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7 September 2011

Online at <https://mpra.ub.uni-muenchen.de/33227/>

MPRA Paper No. 33227, posted 12 Sep 2011 13:35 UTC

# Globalization as a driver or bottleneck for sustainable development. General tendencies and European implications

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## **ABSTRACT**

This article looks at the long-term, structural determinants of environmental performance in the world system. In multiple standard OLS regression models, we test the effects of 26 standard predictor variables, including the ‘four freedoms’ of goods, capital, labour and services, on the following indicators of sustainable development

- ◆ avoiding net trade of ecological footprint gha per person
- ◆ Carbon emissions per million US dollars GDP
- ◆ CO2 per capita
- ◆ Environmental Performance Index (EPI)
- ◆ Global footprint per capita
- ◆ Happy Life Years
- ◆ Happy Planet Index
- ◆ ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)

Our research shows that the apprehensions of quantitative globalization critical research are fully vindicated by the significant negative environmental effects of the foreign savings rate. High foreign savings are indeed a driver of global footprint, and are a blockade against a satisfactory Happy Planet Index performance. The New International Division of Labour (NIDL)-model (Froebel et al., 1980) is one of the prime drivers of high CO2 per capita emissions. MNC penetration, the master variable of most quantitative dependency theories, blocks environmental performance (EPI-Index) and several other socially important processes. Worker remittances have a significant positive effect on the Happy Planet Index, and Happy Life Years.

**Keywords:** International Relations and International Political Economy, International Migration

JEL Classification Numbers: F5, F22

# 1. Introduction

The issues under empirical scrutiny here have an enormous importance for the future of policy-making on a global scale and also in Europe. The EU-2020 strategy, which substitutes the now defunct ‘Libson agenda’, which was the main policy strategy of the European Union from 2000 to 2010<sup>1</sup>, now aims to make Europe a lot ‘greener’ by 2020. Europe must acquire, so the reasoning of Commission President José Manuel Durao Barroso ([http://ec.europa.eu/commission\\_2010-2014/president/about/political/index\\_en.htm](http://ec.europa.eu/commission_2010-2014/president/about/political/index_en.htm)), global leadership on climate change and developing new sources of sustainable growth and social cohesion. Europe should become a low emission economy, and should move in particular towards decarbonising our electricity supply and the transport sector and should develop clean and electric cars<sup>2</sup>. Barroso underlines on the other hand his unmistakable belief in globalization and ‘world economic openness’ as a driver of Europe’s future strategy:

*‘Openness is critical to Europe's future competitiveness. This is not just a question of political preference. It is in our self-interest as the world's leading exporter.’*  
([http://ec.europa.eu/commission\\_2010-2014/president/about/political/index\\_en.htm](http://ec.europa.eu/commission_2010-2014/president/about/political/index_en.htm))

It is clear that the EU-2020 strategy is nowadays somewhat in the shadow of the grave financial turbulences, currently threatening the Euro-Zone. For this reason, readers of this article might think in a first moment that Europeans should better bother about other things and not so much about environmental problems. Yet the question writing how to make Europe a lot ‘greener’ by 2020, how to acquire global leadership on climate change and developing new sources of sustainable growth and social cohesion, how to become a low emission economy, and how to move in particular towards decarbonising our electricity supply and the transport sector and how develop clean and electric cars has a universal message, not just a European one, and has implications especially also for the other highly-developed Western democracies, such as Australia, Canada, Israel, Japan, New Zealand and the United States of America.

In this quantitative research paper, we will re-analyze the solid and accumulating macro-political and macro-sociological evidence on a global scale, published in the world’s leading peer-reviewed social science journals, which seems to indicate that there are indeed serious contradictions between unfettered globalization and unfettered world economic openness and sustainable development for all the countries of the world system, and not just the countries of the European Union. For the first time, we link the deliberations about the EU-2020 strategy with the relatively coherent tendency of these recent studies, most notably Dick and Jorgenson, 2010; Jorgenson and Burns, 2007; Jorgenson, 2003; 2004a, 2004b; 2005; 2006a, 2006b; 2007a, 2007b; 2008; 2009a, 2009b; Jorgenson, and Burns, 2004; Jorgenson, Dick, and Mahutga, 2007; Jorgenson, Kuykendall, and Kennon 2008; Lawrence, 2009; Longo and York, 2008; Mostafa and Nataraajan, 2009; Mostafa, 2010a, 2010b; Nugent, and Shandra, 2009; Shandra, 2007a, 2007b; Shandra, and London, 2008; Shandra, Leckband, and London, 2009; Shandra, Leckband, McKinney, and London 2009; Shandra, London, Whooley, and

