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The Effect of the Business Environment on Pollution

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Abstract

This paper examines the effects of the business environment on pollution in developing countries and the world as a whole, as measured by carbon dioxide (CO2) emissions. Several reduced form equations are estimated by using cross-sectional data within a theoretical framework that relates the business environment to CO2 emissions.

Our empirical finding for developing countries provides strong evidence for a negative correlation between CO2 emissions and the number of procedures to complete before legally starting a business. Control variables of openness, income, and the size of the industrial sector are other significant determinants of CO2 emissions.

For developing and developed countries combined, our results show that there is a negative, but statistically insignificant relationship, between CO2 emissions and the number of procedures to complete before starting a business.

We find that the control variables have a more dominant effect in the global case. Our empirical results confirmed that CO2 emissions rise as (1) the world becomes more open, (2) global per capita incomes increase, and (3) the size of the industrial sector increases. We concluded that bringing appropriate regulatory mechanisms in place can facilitate business formation and operations, and also aid in pollution reduction.

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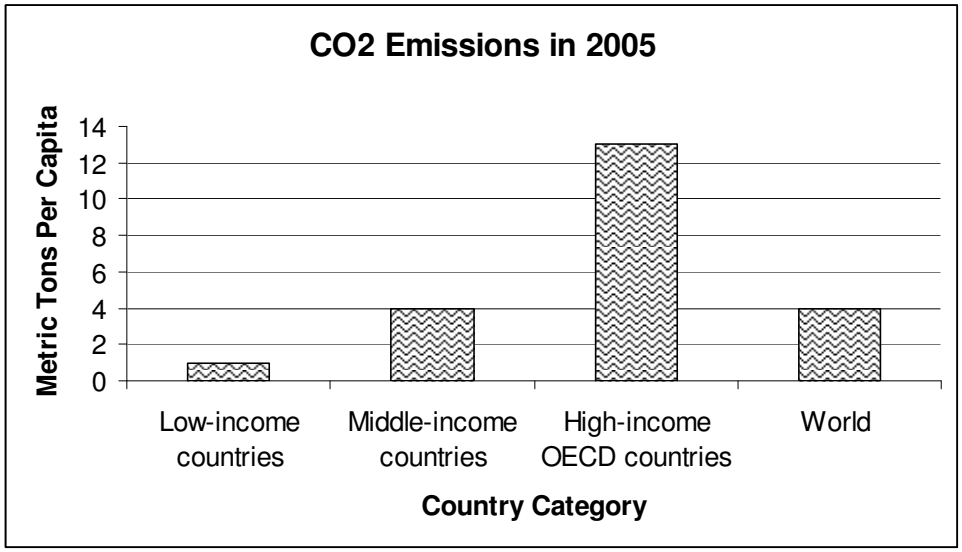
1.0 Introduction

Much of the wealth creation, employment generation, and technological innovation of the world can be attributed to the work of businesses. Although they have improved living conditions in many ways, businesses are also responsible for contributing to environmental deterioration through the processing and generation of toxic materials and emissions. Unregulated businesses are the main culprits in this regard, and their pollution-generating activities have taken a large toll on the health of humans and ecosystems. Greenhouse gases are accumulating at unprecedented rates and have the potential to deliver powerful negative effects across the globe, with the most vulnerable populations living in developing countries. The United Nations notes that current greenhouse gas concentrations have reached 380 parts per million of carbon dioxide (CO_2) – exceeding the amount that has been naturally produced over the last 650,000 years (United Nations Development Program, 2007). Furthermore, the recent *Human Development Report* by the United Nations Development Program notes that major diseases such as malaria and dengue fever could expand their reach as a result of climate change (United Nations Development Program, 2007). Activists and academics have raised awareness about these negative consequences, and now regulators, policymakers, and business leaders have begun to respond to this challenge. Some manifestations of their involvement include introducing changes in the business environment at the national level by creating policies and legislation pertaining to the business formation process, contract enforcement, property registration, and investment protection.

