Sustainability **2009**, *1*, 1305-1322; doi:10.3390/su1041305

OPEN ACCESS

sustainability

ISSN 2071-1050

www.mdpi.com/journal/sustainability

Article

Economy and Sustainability—How Economic Integration Stimulates Stringent Environmental Regulations

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Received: 10 October 2009 / Accepted: 10 December 2009 / Published: 15 December 2009

Abstract: The interaction between economic integration and environmental policy has become an important issue in the last few years. Despite the considerable scholarly attention this topic attracted, actual government responses in terms of environmental policy outputs remain largely untouched by both theoretical and empirical work. To fill this gap, we suggest a theory-based disaggregation of the compound variable economic integration for deriving more precise expectations on its differential impact on environmental policy arrangements. In doing so, we show that economic integration may indeed trigger the promulgation of more demanding environmental regulations. To illustrate our arguments empirically, we analyze the development of Turkish clean air policy between 1975 and 2005.

Keywords: international economic integration; government policy; environment and trade; sustainable development; Turkey; clean air policies

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1. Introduction

In the last three decades, a growing number of both industrialized and industrializing countries have decided to open their economies and conduct liberal trade policies. While the acceleration of international trade was initially regarded against the background of industrial development and income growth, gradually concerns emerged about negative impacts on the environment. The focus of this

discussion has been on whether countries engage in an environmental 'race to the bottom' by deliberately setting environmental protection standards at low levels to attract international capital [1]. This scenario has been associated with a loss in the level of environmental quality and increases in social costs. Policy-makers in industrializing countries, by contrast, have expressed fears that the links between trade policy and environmental policy are used by industrialized countries to erect barriers to trade [2]. These concerns are currently, for instance, present in the public debate surrounding the creation of the Free Trade Area of the Americas (FTAA). Chapter VI of the draft agreement on the creation of the FTAA contains provisions on environmental protection and environmental development priorities.

As a result of the interaction between trade and the environment, a scholarly debate arose in which both the commercial impact of environmental policies [3] and the environmental impact of trade policies [4] have been considered. Despite the large size of this literature, the evidence on the impact of economic integration on environmental policy choices often produces contradictory findings making cumulative research difficult. This study reviews some of the theoretical concepts related to economic integration and illustrates them by using data on environmental policy change in Turkey from 1975 to 2005. While the conclusions which we can draw from the Turkish case are admittedly rather specific, they should still be generalizeable to the emerging market democracies of South Eastern Europe.

To evaluate the causal relationship between economic integration and environmental policy-making in terms of sustainability, we focus on both environmental policy setting and implementation. As a result, we examine two dependent variables, namely changes in the strictness of environmental policy measures regulating air pollution control and actual air pollution through the emission of carbon dioxides (CO_2). Our findings show that an increasing economic integration of the Turkish economy into global markets led to more stringent air pollution regulations. Also, once we control for the remarkable growth of the Turkish economy in the last three decades, we find that the CO_2 emissions have been decreasing since the early 1990s. Further, we can show that the lowering of air emission per unit of economic growth is significantly—though surely not exclusively—related to the promulgation of more demanding air pollution regulations.

Of course, environmental standards are primarily determined by domestic political preferences: usually, they tend to be stricter in more affluent nations with influential green pressure groups [5]. Yet, in this paper we adopt a so-called x-centred research perspective. This implies that instead of explaining the entire variation of the dependent variable, we rather estimate the partial effect that one particular explanatory variable—here economic integration—has on the dependent variable [6].

As concerns the definition of economic integration, we concentrate on three aspects. The first and most rampant definition of economic integration refers to rising international trade and investment flows. The second concept of economic integration takes up the specific trade patterns among countries and focuses on increased trade and investment flows with a particular group of countries. Third, economic integration can be understood as the creation of institutions facilitating cross-border economic flows.

Depending on the concept selected, the environmental policy implications of economic integration are likely to change due to different causal mechanisms. Against this background, we introduce regulatory competition, economic conditionality, and international harmonization as central concepts

for disentangling the environmental policy impact of economic integration. Regulatory competition explicitly models the policy implications of rising competition for trade and investment, whereas economic conditionality pays attention to the regulatory consequences of trade with industrialized, 'high-regulating' countries for industrializing, mostly 'low-regulating' countries. Finally, the mechanism of international harmonization highlights how economic institutions shape the member states' and accession candidates' environmental policies.

The article is structured as follows. First, we introduce the theoretical arguments related to the environmental policy impact of economic integration. On the basis of this discussion we formulate theoretical expectations regarding the likelihood and direction of changes in environmental policy setting. Second, we illustrate the plausibility of our arguments by examining the case of Turkish air pollution regulations and their implementation. Subsequently, we summarize our main findings and present a brief conclusion, in which we interpret our findings against the background of the sustainability concept.

2. Theorizing the Environmental Policy Impact of Economic Integration

With increasing economic integration across countries and the emergence of global markets, more attention has been paid to the extent to which domestic regulatory policies are affected by trade relations. Several studies analyzed the relationship between trade liberalization and environmental policy, focusing in particular on the question whether industrialized countries face 'environmental dumping'. By contrast, only limited attention has been paid so far to the effects of international economic integration on environmental standards in countries that are still in the process of economic transformation, namely emerging market democracies. This paper explicitly focuses on the latter perspective and analyzes the effects of economic integration on environmental protection levels in low-regulating countries that intensify their economic interlinkage with industrialized, high-regulating countries.

