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Original Article

Globalization as a Driver or Bottleneck for Sustainable Development: Some Empirical, Cross-National Reflections on Basic Issues of International Health Policy and Management

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ABSTRACT

Background: This article looks at the long-term, structural determinants of environmental and public health performance in the world system.

Methods: In multiple standard ordinary least squares (OLS) regression models, we tested the effects of 26 standard predictor variables, including the ‘four freedoms’ of goods, capital, labour and services, on the following indicators of sustainable development and public health: avoiding net trade of ecological footprint global hectare (gha) per person; avoiding high carbon emissions per million US dollars GDP; avoiding high CO₂ per capita (gha/cap); avoiding high ecological footprint per capita; avoiding becoming victim of natural disasters; a good performance on the Environmental Performance Index (EPI); a good performance on the Happy Life Years (HLYs) scale; and a good performance on the Happy Planet Index (HPI).

Results: Our research showed that the apprehensions of quantitative research, critical of neo-liberal globalization, are fully vindicated by the significant negative environmental and public health effects of the foreign savings rate. High foreign savings are indeed a driver of global footprint, and are a blockade against a satisfactory HPI performance. The new international division of labour is one of the prime drivers of high CO₂ per capita emissions. Multinational Corporation (MNC) penetration, the master variable of most quantitative dependency theories, blocks EPI and several other socially important processes. Worker remittances have a significant positive effect on the HPI, and HLYs.

Conclusion: We re-analysed the solid macro-political and macro-sociological evidence on a global scale, published in the world’s leading peer-reviewed social science, ecological and public health journals, which seem to indicate that there are contradictions between unfettered globalization and unconstrained world economic openness and sustainable development and public health development. We suggest that there seems to be a strong interaction between ‘transnational capitalist penetration’ and ‘environmental and public health degradation’. Global policy-making finally should dare to take the globalization-critical organizations of ‘civil society’ seriously. This conclusion not only holds for the countries of the developed “West”, but also, increasingly, for the growing democracy and civil society movements around the globe, in countries as diverse as Brazil, Russia, China, or ever larger parts of the Muslim world.

Background

The issues under empirical scrutiny here have an enormous importance for the future of policy-making in environmental politics and public health on a global scale. With the United Nations environmental conference Rio + 20 having ended in Rio de Janeiro, Brazil, in 2012, these substantial issues remain on the table: what are the real drivers and bottlenecks of environmental performance and public health, and what is the role of neo-liberal globalization in the process? And can there be any tendency towards an improvement in environmental and public health trends as long as the global order is being based on

neo-liberal globalization?

In this quantitative research paper, we will thus re-analyse the solid and accumulating macro-political and macro-sociological evidence on a global scale, published in the world’s leading peer-reviewed social science, ecological and public health journals, which seem to indicate that there are indeed serious contradictions between unfettered globalization and unconstrained world economic openness on the one hand and sustainable development for all the countries of the world system on the other hand. For the first time, we evaluate combined evidence about the effects of various manifestations

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of ultra-liberal globalization (and not just one process alone) on an entire variety of indicators, such as the country performance measured by: avoiding net trade of ecological footprint global hectare (gha) per person; avoiding high carbon emissions per million US dollars GDP; avoiding high CO₂ per capita (gha/cap); avoiding high ecological footprint per capita; avoiding becoming victim of natural disasters (number of people per mill inhabitants 1980-2000 killed by natural disasters per year +1); a good performance on the Environmental Performance Index (EPI); a good performance on the Happy Life Years (HLYs) scale; and a good performance on the Happy Planet Index (HPI).

We thus present a new empirical synthesis about peculiar tendencies, already studied by a number of researchers, most notably (1-4) in all detail, who suggested that there seems to be a strong interaction between 'transnational capitalist penetration' and single measures of 'environmental and public health degradation'. Notably enough, not one of these studies used the combined Yale/Columbia indices of the environmental situation, the 'Environmental Sustainability Index (ESI)' and the EPI; available today for a very wide range of countries, and they relied instead on a startling variety of approximately eighteen single major environmental and public health indicators, ranging from carbon dioxide emissions; deforestation; ecological footprint; emission of organic water pollutants; energy use; environmental protection efforts; fertilizer and pesticide consumption; greenhouse gas emissions; growth of ecological footprint; industrial organic water pollution, infant mortality; nitrogen oxides, volatile organic compounds, carbon monoxide and carbon dioxide gas; nitrous oxide emissions; organic water pollution; pesticide consumption; pesticide and fertilizer use; threatened mammal species; total carbon dioxide emissions and emissions per unit of production to water pollution, and infant mortality, often available for only a limited number of developing nations, and often excluding the experience of the countries of East and Central Europe and the former Union of Soviet Socialist Republics (USSR), and other post-communist nations. But none of these studies looked at the effects of the entire variety of globalization processes on the diverse environmental and public health indicators. The current research aims to fill this knowledge gap.