While these changes may be important steps towards improving the business environment, an important empirical question is whether they have helped to abate pollution. However, this question has rarely been systematically investigated in an international context. In this paper, we shall consider the effect of the changing business environment on one of the key agents of environmental pollution, namely CO_2 emissions. We have chosen this particular pollutant for two reasons. First, it has become a focus of international attention after the passage of the 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change because CO_2 emissions are considered a main force behind global warming (Friedl and Getzner, 2003), and high-income OECD countries are major contributors to CO_2 emissions (Figure 1). Second, published data on CO_2 emissions is beginning to appear, which allows researchers a modest start towards quantifying CO_2 contributors and influences.

Figure 1.



Source of data for Figure 1: World Bank (2007).

In view of the above discussion, the prime focus of this paper is to empirically investigate if the regulatory aspects of the business environment affect environmental pollution. Our particular focus is on developing countries, since these are home to millions of the world's poorest and most vulnerable people, who are then forced to cope with the destructive environmental changes (e.g. drought, storms, floods) that pollution contributes to creating (United Nations Development Program, 2007). Businesses create opportunities and jobs, expand the variety of goods and services that are available, and otherwise help to improve people's lives. Although they contribute to increased income and productivity, thereby helping to reduce poverty in developing countries, their actions must also be environmentally sustainable (Costantini and Monni, 2008). The World Bank notes that the immediate gains of depleting or degrading environmental assets due to a firm's actions can be outweighed by costs in productivity and lost options. Additionally, long-term economic growth is unlikely to be sustained unless attention is paid to assets such as freshwater and fish stocks (The World Bank, 2004).

In light of the concerns raised by environmentalists, climate scientists, and international institutions such as the United Nations and the World Bank, this paper examines the effects on CO_2 emissions from a business perspective, an area of investigation that has remained relatively unexplored in business environment

literature. This paper estimates reduced form equations using annual data for selected business environment variables (e.g. starting businesses, contract enforcement, and registration of properties) and other potential influences (e.g. incomes, investment climate, openness, agriculture, and industrial sectors) on pollution.

This paper is unique in several ways. First, it attempts to link the regulatory aspects of the business environment with environmental pollution. Second, the estimation phase of this paper controls for variables that are widely thought to contribute to environmental pollution (e.g. incomes, openness, and size of agricultural and industrial sectors), thus minimizing the mis-specification of the estimable model. Third, the sample includes a total of 115 countries, analyzing the effects on developing countries, and then on developing and developed countries combined, so as to draw policy implications with greater strength and meaning.

The paper is structured as follows: First, we summarize the theoretical underpinnings of the hypothesis that regulation of the business environment reduces pollution, and explain the justification for the use of control variables such as a share of industry in the national income and per capita income. Data and methodology are also discussed. Empirical results are presented in the subsequent section. The paper concludes with our remarks on the implications of the study for pollution policies and future research.

2.0 Theoretical Underpinnings, Methods, and Data

There are many agents of pollution that cause environmental degradation, including nitrogen oxides, carbon monoxide, suspended aerosol particulates, sulfur dioxide, and CO_2. The threshold for dangerous climate change as a result of these agents is a current change in temperature of 2^oC. In the 21^{st} century, the average global temperature could increase by more than 5^oC (United Nations Development Program, 2007). Research on global warming has demonstrated that CO_2 emissions have had a particularly significant role in environmental degradation (Roberts *et al.*, 2003).

The influences on pollution as described above can be generally represented by equation (1).

$$(Pollution)_t^{CO2} = f(B_t, L_t, \mu_t) \qquad (1)$$

Here, *Pollution* denotes CO_2 emissions, *B* denotes a vector of business environment regulatory factors, *L* denotes a vector of pollution control variables,

μ represents all unobservable variables, and t is the time period. The vector of business environment regulatory factors includes the number of procedures to follow in starting a new business, enforcing a contract, and registering a new property. The L pollution control variable includes investment profile, income levels, openness, and the size of agricultural and industrial sectors, respectively.