Generally, industrializing countries are associated with a regulatory 'stuck at the bottom' [7]. However, the empirical literature does not allow for easy conclusions. In fact, there is also strong evidence refuting the hypothesis that economic integration undermines environmental protection standards [5,8-10]. Why is it so difficult to assess whether economic integration is either positively or negatively correlated with stricter protection standards? We argue that besides differing notions of 'environmental policy', the main impediment to a more thorough understanding of the impact of economic integration stems from different conceptualizations of the focal explanatory variable. Some authors conceive of economic integration only in terms of increased competition for international trade and investment [11]. Other contributions focus on regulatory harmonization within the context of institutional economic integration, e.g., accession to the European Union (EU), which confronts national policy-makers with other pressures than mere competitiveness considerations [12]. A third group of empirical works analyzes the effects of environmental provisions included to free trade agreements [13].

Of course, this plurality in the conceptualizations of economic integration is necessary and corresponds to its complex character. However, it is often overlooked that different concepts also

necessitate completely different theoretical underpinnings to produce sound explanations. Consequently, the empirical findings are limited in their comparability. To remedy this situation, we propose to disaggregate the causal mechanisms underlying the different forms of economic integration and to formulate more clear-cut expectations about the direction of environmental policy change induced by economic integration.

A primary interest in competition for international trade and investment would suggest the use of the theory of regulatory competition, whereas economic conditionality is an appropriate concept when the focus is on the direction of trade flows. Moreover, international harmonization helps us to understand the implications of economic integration through the creation of common institutions. These concepts originate from the literature on cross-national policy convergence [14,15]. Their analytical use, however, reaches well beyond this particular area and allows for explaining environmental policy change in more general terms.

2.1. Regulatory Competition

Regulatory competition is associated with the importance of attracting foreign capital and improving the competitive position of the domestic economy. This concept refers to the definition of economic integration as increased cross-border activities. It hypothesizes that the international mobility of goods, workers and capital puts pressure on the nation states to redesign domestic market regulations in order to avoid regulatory burdens restricting the competitiveness of domestic industries [16]. The pressure arises from (potential) threats of economic actors to shift their activities elsewhere. Politicians behaving as rational actors seek to attract investments, for instance, in order to create or preserve working places. This way, regulatory competition clearly predicts a race to the bottom in policies, implying that industrialized, high-regulating countries lower their standards for approaching those of industrializing, low-regulating countries [17]. Equally, industrializing countries might be reluctant to tighten their protection standards in order to preserve their comparative advantage, implying a stuck at the bottom scenario [7,12].

Theoretical work, however, suggests that there are a number of conditions that may drive the stringency of domestic environmental policy in both directions [5,18,19]. In this context, particular emphasis is placed on the distinction of different types of environmental regulations, namely product standards and process standards. Product standards define regulatory requirements for the quality and specific characteristics of traded goods like passenger car emissions. Two conditions can avoid downward dynamics of national product standards. First, competition between products might not only be based on their price, but also on their quality. If quality aspects dominate, stricter standards will constitute a competitive advantage, hence implying a ‘race to the top’ [5]. Second, downward pressures can be avoided, if trade rules allow individual countries to erect exceptional trade barriers for products which do not comply with national environmental standards. Such measures are, for instance, possible within the trade regimes of the World Trade Organization (WTO) and the EU [8].

Process standards, by contrast, refer to the conditions under which certain goods are produced. Typical examples of process standards are sulphur dioxide or nitrogen oxide emission standards for large combustion plants. Strict standards demand filters, which raise production costs. Then the

domestic steel industry, for example, suffers from a competitive disadvantage against the steel producers abroad, if the latter need not apply the same strict standards. In order to avoid such a disadvantage, governments may want to decrease their standards to the level of other countries. The expectations for the direction of changes in process standards are therefore less optimistic than for product standards [19]. While some empirical work shows that high-regulating countries do not tend to lower their process standards in response to competitive concerns [8-10,20], we believe that it is plausible to argue that emerging market economies seek to preserve their relatively lower regulatory level as long as possible to benefit from competitive advantages. The plausibility of this view is further supported by the fact that WTO rules prohibit the use of process standards as non-tariff trade barriers [21]. Accordingly, we formulate two conjectures with regard to the likelihood and direction of environmental policy change: For product standards, we expect upward change, *i.e.*, a tightening of standards, while for process standards the persistence of the *status quo* should be the most likely outcome [11,22].

Conjecture 1a: For product standards, regulatory competition leads to stricter protection standards.

Conjecture 1b: For process standards, regulatory competition leads to the prevalence of the *status quo*.

