INVESTIGATING THE EFFECTS OF THE GLOBAL ECONOMY ON POLICY AND PRACTICE IN DEVELOPING COUNTRIES: FOREIGN DIRECT INVESTMENT AND THE ENVIRONMENT

by

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DISSERTATION ABSTRACT

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Title: Investigating the Effects of the Global Economy on Policy and Practice in Developing Countries: Foreign Direct Investment and the Environment

Is foreign direct investment (FDI) good for the environment in developing countries? Every year the number of foreign investors in developing countries grows, and its importance leads developing nations to make the political environment more hospitable for foreign investors that seek access to natural resources and new markets. I contribute to the debate over the influence of globalization on the environment by asking: Do the effects of multinational corporations (MNCs) on a developing country's environment reflect the commitment of the source country to environmental protection?

Existing literature suggests that international economic flows are channels by which countries providing investment financing can influence the regulatory standards in recipient country. This dissertation explores the possibility of a source effect, where countries receiving FDI begin to reflect the environmental practices of those MNCs providing FDI. In a mixed methods research study, I use content analysis and large-n quantitative analysis to evaluate (i) what distinguishes the effects on environmental protection of FDI from multi-national corporations (MNCs) from different source countries; and, (i) how does FDI from MNCs from different source countries lead to different outcomes in recipient countries. I find preliminary evidence that suggests that

levels of development of the source countries of FDI significantly influence whether FDI improves or degrades environmental quality in recipient countries.

I demonstrate that the increasing flow of FDI from developing countries is leading to pressures for and evidence of declining environmental standards and outcomes in recipient countries. This dissertation provides preliminary evidence supporting a new perspective on international economic flows, showing a 'source effect' in which the strength of concern regarding and interest in protecting the environment in the source country for FDI has an impact on the degree to which environmental outcomes are promoted in recipient countries.

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CHAPTER I: INTRODUCTION

Globalization is increasingly harming environmental justice. Inadequate compromise between domestic governments and multinational corporations (MNCs) has led to failures in protecting environmental resources that the poorest individuals and communities need. It is largely believed that foreign investment from MNCs is critical to development, and it is largely assumed that this investment will diffuse best practices and initiate improvements in technology that will alleviate environmental problems (Schmidheiny 1992). However, the ability to move production anywhere on the globe also gives corporations increasing freedom to locate businesses where they are the most profitable at the expense of local communities and the environment (Madeley 1999). Of particular concern is whether MNCs are bringing policies and practices that are more beneficial or harmful to environmental outcomes in the countries where they invest.

Evidence regarding the relationship between foreign direct investment (FDI) and the environment is mixed and is used to sustain competing claims of "race to the bottom" and "race to the top" effects, depending on the environmental problem, industrial sector, or region under investigation (Vogel 1997). On one hand, it is possible to find evidence that foreign investors are not only having a negative impact on environmental resources (Neafie 2018) but also stalling the introduction of new environmental regulations that would improve the environment (Jorgenson 2007). On the other hand, evidence shows that foreign investors are bringing with them green regulations and technology and

encouraging their use in developing countries (Garcia-Johnson 2000). However, neither side of this debate has investigated the impact that different sources of FDI, and the subsequent diffusion of a variety of environmental policies and practices, will have in developing countries.

To advance this debate, I examine how MNCs vary. I examine the possibility that "source effects"—the degree of potential environmental harm on host country regulations and practices deriving from the environmental atmosphere of a MNC's home country—will cause MNCs to have a more positive or negative impact on environmental practices in developing countries.[1] This theory of source effects is predicated on the idea that exogenous factors at home—social, political, and economic—influence a corporation's internal norms and discount rates, thereby changing their cost benefit analysis of different environmental strategies. As a result, companies from different socio-political and financial environments would have different environmental policies and practices.

Second, I examine how these corporations are diffusing these behaviors into developing countries that have weaker environmental infrastructure. Investment into developing countries is further complicated because it is heavily concentrated in manufacturing and extractive industries, which are highly pollutant. This means that the environmental policies and practices a company carries with them become even more important for the environmental impacts of FDI.

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1 This is derived from the work of Adolph et al. (2017), which shows evidence to suggest a "Shanghai Effect" for trade in developing countries.

This project will examine the role of manufacturing and extractive MNCs by addressing the questions of how, when, and why FDI can affect green policy and practice in developing countries. This study contributes to the growing body of research on policy/environment relationships in comparative perspectives. Drawing from political economic theories—including liberal economic theories, foreign investment dependence, and source effects—and sociological approaches to society and the environment, I employ a three-part study that uses quantitative content analysis, rigorous panel regression techniques, and a case study of South-South investment.

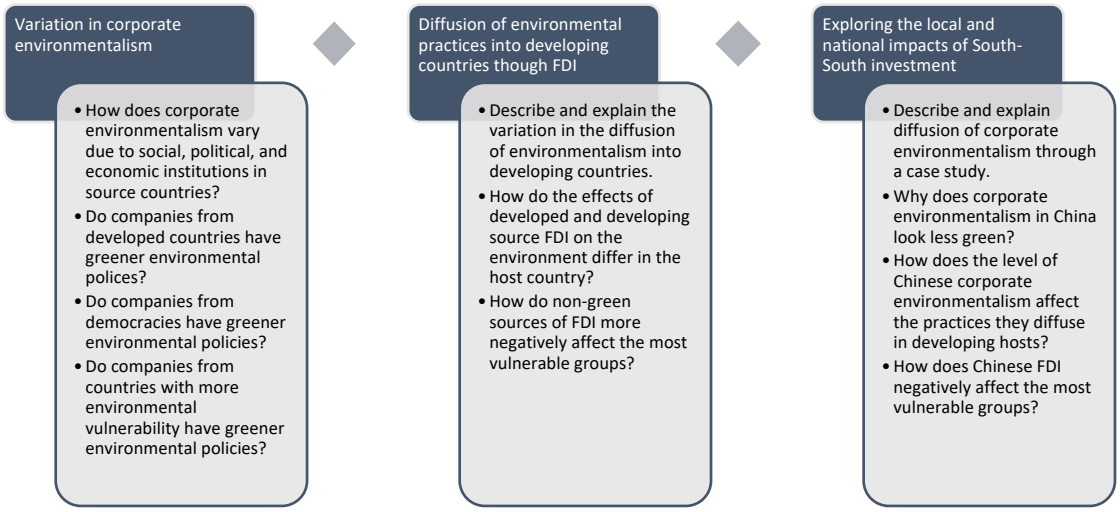

Figure 1.1: Research Design

Figure 1.1 lays out the three-part research design, with the motivating questions. The second chapter is a content analysis of corporate reporting, which looks at commercial environmental policies and traces the institutional variation that may have prompted those policies. The findings of the content analysis indicate significant impacts by political and economic institutions, which are analyzed in the consequent chapters.

The third chapter examines how the environmental consequences vary by economic institutions—developed versus developing. This large-N panel data analysis finds evidence to suggest that companies from developing countries have adverse environmental outcomes in the other developing countries they invest in. Finally, to look more closely at this theory, I use a case study of Chinese corporations. China is a developing country with high levels of outward investment in other developing countries and a historically poor environmental track record. This exploration finds evidence to suggest that China is having a more harmful effect on the environment than other foreign or domestic investors in Africa. Combined together, this three-part research design tests how, when, and why globalization may or may not lead to desired green outcomes.

Understanding Why Corporate Environmentalism Varies—Source Effects

We should expect the effect of FDI to reflect the ideas, values, norms, and concerns that are embedded in the strategies and practices of those making the investments (i.e., MNCs). Corporations are made up of individuals who are largely influenced by the ideas, values, and norms of their society. Political, economic, and social institutions are the sources of information that encourage corporate behavior, and variation in these institutions cause strategies to change.

The logic of this framework is that corporations are organizations managed by rational actors who find themselves in complex and uncertain situations. The main goal of business is to maximize profit, but the strategies to achieve this may shift based on external forces; these may alter not only expected benefits and costs, but also internal norms and discount rates, which may be applied to the cost-benefit analysis (Aligica,

Boettke, and Tarko 2019). A corporation will voluntarily undertake social responsibility practices, like those that benefit the environment, because profits "are the result of a win-win synergistic relationship with its broader social environment" (Aligica, Boettke, and Tarko 2019, 191). The process depicting strategic choice is laid out in Figure 1.2, where we can see that managing actors would weigh the benefits and costs of certain strategies dependent on the internal norms, discount rates, and the perceived linkages to outcomes (adapted from Ostrom's (1990) internal world of individual choice). This means that the valuation of expected costs and benefits relies heavily on exogenous factors, particularly the influence of stakeholder groups linked to the corporation, e.g., government, shareholders, consumers, and so on. As a result, shifts in the social environment, and variations in institutions that affect it will lead to different corporate practices.

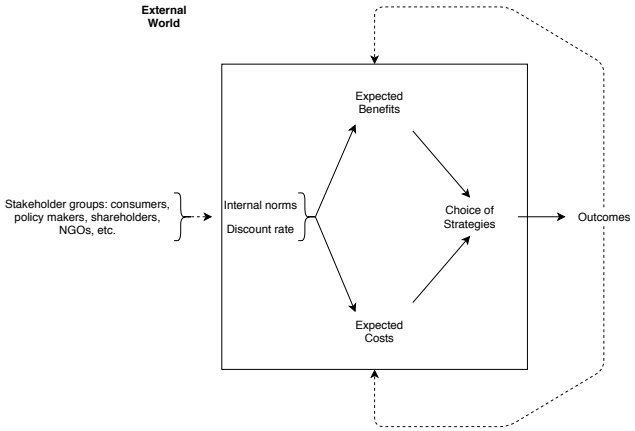

Figure 1.2: Corporate Strategic Choice (Source: Author, Adapted from Ostrom (1990))

Changes to the expected costs and benefit analysis of corporations are often motivated by the outcomes of previous strategies; however, shifts in internal norms or perceptions of stakeholders can alter the norms and discount rates of the MNC. Where

stakeholders share a strong internalized norm, one can expect the corporation to act in accordance with that shared norm. For example, a study on green corporate reporting found that companies in the United States that are influenced by more progressive norms were willing to spend more on sustainability, even when it cost the company more than it benefited it (Di Giuli and Kostovetsky 2014). In this study, the companies were influenced by stakeholders that shared a strong internalized norm: that corporate reporting and sustainability are important. The companies act as a result of social learning and engaging with the wider community and leverage these norms as a benefit to the corporation (Aligica, Boettke, and Tarko 2019). When a corporation ignores the needs and wants of the community, stakeholders shame it for that behavior, which costs money and reputation (Ambec and Lanoie 2008). However, when only a few stakeholders share a norm, corporations will act opportunistically—in their self-interest (Williamson 1975)—and will pursue the path with the highest profit margins.

This general model of corporate decision-making is open to specifications that are dependent on the source. The source of the MNC is where the most amount of stakeholder influence is felt, i.e., where the corporation gains the most amount of competitive advantage by engaging with the community (K. Zeng and Eastin 2007; Vogel 1995; Pauly and Reich 1997; Prakash and Potoski 2007; Adolph, Quince, and Prakash 2017; Aligica, Boettke, and Tarko 2019). The analysis in this dissertation examines where this variation exists over issues of the environment by looking at the social and political institutions that shift community perspectives in source countries, and it shows evidence to support the theory that variation in outcomes in the host country reflect differences at the source.

The Propositions

The three propositions laid out here motivate the hypotheses I explore in my chapters linking the source to corporate environmentalism and the diffusion of environmental practices abroad. These propositions are purely conceptional, general statements prompted by the different literatures on corporate environmentalism, MNCs as sources for policy diffusion, and the relationship between MNCs and the developing countries in which they invest. Each of these propositions will inspire testable hypotheses in the chapters of my dissertation.

Conditions for Green Corporate Environmentalism

It is difficult to provide a specific definition of corporate environmentalism, but we can understand the type of expectations, ideas, and values it assumes. Corporate environmentalism often reflects more on civil society than the government in the source country, but both are motivating factors (Garcia-Johnson 2000). It is largely believed that foreign investment should lead to more sustainable practices through the diffusion of improved technology, innovation, and competition. However, it is often suggested that civil society and the government are only able to focus on environmental issues and sustainability when economic development is at a high level (Korten 2001; Zammit 2003).