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<sup>1</sup> to make the EU "the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion", by 2010 (see: [http://www.europarl.europa.eu/summits/lis1\\_en.htm](http://www.europarl.europa.eu/summits/lis1_en.htm) )

<sup>2</sup> [http://ec.europa.eu/europe2020/index\\_en.htm](http://ec.europa.eu/europe2020/index_en.htm)

Williamson, 2004; and finally Shandra, Shor, and London, 2008, 2009, who all suggested that there seems to be a strong interaction between what these empirical studies tend to call ‘transnational capitalist penetration’ and ‘environmental degradation’.

The rest of this study is organized as follows. In section 2, and due to limitations of space, we only very briefly sketch the main critical theories and earlier major studies on the subject. Section 3 presents the data and the research design. The main results are presented in Section 4, while Section 5 finally summarizes the study, while the appendices should document our results and should be an invitation for the research community to further use and test our explanations.

## 2. Environmental development theory

Due to the usual limitations of space in international social science journals, our sketch of the relevant theories under scrutiny here is very brief indeed. Let us start with what could be termed as the official neo-liberal ‘Bursels/Paris Consensus’ of the EU-Commission and the OECD. For the European Commission, the main threat today is not globalization, but significant fiscal deficits and rising debt ratios, together with the costs of ageing populations, which pose the most significant challenge for fiscal sustainability<sup>3</sup>. For the Commission, first of all a stable and well-functioning financial sector is necessary after the 2008 crisis. Member States, which do not tap their full employment and productivity growth potential because of sectors with low competition, a weak business environment and obstacles to employment and labour reallocation, must act. Appropriate labour market reforms are needed in a number of countries so as to increase wage flexibility, reduce segmentation and improve incentives to work for all. An efficient regulatory business environment, administrative efficiency as well as promoting a higher degree of competition must be provided; Member States face important challenges regarding the human capital endowment and upgrading of their economies.<sup>4</sup> As it is too well known and one even risks stating the obvious, the neo-classical/neo-liberal approach, culminating in the **Washington Consensus** and the **Brussels/Paris-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 (see Tausch/Ghymers, 2006). Indicators of ‘economic freedom’ will be dramatically and positively associated with economic, social and even environmental performance. Declining and restructured public sectors, deregulation and privatization, falling wage shares higher labour market flexibility, higher savings, international competition for locations of productions, international tax competition, no active anticyclical policy price stability and budget consolidation will be the main drivers of efficiency, economic growth, investment, and a cleaner environment.

The omnipresent<sup>5</sup> neo-liberal approach would exactly maintain such a position, by stressing that ‘market methods’ for pollution control are the best alternative. Economists should care about the determination of fee schedules, issues of spatial and temporal variation in fees or

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<sup>3</sup> COUNCIL OF THE EUROPEAN UNION, Brussels, 4 June 2010, 10731/10, ECOFIN 345; COMPET 191; SOC 404; NOTE from The General Secretariat of the Council to Delegations. Subject: Report on EU macro-structural bottlenecks to growth at the national level. Available from: [register.consilium.europa.eu/pdf/en/10/st10/st10731.en10.pdf](http://register.consilium.europa.eu/pdf/en/10/st10/st10731.en10.pdf)

<sup>4</sup> See note above

<sup>5</sup> With 316 quotations in the ISIW-Web of Science documentation system, the analysis by Cropper and Oates is the most often quoted article in the field of global ‘environmental economics’

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'* (Cropper and Oates, 1992: 728-731).