2.2. Economic Conditionality

An important modification to the theory of regulatory competition has been proposed by David Vogel [5], who argues that the erection of trade barriers might not only avoid a race to the bottom, but even induce an upward dynamic between national regulations. He observed this development for the regulation of car emission standards in the US. When California raised its emission standards, most US states followed quickly for two reasons. First, California was permitted to apply its standards to foreign car producers. Second, since licensing procedures for cars are very expensive, car producers wanted to avoid multiple arrangements and hence demanded harmonized requirements throughout the US. Based on this observation, the upward ratcheting of regulatory standards is known as the ‘California Effect’.

In a nutshell, the California Effect stipulates that economic integration can trigger an upward adjustment of regulatory policies in (originally) low-regulating countries. This is most likely, if low-regulating countries aim at integrating their economies with high-regulating countries that possess more advanced regulatory systems. Given their weak economic position and the—compared to high-regulating countries—much higher relative welfare gains associated with economic integration, low-regulating countries are generally more dependent on intensified trade relations as their more wealthy counterparts. This holds particularly true, if the latter have already well-established free trade regimes with each other, such as in the case of the EU.

In this vein, the California Effect touches upon the growing interference and influence of the state government in economic affairs since a somewhat paradoxical consequence of economic liberalization is the increase of public intervention in the economy and the proliferation of rules. As a result, the enhanced activities of regulatory policy-making do not only emerge at the national but also at the global level. In turn, this facilitates governments of high-regulating countries to gain domestic political support for free trade agreements with low-regulation countries [23].

Following this logic, market incentives can also trigger a strengthening of process standards of industrializing countries, if three conditions are met: First, the practices have to be targeted by domestic political or economic pressure groups in a 'green', *i.e.*, high-regulating, country; second, the producing country should seek to enter a free trade agreement with a green country, or be already a member of it; third, the production process should be covered by an effectively enforced international environmental agreement. While the California Effect is generally treated as a refinement of the theory of regulatory competition, we argue that it refers to another causal mechanism, namely economic conditionality.

Economic conditionality thus occurs, when a country needs to adopt certain environmental policies in order to become a member of a free trade agreement or to gain access to the market of green jurisdictions [9,10]. Depending on the degree of power asymmetries between the countries seeking market access, high-regulating countries might also be able to render further economic integration with low-regulating countries dependent on the adoption of respective process regulations. To protect the competitive position of their economies, they can factually impose the adoption of stricter regulatory standards in low-regulating countries in exchange for intensified trade relationships. For example, a number of US laws—of questionable WTO-legality though—authorize, the use of unilateral sanctions to force US trading partner to adopt US-style process standards [5].

In other words, there is an exchange of economic resources for the adoption of stricter environmental policies. Thus, economic conditionality constitutes incentives for low-regulating countries to adjust their regulatory arrangements upwards. This particular mechanism also implies that a country is forced to adopt a certain model without much leeway of modifying it. As a consequence, it can generally be expected to lead to a high degree of similarity of the policies present in the submitting and the imposing country.

Various empirical examples underline the validity of this argument. Borregaard *et al.* [24] argue that the strengthening of Chilean environmental regulations *inter alia* resulted from repeated pressures of the US government and its decision to decrease imports of copper products because of low protection standards. Garcia-Johnson [8] finds that Brazil and Mexico adopted US environmental practices. However, the Brazilian approximation to US legislation was notably smaller due to the country's large domestic market and its intensifying trade relations with the countries of the South Cone. The relevance of specific trade patterns is also underlined by the fact that many governments of the Commonwealth of Independent States have expressed their willingness to adapt their environmental legislation to European standards. "This interest is driven by the general economic and political orientation towards the EU, which is their most important foreign trading and investment partner […]" [25]. Also as a result of the involvement with the international market, the Czech Republic, Poland, and Bulgaria decided to adopt EU-style chemical safety legislation long before they applied for membership [26]. Along the same lines, Prakash and Potoski [4] show that trade creates incentives for firms in developing countries to introduce the relatively costly ISO 14001 management system, if trade occurs with countries whose firms have adopted a progressive environmental programme.

In sum, the concept of economic conditionality explains, why increased economic integration with industrialized countries may induce governments of industrializing countries to introduce stricter environmental protection standards. Modelling asymmetries in terms of political and economic power,

it also allows for explaining why industrialized countries do not lower their protection standards. The EU and the US hence benefit from the large size of their internal economic markets, which turns them into regulatory 'price-makers' [27,28]. In this sense, low-regulating countries are not confronted with competitive pressures but rather with the threat of losing permanent access to attractive markets. This reasoning produces conjecture 2.

Conjecture 2: Economic conditionality leads to stricter protection standards, regardless of the policy type concerned.

2.3. International Harmonization

There are still stronger forms of economic integration, which offer even more effective ways for avoiding an environmental race to the bottom, namely membership in international economic institutions. This may prevent competitive pressures to emerge through the mechanism of international harmonization. International harmonization refers to a specific outcome of international cooperation, in which the countries involved are required to comply with uniform legal obligations defined by free trade agreements, their side agreements, or international or supranational law. International harmonization is generally traced to the existence of interdependencies or externalities which push governments to resolve common problems through cooperation within international institutions, hence sacrificing some independence for the good of the community.