Understanding this phenomenon requires a closer look at the Environmental Kuznets Curve (EKC) hypothesis. According to studies on this hypothesis, during lower levels of development, economic growth is prioritized over environmental protection, allowing for resource plunder and high pollution (Grossman and Krueger 1995; Yandle,

Bhattarai, and Vijayaraghavan 2004; Panayotou 1993). Only when development has reached a certain level, can society begin to focus on post-material values such as environmental concerns (Inglehart 1990). This means that when a nation is developing, economic growth is prioritized; if the economy and environmental protections come into conflict, the creation and enforcement of eco-friendly policies will be weakened or undermined in favor of the market (Gallego and Pitchik 2004). This theory is largely motivated by corporate material values, but it is also compelled by other entities such as the political elites and the citizens that select and support governments who provide high levels of economic growth (Mulligan, Gil, and Sala-i-Martin 2004; Hibbs 2000, 2001; Ferejohn 1986, 1999). Understanding that these groups motivate corporate strategic decision-making, I expect that there is a connection between the level of development and the level of green corporate environmentalism.

Proposition 1. *Corporate environmentalism reflects economic development and demands from stakeholders who are more likely to prioritize environmental policy when they reach a high level of economic growth, and development is stable. Green corporate environmentalism will increase in more developed countries when stakeholders share norms that prioritize environmental issues, thereby making corporate environmentalism greener when development levels are higher and less green when development levels are lower (Tested in Chapters 2 and 4).*

Diffusion of Environmentalism

Multinational corporations (MNCs) operate in developing countries with weak environmental policies and poor infrastructure development. These economic and

political environments often prioritize foreign investment because it promotes economic growth and will make the atmosphere for investment as hospitable as possible, even weakening regulations in less important policy areas, such as the environment. This allows MNCs to operate in a strategic manner that is most beneficial to them, maintaining policies that provide the most competitive advantage. If an MNC has low levels of green corporate environmentalism, it will lack any motivation to improve its behavior. However, if it has high levels of corporate environmentalism, it might seek to improve its competitive advantage by encouraging local governments to increase the environmental regulations of the country. By studying source effects, new patterns develop for our understanding of outward investment and the competing claims over whether FDI creates a "race to the bottom" (RTB) or a "race to the top."

Theories that link development and increased FDI with environmental degradation are often associated with an RTB. Some RTB studies claim that foreign investors seek the promise of access to adequate infrastructure with opportunity for natural resource exploitation (Bellos 2010; Bellos and Subasat 2012; Hu, Deng, and Zhang 2013; Oneal 1994; Jessup 1999; Bues 2011). Other RTB studies claim that developing countries are just pollution havens in which MNCs shift their exploitative practices away from developed countries that have adopted more stringent policies and toward countries that have lax regulations (Levinson and Taylor 2008). These studies claim that investors have practices and policies aimed at exploiting host countries.

If this were the case, then all FDI would be linked with poor environmental outcomes; however, evidence suggest that corporations export better technology and knowledge (Klein, Aaron, and Hadjimichael 2001; Modou and Liu 2017; Schmidheiny

1992) as well as promote norms of environmentalism that change the social and regulatory context between the industry and environmental sustainability (Garcia-Johnson 2000). Research suggest that high income countries are not attracted by weak environmental standards because they are richer and already have higher environmental standards and better technology in place to meet any strict regulations; thus, they are not incentivized by pollution haven opportunities (Bhagwati 2004; Dean, Lovely, and Wang 2009).

The behavior of MNCs is motivated both by limiting costs and increasing benefits; they can be incentivized to change their behavior if the advantages of doing so outweigh the expense. For companies that already have strong environmental strategies, they are not going to change those policies (as it would be costly to do so) and will even promote environmentally beneficial policy changes if they may gain competitive advantage (Garcia-Johnson 2000). This indicates that corporations with greener environmentalism have a "race to the top," or positive effect, on environmental outcomes where they invest.

However, companies that have not adopted better environmental strategies may not change if the regulatory and social institutions where they invest do not provide incentives to do so. The MNCs are largely dependent on their source country's markets and are not motivated by the local economy; thus, if the regulatory agencies are lenient, there are few host country incentives to change behavior. As a result, corporations with less green environmentalism should have a "race to the bottom," or negative effect, on environmental outcomes where they invest. Proposition 2 proceeds from these observations and makes the connection between the source of corporate

environmentalism (Proposition 1) and eco-friendly outcomes in the host countries where MNCs invest.

Proposition 2. *The level of green corporate environmentalism an MNC carries may affect environmental outcomes in the developing host country. As MNCs diffuse their source country's environmental policies and practices into the developing host country, MNCs from green sources should have a positive effect while MNCs from non-green sources will have a null or negative effect, depending on the current policies in the host developing country (Tested in Chapters 3).*

Environmental Justice in Developing Countries

It is also important to understand that MNCs operating in developing states will have an effect not only on the economic system, but on the political and social system as well. On one hand, modernization theorists have been optimistic about the diffusion of environmentalism from MNCs to developing countries. MNCs help improve levels of environmental justice; when the MNC has stronger corporate environmentalism, its practices may influence local civil society, or it may transfer technology that could improve resource use and raise the societal norms on environmentalism to those of advanced industrialized countries.

On the other hand, dependency literature has been highly critical of modernization theorists, claiming that more globalization could perpetuate dependency and under-development (Valenzuela and Valenzuela 1978). MNCs harm developing countries when they promote resource exploitation and push governments to relax regulatory

requirements on the environment, not only harming the natural world but also the most vulnerable populations in developing countries (Rudra, Alkon, and Joshi 2018). The groups most vulnerable to pollution and resource scarcity are usually made up of marginalized citizens that have little political influence and suffer from high levels of poverty and inequality (Rigby and Wright 2013; Flavin 2012; Hickey and Bracking 2005; Gilens 2012). As these groups have no bargaining power, MNCs are able to capture governing agencies and either reduce environmental regulation or maintain the status quo when there are few regulations enforced. This results in worse environmental conditions in developing countries that receive investment from MNCs who are not influenced to use green practices and create green policies.

The negative effects of non-green FDI from developing countries may only be negated by strong political institutions or a strong middle class, which are not mutually exclusive. Middle class groups tend to have more political clout, more resources for political action, and are more socially cohesive (Rigby and Wright 2013). As such, they can act as a check on the power of industry and communicate regulatory needs to policymakers. The middle class also helps bridge the gap between the rich and the poor, and it typically grows larger as a country develops. This group only forms as development grows, at lower levels of development there are less avenues for the citizens to make the government aware of environmental problems that need to be addressed.

Proposition 3. *FDI from non-green sources can adversely impact the poor's access to natural resources and the levels of pollution they are exposed to; as a result, the poorer and less developed a country, the more negative the impacts of MNCs from non-green sources. At lower levels of development, the governments will be influenced by MNCs*

over citizens, who may not be able to overcome collective action problems to lobby for stricter government regulations (Tested in Chapters 3 and 4).

Research Design

This dissertation is organized into three sections, exploring three propositions about corporate environmentalism and the role that the MNCs plays in diffusing environmental practices and policies in host countries. This study requires a mixed methods approach to explore how developed and developing source FDI varies in its effects on developing host country environmental policy and, to a lesser extent, why this variation happens. Through this process, I will show evidence to validate the source effects hypothesis.

Figure 1.3 provides a visual representation of my project. My research design is largely based on testing the role of FDI in diffusing environmentalism from the source country to the host country. In the source country, stakeholder groups influence the strategies that become embedded in the corporation. The investment into corporations in the host country where the investor takes ownership and control of the corporation allows the investor to export their strategies with their investment. Consequently, the outcomes from the corporation in the host country then are largely dependent on the policies and practices that have been diffused through the foreign investor.

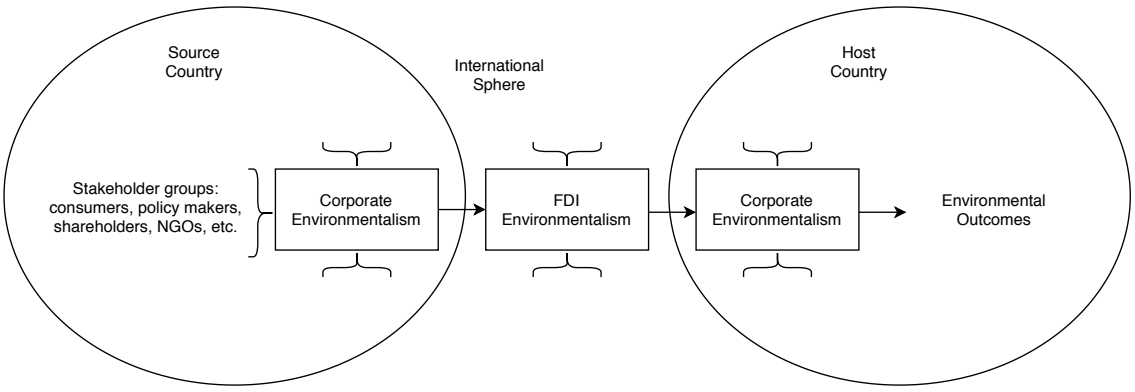

Figure 1.3: Flow of Corporate Environmentalism from Source Country to Host Country

Case Selection

For this study, I narrow my focus to manufacturing and extractive industries. The largest developing country investment comes from manufacturing and extractive industries, which have the greatest impact on the environment (Jorgenson 2007, 2006b; Rudra, Alkon, and Joshi 2018). The importance of these industries to economic growth in developing host countries makes it more probable that they will be able to export corporate environmentalism. These industries are the least likely groups to disseminate environmentalism and most likely to cause resource depletion and pollution. As a result, they are a hard test for positive effects from developed source countries, and if developing source countries do not show negative effects on environmental outcomes, it is unlikely they will in other less pollution-heavy sectors. There are some limitations to this case selection, however. It is important to note that extractive and manufacturing industries are more polluting than others, and so other industries must be considered. However, they may not have the same negative effects.

Research Methods

I explore manufacturing and extractive industries in three different studies using a mixed methods approach. I first begin with a content analysis of corporate reports. In this analysis, I am making observations that capture the environmental reporting practices of corporations and then analyze them dependent on the political, economic, and social institutions of the state in which they originate. This analysis further develops the theory of source effects by showing that (i) there is variation between corporations from different sources and (ii) that this variation can be distinguished through institutional environments, particularly economic and political.

Using the findings from Chapter 2, Chapter 3 tests the theory that MNCs from sources with different economic institutions will result in different outcomes in the developing host countries where they invest. Using a state-level panel study of greenfield investment[2] in developing countries, I test the impacts of developing country inward FDI as a percentage of total FDI coming into a developing country on different environmental factors. This investigates the compositional effects of FDI—i.e., the impacts as developing country FDI *composes* an increasingly larger part of total investment. The major finding of this is that source effects are an alternative lens to understanding the variation in FDI impacts in developing countries,[3] and that a greater number of greenfield FDI projects—in manufacturing and extractive sectors—from developing countries are

2 Greenfield investments are the establishment of a subsidiary in a foreign country that has more investor control relative to investing in an existing local business. These types of investments are often used when expanding into emerging markets (Maverick 2019).

3 For more information on source effects, see Adolph, Quince, and Prakash (2017).

associated with a worsening of the overall environmental situation in the host developing country. I find that developing countries that attract higher levels of FDI from other developing countries, thereby changing the composition of their investment flows, consequently, experience more harmful environmental impacts.

Finally, Chapter 4 focuses on a case study of Chinese outward investment into Africa and explores the mechanisms from Chapters 2 and 3 more closely. I explore the social, political, and economic institutional environments that lead Chinese corporations to adopt specific environmental strategies. I then study the impact of this investment in African countries where China is becoming an increasingly larger proportion of foreign investment. The evidence suggests that Chinese corporations are largely influenced by local institutional environments, causing weaker environmental strategies. This means that when Chinese companies become a larger part of inward investment in Africa, there will likely be more negative environmental outcomes.

Contributions to International Relations Literature

This dissertation complements and challenges the current international relations literature by studying a set of non-governmental actors (multinational corporations) at different levels of analysis (transnational and domestic). This study looks at the everyday behavior of these corporations, which is important to the regulation of production practices, as well as the effects of corporate strategies on governments, communities, and environmental movements. Through the study of corporate environmentalism, I am able to further isolate the dependent variable 'environmental impact' to help further understand the intersection of the international and the domestic.