The theoretical justification for including these variables is as follows: A seminal study by Porter and van der Linde (1995) has argued that the new paradigm of dynamic competitiveness requires properly designed environmental protection standards that can trigger innovation. In this paradigm, the cost of complying with these standards is more than fully offset by innovation in products and processes. The authors introduced the concept of "innovation offsets" in the context of regulation to achieve environmental goals. The same line of thinking can be used to argue that business regulation can improve business practices and trigger mechanisms to prevent degeneration of the environment.

Businesses need to care about reputational capital and social responsibility. Creating measures for reducing pollution will augment reputational capital. Regulated businesses can also be held responsible if they do not follow environmental pollution abatement laws and policies. Businesses can be helped in this regard by making the process for business formation and the creation of property rights institutions more straightforward, making them effective for the protection of investment through such institutions, and by developing enforcement mechanisms for business contracts if they are violated. This is also where governments have a part to play. They provide public goods, support the provision of infrastructure, and mitigate market failures (The World Bank, 2004). Governments can also invoke a strong impact on the business environment through their influence on the investment climate. In particular, government policies in the security of property rights, regulation and taxation, contract enforcement, and corruption can allow firms to assess the incentives and opportunities available to them. Put differently, reform of the business environment through regulation and policies can create "pollution offsets". Using this conceptualization, we state the following hypotheses related to business regulations (section 2.1 -2.7):

2.1 Property rights

One key variable in the changing business environment is the creation of property rights. As Acemoglu *et al.* (2004) have pointed out, the key to economic growth is to have good institutions that secure and protect property rights. When businesses earn entitlement for legal protection through registration, it also ensures a

reasonable level of continuity. This then creates incentives for using resources efficiently, which may contribute to better environmental quality (Solakoglu, 2007). Businesses also become liable for the environmental damage they may create through production and mismanagement of waste. This may also have a positive effect on pollution control.

2.2 Business formation

Easing the process of business formation will lead to establishment of more businesses. It may also cause preexisting informal sector businesses to register in order to take advantage of benefits, such as the fact that formally registered businesses grow larger because they can supply their products and services to larger customers and export markets (World Bank and International Finance Corporation, 2006). Furthermore, demands for quality requirements by larger customers and export markets may lead to businesses becoming more conscious of reputation. Thus, companies may reduce or avoid pollutants in both the process and the products to collect returns on their reputational capital. In addition, if a business is not a registered property, the pollution taxes that many governments impose cannot be collected easily. Monitoring of the abatement production process is not feasible because of free-riding problems associated with unennumerated businesses. Thus, we can hypothesize that the level of pollution will lessen when the regulatory process for business formation becomes easier.

2.3 Investment profile

Foreign investors will not invest in countries where there are no established property rights institutions. If they sense the possibility of nationalization or expropriation of their investment by host governments, or see limitations on the repatriation of profits, or unnecessary bureaucratic hurdles for the execution of investment decisions, foreign investors will shy away from investing in those countries. Reform of unfriendly investment climates will lead to more investment. However, more foreign direct investment may lead to increased pollution because under the “pollution haven hypothesis” countries will export their high pollutant industries to investment-friendly places with less stringent environmental protection laws. Following this line of argument is the hypothesis that the higher the level of foreign direct investment, the higher the level of pollution.

2.4 Enforcing a contract

The absence of a legal mechanism for enforcing business contracts can lead to fewer business transactions. This is because without an enforcement mechanism

in place, business partners may not comply with the provisions of a contract. Disputes may arise but mechanisms to efficiently resolve them may not be there. The cost of a delay could be enormous, and could also lead to business loss or failure. Businesses in this situation would be confined to conducting business within their own social networks. This would reduce the size of the market, adversely affecting efficiency and scale economies. We can hypothesize that a business environment conducive to enforcing contracts will help to create more compliance-oriented businesses, and those businesses that comply with business contracts will also be more amenable to complying with environmental regulations and policies.