Once established, these arrangements constrain and shape the domestic policy choices, even as they are constantly challenged and reformed by their member states [29]. The idea is to neutralize comparative advantages stemming from regulatory differences by creating a 'level playing field'. With regard to environmental policy, several factors favour that international harmonization implies an overall increase in the strictness of regulatory levels, *i.e.*, a compromise that is closer to the strictest rather than weakest regulatory level found in the member states of the international institution in question.

First, it has been argued by several authors [5,18,19] that in certain constellations those countries preferring stricter levels of environmental regulation are more influential in international negotiations, implying that international harmonization takes place at the top rather than the bottom level. This argument has been developed in particular for product standards. In this case, all member states (regardless of their preference for strict or weak standards) share a common interest in international harmonization in order to avoid market segmentation as a result of different national product requirements. While all countries share a common interest in harmonization, those states with a preference for strict standards are in a stronger position to put through their preferences in international negotiations. As all countries share an interest in international harmonization, high-regulating countries are therefore in certain cases able to unilaterally impose their strict standards as the international rule [27]. Based on this argument, we should expect that—at least for product standards—international harmonization implies an upward shift of the regulatory mean.

Second, especially for harmonization at the EU level, additional structural features of the policy-making process might favour an upward shift for other policy types (production standards and non-trade-related policies), for which the above-mentioned interest constellation favouring

harmonization at the top does not apply. The fact that we observe European harmonization at the top rather than at the bottom of existing member state regulations also in these areas has been explained by particular dynamics emerging from a regulatory contest in influencing EU policies between the member states [30]. These dynamics emerge from the interest of national governments to minimize institutional costs of adjusting domestic regulatory arrangements to EU policy requirements. Especially high-regulating countries with a rather comprehensively and consistently developed regulatory framework of environmental policies and instruments might face considerable problems of adjustment, if European policies reflect regulatory approaches and instruments that depart from domestic arrangements. As a result, these countries have a strong incentive to promote their own concepts at the European level. In so doing, the most promising way is to rely on the strategy of the 'first move', *i.e.*, to try to shape European policy developments already during the stages of problem definition and agenda setting. This requires that member states have to win the support of the European Commission, who has the formal monopoly to initiate policies at the EU level. The European Commission, in turn, is generally interested in strengthening and extending supranational policy competencies. As a consequence, only those domestic initiatives that fit with these objectives of the European Commission have a chance to succeed. This specific interaction of national and supranational interests favours the development of innovative and ambitious policies at the EU level, hence driving EU harmonization more towards the top rather than the bottom of domestic regulation levels [31].

Third, even if we assume that the final agreement only lies in the middle between high-regulating and low-regulating countries, there is still a high probability that the mean of national regulatory levels becomes stricter. This can be traced to the fact that the by far largest part of environmental standards follows the principle of minimum rather than total harmonization. In the case of minimum harmonization, it is still possible for countries with a preference for higher regulatory levels to enact standards beyond the minimum level specified in international agreements. In contrast to total harmonization, deviations to the top are therefore still possible, while countries with lower standards are obliged to raise their standards at least to the international minimum level. Given the dominance of minimum harmonization, we thus predict that international environmental policy harmonization is likely to result in shifting the regulatory mean upward. This expectation rests on the assumption that not all high-regulating countries will lower their standards towards the minimum level.

As concerns the empirical findings, the comparative analysis of 40 environmental policy items in 24 countries carried out by Holzinger, Knill and Arts [14] and Holzinger, Knill and Sommerer [15] reveals that EU membership is positively correlated with changes in policy stringency. Further, Knill and Tosun [32] highlight that international harmonization is the most effective way of achieving a tightening of regulatory standards vis-à-vis other mechanisms, such as, for example, economic conditionality. Their results also show that not only member states but also accession candidates adopt European legislation. Accordingly, both states already being members of the EU and accession candidates are likely to expand their environmental policy arrangements by adding European legislation. Therefore, we expect that EU integration is associated with more stringent environmental protection standards. However, in this context we must keep in mind that this expectation only refers to those policies that have been harmonized at the supranational level. In the case of clean air policy, the density of European legislation is remarkable and covers almost all regulatory aspects related to

product standards, process standards and standards that are not related to trade. Hence, speaking of changes in clean air policy, international harmonization at the European level should lead to an overall tightening.

Conjecture 3: International harmonization leads to stricter protection standards for policies harmonized at the supranational level.

3. Empirical Illustration: Environmental Policy Developments in Turkey

To enliven the points raised above, we now present an empirical illustration of the theoretical arguments. To this end, we explore the development of environmental policy setting in Turkey between 1975 and 2005. We chose Turkey as a representative of emerging market democracies, which has experienced all three forms of international economic integration. Further, we believe that the conclusions drawn from the Turkish case can be generalized to the other (potential) EU accession candidates in South Eastern Europe, *i.e.*, Albania, Bosnia and Herzegovina, Kosovo, the former Yugoslav Republic of Macedonia, Montenegro, and Serbia. To be sure, Turkey's economic governance was mostly statist with strict government planning of the budget and government-imposed restrictions over private sector participation, foreign trade, flow of foreign currency, and foreign direct investment (FDI), displaying some parallels to the state-socialist systems formerly in place in most South Eastern European countries.