The rest of this paper is organized as follows. In what follows we briefly sketch the main critical theories and earlier major studies on the subject. This is followed by presenting the data and the research design. We will then present our research findings followed by a summary of our conclusions on a global level. The [additional file](#) is also available for readers, which documents our results and act as an invitation for the research community to further use and test our explanations.

Environmental and public health development theory

Due to the usual limitations of space in all the major international social science and public health journals, our sketch of the relevant theories under scrutiny here is very brief. As it is too well-known and even if one risks stating the obvious, the neo-classical/neo-liberal approach, culminating in the *Washington Consensus*, wants open markets and no barriers, and thinks that the private sector is much better equipped than the public sector, and intends to reduce public deficits (5-7). Indicators of 'economic freedom' will be dramatically and positively associated with economic, social and even environmental and public health performance according to

such a reading of realities (8). Declining and restructured public sectors, deregulation and privatization, higher labour market flexibility, higher savings, international competition for locations of productions, international tax competition, price stability and budget consolidation will be the main drivers of efficiency, economic growth, investment, a good public health performance and a cleaner environment.

The omnipresent neo-liberal approach would stress that 'market methods' for pollution control and public health performance are the best alternative available to the world. Economists should care about the determination of fee schedules, issues of spatial and temporal variation in fees or allowable emissions under permits, the life of permits and their treatment for tax purposes, rules governing the transfer of pollution rights, procedures for the monitoring and enforcement of emissions limitations, and so on. In the neo-liberal flagship article on environmental economics, Cropper and Oates welcome the 'growing receptiveness to incentive-based approaches to environmental management' (9).

One very consistent counter-perspective to this neo-liberal *Washington Consensus*, and unfortunately also 'European Commission approach', is the Kalecki-Steindl paradigm (10), based on the works of the political economists Michal Kalecki and Josef Steindl (see [Table 1](#)), emphasizing the factors of anti-cyclical policy (cycle and trend have the same determinants), demand, international cooperation, lower household savings, a rise of the public sector, a rising wage share, tax coordination, technology and educational policy as promoters of economic growth and employment (11-13). The contrast with the contemporary neo-liberal agenda could not be starker.

Dependency and world systems theories, which start from a similar general outlook as the Kalecki-Steindl paradigm, in turn, culminate in predicting with Cardoso, 1979 the following processes to happen:

1. There is a financial and technological penetration by the developed capitalist centres of the countries of the periphery and semi-periphery,
2. This produces an unbalanced economic structure both within the peripheral societies and between them and the centres,
3. This leads to limitations on self-sustained growth in the periphery,
4. This favours the appearance of specific patterns of class relations, and

These require modifications in the role of the state to guarantee both the functioning of the economy and the political articulation of a society, which contains, within itself, foci of inarticulateness and structural imbalance (14).

For these approaches, low comparative price levels, high foreign savings, the openings of the national economies to free production zones, a low MNC outward investment presence on the world markets (MNC headquarter status) and a high MNC penetration-stock of Inward Foreign Direct Investment (FDI) per GDP, as well as a high world economic openness, measured by the export-share per GDP + import-share per GDP, all could constitute possible negative (sustainable) development bottlenecks.

The relatively coherent tendency of these studies suggests that there seems to be a strong interaction between transnational capitalist penetration and environmental degradation and poor public health performance, especially in third world countries

Table 1. The counter-perspective of the Kalecki-Steindl paradigm, compared to the current global neo-liberal agenda in relation to differences in growth strategies (4)

Steindl–Kaleckian growth policy	Current mainstream on growth
Full employment as main political concerns	Price stability and budget consolidation as main political concerns
Demand as growth driver	Supply as growth driver
Higher effective demand to raise employment	Higher labour market flexibility to raise economic growth
Technology and educational policy	Deregulation and privatization
Lower household savings	Higher savings (for investment)
Stable or rising wage share	Falling wage share (real unit labour costs)
Anti-cyclical policy (cycle and trend have the same determinants)	No active anti-cyclical policy (irrelevant for growth path)
Rise of public sector promotes growth (through effective demand)	Decline and restructuring of the public sector (efficiency)
Tax coordination	International tax competition
International cooperation	International competition (location)

(15–29). To date, the most important neo-liberal counter-study to this fledging scientific tradition was the essay by Ehrhardt-Martinez *et al.*, which analysed deforestation rates, 1980–1995 in the developing countries (30).