2.5 Income

The relationship between income and pollution is summarized by the much-investigated *Environmental Kuznets Curve* (EKC). According to the EKC, pollution increases in the early stages of industrialization and decreases in an inverted U-shaped pattern in more matured and industrialized countries (Rosser, Jr. and Rosser, 2006). That is to say, pollution first rises as countries advance from low to middle level incomes, then begins to fall as countries attain high levels of income. This happens for at least two reasons. First, there is an argument to be made that people begin to look at the environment as a luxury good, and thus, demand superior environmental quality in high income countries (Torras, 2005). Second, the level of pollution decreases because of the use of pollution control technology and phasing out of high pollutant industries in economically prosperous countries (Komen *et al.*, 1997). Thus, pollution begins to decrease after a certain threshold level of income.

Even though the EKC is the most well-known "articulation of the income-environment link" (Torras, 2005), empirical evidence for this hypothesis is less robust because findings have varied by sample base, econometric specification, control variables selected, and the measure of pollution itself (Harbaugh *et al.*, 2002). For example, Ekins (1997) and Shafik (1994) found that some environmental variables improve (e.g. access to better water quality and sanitation) while other worsen (e.g. CO_2 emissions) with income growth.

2.6 Openness

Existing literature suggests that open countries use looser standards of environmental regulation because of the fear of losing international competitiveness. This is also called the race-to-the-bottom hypothesis (Frankel and Rose, 2005). The hypothesis stipulates that free trade will induce developing

countries to relax environmental regulations to attract foreign direct investment by multinational corporations (MNCs). It also implies that given the existence of pollution control legislation and its strict enforcement in more advanced countries, MNCs will export dirty industries to developing countries. Since pollution is exported to developing countries by MNCs from developed countries, the openness hypothesis has two parts: (1) The greater the extent of openness of a developing country's economy, the higher the level of pollution. (2) The greater the extent of openness of a developed country's economy, the lower the level of pollution.

2.7 Size of the industrial sector

Literature points out that many pollutants that emanate from the processes used in the manufacturing sector are inefficient. Production of waste and hazardous substances is therefore a result of the size of the industrial sector of an economy. However, the level of waste and hazardous substances production depends, to some extent, on the type of technology used. Innovation offsets, as per Porter, can bring down the pollution level if environment-friendly technology is widely used. This may occur, particularly for the industrial sector, in some of the more developed countries. However, a large industrial sector will generally produce more CO_2. We therefore hypothesize that the greater the size of the industrial sector, the higher the level of pollution.

On the basis of the theoretical conceptual framework discussed above, the estimation procedure involves a regression analysis of respective data for developing economies and the world (i.e. developing and developed economies combined). The regression analysis is performed on the basis of equations (2) and (3).

$$CO2_t^{Developing} = \alpha_0 + \alpha_1 ip_t + \alpha_2 opn_t + \alpha_3 y_t + \alpha_4 ag_t + \alpha_5 ind_t + \alpha_6 sb_t + \alpha_7 ce_t + \alpha_8 rp + \upsilon_t \quad (2)$$

$$CO2_t^{World} = \chi_0 + \chi_1 ip_t + \chi_2 opn_t + \chi_3 y_t + \chi_4 ag_t + \chi_5 ind_t + \chi_6 sb_t + \chi_7 ce_t + \chi_8 rp + \upsilon_t \quad (3)$$

All variable names, definitions, and measures and sources of data are presented in Table 1. The sample year is 2003 and the sample of countries is listed in Appendix 1.