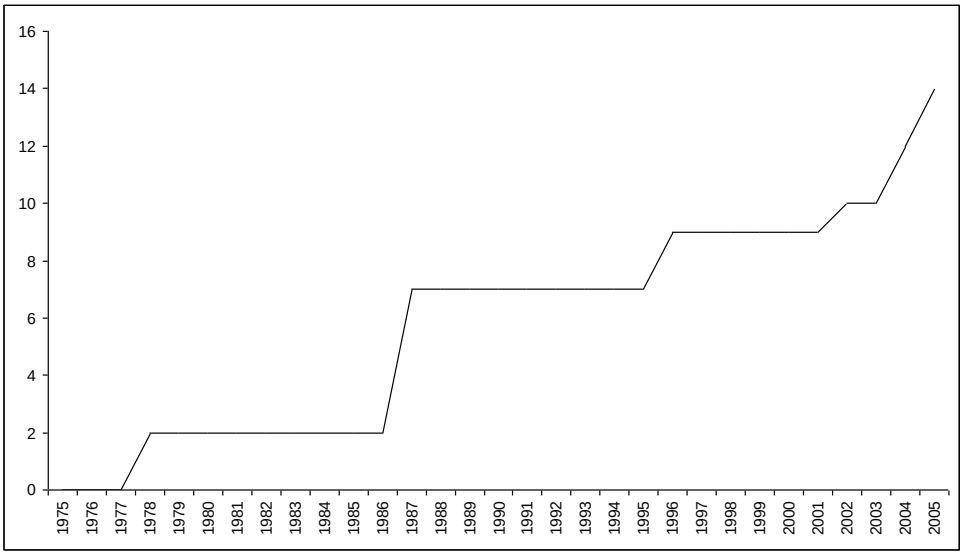
Broadly speaking, the year 1983 represents the major turning point in Turkish economic policy, when Prime Minister Turgut Özal initiated a series of reforms designed to shift the economy from a statist, insulated system to a more private-sector, market-based model. Thanks to a steady expansion of trade in goods and services, Turkey has become highly integrated into the world economy. The country's share of EU-oriented exports has been growing and so has its attractiveness for FDI [33]. In addition, Turkey was officially recognized as a candidate for full EU membership on 12 December 1999 at the Helsinki summit of the European Council. Due to this variation in the focal explanatory variable over the observation period, the country provides an ideal case for illustrating—albeit not for testing—the environmental policy effects of international economic integration.

3.1. Description of Environmental Policy Change

To measure environmental policy change, we focus on one essential policy subfield, namely legislation related to combating air pollution [26]. We evaluate the strictness of air pollution regulations on the basis of legislative outputs, *i.e.*, legal acts. To this end, we base our measurement on the concept of 'regulatory density', which describes the extent to which a certain policy area is covered by governmental activities. Regulatory density tells us something about the legislative penetration and internal differentiation of a policy field, subfield or specific policy item. The dimension of regulatory density hence measures the extensiveness or breadth of governmental intervention. Any increase in regulatory density indicates policy expansion; any decrease, by contrast, can be interpreted as policy dismantling. To be able to judge whether we are confronted with policy expansion or dismantling, we must define a reference point. Here the year 1975 forms the baseline since at this point in time hardly any air pollution regulations existed in Turkey.

More precisely, we generate a variable which approximates changes in the regulatory strictness through the cumulative number of legal acts with an 'expansive' character. To be sure, none of the legal acts coded abolished an already existing air pollution measure. Consequently, we discovered an ongoing legislative expansion. The data employed for this article are original and were collected by the research teams of the CONSENSUS project ('Confronting Social and Environmental Sustainability'), which is funded by the European Commission within the Seventh Framework Programme. Figure 1 exhibits the changes in the cumulative number of legal acts on combating air pollution.

Figure 1. Cumulative number of air pollution regulations (1975–2005).



We can easily infer from the figure that over the observation period of three decades the regulatory level increased steadily. A relative regulatory stability is only observable for the early observation period, *i.e.*, until 1986. The policy adoption curve, however, becomes even steeper in the 2000s, reflecting the adoption of several European directives. In fact, in 2001, the Turkish government adopted a national programme for the adoption of the *acquis communautaire* on the basis of the Accession Partnership. Since the *acquis communautaire* also comprises a considerable number of European environmental policies [31], the adoption of the national programme is closely interlinked with increased environmental policy activities.

More generally, the air pollution regulations promulgated between 1975 and 2005 comprise both product and process standards, although the latter are marginally higher in number. They comprise various specifications regarding heating systems and provisions on energy efficiency as well as emission standards for a number of air pollutants. Yet, the Turkish clean air regulations reach well beyond command-and-control instruments. They also introduce planning instruments and comprehensive permitting systems such as in the regulation on the control of industrial air pollution of 2004.