I also bring the theory of source effects into the study of FDI (Adolph, Quince, and Prakash 2015). This study provides a foundation for determining how the source of FDI matters through creating variation in the strategies corporations pursue. In looking at source effects, I focus on how corporations from a variety of places develop diverse ideas about corporate environmentalism, which may have a range of effects on the developing host country. This is important to the larger international relations literature because it explains the debate in the literature about whether FDI is a help or a hindrance to developing countries.

I also draw on the common claim that FDI wields more influence over domestic politics and institutions in developing countries than in developed countries. Developing countries see foreign investment as an important and persistent driver of the global economy and of their own domestic economic growth (Pandya 2010; Fontagne 1999). I show support for the theory that developing countries are more dependent on FDI as well as more vulnerable to the conditions of the global economic system and the policies that investors bring with them (Chase-Dunn 1975; Bornschier and Chase-Dunn 1985).

CHAPTER II: CORPORATE SUSTAINABILITY REPORTS AND GREEN ENVIRONMENTALISM: OPERATIONALIZING THE ENVIRONMENTAL IDEOLOGY OF CORPORATIONS

Introduction

Why do corporate environmental practices vary by source? Corporate social responsibility (CSR) reports are becoming increasingly popular; however, the extent to which corporations participate in CSR varies. Today, more than 8000 companies that are signatories to the United Nations' Global Compact come from more than 150 countries and have different options to engage with society. Wang et al. (2016) note that the scale and prominence of CSR acceptance reflects a shift from a conversation about what a multinational corporation's (MNCs) mission is—"should we do it"—to one about the mechanisms and processes by which MNCs conceptualize and undertake social obligations—"how we do it." As a result, as social, political and economic institutions vary, as do the corporate policies and practices reported by MNCs (Aguilera and Jackson 2003). This is largely driven by the different stakeholder claims motivated by the different institutional environments in their own countries (H. Wang, Choi, and Li 2008). It is my belief that when it comes to environmental CSR, MNCs are largely influenced by this national context—at their source—and that the economic, social, and regulatory institutional environments motivate MNCs to be more or less involved in green CSR.

One reason suggested by the literature is that the diverse environments in different countries shape CSR. For example, its evolution in emerging and developed economies may differ due to economic, political, or social institutional contexts. For example, in middle- and low-income countries, the economic and political institutions are dominated

by those that seek to promote economic growth over environmental protection, leading to unsustainable environmental practices (Korten 2001; Zammit 2003). However, as countries become more stable economically, stakeholder groups may expect business to be more environmentally responsible and to have better stewardship of natural resources (George, Schillebeeckx, and Liak 2015). Not only economic, but also social and regulatory institutional environments may also play a large role in compelling MNCs to act (Gardberg and Fombrun 2006). How MNCs conform to expectations in these different institutional environments varies and, according to Wang et al. (2016), has been largely understudied.

To investigate the role that institutional environments play in shaping CSR, I collected CSR reports from more than 50 MNCs in extractive and manufacturing industries in both developed and developing countries across different political environments. I argue that the goals and processes of environmental CSR will vary due to the different social, economic, and political institutional environments at a MNC's source. I coded and analyzed these reports using quantitative content analysis, multiple regression, and other parametric statistical techniques. The findings indicate that levels of professed greenness in CSRs vary in different institutional environments, largely driven by the MNC's development context in its source country.

This chapter contributes to the literature on international political economics in two ways. First, it explores the theoretical phenomenon of source effects and legitimizes the theory as a useful tool in globalization studies by investigating the variation of MNCs' level of environmental concern by source (Lane and Milesi-Ferretti 2008; K. Zeng and Eastin 2007; Vogel 1995; Pauly and Reich 1997; Prakash and Potoski 2007).

Second, I operationalize and assess the roles of and relationships with stakeholders in corporate social responsibility (CSR) reporting more thoroughly and comprehensively than has been done previously. I use 53 specific environmental parameters of corporate greenness, which are derived from the literature on globalization and corporate environmental disclosures, to assess the role that different institutions play in shifting corporate reporting. I find evidence to suggest that political and economic institutional environments have more effect on MNC green policies than social institutional environments.

In the next section, I introduce the concept of CSR greenness; I discuss what CSR reports are, the credibility of these reports, and the specific indicators one should look for in assessing the greenness of a corporation. I also show 'how investment greenness can be shown to vary,' before I discuss the institutional environments that can cause variation. In the third section, I discuss the mechanisms that may cause CSR to vary, and the effects that different institutional environments may have. After that, I introduce my quantitative content analysis research design, including the indicators that give CSR reports credibility, show stakeholder relationships, and that display their outward greenness. Finally, I will use my research to confirm that levels of development and political regime matter to CSR reporting and conclude by indicating future avenues for research.

Background: Corporate Social Responsibility (CSR) Reports

CSR reports are important sources of knowledge of how corporations both present themselves and behave at home and abroad (Hah and Freeman 2014). The main goals of

these reports are to reveal corporate performance type and communicate corporate strategy to stakeholder groups. Over the years, international guidelines and national government policies have made these reports gradually more reliable and a source for recognized corporate policies (Clarkson, Overell, and Chapple 2011). Additionally, as CSR has become increasingly important to stakeholders, corporations have prioritized revealing good environmental strategy to distinguish themselves from companies who can only report "bad" news (Clarkson et al. 2008; Jose and Lee 2007; Lock and Seele 2016). The importance of these reports is so evident that companies have even been willing to take a loss in terms of direct value (i.e., increase in profit) to provide these reports (Di Giuli and Kostovetsky 2014).

In these reports, companies credibly communicate their environmental policies and practices to show how green they are, respective to the expectations of society, regulation, and economics. These reports also show the extent to which the company allows external stakeholders to influence corporate policy decisions (Herzig and Schaltegger 2006; Fifka 2013; Jose and Lee 2007; S. X. Zeng et al. 2012; Sotorrío and Sánchez 2010; Kolk 2010; Clarkson et al. 2008). Studies also state that these reports have become more credible[4] as they standardize by international and domestic guidelines, providing a more accurate depiction of a MNC's internal practices and policies (Lock and

[4] These reports are independent corporate editorials in which companies self-report their corporate greenness, raising concerns that these environmental reports are nothing but 'greenwashing'—the act of reporting only positive environmental policies and practices (Lyon and Maxwell 2003). However, governments, stakeholders, and pressure on corporations from international organizations that regulate the CSR reports increase the legitimacy and credibility of the information included (Lock and Seele 2016; Di Giuli and Kostovetsky 2014). Legal violations can lead to fines that organizations must report in their financial obligations or adhere to these laws whereas stakeholders and international organizations put social pressure on organizations to be environmentally responsible and have been successful in their influence of corporate responsibility and reporting (Wolf 2014; Di Giuli and Kostovetsky 2014). The result is that the reports are now seen as a credible source of the upper limit of corporate policy.

Seele 2016). As a result, these reports can indicate the shape of a MNC's CSR or, as I will refer to it, a corporation's level of greenness.

The Argument: Institutional Environment Effects on CSR Reports

Companies create their environmental policies around the shifting institutional environments of economics, society, and politics (Albino et al. 2009). CSR development is prefaced on three factors: strategy—CSR is a means to increase profits; altruism—CSR is developed because corporations have normative behaviors that indicate they are concerned with social benefits; and coercion—the taxes, fines, and subsidies from regulatory agencies (Husted and Salazar 2006). This section examines the institutional environments that affect these three components and the development of green CSR. It also introduces three hypotheses that will be explored in this research.

Economic Institutional Environment

MNCs are largely considered to be driven by the goal of maximizing profits and shareholder value (Falkner 2005), and a corporation's profits may be affected by environmental strategies that would eat into this profit. However, in different economic institutional settings, the economic situation may push corporate norms toward environmental strategies. For example, different levels of development cause changes to the market—the economic institution—that corporations are operating in. This happens because at different levels of development the material goods available and the material values of citizens both change and influence corporate decision-making.

In countries at lower levels of development, MNCs are more focused on maximizing profits than on pursuing green strategies. The economic institution

encourages society to focus on material values, such as services and goods that will advance economic growth, and considers environmental stewardship to be a lower priority than economic development; this allows companies to access resources and pollute to meet the demands of economic growth (Najam, Runnalls, and Halle 2007). Even developing countries' laws and institutions fail to take into account the need to make economic development compatible with environmental protection (Conca 2006; Abers and Keck 2013; Huitema and Meijerink 2009; Molle and Wester 2009). When environmental laws do exist in this environment, the policies are often contradictory, pursuing numerous objectives simultaneously, in an unsuccessful attempt to achieve both economic and environmental goals (Lim, Menaldo, and Prakash 2014). The developing country's economic environment encourages organizations to focus more on economics than the environment, and I would expect that MNCs in these institutional environments to have fewer green policies.

As the economy develops, there is a shift to implementing better environmental strategies (Grossman and Krueger 1995; Seldon and Song 1994). This happens when the economic institutional environment goes past the tipping point of the Environmental Kuznets curve (EKC)—the point on the inverse U-shaped curve at which resource plunder and pollution start to decrease as society advances (Andreoni and Levinson 1998). This is credited to a shift toward post-material values, which are taken for granted during early stages of economic growth, such as the environment (Inglehart 1997) and access to more and better technology.

In summary, development largely affects strategic corporate choices, and to a lesser extent the altruistic and coerced elements of their CSR. During development,

MNCs will consider environmental amelioration to be unsustainable because it extracts costs (Najam, Runnalls, and Halle 2007). However, in developed countries, MNCs will fund technology and research to encourage environmental betterment to distinguish themselves from their competitors and create a competitive advantage (Garcia-Johnson 2000).

Hypothesis 1 (H1): Companies from more economically developed source countries will have greener CSRs.

Political Institutional Environment

State actors also play an important role in influencing what standards and regulations a corporation adopts (Campbell and Ortíz 2012). Regulators can provide legitimacy to corporate actors by recognizing the organization's existence (Deephouse 1996). Paired with the increased economic gains of conforming to political institutional pressure and legal coercion, it is more likely a firm will conduct business in line with regulatory demands (Oliver 1991). Additionally, regulation will cause firms to make production and extraction more environmental, leading to more innovation than firms subject to weaker regulatory environments (Shrivastava 1995; Porter and van der Linde 1995).

States with more democratic institutions tend to encourage more environmentally friendly corporate practices. In democracies, there is a larger selectorate, in which citizens have more opportunities to voice their diverse interests and influence the government (Grossman and Krueger 1995; Panayotou 1993; Seldon and Song 1994; Yandle, Bhattarai, and Vijayaraghavan 2004). This gives more access points to

marginalized populations, who are frequently more affected by poor environmental resource management and pollution, to push for more effective environmental policies (Li and Reuveny 2006). As a result, democracies will have to respond to concerns that are raised by vulnerable populations, which may not have the opportunity in other types of regimes. This will force political institutions to create regulations faster than authoritarian regimes, which have a smaller selectorate (Li and Reuveny 2006; Bernauer and Koubi 2009b; Fiorino 2011; Farzin and Bond 2005).[5]

Additionally, less democratic states may limit competition and direct access for society to influence corporations, which are more likely to develop environmental technologies or standards beyond the rest of the industry's capabilities when facing regulatory competition. The struggle for market size leads corporations to seek technology strategies that make their product cheaper or more attractive; often, this will be in the form of more efficient resource use or environmental strategies that make a company stand out from its less green competitors (Bernauer and Caduff 2004).

When governments limit the ability of society to influence corporations, they are also less motivated to appear green. Society can influence corporations by buying their goods, but also through protests and boycotts. Less democratic governments, particularly those that manage state-owned enterprises, are more likely to stifle social movements against corporations that may have a negative effect on their profit margins. This is considered an illiberal market practice and prevents the formation of green CSR policies

[5] However there is no clear empirical evidence to suggest there are differences between types of democratic systems, i.e., parliamentary versus presidential, or proportional representation versus multi-party (Fiorino 2011).

because it prohibits the direct influence society has on MNCs to create better normative behaviors (Aligica, Boettke, and Tarko 2019). This indicates that the level of democracy present affects the role of a regulatory institution, playing an important role in the creation of CSR and changing the degree of greenness that a corporation undertakes. I would expect that practices and policies will be greener in companies from liberal democratic states.

Hypothesis 2 (H2): Companies from more democratic source countries will have greener CSRs.