3.0 Empirical Results

Tables 2 and 3 present the descriptive statistics for developing countries and the world, respectively. It is clear from Table 2 that mean CO_2 emissions are low in developing countries as opposed to developing and developed countries combined (Table 3). On the other hand, mean scores for business environment variables are higher in developing economies (Table 2) as opposed the world (Table 3), possibly indicating a more regulated business environment in the former case. Developing countries also have a larger agricultural sector (Table 2) compared to the world (Table 3), as indicated by the mean score for agriculture valued added.

Table 1. Variable definition and data sources.

Variable	Definition	Measure	Source of data
CO_2	Carbon dioxide	Carbon dioxide emissions (metric tons per capita)	World Development Indicators (World Bank, 2007)
IP	Investment profile	The assessment of contract viability/expropriation, the ability to repatriate profits and payment delays	World Development Report 2005 (World Bank, 2005)
OPN	Openness	The percentage of trade share in gross domestic product	World Development Indicators (World Bank, 2007)
Y	Income	Per capita gross national product in US dollars	World Development Indicators (World Bank, 2007)
AG	Size of agricultural sector	Agricultural value added as a percentage of gross domestic product	World Development Indicators (World Bank, 2007)
IND	Size of industrial sector	Industrial value added as a percentage of gross domestic product	World Development Indicators (World Bank, 2007)
SB	Starting a business	The number of procedures to complete for legally operating a business	World Development Report 2005 (World Bank, 2005)
CE	Contract enforcement	The number of procedures to follow from the moment a plaintiff files a lawsuit in court until the moment of final determination	World Development Report 2005 (World Bank, 2005)
RP	Registering a property	The number of procedures required to officially register property in an urban area	World Development Report 2005 (World Bank, 2005)

Table 2. Descriptive Statistics: Developing Economies (Raw Data, Non-Logs).

Variable	Mean	Standard Deviation	Minimum	Maximum
CO_2	2.97	4.37	0.01	32.74
SB	10.81	2.87	5.00	19.00
CE	32.78	10.85	14.00	58.00
RP	6.89	3.02	2.00	21.00
IP	8.05	2.03	2.50	12.00
Y	2226.70	2786.70	100.00	20050.00
OPN	79.08	35.15	27.10	205.80
AG	16.58	11.33	0.50	51.00
IND	31.48	10.88	13.70	67.40

Table 3. Descriptive Statistics: World (Developing and Developed Economies). Raw Data, Non- Logs.

Variable	Mean	Standard Deviation	Minimum	Maximum
CO_2	4.89	5.81	0.013	33.41
SB	9.90	3.45	2.00	19.00
CE	30.17	11.35	11.00	58.00
RP	6.31	3.07	1.00	21.00
IP	8.91	2.35	2.50	12.00
Y	7552.20	10744.0	100.00	43730.0
OPN	83.84	51.75	22.40	400.0
AG	13.64	12.35	0.10	60.00
IND	31.10	10.38	10.70	67.40

Tables 4 and 5 present the regression results of equations (2) and (3). While equations (2) and (3) represent the general estimable form of the proposed hypotheses, it should be noted that these equations are tested in different specifications, as indicated in columns (1) to (3) of Tables 4 and 5. In essence, each of the business environment variables are tested separately so as to avoid overlapping effects, and to gauge more precisely the extent of impact of each of the business variables on CO_2 emissions. All variables are in natural logs, and the regression analysis is of the double log form. The adjusted R-square values for developing countries are considered to be good - ranging from 0.79 to 0.80. The adjusted R-square scores for developing and developed economies combined are

also good, and are greater than 0.80. The F-statistics are highly significant in all of the specifications in Tables 4 and 5.

Table 4. Regression results for developing economies.
Dependent variable: Log of CO_2 emissions.