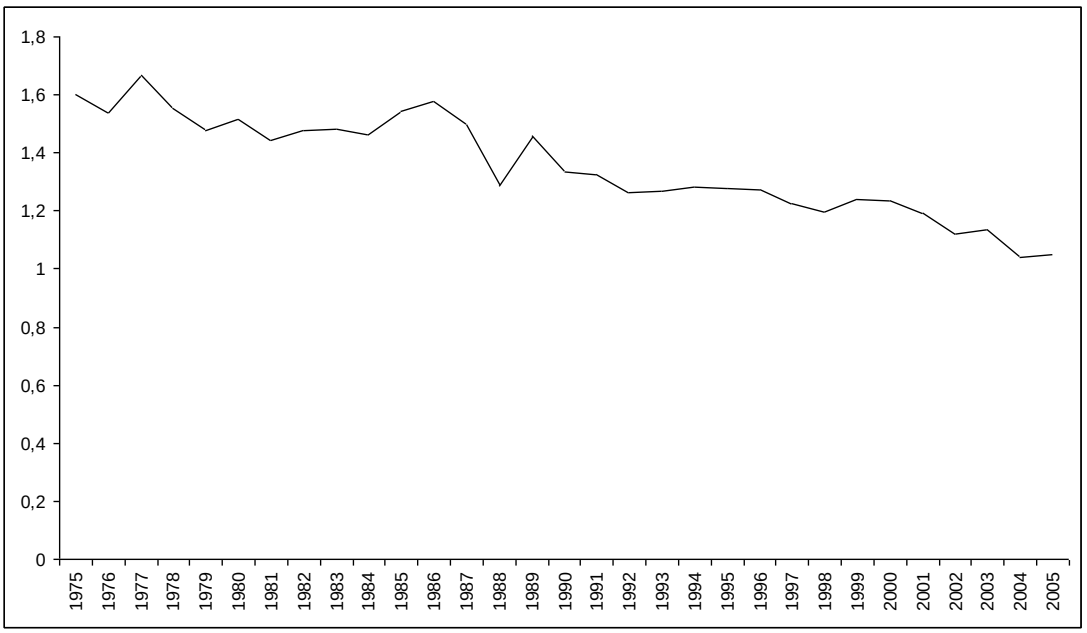
Concerning product standards, the legal act on the phase-out of leaded gasoline in accordance with the European Directives 2003/17/EC and 98/70/EC introduced in 2004 surely represents one of the most important measures. The corresponding regulation lays down a detailed timetable for accomplishing a total ban of leaded gasoline by 1 January 2006.

3.2. Description of Changes in Environmental Quality

To examine whether an increase in the cumulative number of air pollution regulations is paralleled by an actual improvement of the air quality, we rely on data on the change of CO_2 emissions (given in metric tons) over the observation period. The data were taken from the World Development Indicators of the World Bank. We are well aware that the use of such data is problematic as concerns the lacking possibility to control for intervening variables and the absence of standardized measurement guidelines. This also implies that changes in CO_2 emissions per capita must not perfectly correlate with the practical application of protection standards. Yet, regarding the case of Czech water policy, Earnhart and Lizal [34] show that the variation in environmental policy outcomes indeed correlates with the variation in environmental policy outputs. Hence, for the strictly illustrative purpose of this analysis we argue that these data are appropriate for evaluating the relationship between economic integration and sustainability.

However, instead of relying on changes in the overall CO_2 emissions, we rather calculate the ratio of emissions and economic growth. This decision is motivated by the economic literature, which stipulates that economic integration affects environmental quality through several different channels, *i.e.*, through product effects, scale effects, and structure effects [1,22]. Product effects refer to the transnational exchange of products and services that have ecological impacts. Scale effects focus on the possible expansion of economic activity and growth. Structure effects relate to production patterns in a particular country and the use of natural resources due to intensified trade. For our theoretical interest, only scale effects are of relevance since economic growth—as in the case of the Turkish economy—might at least initially lead to enhanced pollution. To avoid a misinterpretation of the changes in Turkish air emissions due to economic growth, we control for this factor by computing the ratio of CO_2 emissions and changes in the Gross Domestic Product (GDP). Figure 2 exhibits the development of the ratio over time.

Figure 2. Emission loads of CO_2 per GDP unit change.