Social Institutional Environment

Stakeholder theory (Freeman 2010) of corporate management integrates the social contract into organizational decision-making. As a result, companies are influenced by social institutions to change their normative behavior and create policy that is beneficial to society[6] and goes "beyond what the letter and spirit of the law require or the market demands" (Baron 2001). It is a broadly accepted supposition that CSR goes beyond just a legal and profit-seeking enterprise and reflects the society that it comes from (Husted and Salazar 2006; Davis 1973; Aligica, Boettke, and Tarko 2019; Baron 2001). Even shareholders are not purely driven by profits and have other values and interests that they influence companies to pursue (Aligica, Boettke, and Tarko 2019). Since corporations engage in CSR activities other than those related to economic and regulatory institutions, it means that different social institutions may also play a role in corporate greenness.

[6] See the work of Elinor Ostrom on institutional theories and the emphasis of investigating institutions "beyond markets and state"(Ostrom 1999, 1998, 1990).

Corporations are often influenced by their stakeholder groups to limit their resource use and pollute less (Matten and Moon 2008). Stakeholders hold MNCs accountable for that performance through protests or putting money into other products (Schaltegger and Burritt 2000). Stakeholder environmental opinions, like political opinions,[7] are largely informed by the amount of awareness individuals have on the issue, and to a lesser extent by elites. Awareness can come from factors of salience, temporality, and spatiality. One way to look at how the social institutional environment may shift CSR reports is through vulnerability.

Stakeholders are more apt to act when there is some perceived vulnerability to negative environmental impacts. This often takes the form of environmental justice—"the pursuit of equal justice and protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, and/or social economic status" (Rajzer et al. 1997; Beckman, Khare, and Matear 2016). This is instigated when a company does something that has a negative effect on a local community (Kurtz 2005; Gosine and Teelucksingh 2008) or where there is more vulnerability to environmental problems. When vulnerability to environmental problems is higher, there would be more salience to environmental problems, which will cause stakeholders to pressure MNCs to change.

Stakeholders have more impact on the environmental policy of a corporation when their claim is considered legitimate and urgent. Legitimacy is the necessary condition for MNC action; the corporation must find the issue to be salient to them

[7] See Zaller (1992).

because the stakeholders making the claim have the power to affect the organization (Beckman, Khare, and Matear 2016; Parent and Deephouse 2007). The urgency expressed by a legitimate stakeholder would also change the importance of the issue to the company and increase the expediency with which the MNC reacts to a claim (Mitchell, Agle, and Wood 1997). These are two features that are particularly relevant to environmental issues and which have the potential for both immediate impacts and far-reaching effects

Hypothesis 3 (H3): Companies from more environmentally vulnerable source countries will have greener CSRs.

Of the three institutional environments discussed above, the economic institutions are the most necessary for corporations to pursue greener strategies. I believe that regulatory environments and societal influence are sufficient, but in institutional environments where development is low, the lack of middle class and importance of economics would limit the ability and willingness of the government and/or society to act.

Research Design

Corporate sustainability is a key concern for business and society, and it has special relevance for firms that are also investing abroad and producing a larger global impact on the environment. CSR does not exist independent of a MNC's source state institutional context; it is a social, economic, and political phenomenon. Some research has started to explore the role of the stakeholders influence on CSR (H. Wang, Choi, and Li 2008; H. Wang et al. 2016). However, this research has not fully examined the way

that variation in the institutional setting affects the creation of CSR. Through this research design, I investigate the way different institutional environments (social, environmental, and political) shape the corporate sustainable responsibility report greenness.

Data

I collected data from a sample of 64 companies from the top 500 largest investors from 2003-2015, as listed in the Greenfield capital investment data set ("FDIMarkets" 2016). My research study is limited by selecting too few firms. I am aware of this limitation, and sample firms were selected in a stratified sampling criterion based on three reasons. First, this sample includes only foreign investing companies from the manufacturing and extractive industries, as these high-polluting sectors already have a strong relationship with environmental disclosures and standardization of these reports (Nieminen and Niskanen 2001). Since these industries have similar impacts on the environment and share similar values, it homogenizes the CSR reports being studied and it is more likely that reports will look analogous. This means that any deviation would be from the institutional variation predicted and not from industrial differences. Using the Fortune 500 list 75 firms were drawn through randomization, with special attention to making sure that 1/3 of the firms represented developing countries. 64 were completed from the CSR reports found.

I selected the largest global companies for two reasons. First, the content of corporate reports is more positively associated with the size of the companies (Bolívar Rodríguez 2009), meaning that larger companies have similar reports usually reflective of

national and international standards. This reduces reporting variation due to factors other than social, political, and economic institutional variation. Second, large firms are identified and lobbied by government and society. Multinational companies, because of their size and presence, have an impact on the ecologies of the economies in which they function, which should be reflected in the public's increased awareness of their social and environmental impact (White 1999).

Finally, random firms were selected with consideration paid to the independent variable: development level, vulnerability, and political system. This selection on the independent variable was to ensure I could assess the variation of the different institutional settings.

Operationalizing: Corporate Greenness

The key research design issue in this study is to develop a reliable proxy of CSR report greenness. Since I seek to assess the relative greenness of environmental policies from different MNCs in this study, I use content analysis to analyze corporate greenness, a method widely employed in the literature (Fifka 2013; Fetters, Curry, and Creswell 2013; Lock and Seele 2016; Clarkson et al. 2008; Jose and Lee 2007; Ihlen and Roper 2014). This technique facilitates inference "by objectively and systematically identifying specified characteristics of messages" (Holsti 1969). I break down the text into five indicators: environmental planning and policy (EPP), reporting (REP), external organization policy (EOP), community and social policy (CSP), and regulatory policy REG). I use a standardized coding of these indicators, see Figure 1. The coding of the CSR reports follows a priori coding method, where the codes were developed from the

literature and theories of corporate sustainability. This required a strong theoretical foundation, and then some additional coding was developed after initially being applied to a set of test cases. For more on my code book, see Appendix I.[8]

The five indicators, shown in Table 2.1, represent the five areas for evaluating a corporations' level of environmentalism: (1) EPP, (2) REP, (3) EOP, (4) CSP, and (5) REG. The first and second indicators, EPP and REP, evaluate the policies and practices a corporation has adopted in regard to their internal policies and reporting procedures. The third, fourth, and fifth indicators, EOP CSP, and REG, evaluate the external policies and practices a corporation has in regard to the community, their consumers and suppliers, regulations, and non-governmental organizations. These five sections build on the guidelines that prior literature has found important in determining if a corporation has green environmental policies and practices (Bolívar Rodríguez 2009; Jose and Lee 2007; Sotorrío and Sánchez 2010; Aguilera and Jackson 2003; Shin 2014; Clarkson, Overell, and Chapple 2011; Clarkson et al. 2008; Ihlen and Roper 2014; Fifka 2013), and provide a conceptual framework for the development of a well-rounded assessment of CSR reports.

The coding rules (outlined in Appendix I) scored and tallied the elements in order to compare and evaluate levels of green environmentalism. Every element was scored using a binary coding measure (1,0), either the element was present or not in the CSR reports. The elements were tallied together for a total score, but also tallied into the different institutional areas as depict in the literature based on corporate planning,

[8] My code book was developed from the work of Clarkson et al. (2008), Fetters, Curry, and Creswell (2013), Fifka (2013), Ihlen and Roper (2014), Jose and Lee (2007), Lock and Seele (2016), Albino et al. (2009), and so on.

reporting, government interactions, stakeholder/community interactions, and industry and nongovernmental organization interactions.

Environmental Planning and Policies (EPP)

Environmental planning and policy is the presence and extent to which corporations create general guidelines that outline their environmental principles, rationale, and philosophical underpinnings (Jose and Lee 2007). Management theory tells us that planning is the first management function a MNC undertakes for a successful endeavor (Hall 1999; Daft 1995). Good environmental planning should have goals, a strategic rationale, a driving force (i.e., managers and a department), and a planning approach (i.e., including or not including stakeholders) (Jose and Lee 2007). Green environmental policy has two key ingredients: tangible commitments to environmental issues and the actions needed to translate those commitments into action (Jose and Lee 2007). Clarkson et al. (2008) suggest that greener corporations will have proper planning, structure, and leadership, and they will inform stakeholders of their achievements through their CSR reports. The companies also receive pressure from international organizations that regulate these reports, making sure that the information they present is accurate and reliable; this increases the legitimacy and credibility of the information included (Lock and Seele 2016; Di Giuli and Kostovetsky 2014).

Environmental Planning and Policy (EPP)	Presence of tangible goals
	Goals have a deadline
	Policy prioritizes sustainability over profitability
	Policy includes direct stakeholder input
	Life-cycle approach to sustainability
	Environmental committee or department
	Executive-level environmental manager (such as Chief Environmental Officer)
	Entities abroad are subject to the same environmental policies
	Employee training programs
	Internal audits are performed
	Invests in the development of environmentally friendly technology
	Presences of Environmental Management Systems (EMS)
Reporting Policy (REP)	Data on energy consumption, CO2, emissions, and water is present
	Data as a historical trend
	Data relative to corporate targets
	Data in absolute and normalized forms
	Data at disaggregate levels (i.e., factory, geographic segment)
	Data relative to industrial peers
	Environmental reports are certified by an external third party
	Uses global initiatives to report on environmental issues
External Organization Policy (EOP)	Invests in outside companies/organizations to develop environmental technology
	Partners with non-governmental organizations to promote and disseminate environmental information
	Membership in an international environmental organization
	Recognition of sustainability efforts by the international organization
	Promotes environmental stewardship in suppliers
	Shares company data with international organizations
	Participates in an industry-related environmental organization
	Chairs/co-chairs an industry environmental organization
	Founded an industry environmental organization
	Promotes solutions to environmental issues with industry peers
Community and Social Policy (CSP)	Environmental initiatives or goals at the community level
	Sets up a community environmental program (such as a tree planting program)
	Has local community program at multiple sites (at least two)
	Reports outcomes/successes of environmental community programs
	Promotes consumer environmental stewardship
	Sets up community engagement forums about environmental impacts
	Fulfills statutory information disclosures to shareholders
	Issues environmental reports and announcements on a biannual basis or more often
	Dedicated mailbox to receive stakeholder opinions
	Bidirectional communication with stakeholders (such as a phone number)
	Conducts public assessment of environmental impacts
	Stakeholders have an active role in the disclosure process
Regulatory Policy (REG)	Complies with external regulation for corporate reporting
	Attends political forums
	Offers company environmental expertise to government
	Strategic cooperation with government departments
	Promotes increased environmental regulation
	Improves goals to exceed current environmental regulation
	Current operations exceed regulatory requirements

Table 2.1: Indicators and Measurements for the Assessment of the greenness Level of CSR Reports (Source: Author)

Reporting Policies (REP)

The reporting policies variable examines the data that companies are providing that show their environmental impacts. Similarly to Jose and Lee (2007), I use reporting to represent two categories of information: disclosure and audits. Companies who want to appear green will offer complete (historical) data on their environmental emissions, show that they are meeting those goals, and illustrate that this data is verified by an outside source (Jose and Lee 2007; Clarkson et al. 2008; Takahashi and Meisner 2012). This indicator reflects measurements of data provided, auditing, and indicators used.

External Organization Policies (EOP)

External Organization Policy is also driven by voluntary involvement in environmentally beneficial activities at the local and international level. The latter can give more credibility to CSR reports, and approval from external organizations can open or close international markets to MNCs and even prompt local regulators to increase regulations (GRI 2011). MNCs will work with international organizations and other industry leaders to show their willingness to be green. To measure this, the indicator assesses the relationship between the MNC and both international organizations and industry peers.

Community and Social Policies (CSP)

Community and Social Projects are an indicator of a MNC's engagement with its stakeholders. A sustainable business has been defined as "one that meets the needs of its stakeholders, all of these stakeholders, without compromising its ability also to meet their needs in the future" (Hockerts 1999, 32). Since the early 1990s, the standard theory for

organizational performance is that MNCs are largely responsible to a wider set of groups than simple shareholders (Hubbard 2009; Brown and Fraser 2006; Steurer 2006). This complex constituency of stakeholders drives MNC environmental policy and pushes them to increase environmental sustainability goals (Hoffman 2001; Matten and Moon 2008; Aguilera and Jackson 2003), like cutting carbon emissions, buying renewable energy credits, starting sustainability organizations, and even lobbying governments to increase regulations of greenhouse gas emissions (Di Giuli and Kostovetsky 2014). When stakeholders demand more environmental policy, the more deliberation—resembling the deliberative democratic theory—evident between MNCs and stakeholders, the higher the level of green policy expected (Scherer and Palazzo 2011; Fung and Olin Wright 2003; Fung 2004). Using Fishkin and Luskini's (2005) outline of deliberation, this indicator has measurements for processes that are informative, balanced, conscientious, substantive, and comprehensive, i.e., reports on environmental programs, bi-directional communication, public assessment panels, and active stakeholder engagement in the CSR process.