One very consistent counter-perspective to this *'Commission approach'* is the **Kalecki/Steindl-paradigm** (see Guger/Marterbauer/Walterskirchen, 2004), based on the works of the political economists Michal Kalecki (June 22<sup>nd</sup> 1899 – April 17<sup>th</sup> 1970) and Josef Steindl (April 14<sup>th</sup> 1912 – March 7<sup>th</sup> 1993), emphasizing the factors of anticyclical 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 (Kalecki, 1943, 1966, 1968, 1968, 1971, 1971, 1979, 1996, Kalecki and Feiwel, 1972; Steindl, 1952, 1979, 1988, 1990). The contrast with the contemporary neo-liberal agenda could not be starker:

**Table 1: The counter-perspective of the Kalecki-Steindl-paradigm, compared to the current global neo-liberal agenda**

Differences in growth strategies	
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)
Anticyclical policy (cycle and trend have the same determinants)	No active anticyclical 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)

Source: Guger/Marterbauer/Walterskirchen, 2004

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

- There is a financial and technological penetration by the developed capitalist centres of the countries of the periphery and semi-periphery,
- This produces an unbalanced economic structure both within the peripheral societies and between them and the centres,

- This leads to limitations on self-sustained growth in the periphery,
- 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 (Cardoso, 1979).

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 PEN - stock of Inward 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.

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 through debate on globalization and inequality, see also: Herkenrath and Bornschier, 2003; Herkenrath, Koenig, Scholtz, and Volken, 2005; Heshmati, 2003, 2006, 2006, 2007; Heshmati and Lee, 2010; Heshmati and Oh, 2006; Heshmati and Tausch, 2007).

- **MNC penetration** (MNC PEN) measures the different degrees of weight that foreign capital investments have in the host countries, i.e. the UNCTAD percentages of the stocks of multinational corporation investments per total host country GDP. This research tradition has been especially developed, as we already mentioned, by the Swiss sociologist Volker Bornschier and his school. Bornschier and his school predicted a strong negative determination of development by a high MNC penetration, due to the negative consequences, monopolies have on the long term development trajectory of countries
- We also ascertain the **growth of MNC penetration over time (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/Heinrichs and Kreye, 1980 already predicted the unfettered rise of this model ('export processing zones'), especially in China and Southeast Asia. Froebel/Heinrichs/Kreye, 1980 was followed, among others, by the studies Ross, 2004; and Singa-Boyenge, 2007. Export Processing Zones (EPZ) – or '**Free Production Zones**' already account for some 80 percent 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' (Kohler/Tausch, 2001) is operationalized here simply by ERD or ERDI, 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, 1964 and Samuelson, 1964, 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 (Kohler/Tausch, 2001).

- 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.

A real ‘**growth industry**’ of macro-quantitative sociological, and political science research over the last years looked empirically at the ‘bottlenecks’ and ‘drivers’ of the environmental situation of the countries of the world system. But as yet, notably enough, not a single of these studies used the combined Yale/Columbia indices of the environmental situation, especially the ‘*Environmental Performance Index (EPI)*’, available today for a very wide range of countries. These studies relied instead on a startling variety of approximately 18 major environmental 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 nations, and often excluded the experience of the countries of East and Central Europe and the former USSR, and other post-communist nations.

From a conceptual viewpoint, this de-facto exclusion of former (in Eastern Europe and the former USSR) or continuously Communist nations (in Asia and in Cuba) in most of the most widely circulated research publications is a major and very serious theoretical weakness. Excluding the real of former Communism from the horizon of studies almost automatically biases against neo-liberal theories, because the heavy state sector influence under Communism is historically associated with the extreme ecological legacy of failure of ‘real existing socialism’ in ecological performance (for a review of these issues, inter alia: Burckett, 1999; Auer and Reuveny, 2001). The environmental crisis, blamed in most empirical studies on the workings of ‘*transnational capitalism*’ was especially severe in the heavy industrial and polluted Communist countries before the transformation to some form of capitalism and **before** the large-scale penetration of these countries by transnational capital.

Nevertheless, the relatively coherent tendency of these studies, most notably Dick and Jorgenson, 2010; Jorgenson and Burns, 2007; Jorgenson, 2003; 2004a, 2004b; 2005; 2006a, 2006b; 2007a, 2007b; 2008; 2009a, 2009b; Jorgenson, and Burns, 2004; Jorgenson, Dick, and Mahutga, 2007; Jorgenson, Kuykendall, and Kennon 2008; Lawrence, 2009; Longo and York, 2008; Mostafa and Nataraajan, 2009; Mostafa, 2010a, 2010b; Nugent, and Shandra, 2009;

Shandra, 2007a, 2007b; Shandra, and London, 2008; Shandra, Leckband, and London, 2009; Shandra, Leckband, McKinney, and London 2009; Shandra, London, Whooley, and Williamson, 2004; and finally Shandra, Shor, and London, 2008, 2009, suggests that there seems to be a strong interaction between transnational capitalist penetration and environmental degradation, especially in third world countries.