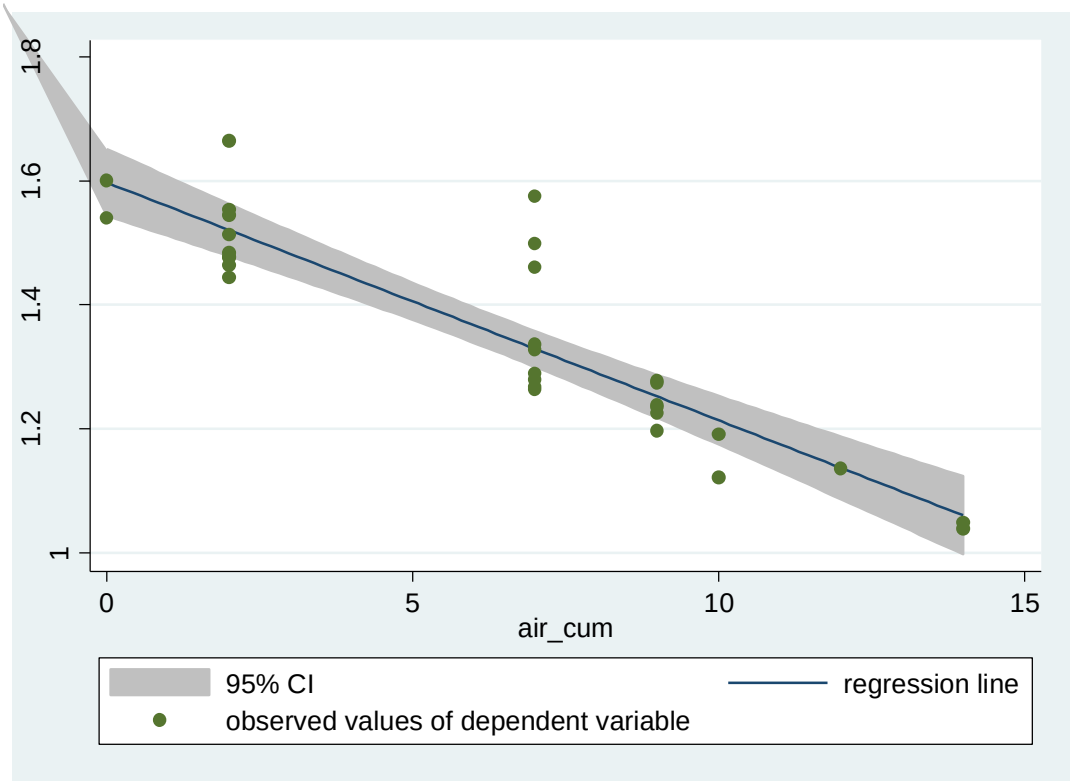


The figure reveals a differential picture of the CO_2 emission loads per GDP unit change. While in the period from 1978 to 1987 the ratio was relatively constant and even implied punctual increases in the emissions relative to economic growth, after 1991 we can detect an ongoing lowering of CO_2 emission loads per GDP unit increase. The slope of the curve becomes particularly steep after 2000, indicating a decrease at increasing rates for CO_2 emission loads per GDP increase.

Is this development related to more stringent regulations? To answer this question we run a simple bivariate regression in which the ratio of CO_2 emission loads per GDP unit change represents the dependent variable and the cumulative number of air pollution regulations is the explanatory variable. The results of this exercise are illustrated by Figure 3. The regression line indicates the existence of a significant and negative relationship between both variables. The dots represent the observed values of the dependent variable, *i.e.*, the ratio of CO_2 emission loads per GDP unit change, which cluster on a limited number of values due to the particular character of the explanatory variable. The residuals become notably smaller towards the end of the observation period. Moreover, we added the 95% confidence intervals for giving the readers the possibility to evaluate the precision of the estimation.

From this figure it follows that for the case at hand we can confidently state that an increase in the density of air pollution regulations has been responsible for the reduction of CO_2 emission loads per GDP unit increase. Of course, this model is reductionist and leaves out a number of additional explanatory factors, e.g., technological progress. Nevertheless, it manages to give a first impression of the causal relationship between environmental policy outputs and outcomes.

Figure 3. Relationship between CO_2 emission loads and air regulations.



So far, we learnt how the Turkish government extended the strictness of air pollution regulations and revealed that CO_2 emission loads per GDP unit increase have been falling since 1991. Moreover,

we demonstrated that there is a significant and negative causal relationship between both variables. What is now missing is an explanation for the increase in the regulatory protection level. We address this aspect in the next section.

3.3. Explaining Policy Change

How can we explain the increasing strictness of air protection regulations in Turkey? Before we can answer this question, we must operationalize the three analytical concepts associated with economic integration, namely regulatory competition, economic conditionality, and international harmonization.

For evaluating whether regulatory competition is effective we rely on two variables. The first variable is *Trade Dependence*, which indicates how strongly a country relies on exports. It is calculated as the percentage share of exports on the GDP. The data were taken from the World Development Indicators of the World Bank. The second variable is *FDI* inflows per capita measured in US dollar at current prices. The data were extracted from the FDIStat database.

To assess the effectiveness of economic conditionality, we use data on the Turkish exports directed at industrialized states. The data for the corresponding variable *Exports to Industrial States* were taken from the Direction of Trade Statistics of the International Monetary Fund, which conveniently provides information on country-specific patterns of trade.

Finally, the variable *EU* is related to international institutional integration within the context of the European integration. It is a binary variable that takes the value 1 for each observation after 1999 since Turkey then had received the status of an accession candidate. For the years predating 1999, the variable takes the value 0. Table 1 presents the summary statistics for the three interval-level explanatory variables, *i.e.*, *Trade Dependence*, *FDI*, and *Exports to Industrial States*. The minimum and maximum values of the indicators nicely illustrate the changes in the degree of Turkey's economic integration with international markets.

Table 1. Summary Statistics of the Explanatory Variables.

Variable	N	Mean	Standard	Minimum	Maximum
Trade Dependence	31	15.39	7.13	3	27
FDI	31	14.2	25.38	0.24	137.47
Exports Industrial States	31	0.047	0.032	0.01	0.127

In a second step, we calculate Pearson correlation coefficients since the number of observations is too small to run more powerful estimation models for count data. The Pearson correlation coefficient ranges from (–1) to 1. A value of 1 indicates that there is a perfect positive linear relationship between two variables, with all data points lying on the same line and with *Y* (dependent variable) increasing with *X* (independent variable). A score of (–1) shows that all data points lie on a single line but that *Y* increases as *X* decreases. A coefficient with the value 0 signals that there is no linear relationship between the variables. Table 2 presents the Bonferroni-corrected correlation coefficients of the four explanatory variables and the two dependent variables.