In this article, we will duly take into account several indicators of globalization and dependency, which are being measured by the following different variables of ‘(in)/dependent development’ [for a more thorough debate on globalization and inequality, see also (31–34)]:

- MNC penetration (MNC PEN) measures the different degrees of weight that foreign capital investments have in the host countries, i.e. the United Nations Conference on Trade and Development (UNCTAD) percentages of the stocks of MNC investments per total host country GDP. This research tradition has been especially developed who predicted a strong negative determination of development by a high MNC penetration, due to the negative consequences that monopolies have on the long term development trajectory of countries (35).
- We also ascertain the growth of MNC penetration over Dynamic Effects from Multinational Corporations Penetration (DYN MNC PEN), from 1995 to 2005. The Bornschier school expected short-term dynamic effects from such MNC penetration increases.
- Equally, Bornschier and his school already developed a high theoretical and empirical awareness about the long-term consequences of the presence or absence of ‘MNC headquarter status’ (MNC HEADQU), measured in our analysis by the indicator MNC outward investments (stock) per GDP. Bornschier and his school expected that a high headquarter status mitigates against the long-term negative effects of MNC penetration.
- FPZ (free production zones) employment as % of total population is the indicator, best suited to measure the new international division of labour (NIDL). Froebel already predicted the unfettered rise of this model (‘export processing zones’), especially in China and Southeast Asia (36). Froebel was followed, among others, by Rondinelli, Ross, and Singa-Boyenge (37–39). Export Processing Zones (EPZ)—or ‘Free Production Zones’ already account for some 80% of the merchandise exports of countries like China, Kenya, the Philippines, Malaysia, Mauritius, Mexico,

Senegal, Tunisia, Vietnam. 3500 EPZs in 130 countries of the world now employ 66 Million people, among these 40 million employees in China.

- ‘Low comparative price levels’ or ‘unequal exchange/unequal transfer’ (40) is operationalized here simply by ERD (exchange rate deviation) or ERDI (exchange rate deviation index), the exchange rate deviation index, which measures the degree, to which globalization has contributed to lowering the international price level of a country; i.e. it is an indicator about the openness of the price system *vis-à-vis* the pressures of dependent insertion into the global economy. Ever since Balassa, (41) and Samuelson (42) economists have linked the comparative price level to the price relationship between tradables and non-tradables. Neoliberals assume that globalization will lead towards a lowering of comparative price levels around the globe. ERD is calculated by the ratio between GDP at purchasing power parities, divided by GDP at current exchange rates (40).
- For dependency authors, foreign savings show the weight that foreign savings, mostly from the centres and richer semi-peripheries, have in the accumulation process of the host countries in the periphery and semi-periphery. It is calculated by the difference between the share of investments per GDP and the share of savings per GDP.

These three theoretical positions—the neo-liberal approach, the ‘neo-Keynesian’ Kalecki-Steindl paradigm, and the dependency-world systems research, inspired a great number of empirical studies not only on economic growth, but also on sustainable development.

The cross-national analysis of the effects of migration patterns on the development of the countries of the world system is only of a more recent date (43,44). Considering the enormous quantity of migration-related human transport and its environmental and public health impacts around the globe, to our knowledge, there is as yet not a single essay available on the relationship between the freedom of movement and the environment and public health. The divisive issue of migration policy divides opinions around the globe, and it also divides opinions among the global social science research community. In dealing with the issue of migration, we first might notice that there is hardly any solid cross-national evidence available about the macro-societal effects of migration on national development.