Considering the enormous quantity of migration-related human transport and its environmental 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. 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 – with the laudable exception of Sanderson, 2010, which analyzed the effects of migration on the Human Development Index, there is no 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 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. **Migration is thus seen as a win-win situation** (UNDP HDR, 2009). UNDP HDR 2009 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 (UNDP HDR, 2009: 72). 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 US\$190 billion 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 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; World Values Survey, September 20th 2010, online data analysis from <http://www.wvsevssdb.com/wvs/WVSAnalyze.jsp>).



### 3. Developing the research design and presenting the data

Our investigation duly acknowledges many of the key determinants of economic growth, mentioned in the economic literature, 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' ( $\ln \text{GDP per capita}$ ;  $\ln \text{GDP per capita}^2$ ); the simple Huntingtonian fact of whether a country is Muslim country, to be measured by the Organization of Islamic Conference (OIC) Membership or by Muslim population share (Nationmaster); UNDP data on the simple geographical fact of population density (based on the 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 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.

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). 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-PAWS XVIII ordinary least square standard regression of the '**kitchen sink type**' (Durlauf *et al.*, 2008) of economic growth and economic, social and political performance in the research tradition of Barro, 2003. To our knowledge, the term '*kitchen sink regression*', commonly used in econometrics of economic growth, was re-introduced in more recent standard social science journal vocabulary in Laver and Shepsle, 1999. 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 (Ades and Glaeser, 1999, Alesina and La Ferrara, 2005, Barro and Sala-i-Martin, 2003, Barro 1991, 1996, 1998, Bloom and Sachs, 1998, Chanda and Putterman, 2007, Dowrick and Quiggin, 1997, Easterly and Levine 1997, Frankel and Romer, 1999, Gallup and Sachs, 1999, Grier and Tullock, 1989, Hall and Jones, 1999, Kamarck, 1976, Kormendi and Meguire, 1985, Levine and Renelt, 1992, Mankiw, Romer and Weil, 1992, Rodriguez and Rodrik, 2001).

## 4. The main results: beyond the pro-globalist environment approach

We will now present the results of our standard OLS multiple regression analyses. In our view, the regression results, presented in the Appendix 1 of this work, 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: the final results from multiple regression analysis. The properties of the statistical investigations**

	adj R <sup>2</sup>	df	F	error probability of the entire equation
Global footprint	81.200	135	117.592	.000
Environmental Performance Index (EPI)	78.900	140	88.259	.000
Happy Life Years	77.100	102	86.653	.000
CO2 per capita	72.700	159	71.594	.000
avoiding net trade of ecological footprint gha per person	40.900	138	20.111	.000
Happy Planet Index	38.000	119	19.217	.000
Carbon emissions per million US dollars GDP	35.000	144	16.535	.000
ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)	14.400	159	7.713	.000

So let us now see the results in detail. 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. The environmental variable, affected by economic freedom in a good direction, is carbon emissions per GDP.

Our next analysis deals with the impact of **world economic openness** on the main indicators of the environment. Again, it emerges that the impact of liberal policies – just as in the case above – on the quality of environmental 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 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** 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 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.

But the main thrust of the serious apprehensions of globalization critical research 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 Happy Planet Index performance.

The New International Division of Labour (NIDL)-model, featured in the critical theories of globalization since the 1970s, most prominently in the works of Froebel, Heinrichs, and Kreye, and 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.

**MNC penetration**, the master variable of most quantitative dependency theories, blocks environmental performance (EPI-Index) and several other socially important processes

<b>MNC PEN - stock of Inward FDI per GDP</b>	quintile share income difference between richest and poorest 20%	0.221	0.013
	Infant mortality 2005	0.160	0.000
	democracy measure	-0.147	0.011
	Environmental Performance Index (EPI)	-0.113	0.005
	rule of law	-0.090	0.168

**Worker remittances** have a significant positive effect on the Happy Planet Index, and Happy Life Years. In order to be able to compare the results for worker remittances with the other migration policy variables, we would have to multiply the results by a factor of minus 1 in order to make them comparable with the results about inward migration. We would have to keep in mind, though, that the indicator does not measure **net** worker remittances, but only **worker remittances** accruing to the economy of a given country, exporting labour to the world economy. While high worker remittance ratios are very typical for migrant workforce exporting countries, the migration recipient countries typically will have very low numerical values on this indicator. But also, poor countries not substantially integrated at all into the sending **and** receiving of guest workers **also** have low numerical values on this indicator. We can assume that the export of labour to the world economy indeed has beneficial effects on life quality (Happy Planet Index, Happy Life Years). We can also assume that the **import of labour** to the world economy has – ceteris paribus – detrimental effects on life quality (Happy Planet Index, Happy Life Years).