Regulatory Policies (REG)

Regulatory Environment Involvement is an indicator of not only a corporation's compliance with regulation but their participation in the regulatory process. Corporate sustainability reports include information about their political actions, including times that they lobby or promote environmentally friendly policies to governments (Jose and Lee 2007). Economic theory suggests that companies will build alliances with state actors who can "realign the ideological and material bases of the dominant hegemonic order"

(Falkner 2003). This means that MNCs are incentivized to influence government policies in a way that is favorable to the firm (Vernon 1971; Baysinger 1984). However, as a MNC becomes more involved in the government system, they are also being influenced, as the relationship is mutually reinforcing and will push businesses to take up specific policies or practices that make them greener (Campbell and Ortíz 2012). This indicator measures the relationship with government from simple compliance to active engagement in the political process.

Descriptive Statistics

This section provides a general analysis of my dependent variable and looks more closely at the descriptive statistics of my content analysis. Table 2.2 presents the state-level profiles of the companies in the sample with related independent variables. I analyze 64 companies from 21 countries. In my study, the largest number of companies come from the United States (n=11, 17%) and China (n=11,17%); given my stratified random sampling methods, this is unsurprising since China is the largest of the developing country investors, and the US is the largest of the developed country investors. 64% of the companies come from countries that are considered developed (dev); the other 36% come from developing countries or transition economies. Development is indicated by their classification according to the United Nations (2017). Approximately 75% of the companies come from democratic countries, 5% from anocratic, and 20% from autocratic. Of these 64 companies, 55% are from countries that are considered highly vulnerable (vul-cat) to climate issues, 25% are from countries that

are sensitive to these issues, but it is not a timely or urgent matter, and 20% are from countries with a low sensitivity to climate issues.

Source	Score	Dev	HDI	Democracy	Dem-Cat	Vul	Vul-Cat	Count
UAE	12.0	1	0.83	-8	autocracy	0.38	High	1
China	20.4	0	0.72	-7	autocracy	0.39	High	11
India	21.0	0	0.60	9	democracy	0.50	High	3
Brazil	21.0	0	0.75	8	democracy	0.38	Highest	1
Russia	24.0	0	0.80	4	anocracy	0.33	Sensitive	1
Indonesia	25.0	0	0.68	9	democracy	0.45	Highest	1
Azerbaijan	26.0	0	0.75	-7	autocracy	0.41	High	1
South Africa	27.0	0	0.66	9	democracy	0.40	High	1
Czech Republic	28.0	1	0.87	9	democracy	0.31	Low	1
Taiwan	28.5	0	0.90	10	democracy	0.39	High	2
Ireland	29.0	1	0.91	10	democracy	0.34	High	1
Italy	31.0	1	0.87	10	democracy	0.32	Sensitive	2
Netherlands	31.5	1	0.92	10	democracy	0.35	Sensitive	2
Malaysia	32.0	0	0.78	5	anocracy	0.38	High	1
United States	34.3	1	0.91	8	democracy	0.34	Sensitive	11
France	35.0	1	0.89	9	democracy	0.30	Low	3
UK	36.0	1	0.90	8	democracy	0.30	Low	3
Germany	37.6	1	0.92	10	democracy	0.29	Low	6
South Korea	37.7	1	0.90	8	democracy	0.38	High	3
Thailand	38.0	0	0.72	-3	anocracy	0.41	High	1
Japan	40.2	1	0.89	10	democracy	0.37	High	8

Table 2.2: Summary of CSR greenness Score with Independent Variables (Source: Author, Data: Author, QoG Dataset, Polity IV Dataset, and ND-GAIN Dataset (Dahlberg et al. 2015; Marshall, Gurr, and Jaggers 2019; Chen et al. 2015)*)*

The main descriptive statistics for the corporate greenness scores of Environmental Policy and Planning (EPP), Corporate Reporting (REP), External Organization Policy (EOP), Community and Social Policy (CSP), and Regulatory Policy

(REG) indices are shown in Table 2.3, and they explore the findings of my content analysis for all companies in my study. The results indicate that all of the environmental characteristics of a CSR report are conveyed with similar consistency. There is not one area in corporate environmental reporting where corporations tend to report at higher levels than others, meaning that around 60% of corporations have environmental policy and practice standards, in addition to having practices regarding the community, consumers, suppliers, regulations, and non-governmental organizations they interact with. Environmental Policy and Practice had the highest average, which is foreseeable given that many of these indicators are part of the Global Reporting Initiative Guidelines (Global Reporting Initiative 2019). The lowest area is in the reporting of data about the environmental impacts of a corporation; this is expected as extractive and manufacturing industries tend to have poorer environmental performance.

Variable	Mean	% Average	Std. Dev.	Min	Max	Max Possible
EPP	7.57	63.1	2.52	2	12	12
REP	4.22	52.8	1.78	0	7	8
EOP	6.27	57	3.08	0	11	11
REG	4.94	61.7	1.66	2	8	8
CSP	8.65	61.8	2.80	2	14	14

Table 2.3: Descriptive Statistics for the CSR Scores (Source: Author, Data: Author)

Table 2.4 reports on the top and bottom codes from the sample. These are the elements of the coding scheme that came up the most and least often in CSR reports; the percent column on the right indicates which percentage of reports contain these codes.

The most reported on indicators come from the environmental policy and practice (EPP) indicator. Most companies seem to invest in research for environmentally friendly technology for their own use, include assessments of product lifecycle goals, and have environmental management systems. Additionally, the other three top ranked codes are all related to reporting standards. These codes indicate that almost all companies use global reporting initiatives, fulfill legal disclosure requirements, and provide feedback mechanisms for stakeholders.

The lowest ranked codes show the areas that corporations are the least environmentally friendly. This analysis indicates that overall corporations do not indicate their performance compared to industrial peers nor chair industrial environmental groups. Given the poor performance of companies in the extractive and manufacturing sectors, this is unsurprising. Companies also seem to lack leadership on environmental issues and often house environmental management under other departments. All of these codes indicate areas where MNCs could go beyond standard practices, i.e., biannual reporting or promoting more environmental regulations and, predictably, are done by very few corporations. Is variation in institutional environments causing this deviation in the CSR environmental reporting?

Rank	Indicator	Code	%
1	EPP (9)	Invests in the development of environmentally friendly technologies for their own use	96%
1	REP (8)	Uses global initiatives to report on environmental issues (GRI, ISO, etc.)	96%
1	CSP (4)	Fulfills statutory information disclosure to shareholders (legal requirements from state or international bodies)	96%
4	EPP (4)	Company policy includes assessment of product lifecycle goals	94%
4	EPP (11)	Employs environmental management systems (EMS)	94%
4	CSP (3)	Bidirectional communication with stakeholders (phone number/email)	94%
48	EOP (9)	Founded an industry environmental organization	24%
48	EPP (8)	Executive-level Environmental Manager (President/VP level/Chief Environmental Officer)	22%
48	REG (7)	Promotes increased environmental requirements	22%
51	CSP (5)	Issues reports and announces results on (at least) a semi-annual basis	18%
54	EOP (11)	Chairs/co-chairs an industrial group on the environment	8%
53	REP (2)	Data relative to industrial peers or rivals or industry is presented (must show it relative to industry average or major competitor average)	4%

Table 2.4: Top and Bottom Indicators in Sample Scores (Source: Author, Data: Author)

To determine if CSR greenness varies by institutional environments, I use standard operationalizing indicators for economic, political, and social institutions. For all institutional environment evaluations, I test on two different measurements: a categorical indicator and a continuous variable. These indicators come from two

independent sources to check the robustness of my findings across different measures of development, democracy, and vulnerability.

Independent Variable: Institutional Environments

Economic Institutional Environments

To distinguish different economic institutions, I look at two indicators of development: the Human Development Index (HDI) (UNDP 2018) and the United Nations categorization of countries (2017). These two indices identify progress through different lenses to measure economic growth and human development. The HDI emphasizes human capabilities and provides a measurement that gives more information than economic growth alone. The HDI includes dimensions such as a long and healthy life, education, and standard of living. It measures these on a scale of 0 to 1, and it produces an HDI score closer to 1 if the state is more developed and closer to 0 if a state is still developing.

The UN categorization is based more on economic growth. The United Nations report classifies countries into three categories: developed economies, economies in transition, and developing economies. For simplification in this study, I am only looking at developed and developing countries. These classifications are based on the basic economic conditions in the countries, and make each grouping mutually exclusive, even if the state has characteristics that would place it in more than one category (United Nations 2017). These make it a useful method of categorization for this study and, based on the information gathered and reviewed from it, I would expect that companies from developed countries would have greener reports than those still developing.

Political Institutional Environment

To distinguish political institutions, I will look at two indicators of democracy: Polity IV index (Marshall, Gurr, and Jaggers 2019) and the V-dem Liberal Democracy Index (Global Change Data Lab 2018). The Freedom House (2019) dataset categorizes levels of polity on a 21 point scale from -10 to 10. The regimes can be categorized as "autocracies" (-10 to -6), "anocracies" (-5 to +5), and "democracies" (+6 to +10). Democracies should be associated with greater CSR greenness as there are less restrictions on the public to voice their dissatisfaction, and regulators will pass more laws that force corporations to be more environmentally friendly. I use this dataset as both a category variable and as a continuous variable to assess the effect of the political institutional environment on corporate reporting.

The V-Dem Liberal Democracy Index (Global Change Data Lab 2018) scores the strength of the democratic institutions in a state from weak to strong on a scale of 0 to 1. This index aggregates across several different factors, including suffrage rights, clean elections, equality before the law, constraints on the executive branch, and the freedom of association and expression. A state that ranks closer to 1 should be more democratic and show evidence of greater CSR report greenness. Like with the HDI index, this tool focuses on other dimensions that offer a more holistic approach and provide a secondary test to check the categorical findings.

Social Institutional Environment

To distinguish social institutional environments, I look at two indicators that could cause companies to encounter civil unrest: the vulnerability index (Chen et al.

2015) and the environmental performance index (EPI) (2018). Often CSR reports are responding to susceptibility to climate impacts and pollution. For this study, I am looking at variation in vulnerability to climate change as leading shifts in the social institutional environment that would cajole stakeholders to pressure corporate action. The University of Notre Dame Global Adaptation Index (ND-GAIN) measures vulnerability as the "propensity or predisposition of human societies to be negatively impacted by climate hazards" (Chen et al. 2015). This includes assessments on food, water, health, ecosystem services, human habitat, and infrastructure vulnerability to changes in climate. These measurements are measured by exposure, sensitivity, and adaptive capacity. As this approximates vulnerability across different sectors, it is a good proxy for assessing the potential vulnerability citizens might face to environmental disturbances that would incite stakeholder demands for MNC action on climate issues.

This data is presented in two ways: (1) the vulnerability score assessed by the ND-GAIN index and (2) the categorizations of these vulnerability scores into four categories: highest sensitivity ("highest"), high sensitivity ("high"), sensitive, and low sensitivity ("low").

Results

Economic Institutional Environment

The descriptive stats for the effect of economic institutions on the environmental reporting scores, and the indexes for Environmental Policy and Planning (EPP), Corporate Reporting (REP), External Organization Policy (EOP), Community and Social Policy (CSP), and Regulatory Policy (REG) are shown in Table 2.5. This provides

preliminary evidence in support of the first hypothesis (H1), that more developed countries will have MNCs with higher levels of corporate greenness.