Most liberal and left of the centre-oriented global political discourse would expect that worker remittances have very general, beneficial general and also environmental and public health effects for the sending countries, and that they amount to a very huge transfer machine of wealth from the rich, migration recipient countries to the poor, migration sending countries (45). Migration is thus seen as a win-win situation (46–48). United Nations Development Program-Human Development Report (UNDP-HDR) maintains that financial remittances are vital in improving the livelihoods of millions of people in developing countries. There is a positive contribution of international remittances to household welfare, nutrition, food, health and living conditions in places of origin. Even those whose movement was driven by conflict can be net remitters, as illustrated in history in Bosnia and Herzegovina, Guinea-Bissau, Nicaragua, Tajikistan and Uganda, where remittances helped entire war-affected communities to survive. In some international migration corridors, money transfer costs have tended to fall over time, with obvious benefits for those sending and receiving remittances. An important function of remittances is to diversify sources of income and to cushion families against setbacks such as illness or larger shocks caused by economic downturns, political conflicts or climatic vagaries (48). Similarly, the UNDP also maintains that there should be significant aggregate gains from movement, both to movers and to destination countries. The destination countries will capture about one-fifth of the gains from a 5 percent increase in the number of migrants in developed countries, amounting to 190 billion US dollars. Immigration increases employment, with no evidence of crowding out of locals, and investment also responds vigorously to immigration. Population growth due to migration increases real GDP per capita in the short run, one-for-one (meaning that a 1 percent increase in population due to migration increases GDP by 1 percent). However, not all of the optimistic forecasts of the liberal migration policy school of thought can be maintained on a 1:1 basis. It cannot be excluded out of hand that inward migration increases—*ceteris paribus*—the environmental and public health strain variables in the migration recipient countries due to the direct, mostly transport related effects a society based on large-scale immigration implies, but also because of the priorities in favour of economic growth and not the environment, which are observable in the majority of the migration sending countries in international value surveys (protecting environment vs. economic growth—data from the latest wave of the World Values Survey, 2004–2007) (49).

Methods

Our investigation duly acknowledges many of the key determinants of economic growth, mentioned in the economic literature (34,50–57), like current shares of the country's inhabitants in total world population, calculated from UNDP data; the famous Heritage Foundation 2000 Economic Freedom Score; absolute geographical latitude, adapted from Easterly's growth theory; the UNDP figures for long-term annual population growth rate, 1975–2005 (%); the trade-off between development level and development performance, otherwise also known in economics as 'conditional convergence' (\ln GDP per capita; \ln GDP per capita 2); the simple (Huntingtonian) fact of whether a country is Muslim country, to be measured by the Organization of Islamic Cooperation (OIC) Membership

or by Muslim population share (Nationmaster); UNDP data on the simple geographical fact of population density (based on the openly available United States CIA's World Factbook); UNDP data on public education expenditure per GDP; and the UNDP education index, combining the enrolment rates at the primary, secondary and tertiary education level. We also take into account UNDP figures on military expenditures per GDP and the openly available US CIA data on military personnel rate, which are key variables of contemporary political science international relations theory and peace research. In our analysis, we also show the theoretical and practical (political) potential of the following drivers of development, which are somewhat a '*terra incognita Australis*' in the hitherto existing macro-sociological debate, like migration and European (Monetary) Union membership [For an extensive list on the usage of these control variables in recent literature, see Tausch and Heshmati study (34)].

The choice of a country to be included in the final analysis (175 countries) was determined by the availability of fairly good data series for these independent variables (if not mentioned otherwise, UNDP data for the middle of the first decade of the new millennium, contained in the dataset Tausch (58)). In the final regressions, we applied the 'listwise deletion of missing values' routine. The statistical design of our study is thus based on the usual, SPSS 20 (SPSS Inc., Chicago, IL, USA) ordinary least square standard regression of the 'kitchen sink type' (54,59) of economic growth and economic, social and political performance in the research tradition of Barro (60). Prior stepwise regression procedures selected the significant among the total list of 26 available predictors. Surveying the vast econometric literature on the subject of the possible drivers and bottlenecks of development of a given country, one also finds support for the inclusion of geographic and demographic variables in the comparative analysis of development success or failure (61–63).