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 globalization critical public in Western countries thinks, while freedom number four – labour – should have only positive effects, fully described by neo-liberal economics?** 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 (Happy Planet Index, Happy Life Years).

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.

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

Environmental Performance Index (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 are rather limited in comparison to the other drivers and bottlenecks of international development, under investigation here. They significantly diminish the number of Happy Life Years, indicating a *ceteris paribus* negative trade-off **not** with life expectancy, but with **life quality as such**, as measured by the Happy Life Years 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 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 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 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 Environmental Performance Index.

Our empirical results also suggest a new perspective on the curve-linear relationships between development level and environmental 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 performances**. They all concern the environment and the health/basic human needs dimensions:

avoiding CO2 per capita  
avoiding global footprint  
avoiding net trade of ecological footprint gha per person  
Environmental Performance Index (EPI)  
Happy Planet Index

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 efficiency of the economy, and avoiding disaster risk. All these effects suggest that *‘things get worse before they get better’*:

avoiding carbon emissions per million US dollars GDP  
avoiding ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)

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 variables. **Increases in MNC penetration over time** had no significant effect on the environment. **Net international migration rates**,

2005-2010, which is a typical migration flow measure, do **not** affect significantly any of our environment 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 indicators in a significant way. Also, the share of **public education expenditures per GDP** has no significant effects on any of our environmental indicators. **Annual population growth** has no significant effect on any of the environmental development indicators.

## 5. Conclusions

Let us start with conclusions, which are immediately relevant for the EU's 2020 strategy. Our empirical investigations showed that – per se - European Union and or European Monetary Union membership have, by global comparison, rather small beneficial effects on the environmental situation. There are only two significant positive effects to be reported in this context, and both concern a comparable dimension of environmental 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.

For the other Western democracies, and indeed for all countries of the world system, we might add that not all liberal approaches to environmental 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. 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 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? Part, but only part of the main thrust of globalization critical research, 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 New International Division of Labour (NIDL)-model, is one of the prime drivers of high CO2 per capita emissions. MNC penetration, the master variable of most quantitative dependency theories, blocks environmental performance (EPI-Index) and several other socially important processes. Worker remittances have a significant positive effect on the Happy Planet Index, and Happy Life Years. 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.

Our detailed studies, based on multiple regressions, further confirmed the globalization critical paradigm:

- The apprehensions of globalization critical research are 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 Happy Planet Index performance.
- The New International Division of Labour (NIDL)-model, is one of the prime drivers of high CO2 per capita emissions.
- MNC penetration blocks environmental performance

Our final conclusion at the European level is that in our opinion, European policy-making finally should dare to take the globalization-critical organizations of ‘civil society’ seriously (Brand, 2005; Brand and Raza, 2003; Brand *et al.*, 2000; Brand *et al.*, 2001). This conclusion is also relevant for other regions of the world system.

# Appendix 1: multiple regressions – the dependency model, tested against feminist, demographic, neoliberal, geographic, cultural, peace research, human capital policy predictors, migration theories and integration theories

Predictors (pre-selection of the significant predictors by prior selection, using stepwise regression)

% women in government, all levels  
% world population  
2000 Economic Freedom Score  
Absolute latitude  
Annual population growth rate, 1975-2005 (%)  
comparative price levels (US=1.00)  
foreign savings rate  
FPZ (free production zones) employment as % of total population  
ln GDP per capita  
ln GDP per capita ^2  
Membership in the Islamic Conference  
military expenditures per GDP  
military personnel rate ln (MPR+1)  
MNC outward investments (stock) per GDP  
MNC PEN - stock of Inward FDI per GDP  
MNC PEN: DYN MNC PEN 1995-2005  
Openness-Index, 1990 (export-share per GDP + import-share per GDP)  
population density  
public education expenditure per GNP  
UNDP education index  
worker remittance inflows as % of GDP  
Immigration - Share of population 2005 (%)  
Muslim population share per total population  
net international migration rate, 2005-2010  
Years of membership in the EU, 2010



years of membership in EMU, 2010

The reported equations were chosen from the following dependent variables:

