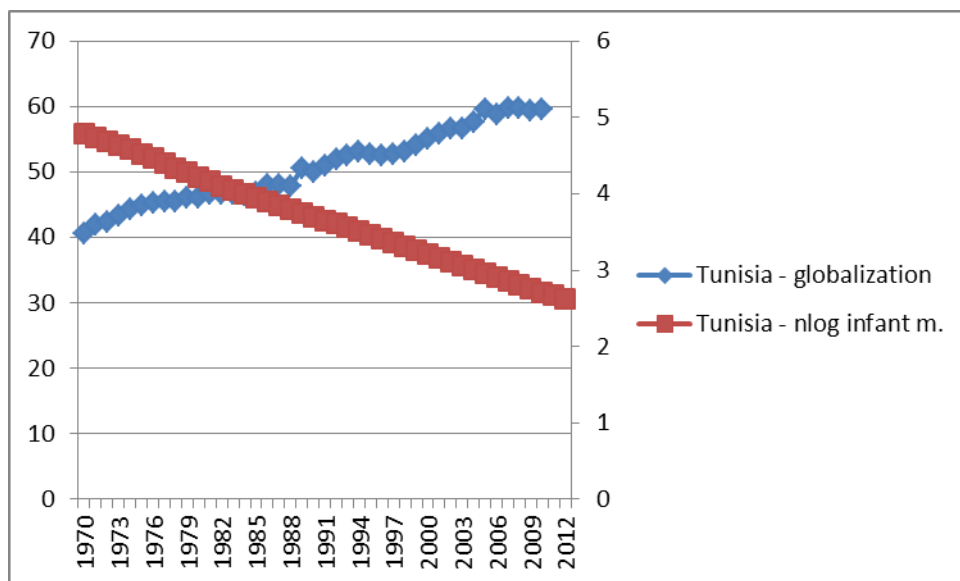Right-hand scale: natural logarithm of infant mortality rate (calculated from http://data.worldbank.org/indicator)
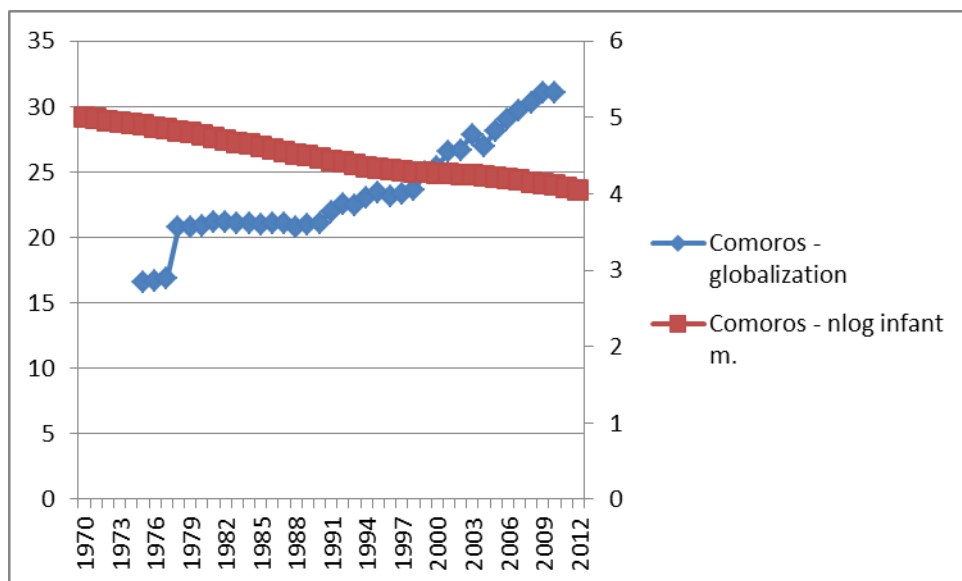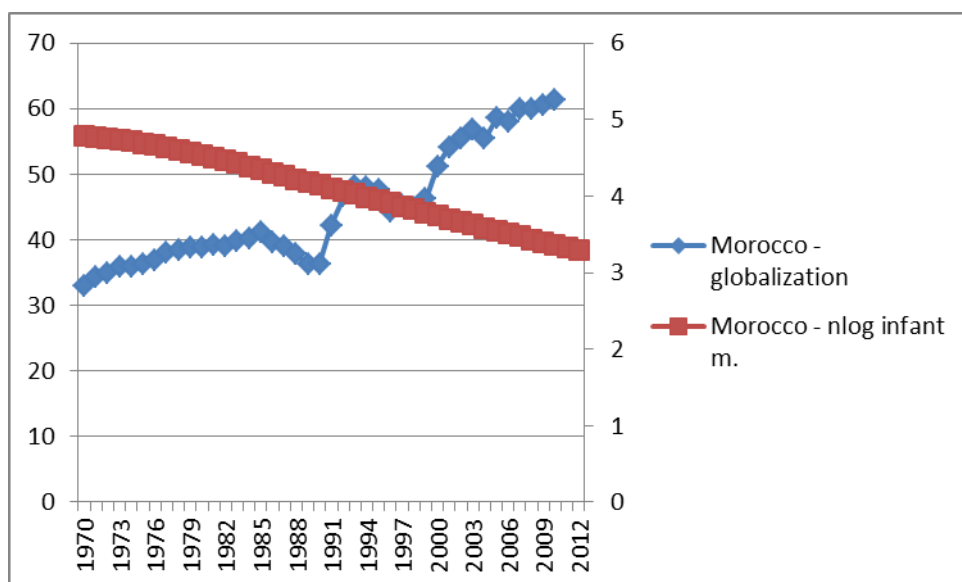