Table 2.5 reports the average scores for the total CSR report scores from the content analysis and broken down into each of the indicator variables. A paired-samples t-test was conducted to compare the scores for each of these groups to determine whether the mean difference between scores is zero (i.e., are these groups significantly different from each other?). Results indicate that developed countries have higher CSR report scores than developing countries and outperform developing countries in CSR reporting in all areas but regulatory. The results of the paired-samples t-test are as follows[9]: total score ($t(62) = -4.4^{***}$, $p= 0.0001$), and all five variables: EPP ($t(62) = -5.31^{***}$, $p= 0.000$), REP ($t(62) = -2.05^{**}$, $p= 0.046$), EOP($t(62) = -2.67^{***}$, $p= 0.004$), CSP($t(62) = -3.9^{***}$, $p= 0.0003$), and REG ($t(62) = -1.49$, $p= 0.144$). Results indicate that developed countries have higher CSR report scores than developing countries and outperform developing countries in CSR reporting in all areas but regulatory.

This agrees with my hypothesis that corporations in developed countries are in an economic institutional environment that allows corporations to develop greener CSRs. It appears to be a result of the characteristics of companies from a developed country, i.e., their ability to focus on post-material values. These companies express a stronger commitment to the environment through community activities, product lifecycle goals, and actively indicate to investors that the company's management practices are making environmental sustainability one of their priorities. The practice of stating environmental

[9] Significance is indicated by the "*" that the findings are significant at *** $p<0.01$, ** $p<0.05$, * $p<0.1$

goals and practices increases the legitimacy of the corporation's sustainability program, and makes the MNC's reporting appear more authentic to stakeholder groups (Bolívar Rodríguez 2009).

Developing country MNCs use their CSRs to send different messages. They express less commitment to convincing stakeholders of their environmental practices and are not trying to create perceptions of greenness. This is possibly because post-material values are seen as a secondary, or even tertiary goal, when the economy is still growing. An interview with Chinese managers expressed this sentiment when they claimed to hide environmentally friendly beneficial behavior if it did not also benefit the corporation's profit margins and economic growth (S. X. Zeng et al. 2012). The findings of the variable on regulatory policies confirm that corporations are focused on financial gains, and that most companies will fall in line with regulatory policies as these can place financial burdens on the companies, i.e., fines. Finding that there is not significant difference between developed and developing countries on this indicator reinforces that developing country MNCs are focused on financial gains. The scores from the content analysis show that the managers are acting in such a way as to make the MNCs appear committed to financial gains, which can lead to lower levels of green environmental activity than those from developed countries.

	Developed	Developing
n	43	21
Score		
Mean	35.1	24.6
% Average	66.2	46.4
Std. Dev.	7.87	7.69
Min	12	11
Max	51	38
EPP		
Mean	8.64	5.38
% Average	72.0	42.0
Std. Dev.	2.06	1.93
Min	4	2
Max	12	9
REP		
Mean	4.58	3.50
% Average	57.2	43.8
Std. Dev.	1.66	1.86
Min	1	0
Max	7	6
EOP		
Mean	7.06	4.63
% Average	64.2	42.0
Std. Dev.	2.68	3.28
Min	0	0
Max	11	9
CSP		
Mean	9.61	6.69
% Average	68.6	47.8
Std. Dev.	2.46	2.44
Min	3	2
Max	14	11
REG		
Mean	5.18	4.44
% Average	64.8	55.5
Std. Dev.	1.78	1.31
Min	2	2
Max	8	7

Table 2.5: Comparison of Companies from Developed and Developing Countries: Descriptive Statistics of CSR Scores (Source: Author, Data: Author)

Figure 2.1 further tests the first hypothesis using the Human Development Index. This figure shows the predicted values at a 95% confidence interval (CI) for CSR reports

at a given level of development in the range of my sample (HDI > 0.6). The predicted range of CSR report values increases when companies come from countries at higher levels of development. The interval is narrower at higher levels of development because I have more samples of companies from countries at higher levels of development. At an HDI of 0.7 (a medium level of development for emerging economies, like Thailand, China, and Indonesia), the predicted CSR scores are between 20 and 28. This is significantly different from the CSR scores predicted for an HDI of 0.9 (a high level of development for countries, like United States, Taiwan, South Korea, and the United Kingdom), which are between 32 and 37. These findings indicate that as a state develops, the more likely it is that corporations will be committed to environmental issues and address this in their CSR reports.

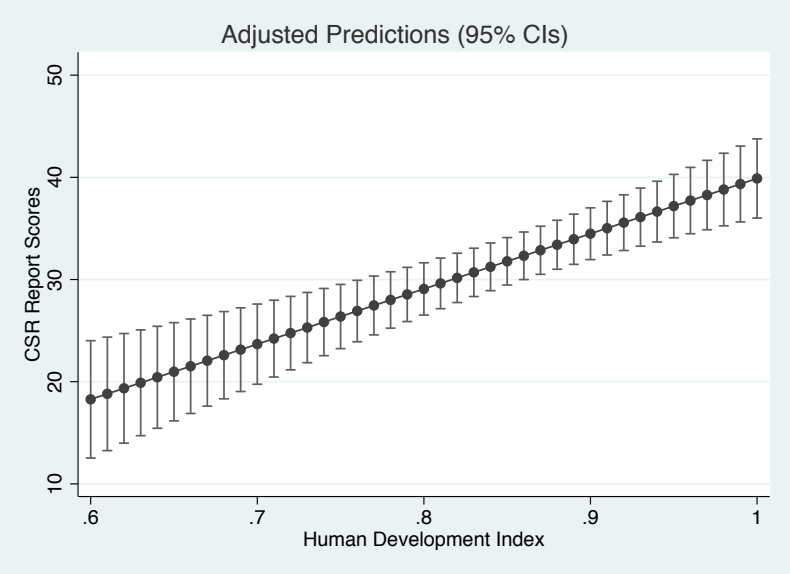

Figure 2.1: Human Development Index Margins Plot with Predictions at 95% Confidence Intervals (Source: Author Data: UNDP (2018))

The simple regression model[10] for Figure 2.1 reports that for every 0.1 increase in HDI, CSR report scores go up about 5.4 points on average (robust standard error=1.1). This significant relationship (at a 95% CI) between HDI and CSR report scores reinforces the findings from Table 2.5 and shows a moderate relationship between HDI and CSR report greenness. This provides a robustness check for my findings and shows a strong relationship between development and corporate greenness.

Political Institutional Environment

The descriptive stats for the effect of political institutions on CSR report scores and the indexes for EPP, REP, EOP, CSP, and REG are shown in Table 2.6. On average, democracies score 13 points higher than non-democracies on the environmental content analysis. This provides preliminary evidence in support of the second hypothesis (H2), that more democratic countries will have MNCs with higher levels of corporate greenness.

Table 2.6 shows the total content analysis scores for CSR reports between democratic and non-democratic nations. Using the V-dem Liberal Democracy Index (Global Change Data Lab 2018), anocracies and autocracies are labelled "0" for non-democracy, and democracies are labeled "1" for democracy. Table 2.5 give the average for the total CSR report scores and for each of the indicator variables. Similarly, to the CSR content analysis outcome for developed versus developing countries, there are

[10] $CSR_i = \alpha + \beta_1 HDI_i + \varepsilon_i$, where α is the constant, β_1 is the change in the DV when there is a one-unit change in HDI, and ε indicates independent and identically distributed random errors using a robust clustered standard error of variance (VCE) because my sample is largely clustered by country.

significant differences for all paired t-test samples, except in regulatory policies. The results of the paired-samples t-test are as follows[11]: total CSR score (t(62) = -3.57***, p= 0.0008), EPP (t(62) = -3.17*** p= 0.003), REP (t(62) = -2.82***, p= 0.007), EOP(t(62) = -3.38***, p= 0.001), and CSP(t(62) = -2.47**, p= 0.017), and REG (t(62) = -0.72 , p= 0.476).

In summary, democratic state MNCs' results indicate high scores in reporting for all variables, but they may not be any different from non-democratic state MNCs in their relationships with regulators. It appears to be a result of the characteristics of companies from a democratic state; in democratic countries, the corporations may have a stronger relationship with local communities, unlike in non-democratic countries where only a smaller elite group can influence the market and consumer behavior. These companies express their commitment to the environment through reporting their environmental impact and their policy measures at a much higher rate. This is because in democratic countries the companies must show legitimacy to all stakeholder groups.

Non-democracies are introducing new regulations to force companies to commit to CSR reports (Hofman, Moon, and Wu 2017; L. Lin 2010; L. Wang and Juslin 2009), but the nature and extent of their greenness compared to those in democratic countries varies greatly. MNCs from non-democratic countries do not appear to report strong environmental commitments. This finding may support the research that argues that in non-democracies communities, labor organizations, and NGOs have less influence on the development of CSR (Hofman, Moon, and Wu 2017).

[11] Significance is indicated by the "*" that the findings are significant at *** p<0.01, ** p<0.05, * p<0.1

	Democratic	Non-Democratic
N	48	16
	Score	
Mean	33.77	20.00
% Average	63.7	37.7
Std. Dev.	8.29	5.54
Min	11	12
Max	51	26
	EPP	
Mean	8.10	5.14
% Average	67.5	42.9
Std. Dev.	2.49	1.35
Min	2	4
Max	12	8
	REP	
Mean	4.56	2.00
% Average	57.1	25.0
Std. Dev.	1.62	1.29
Min	1	0
Max	7	4
	EOP	
Mean	6.95	2.86
% Average	63.2	26.0
Std. Dev.	2.63	3.34
Min	0	0
Max	11	7
	CSP	
Mean	9.13	5.71
% Average	65.2	40.8
Std. Dev.	2.66	2.14
Min	3	2
Max	14	8
	REG	
Mean	5.03	4.29
% Average	62.8	53.6
Std. Dev.	1.78	1.11
Min	2	2
Max	8	5

Table 2.6: Comparison of Companies from Democratic and Non-democratic Countries: Descriptive Statistics of CSR Scores (Source: Author, Data: Author)

In non-democracies, there is more suppression of civil society. For example, in China, the government regulates both the abilities of international organizations and societal expectations of businesses (Hofman, Moon, and Wu 2017). This cuts off two

important areas that would encourage corporations to be greener. My findings show that the average for both external organizations (EOP) and social organizations (CSP) exhibit that they are lower priorities in the CSR reports in non-democratic countries, even compared to the developing country reports, which describe higher average EOP scores and CSP scores. In the study, 14 of the 16 non-democratic companies are developing, which means the main institutional difference between 90% of these companies is whether they are democratic or not. On average, developing countries have a score of 6.7 for community environmental engagement and 4.6 for engagement with international, regional, and industrial environmental organizations. When these states are also non-democratic that average drops to 5.7 for community engagement and only 3.9 for engagement with environmental organizations. This shows that MNCs in non-democratic countries are not trying to send a message that they prioritize environmental issues or activities; instead, they show a commitment to environmental issues only as they pertain to regulatory agencies.

To check the robustness of these findings, I performed two regression models, [12] in which the margins plots can be seen in Figure 2.2 with 95% CIs. These models, which use different indices to measure democracy of countries, both find significant effects of democracy on the environmental program of corporate sustainability reports. The Liberal Democratic Index model has a 1.6-point rise in the CSR report score for every unit increase in liberal democracy (standard error = 0.5), and the Polity IV index has a 0.74-

[12] $CSR_i = \alpha + \beta_1 Democracy_i + \varepsilon_i$, where α is the constant, β_1 is the change in the DV when there is a one-unit change in Polity IV or in the Liberal Democratic Index, and ε indicates independent and identically distributed random errors using a robust clustered standard error of variance (VCE) because my sample is largely clustered by country.

point rise in CSR report score for every unit increase in democracy (standard error = 0.2). In looking at what this means for different countries in the model, for a non-democratic, autocracies, like China or Azerbaijan, with a polity score of -7, one would expect score to be between 16 and 26 at a 95% confidence interval. For non-democratic anocracies, like Russia or Malaysia, with a polity score of around 4, the expected score would be higher, between 27 and 32. The probable score for democracies is even higher, for countries like Taiwan, the Netherlands, and Germany the score should sit between 31 and 37.

These findings are shown in the margin's plots of Figure 2.2. In these figures, the scatterplots illustrate the scores of the sample population against the regression predictions at 95% confidence intervals. In both indices, there is significant evidence to support the second hypothesis: that companies from democratic countries are greener. This figure provides a robustness check to the findings from Table 2.5 and shows a moderate relationship between both the Liberal Democratic Index and the Polity IV Index and CSR report greenness. Findings indicate that companies from more democratic countries are more likely be committed to environmental issues and address this in their CSR. This provides a robustness check for my findings and strengthens the relationship between democracy and corporate greenness.