Variable	1	2	3
Constant	-9.530 (4.642)*	-10.521 (4.712)*	-10.743 (4.860)*
lnIP	-0.319 (0.956)	-0.313 (0.919)	-0.311 (0.912)
lnOPN	0.260 (1.304)	0.331 (1.647)***	0.337 (1.660)***
lnY	1.077 (8.315)*	1.084 (8.160)*	1.086 (8.040)*
lnAG	0.019 (0.098)	-0.024 (0.121)	-0.018 (0.089)
lnIND	0.839 (2.957)*	0.736 (2.589)*	0.729 (2.563)**
lnSB	-0.551 (1.846)***	…	…
lnCE	…	-0.060 (0.258)	…
lnRP	…	…	-0.010 (0.046)
N	87	87	87
DW	1.07	1.72	1.70
R-square	0.80	0.79	0.79
R-square (Adj.)	0.78	0.77	0.77
F-statistics	52.1	49.5	49.5

Note: *t*-statistics are in parentheses. *ln* denotes logs.
*, **, and *** indicates statistically significant at the 1, 5 and 10 % levels respectively.

Table 5. Regression results for developing and developed economies combined.
Dependent variable: Log of CO_2 emissions.

Variable	1	2	3
Constant	-11.010 (7.317)*	-11.638 (7.754)*	-12.041 (8.115)*
LnIP	-0.226 (0..706)	-0.222 (0.694)	-0.209 (0.656)
lnOPN	0.287 (1.863)***	0.292 (1.919)**	0.337 (2.180)**
lnY	0.919 (9.549)*	0.943 (10.350)*	0.960 (10.570)*
lnAG	0.096 (0.858)	0.107 (0.961)	0.113 (1.025)
lnIND	1.075 (4.834)*	1.018 (4.554)*	1.065 (4.990)*
lnSB	-0.028 (0.149)	…	…
lnCE	…	0.154 (0.790)	…
lnRP	…	…	0.227 (1.439)
N	115	115	115
DW	1.65	1.60	1.68
R-square	0.81	0.81	0.82
R-square (Adj.)	0.80	0.80	0.80
F-statistics	77.5	78.1	79.4

Note: t-statistics are in parentheses. *ln* denotes logs
*, **, and *** indicates statistically significant at the 1, 5 and 10 % levels respectively.

A number of variables produced the expected outcomes, and their coefficients are statistically significant. These are discussed as follows:

3.1 Regulation of the business environment and pollution in developing countries

Table 4 presents the regression results for developing countries. The sample includes 87 low and middle-income countries (see Appendix 1). As previously mentioned, business environment variables are tested separately. Turning to business environment variables, Table 4 shows that the coefficient of starting a business (*SB*) is negative, as expected. *SB* is also statistically significant at the 10 % level. The results of *SB* provide strong confirmation of a negative correlation with CO_2 emissions. Based on this coefficient, it can be suggested that countries where the regulatory environment is stringent (i.e. there are more procedures to complete before legally starting a business) have lower levels of CO_2 emissions. Interestingly, the developing country case produced further evidence of a negative correlation between the regulated business environment and CO_2 emissions. The two other business variables, *CE* and *RP*, produced expected negative signs on their coefficients, but were found to be statistically insignificant. The results of *EC* and *RP*, nevertheless, provide weak evidence that developing countries with more procedures to follow for contract enforcement and registration of properties have lower levels of CO_2 emissions.

Turning to the control variables, our results indicate that a number of variables outside the business environment are highly significant. For example, openness *(OPN)*, incomes *(Y)*, and the size of the industrial sector *(IND)* are significant determinants. The coefficient of openness is positive and statistically significant at the 10 % level in two of our specifications (columns 2 and 3 in Table 4). Similarly, income and the size of the industrial sector have positive and statistically significant coefficients in all three specifications. Based on our regression results, it can be strongly argued that higher per capita incomes are associated with higher levels of CO_2 emissions, and that the larger the industrial sector, the higher the CO_2 emission levels.