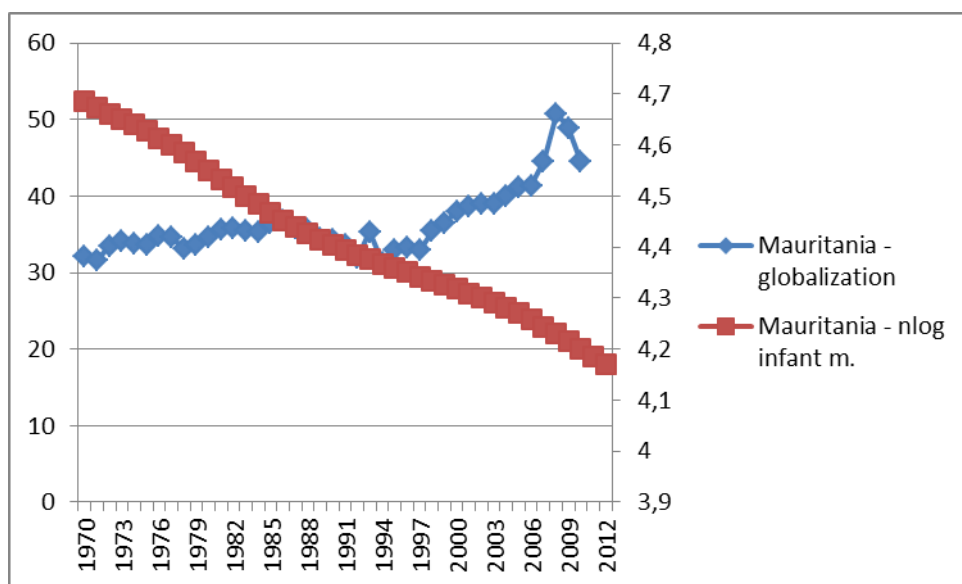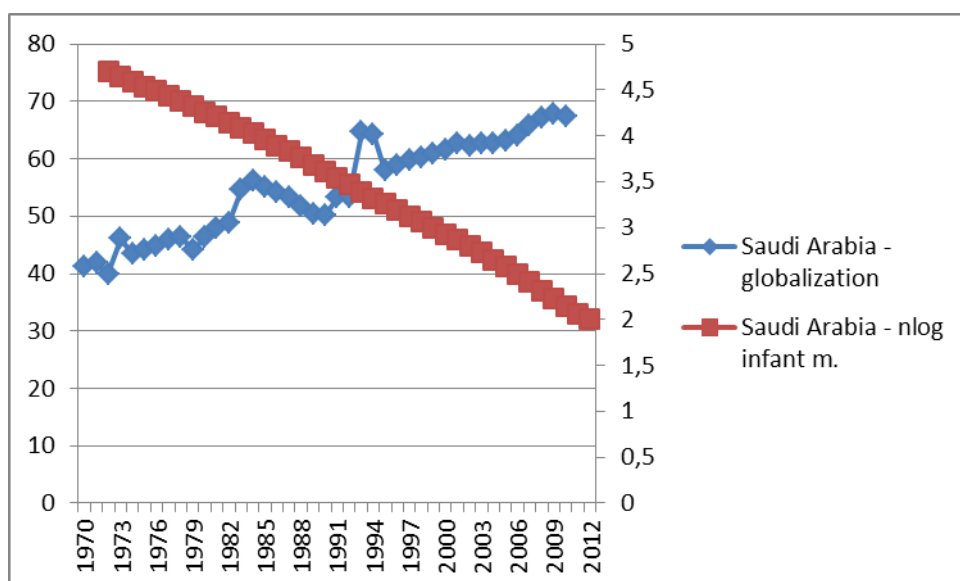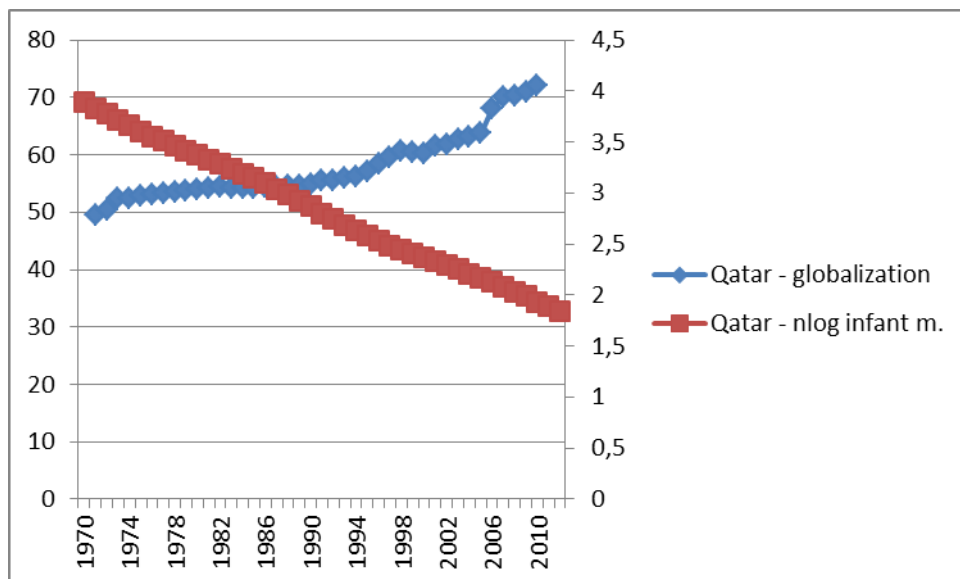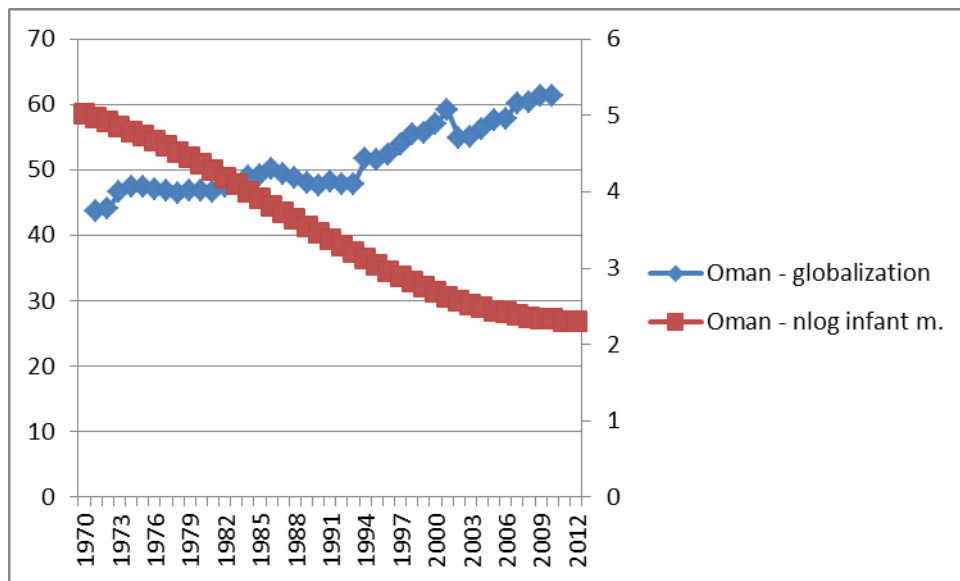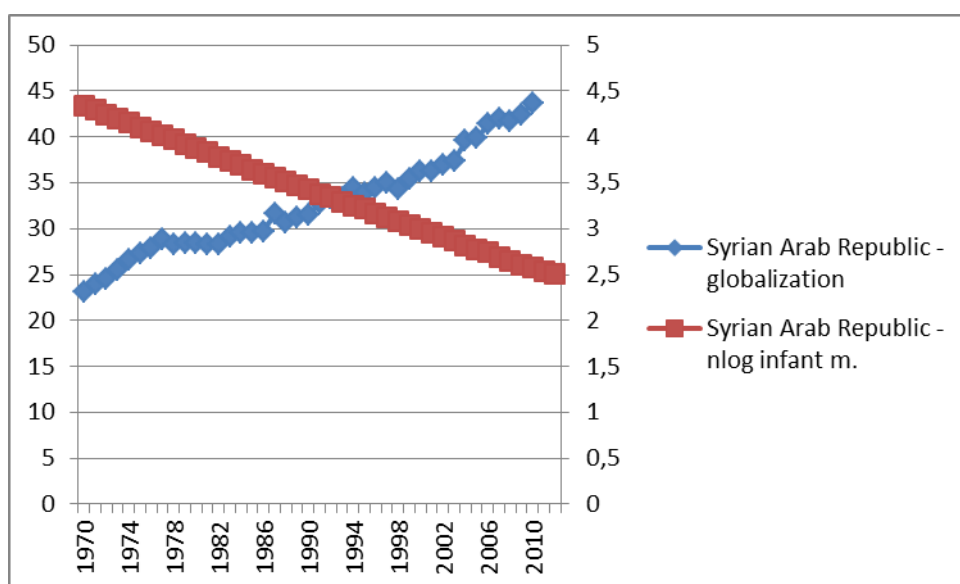
Globalization and income inequality in the countries of the Arab League

Left-hand scale: KOF Index of Globalization rate (calculated from
http://www.kof.ethz.ch/en/indicators/globalisation-index/)

Right-hand scale: GINI Income Inequality (calculated from http://utip.gov.utexas.edu/data.html)