In this research we examined the following main independent variables or predictors (pre-selection of the significant predictors by prior selection, using stepwise regression):

1. % women in government, all levels
2. % world population
3. 2000 Economic Freedom Score
4. Absolute latitude
5. Annual population growth rate, 1975-2005 (%)
6. Comparative price levels (US=1.00)
7. Foreign savings rate
8. FPZ (free production zones) employment as % of total population
9. \ln GDP per capita
10. \ln GDP per capita 2
11. Membership in the Islamic Conference
12. Military expenditures per GDP
13. Military personnel rate \ln (MPR+1)
14. MNC outward investments (stock) per GDP
15. MNC PEN - stock of Inward FDI per GDP
16. MNC PEN: DYN MNC PEN 1995-2005
17. Openness-Index, 1990 (export-share per GDP + import-share per GDP)
18. Population density
19. Public education expenditure per GNP
20. UNDP education index
21. Worker remittance inflows as % of GDP

22. Immigration - Share of population 2005 (%)
23. Muslim population share per total population
24. Net international migration rate, 2005–2010
25. Years of membership in the EU, 2010
26. Years of membership in EMU, 2010

The reported equations for this analysis were chosen from the following dependent variables, which were entered into the final multiple stepwise regressions. These variables correspond to standard knowledge in comparative political science and sociology. The reported equations for this analysis were chosen from the following dependent variables, which were entered into the final multiple stepwise regressions. These variables correspond to standard knowledge in comparative political science and sociology.

1. Ecological footprint (gha/cap)
2. EPI
3. HLYs
4. HPI
5. Avoiding net trade of ecological footprint gha per person
6. ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)
7. Carbon emissions per million US dollars GDP
8. Carbon emissions per capita

Results and Discussion

We will now briefly present the results of our standard OLS multiple regression analyses. In our view, the regression results, presented in the mentioned [additional file](#) of this paper, present the best available choice of variables from both the theoretical as well as statistical perspective. In testing the implications of the competing paradigms, we arrive at the following list of multiple regressions with very significant statistical results ([Table 2](#)).

In what follows we will elaborate on results. First we concentrate on the indicators of the economic freedoms of trade, capital, services and labour.

Our first analysis deals with the impact of world economic openness and hence, the freedom of trade, on the main indicators of the environment. It emerges that the impact of liberal policies on the quality of environmental and public health policy is not necessarily and generally negative. In the world system, some of the most persistent sinners in terms of CO₂ and SO₂ output, poisoning lands, rivers and woodland were the Communist dictatorships, which ruled East-Central Europe until 1989/90.

Thus it is no surprise that world economic openness does not increase, but decreases—*ceteris paribus*—CO₂ emissions per capita.

The significant influence of comparative price levels, measuring the level of services, on our chosen indicators is equally clear. Neo-liberal theories start from the assumption that low comparative price levels will be an advantage for the development process, and high comparative price levels will impede the development trajectory. Our empirical results confirm the fact that a liberal framework does not necessarily impede a good ecological and public health performance. It can be shown that high comparative price levels indeed lead necessarily towards a higher involvement in the net trade of ecological footprint gha per person.

As far as freedom of capital is concerned the main thrust of the serious apprehensions of research, critical of neo-liberal globalization is fully vindicated by the significant effects of the foreign savings rate. High foreign savings are indeed a driver of global footprint, and are a blockade against a satisfactory HPI performance. The NIDL model, based on free production zones or export processing zones, featured in the critical theories of globalization since the 1970s, which best can be measured by the indicator free production zones employment as % of total population, is one of the prime drivers of high CO₂ per capita emissions.

The freedom of labour considerably affects social outcomes. Worker remittances have a significant effect on the environment and public health. They have a positive effect on the HPI and HLYs. We can assume that the export of labour to the world economy indeed has beneficial effects on life quality (HPI, HLYs). We can also assume that the import of labour to the world economy has—*ceteris paribus*—detrimental effects on public health and life quality (HPI, HLYs).

The consensus of a large and ever-growing tradition of research would tend to see the effects of international migration on the recipient countries in very positive terms, the political noise from migra-phobic politicians to the contrary. However, not all of the optimistic forecasts of this liberal school of thought can be maintained empirically or at least on a 1:1 basis. Why should the globalisation of three freedoms - capital, goods and services—be so socially and environmentally destructive in its consequences—as the critical public in Western countries thinks, while freedom number four—labour—should have only positive effects, fully described by neo-liberal economics? Why

Table 2. The properties of the statistical investigations

	Adj R ²	df	F	Error probability of the entire equation
Global footprint	81.200	135	117.592	0.000
Environmental Performance Index (EPI)	78.900	140	88.259	0.000
Happy Life Years	77.100	102	86.653	0.000
CO ₂ per capita	72.700	159	71.594	0.000
Avoiding net trade of ecological footprint gha per person	40.900	138	20.111	0.000
Happy Planet Index	38.000	119	19.217	0.000
Carbon emissions per million US dollars GDP	35.000	144	16.535	0.000
Avoiding becoming victim of natural disasters	14.400	159	7.713	0.000

should one be a globalization critic in the case of the freedom of trade, capital and services, and be neo-liberal at the same time concerning the effects of freedom of labour? We already hinted above at the fact that we can assume from the effects of worker remittances that the import of labour to the world economy has—*ceteris paribus*—detrimental effects on life quality.