- ecological footprint (g ha /cap)
- Environmental Performance Index (EPI)
- Happy life years
- Happy Planet Index, HPI
- avoiding net trade of ecological footprint gha per person
- ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)
- Carbon emissions per million US dollars GDP
- Carbon emissions per capita

Dependent variable	results from stepwise regression	statistical properties	statistical properties	statistical properties	statistical properties	statistical properties	Development dimension
<b>Environmental Performance Index (EPI)</b>	<b>Independent Variable</b>	<b>B</b>	<b>standard error</b>	<b>Beta</b>	<b>t-value</b>	<b>error probability</b>	<b>environment</b>
	Constant	-66.751	27.623		-2.417	0.017	
	% world population	-0.548	0.216	-0.100	-2.536	0.012	
	ln GDP per capita	23.041	6.605	2.158	3.489	0.001	
	ln GDP per capita ^2	-1.084	0.374	-1.750	-2.898	0.004	
	<b>military personnel rate ln (MPR+1)</b>	<b>-3.298</b>	<b>0.806</b>	<b>-0.174</b>	<b>-4.091</b>	<b>0.000</b>	
	<b>MNC PEN - stock of Inward FDI per GDP</b>	<b>-0.094</b>	<b>0.033</b>	<b>-0.113</b>	<b>-2.871</b>	<b>0.005</b>	
	UNDP education index	36.930	4.216	0.560	8.760	0.000	
	<u><i>memorandum item: statistical properties of the equation</i></u>	adj R^2	df	F	error probability of the entire equation		
		78.900	140.000	88.259	.000		
<b>Global footprint</b>	<b>Independent Variable</b>	<b>B</b>	<b>standard error</b>	<b>Beta</b>	<b>t-value</b>	<b>error probability</b>	<b>environment</b>

Global footprint	Constant	31.026	4.440		6.988	0.000	
	<b>foreign savings rate</b>	<b>0.017</b>	<b>0.009</b>	<b>0.082</b>	<b>1.872</b>	<b>0.063</b>	
	ln GDP per capita	-8.365	1.065	-4.870	-7.851	0.000	
	ln GDP per capita ^2	0.580	0.063	5.838	9.203	0.000	
	population density	0.000	0.000	-0.089	-2.283	0.024	
	years of membership in EMU, 2010	-0.128	0.042	-0.141	-3.037	0.003	
	<u>memorandum item: statistical properties of the equation</u>	adj R^2	df	F	error probability of the entire equation		
		81.200	135.000	117.592	.000		
<b>ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)</b>	<b>Independent Variable</b>	<b>B</b>	<b>standard error</b>	<b>Beta</b>	<b>t-value</b>	<b>error probability</b>	<b>environment</b>
	Constant	-15.273	5.398		-2.830	0.005	
	ln GDP per capita	4.262	1.287	3.751	3.312	0.001	
	ln GDP per capita ^2	-0.247	0.074	-3.741	-3.355	0.001	
	UNDP education index	-2.011	0.839	-0.289	-2.397	0.018	
	<b>Immigration - Share of population 2005 (%)</b>	<b>-0.018</b>	<b>0.012</b>	<b>-0.124</b>	<b>-1.497</b>	<b>0.136</b>	
	<u>memorandum item: statistical properties of the equation</u>	adj R^2	df	F	error probability of the entire equation		
		14.400	159.000	7.713	.000		
<b>CO2 per capita</b>	<b>Independent Variable</b>	<b>B</b>	<b>standard error</b>	<b>Beta</b>	<b>t-value</b>	<b>error probability</b>	<b>environment</b>
	Constant	32.170	12.138		2.650	0.009	
	<b>FPZ (free production zones) employment as % of total population</b>	<b>0.331</b>	<b>0.063</b>	<b>0.238</b>	<b>5.281</b>	<b>0.000</b>	
	ln GDP per capita	-9.438	2.877	-2.104	-3.281	0.001	
	ln GDP per capita ^2	0.706	0.168	2.713	4.214	0.000	
	<b>Openness-Index, 1990 (export-share per GDP + import-share per GDP)</b>	<b>-0.020</b>	<b>0.006</b>	<b>-0.164</b>	<b>-3.240</b>	<b>0.001</b>	