After looking at the effects of democracy and regime type one thing seems to stand out: how the MNCs relationships with external organizations and the community change. When looking at the effects of regime type, it seems that corporations need to prove more legitimacy to stakeholders and external organizations. In non-democracies, where civil society and external organizations hold less importance, the MNCs are not making efforts to participate and engage with these environmental groups. However,

when looking at development as the variable of interest, the same behavior to take care of the needs of stakeholders and be a part of external organizations is not as strong because development alone does not drive corporations to seek out the needs of stakeholders and to join external organizations. This fits my hypotheses and lines up with the literature about corporate behavior.

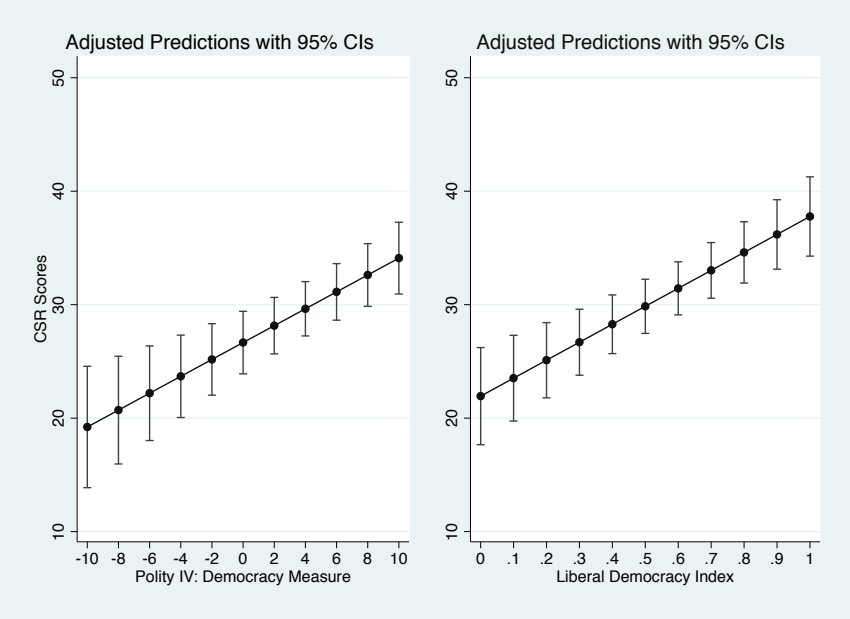

Figure 2.2: Democracy Margins plot with Predictions at 95% Confidence Intervals (Source: Author, Data: V-Dem Liberal democracy index (Global Change Data Lab 2018) *and Polity IV* (Marshall, Gurr, and Jaggers 2019)*)*

Both political institutional and economic institutional environments show significant impacts on corporate sustainable responsibility. The only area that does not show significant differences in both is regulation (REG), which indicates that regardless of political or economic institutional environments, corporations are still building

relationships with regulatory agencies because they have the ability to level financial losses to the MNC.

Social Institutional Environment

The social institutional environment encompasses the non-financial and non-political issues that would induce stakeholders to pressure MNC to act on environmental issues. I am testing the effect of different levels of vulnerability, which would motivate urgent and legitimate claims from stakeholder groups for corporate change. The descriptive stats for the effect of social vulnerability on CSR report scores and the indexes for EPP, REP, EOP, CSP, and REG are shown in Table 2.7. These findings do not support the third hypothesis (H3), that more vulnerable countries will have MNCs with higher levels of corporate greenness; rather, the findings indicate that there is no difference in reporting between countries at different vulnerability levels.

The effects of the vulnerability variable are assessed in Table 2.7 using the categorization of the vulnerability scores, but with highest sensitivity and high sensitivity collapsed into the high sensitivity category (this was done because there were only two companies from highly sensitive countries). The three categories are displayed below and show very little difference; the average CSR environmentalism scores actually go down from low sensitive to highly sensitive countries, which contradicts Hypothesis 3. An ANOVA was conducted to compare the effect of vulnerability on CSR in conditions where there was low, moderate, and high climate vulnerability. According to this model, there is no significant effect of climate vulnerability on CSR for the three conditions ($F(3,61) = 1.95$, $p=0.1532$). This means that there is no difference in the environmental

behavior of companies that come from countries with different climate vulnerability levels.

	Low Sensitivity	Sensitive	High Sensitivity
n	13	18	33
Score			
Mean	35.9	32.6	29.4
% Average	67.7	61.5	55.5
Std. Dev.	6.6	6.9	10.6
Min	28	23	11
Max	47	44	51
EPP			
Mean	8.3	7.9	7.1
% Average	69.2	66.1	59.0
Std. Dev.	2.4	1.8	2.9
Min	4	5	2
Max	12	11	12
REP			
Mean	4.9	4.3	3.9
% Average	61.3	53.6	49.0
Std. Dev.	1.5	1.6	1.9
Min	2	1	0
Max	7	7	7
EOP			
Mean	7.3	7.0	5.4
% Average	66.4	63.6	49.5
Std. Dev.	2.4	3.0	3.3
Min	2	2	0
Max	10	11	10
CSP			
Mean	10.0	8.4	8.3
% Average	71.4	59.7	59.1
Std. Dev.	2.1	2.2	3.2
Min	7	3	2
Max	13	12	14
REG			
Mean	5.4	5.0	4.7
% Average	67.5	62.5	59.0
Std. Dev.	1.6	1.9	1.6
Min	2	2	2
Max	8	8	8

Table 2.7: Comparison of Companies from Countries at Different Levels of Vulnerability to Environmental Disturbances: Descriptive Statistics of CSR Scores (Source: Author, Data: Author)

The characteristics of climate vulnerability may be a factor, since issues of climate change sometimes do not have the same urgency as other environmental issues, i.e., an oil spill or air pollution releases. If a recent environmental event impacted stakeholders, they might react and demand change, but usually it is the economic and political institutional environment that can effect environmental change in corporations. More research could look into the effect that large environmental disasters have on communities that might spur significant change, but vulnerability alone does not show any significant change in behavior, according to this model.

For this analysis, Figure 2.3 also shows the relationship between vulnerability and CSR environmental scores. This displays the weak negative relationship between vulnerability levels and corporate greenness. The regression model[13] for this figure reports a significant decrease of 7.3 points for every 0.1 increase in vulnerability (standard error=1.5). In respect to the countries in this model, a highly sensitive country such as Indonesia, with a vulnerability score of 0.45, would likely have a score between 19 and 30 at a 95% confidence interval; and a country with a low sensitivity score of 0.3, like France or the Czech Republic, would probably have a CSR score between 33 and 38. This model and figure further contradict Hypothesis 3 (H3).

While these results dispute my hypothesis, the results are unsurprising, given that many of the countries in the highly sensitive category are both developing and non-democracies, which have already been shown to have lower CSR scores due to other

[13] $CSR_i = \alpha + \beta_1 Vulnerability_i + \varepsilon_i$, where α is the constant, β_1 is the change in the DV when there is a one-unit change in Vulnerability, and ε indicates independent and identically distributed random errors using a robust clustered standard error of variance (VCE) because my sample is largely clustered by country.

institutional factors. This evidence suggests that there is no significant relationship between vulnerability and corporate sustainable responsibility because the economic and political institutions are more important. Stakeholder groups, while they might find social issues like vulnerability important, will not push for change on those issues if the economy is still growing and/or democratic institutions are not in place to allow civil society to push for change.

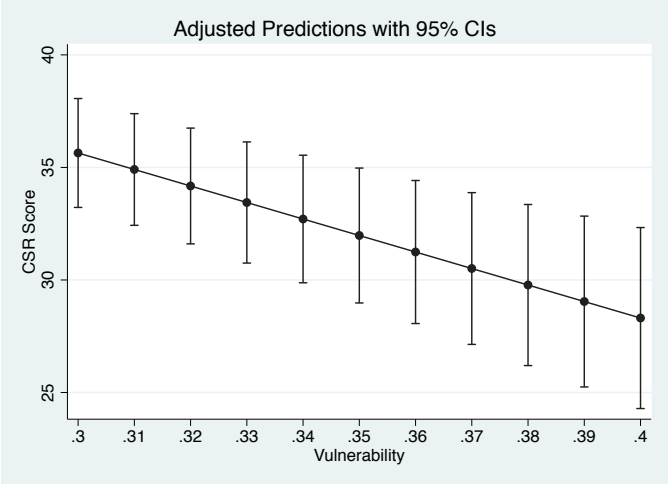

Figure 2.3: Vulnerability Scatterplot with Predictions at 95% Confidence Intervals (Source: Author, Data: ND-GAIN (Chen et al. 2015)*)*

Conclusions and Future Areas of Study

The findings indicate that political and economic institutional environments have a more significant impact than social institutional environment. They also illustrate that development and democracy tend to have strong effects on the level of greenness apparent in CSR reports.

The evidence strongly supports the premise that businesses in developed countries face stronger expectations to be environmentally responsible and good stewards of natural resources (George, Schillebeeckx, and Liak 2015). This supports the literature that finds that as countries develop, they are more concerned with post-material values, and will push for more environmental changes that could improve environmental infrastructure and resource management.

Additionally, democracy also matters for pushing forward green business practices. There is evidence that businesses from democracies tend to also encourage better environmental CSR. Future research should investigate variation in the strength of regulatory agencies across and within democracies and non-democracies. MNCs respond to pressures that create some sense of urgency; in weak regulatory environments, with no ability to enforce regulations, MNCs will not be as green as those from stronger regulatory agencies. This is more apparent at the global level, where international organizations with stronger enforcement mechanisms have been more successful than others in cajoling corporations to be green.

One area of future study is to look more closely at the interaction between democracy and development in making companies more or less green. In my sample, 95% of the democratic countries are also developed countries, so that could be swaying the results. This research program could be utilized to examine more developing nations that are democratic and non-democratic to see if democratic institutions are counteracting the impact of economic institutions.

The social institutional environment shows a weaker relationship in encouraging stronger CSR. It is not surprising that social values play a less significant role than

democracy or development as society is reflective of both the economic and political institutional environments. Political institutions can prohibit social interactions with businesses, and development goals may alter the priorities of society. Table 2.8 shows the composition of democracy and development at different levels of vulnerability. The negative relationship between vulnerability and levels of greenness may be because all of the sensitive countries are developed and democratic. However, when I controlled for both characteristics, I still did not find a significant or positive relationship between vulnerability and CSR greenness. More research could be done to investigate how social institutional environments affect CSR on a local level since social inclusion in CSR reports is very high.

	Developing	Developed	Non-Democracy	Democracy
Low Sensitivity	0	13	0	13
Sensitivity	1	17	1	17
High Sensitivity	20	13	12	21

Table 2.8: Composition of Vulnerability Categories by Development and Democracy (Source: Author, Data: Polity IV Dataset, and ND-GAIN Dataset (Chen et al. 2015; Marshall, Gurr, and Jaggers 2019)*))*

This chapter has sought to explore how different institutional environments shape CSR. The findings indicate that political and economic variables in a corporation's home state plays a stronger role in shaping CSR, with economic variables appearing to have the greatest function. This is an important field of study, as these corporate policies and practices may be exported abroad. Many of these companies are large investors in

countries abroad, and their investment is an important mechanism for the diffusion of these environmental regulatory standards, norms, and industrial practices (Prakash and Potoski 2007; M. Delmas and Montiel 2008). Every year the number of companies investing abroad increases, and these companies are increasingly coming from countries that are non-democratic and/or developing. The variation in the source state's institutions may have an impact on the level of greenness in the corporation's policies and practices as they go abroad.

CHAPTER III: IS FOREIGN DIRECT INVESTMENT IN DEVELOPING COUNTRIES HARMFUL OR HELPFUL? AN ANALYSIS OF THE VARIATION OF ENVIRONMENTAL OUTCOMES DUE TO THE SOURCE OF FOREIGN INVESTMENT

Introduction

Does foreign direct investment (FDI) lead to exploitative environmental practices in developing countries? Socio-economic theories argue that developing countries are most at risk of being exploited by foreign investors seeking manufacturing and extractive industries. Thus, policymakers in these countries must be concerned by where investment comes from, particularly if it is having adverse effects on local populations. Whether the effects of FDI are beneficial to or exploitative of environmental infrastructure in developing countries is an important ongoing debate in political economy. However, few studies have investigated the ways that investment from different sources may be one variable leading to diverse environmental outcomes in developing countries. Such analysis is critical to understanding the broader effects of globalization and to better evaluate the variation in FDI's impacts in developing economies. With this in mind, two important questions are investigated in this analysis: Are the effects of FDI dependent on where it originates? If so, does the level of development of the host country matter in mitigating them?