3.2 Regulation of the business environment and global pollution

Table 5 presents the regression results for the world (i.e. developing and developed countries combined). The sample includes 87 low and middle-income countries and 28 developed countries (see Appendix 1). As with the developing and developed country cases, the business environment variables are tested separately. Table 5 shows that only one of the three business environment

variables has the expected effect. Although the coefficient of *SB* is negative as expected, it is statistically insignificant. The results of *SB* provide a weak confirmation of a negative correlation with CO_2 emissions. In the global case, the control variables are more dominant than the business environment variables. The results in Table 5 show that openness, income, and the size of industrial sector have positive and statistically significant coefficients. Thus, it can be strongly argued that CO_2 emissions rise as (1) the world becomes more open, (2) global per capita incomes increase, and (3) the size of the industrial sector increases.

4.0 Summary and Concluding Remarks

The purpose of this paper was to examine the effects of a range of business variables on environmental pollution for developing countries using cross-sectional data. The analytical procedure adopted here included an estimation of reduced form equations for both developing countries, and developing and developed countries combined. The empirical results obtained confirmed a number of our theoretical contentions.

Our results for the developing country case provide strong evidence of a negative correlation between CO_2 emissions and starting a business, thereby suggesting that in developing countries where the regulatory environment is stringent in terms of starting a business (i.e. there are more procedures to complete before legally starting a business), lower levels of CO_2 emissions are recorded. The developing country case also provides weak evidence that when there are more procedures to follow in terms of contract enforcement and registration of properties, lower levels of CO_2 emissions are achieved. The developing country case confirmed that openness, incomes, and the size of the industrial sector are significant determinants of CO_2 emissions.

We also attempted to test the effect of the business environment on CO_2 emissions for the world (i.e. developing and developed countries combined). Our results show that there is a weak relationship between the number of procedures to complete before starting a business and CO_2 emissions. We find that the control variables have a more dominant effect in the global case. In essence, our empirical results confirmed that CO_2 emissions rise as (1) the world becomes more open, (2) global per capita incomes increase, and (3) the size of the industrial sector increases.

Although there is much empirical research on the effects of environmental regulation on pollution, there is little research examining the effect of business regulation on pollution. This study is an initial attempt to fill this gap. The results

obtained here have clear policy implications since it appears that putting regulatory mechanisms in place to facilitate business formation and operation can also help reduce pollution. This is a key empirical finding. While our study focused on only one agent of pollution, CO_2, there is a need for research that examines the effects of business regulation on other pollutants such as methane, nitrous oxides, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride - all of which are greenhouse gasses (United Nations, 1998).

The rise of highly populated countries like India and China as major economic powers has begun to affect pollution globally. If other countries from Latin America, Africa, and Asia begin to catch up with these emerging economic powers then environmental pressure is bound to increase even further (Gillespie and Leflaive, 2007). That is to say, the connection between business and the environment will intensify. Given this new reality, policy makers must understand how businesses can be remodeled to make them more environment-friendly and responsive to pollution problems. Improvements in business regulation can certainly help to reduce pollution problems perpetrated by CO_2 emissions.

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Appendix 1: Sample countries.

Developing countries	Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Bangladesh, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cameroon, Chad, Chile, China, Colombia, Congo Democratic Republic, Congo Republic, Costa Rica, Cote d'Ivoire, Croatia, Dominican Republic, Ecuador, Egypt Arab Republic, El Salvador, Estonia, Ethiopia, Ghana, Guatemala, Guinea, Haiti, Honduras, Hungary, India, Indonesia, Iran Islamic Republic, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Latvia, Lebanon, Lithuania, Malawi, Malaysia, Malta, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Senegal, Serbia and Montenegro, Sierra Leone, Slovak Republic, South Africa, Sri Lanka, Syrian Arab Republic, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Venezuela, Vietnam, Yemen Republic, Zambia and Zimbabwe.
Developed countries	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea Republic, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States, Hong Kong, China, Saudi Arabia, Singapore, Slovenia, and United Arab Emirates.