	population density	-0.001	0.001	-0.121	-2.710	0.007	
	<b>Immigration - Share of population 2005 (%)</b>	<b>0.168</b>	<b>0.025</b>	<b>0.348</b>	<b>6.811</b>	<b>0.000</b>	
	<u>memorandum item: statistical properties of the equation</u>	adj R <sup>2</sup>	df	F	error probability of the entire equation		
		72.700	159.000	71.594	.000		
<b>Carbon emissions per million US dollars GDP</b>	<b>Independent Variable</b>	<b>B</b>	<b>standard error</b>	<b>Beta</b>	<b>t-value</b>	<b>error probability</b>	<b>environment</b>
	Constant	-6595.543	1383.628		-4.767	0.000	
	2000 Economic Freedom Score	-7.988	3.279	-0.236	-2.436	0.016	
	Absolute latitude	12.325	2.012	0.544	6.125	0.000	
	ln GDP per capita	1792.705	325.022	5.614	5.516	0.000	
	ln GDP per capita ^2	-111.407	19.201	-6.024	-5.802	0.000	
	<b>Immigration - Share of population 2005 (%)</b>	<b>8.903</b>	<b>2.615</b>	<b>0.267</b>	<b>3.404</b>	<b>0.001</b>	
	<u>memorandum item: statistical properties of the equation</u>	adj R <sup>2</sup>	df	F	error probability of the entire equation		
		35.000	144.000	16.535	.000		
<b>avoiding net trade of ecological footprint gha per person</b>	<b>Independent Variable</b>	<b>B</b>	<b>standard error</b>	<b>Beta</b>	<b>t-value</b>	<b>error probability</b>	<b>global ecological justice</b>
	Constant	-85.394	31.144		-2.742	0.007	
	% women in government, all levels	-0.130	0.072	-0.125	-1.801	0.074	
	<b>comparative price levels (US=1.00)</b>	<b>-8.056</b>	<b>2.312</b>	<b>-0.401</b>	<b>-3.485</b>	<b>0.001</b>	
	ln GDP per capita	22.761	7.550	3.880	3.015	0.003	
	ln GDP per capita ^2	-1.436	0.462	-4.195	-3.109	0.002	
	<b>Years of membership in the EU, 2010</b>	<b>0.234</b>	<b>0.050</b>	<b>0.396</b>	<b>4.716</b>	<b>0.000</b>	
	<u>memorandum item: statistical properties of the equation</u>	adj R <sup>2</sup>	df	F	error probability of the entire equation		
		40.900	138.000	20.111	.000		

Happy Planet Index	Independent Variable	B	standard error	Beta	t-value	error probability	happiness
	Constant	-280.000	46.695		-5.996	0.000	
	<b>foreign savings rate</b>	<b>-0.236</b>	<b>0.112</b>	<b>-0.189</b>	<b>-2.105</b>	<b>0.037</b>	
	ln GDP per capita	73.912	11.094	7.100	6.662	0.000	
	ln GDP per capita ^2	-4.158	0.649	-6.908	-6.411	0.000	
	<b>worker remittance inflows as % of GDP</b>	<b>0.587</b>	<b>0.135</b>	<b>0.356</b>	<b>4.346</b>	<b>0.000</b>	
	<i><u>memorandum item: statistical properties of the equation</u></i>	adj R^2	df	F	error probability of the entire equation		
		38.000	119.000	19.217	.000		
Happy Life Years	Independent Variable	B	standard error	Beta	t-value	error probability	happiness
	Constant	-87.614	35.855		-2.444	0.016	
	ln GDP per capita	19.100	8.451	1.542	2.260	0.026	
	ln GDP per capita ^2	-0.460	0.490	-0.644	-0.938	0.350	
	<b>military expenditures per GDP</b>	<b>-0.754</b>	<b>0.318</b>	<b>-0.113</b>	<b>-2.370</b>	<b>0.020</b>	
	<b>worker remittance inflows as % of GDP</b>	<b>0.257</b>	<b>0.112</b>	<b>0.118</b>	<b>2.295</b>	<b>0.024</b>	
	<i><u>memorandum item: statistical properties of the equation</u></i>	adj R^2	df	F	error probability of the entire equation		
		77.100	102.000	86.653	.000		

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