Also, the percentage of the population with what today is called an ‘immigration background’ has—*ceteris paribus*—a negative effect on some other key indicators of the environment. Immigration, and all the transport activities it causes, increases without question the CO₂ output of a given society, and it also increases the ratio of carbon emissions per GDP. But there are not only clear-cut detrimental effects. Also, there are positive ones. Interestingly enough, a large share of people with migration background per total population also is significantly associated with a lower number of people per million inhabitants 1980–2000 killed by natural disasters per year, but this ratio might also reflect past migration patterns from disaster prone regions to safer places with less disasters over the earlier decades, reflected in higher ratios of people with migration background per total population decades later.

Now let us analyse the effects of the other, controlling variables. In accordance with neo-liberal approaches, and in discord with the mainstream of globalization-critical research, Economic Freedom as such has a significant positive impact on indicators of the environment and public health. The environmental and public health variable, affected by economic freedom in a good direction, is carbon emissions per GDP.

The UNDP education index as the chosen predictor for the long-standing UNDP human capital propelled development approach has the predicted significant and beneficial effects on EPI, ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1) (reduction of disaster risk).

The significant effects of military expenditures per GDP on the environment and public health are rather limited in comparison to the other drivers and bottlenecks of international development, under investigation here. They significantly diminish the number of HLYs, indicating a *ceteris paribus* negative trade-off not with life expectancy, but with life quality as such, as measured by the HLYs Indicator. The burden of the military effort thus has a limited negative effect on life quality. Our research results suggest that—*ceteris paribus*—high military personnel rates are a bottleneck of the environmental performance, as measured by the Yale/Columbia EPI Index.

The best single measure on the control, which women exercise over the structures of national government, arguably is the indicator ‘% women in government, all levels’, which goes much beyond the ministerial level and looks at different layers of government, i.e. the top political and administrative sphere, where the real decisions on the day-to-day running of a given country are being taken. It is the globally leading indicator of established feminist power. However, there is also a darker side to the whole story, although the effects are only significant at the 7.4% and the 5.2% level. *Ceteris paribus* it holds that structures, where ‘real existing feminism’ plays an important role, are tending towards a higher involvement in the international trade of ecological footprint, the most visible sign of globalization, affecting the environment and public health either as net exporters or net importers of ecological footprint. The result indicate that real existing, established feminist power—under the conditions of ‘real existing globalization’ has not come to

terms positively with all the environmental and public health indicators under scrutiny here.

Our empirical investigations also show that European Union and or European Monetary Union membership have rather small beneficial effects. There are only two significant positive effects to be reported in this context, and both concern a comparable dimension of environmental and public health policy. The member countries of the European Monetary Union are good at reducing ecological footprint. Likewise, years of EU-membership coincide with avoiding net trade of ecological footprint.

We will now look closer at the significant effects of the geographical, demographical and historical determinants of development performance, which cannot be influenced by short-term or, in many cases, even long-term actions of governments, and which have to be interpreted as ‘givens’, which a country faces today.

Let us start with the effects of absolute latitude, a variable, which often appears in the econometrical literature on drivers and bottlenecks of development performance, but which is outside the domain of interest of the mainstream of empirical dependency and world-systems research. Predictably, and due to climatic reasons, latitude has a very strong and significant effect on carbon emissions per million US dollars GDP, and has a considerable negative effect on life satisfaction.

Population density seems to affect the ecological costs of infrastructure, and significantly reduces CO₂ emissions per capita and global footprint. The percentage share of a given country in current world population today, and hence, population size, has an independent and *ceteris paribus* negative development effect on the EPI.

Our empirical results also suggest a new perspective on the curve-linear relationships between development level and environmental and public health development performance. Let us clearly distinguish here between the old ‘Kuznets hypothesis’ of first deteriorating, and then improving income inequalities, and the ‘Matthews effect’ of rising, and then shrinking (economic) growth rates. In our research, we could establish that, after taking care of the direction of the indicators, there is a wide array of first improving and then deteriorating environmental and public health performances. They all concern the environment and the health/basic human needs dimensions including avoiding CO₂ per capita; avoiding global footprint; avoiding net trade of ecological footprint gha per person; EPI; and HPI.