Table 2. Correlation Coefficients.

Variable	Regulatory Output
Trade Dependence	0.8512***
FDI	0.6423***
Exports Industrial States	0.9432***
EU	0.6713***

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Remarkably, all explanatory variables are significantly and positively correlated with the regulatory output, *i.e.*, the changes in the regulatory strictness. In this context, the most interesting observation refers to the two variables related to regulatory competition, *i.e.*, *Trade Dependence* and *FDI*, since both of them display a positive sign. From this is follows that for the case at hand, we find no support for the occurrence of a stuck at the bottom as purported by conjecture 1b. In light of the fact that the environmental policy reforms entailed a relatively balanced adoption of both process and product standards, this implies a rather strong rejection of the conjecture.

By contrast, we find support for conjectures 1a, 2, and 3. Particularly high is the correlation between the strictness of air pollution regulations and the dependence on exports to industrialized states, which provides a strong support of our reasoning regarding economic conditionality. Somewhat surprising is the strong impact of international harmonization since not all air protection standards promulgated by the Turkish government represent EU legislation. In light of these findings, we can conclude that international economic integration is not likely to cause a regulatory stuck at the bottom. The isolate impact of all of the different dimensions of international integration has been strictly positive, which in turn positively affects the ratio of CO_2 emissions and economic growth as illustrated by figure 3.

Nevertheless, we are well aware of the limitations of this study. Therefore, we encourage further research which contrasts the relationship between environmental policy outputs and outcomes more systematically. Also, we did not specify a complete model causal but rather focused very specifically on the policy implications of economic integration. Hence, there are various avenues for future research in this particular area.

4. Conclusions

The linkage between economic integration and environmental policy has indeed become an important topic in the last few years. This is reflected by the impressive size of the body of scholarly literature and ongoing public debates. In this paper, we scrutinized how increased economic integration affects the stringency of environmental policy setting and enforcement. To improve the state of theorizing, we introduced the concepts of regulatory competition, economic conditionality and international harmonization, to which several studies implicitly make reference to—sometimes by merely using a different terminology or slightly different definitions. In the way we use these concepts, regulatory competition refers to economic integration through enhanced trade and FDI inflows by asking whether national governments compete over the optimal design of domestic regulations in order to attract foreign capital and to improve the competitive position of their economy. Economic

conditionality is predominantly likely to affect the stringency of environmental protection standards in industrializing countries, whose main trading partners have demanding environmental protection standards, or which seek to enter a free trade agreement with industrialized countries. Concerning international harmonization, we exclusively focused on the environmental policy implications of the EU.

Our descriptive analyses of the case of Turkish clean air policy highlighted that all of these dimensions are likely to trigger an upward change of environmental policy arrangements. In this way, we showed that the theoretical predictions of an environmental stuck at the bottom due to competitive concerns is rather unlikely to happen. Furthermore, we shed light on the relationship between environmental policy outputs and outcomes. In this sense, we illustrated that air pollution per GDP unit increase has been falling since the early 1990s and that this development is significantly affected by promulgation of more stringent air pollution regulations.

However, we should be careful when interpreting this empirical picture. Emerging market democracies still suffer from a number of problems related to the implementation of environmental protection standards. For example, the European Commission's 2004 Regular Report on Turkey explicitly highlighted problems related to the implementation and enforcement of newly adopted environmental policy measures [35]. Often the administrative units in charge of ensuring compliance with regulations lack sufficient capacities and/or technical knowledge. To remedy this situation, the EU offers the country assistance in strengthening its bureaucratic structures. In this context, the so-called twinning projects are an important instrument. Additionally, Kalaycioglu and Gönel [36] emphasize that business sectors are often involved in corrupt practices and pay bribes in order to lower the burden of enhanced regulatory burden.

Coming back to the core research question on whether economic integration leads to sustainable development, we can give a carefully optimistic statement on the basis of our study. However, we must stress that in evaluating the impact of air pollution regulations we accepted that economic growth entails a certain degree of environmental degradation. This perspective is rather distant from a balance between the economic and environmental dimensions of development as intended by the sustainability principle [37,38]. Rather, we can safely state that governments—even in emerging market democracies—respond adequately to the environmental challenges which economic progress brings along. What we cannot do is to judge whether these response are optimal or imply a long-term balance between economic progress and environmental protection. What we, however, can do is to highlight that environmental policy arrangements in emerging market democracies are consequential. To which degree remains to be clarified by future work.

Acknowledgements

We thank Semra Cerit Mazlum and Marc Steinbüchel who assisted us with their data collection and coding efforts as well as two anonymous referees for very valuable comments and suggestions. Moreover, we gratefully acknowledge funding from the European Commission's Seventh Framework Programme (Project Acronym: CONSENSUS; Project Number: 217239). For further information on the CONSENSUS project, see: www.fp7-consensus.eu.

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