The pessimistic essence of the Kuznets curve with rapidly increasing societal problems and very deficient development performances at middle stages of development holds for the following phenomena of the ecological and public health efficiency of the economy, and avoiding disaster risk. All these effects suggest that ‘*things get worse before they get better*’.

The following variables wield no significant effects: for the globalization critical paradigm of Volker Bornschier, an important control variable was MNC headquarter status. But it has no significant effect on any of our environmental and public health variables under scrutiny here, but it might well affect other processes. Increases in MNC penetration over time had no significant effect on the environment and public health. Net international migration rates, 2005-2010, which is a typical migration flow measure, do not affect significantly any of our environment and public health development indicators.

Also, the *ceteris paribus* effects of membership in the Islamic Conference and Muslim population shares cannot be reduced to a simplistic reasoning. They do not affect any of our chosen environmental and public health indicators in a significant way. Also, the share of public education expenditures per GDP has no significant effects on any of our environmental and public health indicators. Annual population growth also has no significant effect on any of the environmental and public health development indicators.

Our results should be seen in the framework of the recent tendency of cross-national research to focus on the effects of ‘smart development’ and ‘environmental and public health cross-national economics’ (34,44,64–69).

The growing democracy and human rights movement in many countries around the globe could find in such an approach an important tool to further analyse social, environmental and public health realities from the scientific perspective of rigorous quantitative analysis, based on the analysis of recognized international data in the philosophical framework of ecumenical Enlightenment and humanism (7,34,58,69–100).

Conclusion

This study set out to examine the long-term, structural determinants of environmental and public health performance in the world system. The results suggest that for the countries of the world system, we should state first of all that not all liberal approaches to environmental and public health policies are falsified. In accordance with neo-liberal approaches, and in discord with the mainstream of globalization-critical research, Economic Freedom has a significant positive impact on indicators of the environment and public health. It also emerges that world economic openness does not increase, but decreases—*ceteris paribus*—CO₂ emissions per capita. The significant influence of lowering comparative price levels, i.e. the globalization of services, on our chosen indicators is equally clear. Our empirical results confirm the fact that a liberal framework does not necessarily impede a good ecological and public health performance. It can be shown that high comparative price levels indeed lead necessarily towards a higher involvement in the net trade of ecological footprint gha per person. Reducing the net trade of ecological footprint gha per person is intrinsically linked to the globalization of services.

What are then the effects of the globalization of goods, labour and capital on the environment and public health? Only a part of the main thrust of research, sympathizing with globalization critical movements, which is so prominent today in the literature, is fully vindicated by the significant effects of the foreign savings rate. High foreign savings, and hence, a reliance on foreign sources of savings, are indeed a driver of global footprint, and are a blockade against a satisfactory Happy Planet Index performance. The NIDL model, emerges one of the prime drivers of high CO₂ per capita emissions. MNC penetration, the master variable of most quantitative dependency theories, blocks EPI. Worker remittances have a significant positive effect on the HPI, and HLYs. The percentage of the population with an ‘immigration background’ has—*ceteris paribus*—a negative effect on some other key indicators of the environment and public health. Immigration, and all the transport activities it causes, increases the CO₂ output of a given society, and it also increases the ratio of carbon emissions per GDP.

We re-analysed the solid macro-political and macro-

sociological evidence on a global scale, published in the world’s leading peer-reviewed social science, ecological and public health journals, which seems to indicate that there are contradictions between unfettered globalization and unfettered world economic openness and sustainable development and public health development. Like several recent studies, most notably (1–4) we suggest that there seems to be a strong interaction between ‘transnational capitalist penetration’ and ‘environmental and public health degradation’. Global policy-making finally should dare to take the globalization-critical organizations of ‘civil society’ seriously (101). This conclusion not only holds for the countries of the developed “West”, but also, increasingly, for the growing democracy and civil society movements around the globe, in countries as diverse as Brazil, Russia, China, or ever larger parts of the Muslim world.

Ethical issues

Opinions expressed in this article are exclusively those of the author in his academic capacities.

Competing interests

None.

Author’s contribution

AT is the single author of the manuscript.

Additional files

Additional file: Contains the supplementary table.

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