Developing country FDI is just one variation in investment that could be examined through source effects (Adolph, Quince, and Prakash 2017). There are two

reasons this focus is advantageous: First, developing country FDI has been increasing since 2000. As developing countries increase investment, they change the composition of FDI in the host country and, because it is new investment, the effects are easier to isolate. Second, political-sociological theories suggest that countries at a lower level of development have "less-green" environmental policies (Andreoni and Levinson 1998; Hilton and Levinson 1998; Levinson and Taylor 2008). For example, the Chinese, major international investors, have a poor environmental record when it comes to investment projects. Since 2013, despite worldwide decreases in coal investment overseas, Chinese corporations have invested more than $15 billion into developing countries, with another $13 billion in proposed funding (Tan 2018). Such behavior is similar in corporations from other developing countries that often have more projects with environmentally harmful effects.

To evaluate the relationship between FDI and environmental outcomes in developing countries, I begin with a state-level panel study of greenfield investment in developing countries. Greenfield investment is investment into a country that involved building new facilities and is an active investment into the host country. I test the impacts of developing country incoming greenfield FDI as a percentage of total FDI coming into a developing country[14] on to different environmental factors: water access, air quality, air pollution, and forest size. The advantage of this approach is that it allows me to look at the variation in FDI inflows from developing country to developing country and how the effects change based on the amount of FDI received. I first show that the rate of potable

14 Flows are used instead of stocks as the stock amounts for developing countries were unattainable.

water provision has slowed in countries that host higher levels of greenfield FDI from developing countries while air pollution has increased. Evidence that FDI from developing countries is associated with slower rates of potable water access and increasing air pollution suggests the importance of FDI on the environment in countries where greenfield FDI from developing countries is a larger percent of all greenfield investment. Second, I use an interaction model of FDI and the Human Development Index (HDI) to test the relationship between these effects and development. Evidence that confirms this relationship between development and FDI suggests that the level of development of the host country matters for the impact of incoming FDI, and that countries at lower levels of development may be experiencing more regulatory capture as well as having compounded effects on more marginalized communities, which may be affected by environmental resource impacts. This evidence also confirms that source effects are an empirical regularity, which merits continued scholarly investigation.

My major finding is that source effects are an alternative lens to understanding the variation in FDI impacts in developing countries,[15] and that a greater number of greenfield FDI projects—in manufacturing and extractive sectors—from developing countries are associated with a worsening of the overall environmental situation in the host developing country. I find that developing countries which attract higher levels of FDI from other developing countries consequently experience slower increases in potable water access and higher levels of air pollution. This effect is even more pronounced in poorer countries with a lower GDP per capita and a larger population of the poor, where

15 For more information on source effects, see Adolph, Quince, and Prakash (2017).

regulatory capture by multinational corporations (MNCs) is more likely and the marginalized groups are unable to make demands for reforms in response to these actions.

This research makes two contributions. First, I introduce to the study of FDI the theory of source effects, which are variations in environmental outcomes which reflect and correlate with environmental norms and practices of the FDI's source country (Adolph, Quince, and Prakash 2017). It starts with the notion that not all investment comes from sources that generate better environmental outcomes; rather, countries at different levels of development have disparate ideas of material or post-material values (Inglehart 1997), which may cause some investors to behave differently. This is important because it explains the variation in the literature about whether FDI is harmful or helpful to the environment in developing countries.

Second, I build on the common claim in comparative politic economics that FDI wields more influence over domestic politics and institutions in developing countries than in developed countries. Developing countries see foreign investment as the important and persistent driver of the global economy it has been since the mid-1980s (Pandya 2010; Fontagne 1999). I will show evidence to further the theory that developing countries are more vulnerable than developed countries to the conditions of the global economic system and the practices that investors bring with them (Chase-Dunn 1975; Bornschier and Chase-Dunn 1985).

Literature Review: Development, FDI, and the Environment

There are three main hypotheses that link globalization and the environment: the Environmental Kuznets curve (EKC) hypothesis, the pollution haven hypothesis (PHH), and the halo effect hypothesis. These three hypotheses associate FDI with both positive and negative effects on the environment.

Both the EKC and the PHH literature are often associated with a "race to the bottom" hypothesis in environmental studies. The "race to the bottom" (RTB) literature claims that foreign investors are only looking for the assurance of adequate infrastructure with natural resource exploitation promise (Bellos 2010; Bellos and Subasat 2012; Hu, Deng, and Zhang 2013; Oneal 1994; Jessup 1999; Bues 2011). The EKC hypothesis describes an inverse U-shaped relationship between pollution and economic development: as states grow, pollution also grows, until they eventually reach the tipping point, after which pollution decreases as the economy continues to grow (Andreoni and Levinson 1998)—i.e., early developers will have higher pollution than later developers. The PHH posits that FDI will have negative effects because as environmental regulations increase in developed countries, high-polluting firms will shift operations to countries with more lax regulations (Levinson and Taylor 2008). The RTB literature presents arguments that corporations are moving abroad to use practices that allow for depletion and degradation of environmental resources (Jorgenson 2007; Frey 2003; Gallagher 2006; Leighton, Roht-Arriaza, and Zarsky 2002). These studies find evidence to suggest that the intensification of FDI increasingly puts pressure on natural resources, such as water, air, and forests (Jorgenson 2007; Perkins and Neumayer 2008; Grimes and Kentor 2003; Neafie 2018).

The halo effect hypothesis is linked to "the race to the top" (RTT). This literature links the positive tradeoffs of MNCs, such as "best practice" transfers (i.e., technology and managerial capacity) that will lead to economic growth and 'green' development (Rudra and Jensen 2011; Modou and Liu 2017; Klein, Aaron, and Hadjimichael 2001; Garcia-Johnson 2000). The halo effect hypothesis suggests that globalization has positive effects because MNCs disseminate superior knowledge, technology, and environmentally friendly practices, in addition to improving the environmental performance of domestic businesses (Garcia-Johnson 2000).

This chapter posits that these hypotheses may all be true because it is where FDI comes from and where it is going to that matter for the impact that FDI has on environmental outcomes. By disaggregating FDI and looking at different sources of FDI, it is possible to determine what conditions cause a "race to the bottom" or a "race to the top". I analyze FDI from diverse source countries at different levels of development in order to test the influence of source effects on environmental outcomes in developing countries. This is also crucial information for regulators who want to know which effect is being triggered by the MNCs in their country.

The Argument

Until the early 2000s, foreign direct investment (FDI) came almost exclusively from developed countries, but since then, there has been a steady rise in FDI flows from developing countries (see Figure 3.1). One question arising from this shift is whether FDI from developing source countries is different from FDI from developed source countries?

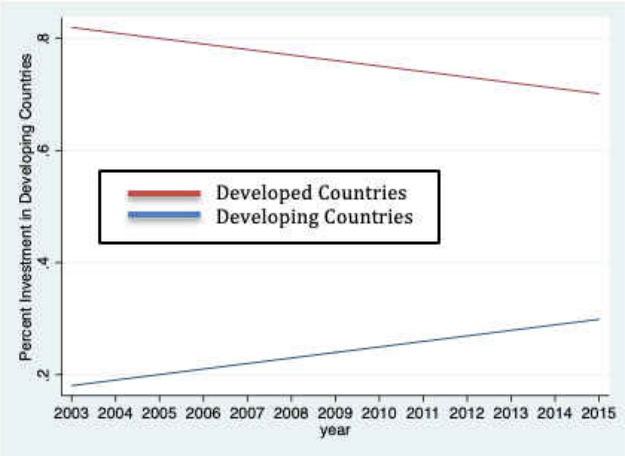

Figure 3.1: Investment flows into developing countries, % of total investment (Source: Author, Data QoG Standard Dataset (Teorell et al. 2013))

Foreign investors establish corporate policy through a cost benefit analysis that incorporates internal corporate norms and discount rates that are heavily influenced by the external world through stakeholders—policymakers, shareholders, consumers, and so on. At high levels of development, socio-economic literature suggests that citizens of a country begin to prioritize post-material values like the environment (Inglehart 1997). This change in the external world shifts the internal norms and discount rates of economic institutions through mechanisms such as laws, consumer buying patterns, and shareholder influence. As a result, corporations are persuaded by stakeholders to improve the well-being of the poor through the transfer of "best practices" (i.e., tech spillover, environmental management systems, etc.) (Garcia-Johnson 2000; Modou and Liu 2017; Klein, Aaron, and Hadjimichael 2001).

However, during periods of development, stakeholder groups often prioritize material values, i.e., economic growth, over post-material values. The Environmental Kuznets Curve (EKC) literature suggests that during development, economic growth is

prioritized over environmental protection, allowing for excessive pollution and resource use (Grossman and Krueger 1995; Yandle, Bhattarai, and Vijayaraghavan 2004; Panayotou 1993). As a result, the stakeholder groups in developing countries will both directly and indirectly influence corporate environmental policies and practices.

Studies find that when consumer and shareholder groups are dominated by those that seek to promote economic growth over environmental protection, corporate pollution levels and resource extraction increase to unsustainable levels (Korten 2001; Zammit 2003; Mulligan, Gil, and Sala-i-Martin 2004). In this case, these stakeholders also tend to support less environmental regulation because economic growth and material prosperity have tangible benefits that they can quickly realize (Rogoff 1990). Policy reflects these views because the policymakers fear that the selectorate—the group of people who are responsible for giving the policymakers power—may remove them from power when macroeconomic performance wavers or if economic growth stagnates (Hibbs 2000, 2001; Ferejohn 1986, 1999). Consequently, lesser-developed countries have weaker, less comprehensive environmental practices and policies, and corporate strategic environmental choices will not favor environmental amelioration (Matten and Moon 2008; Holtbrügge, Berg, and Puck 2007). The corporations from these countries are not being influenced by the consumers to protect the environment, and government regulations on the corporations also will be weaker.

Environmental and economic policy come into conflict directly when the former diminishes profits, incurs a financial cost, or causes resources diverted for sustainability to adversely affect economic production (Najam, Runnalls, and Halle 2007; Gallego and Pitchik 2004). As a result, even in countries where there is environmental policy in place,

there is often weak enforcement as it can be costly and be in opposition to economic goals. For example, Chinese companies are not known for observing Chinese environmental law or good environmental practices because it is not expected of them (Watts 2010, 159; Hua 2009). Historically, local officials have often overlooked bad environmental practices that yield economic gains (Economy 2010), and without external motivation, Chinese managers are not influenced to voluntarily change behavior, even with knowledge of their environmental impacts (Fryxell and Lo 2003).

Corporations in countries like China are not influenced by the key stakeholders to be greener and have developed weaker environmental policies and practices. As a result, the foreign investment flows from these developing countries will be a mechanism for cross-country diffusion of less environmentally beneficial regulatory policy, norms, and industrial practices as it is costly to change, and so corporations will seek countries with weak environmental policy or where regulatory capture is possible.

Much of the globalization literature links the diffusion of regulation and practice to global economic partners (Garcia-Johnson 2000; Rudra and Jensen 2011). On one hand, there are positive impacts; Garcia-Johnson (2000) finds that US chemical companies carry with them positive practices in South America and influence regulatory agencies and corporate standards to adopt these new practices. On the other hand, this linkage was confirmed to be both positive and negative by Adolph et al. (2017), who find a "Shanghai Effect" on labor rights, in which the importing country, China, does not care about the labor standards in the foreign jurisdiction, so does not make any effort to improve the standards of the local labor practices. Furthermore, the International Institute for Sustainable Development finds in the literature that, like in many industrializing

countries past and present, Chinese companies ignore environmental impacts and participate in illegal environmental activities while operating abroad (Y. Wang et al. 2016).

FDI having negative impacts on environmental outcomes is not new, and there is a history of European and American corporations negatively impacting environmental outcomes in developing countries. However, regulators must be concerned about who may be having a larger impact on the environment today, and it may be that this "no-strings-attached" developing country-to-developing country investment needs more standards of environmental protection. Local companies also may not be enticed to take up greener practices or to remove costly ones if they make them less competitive with foreign investors. This shows that there are distinct differences between developed and developing countries; it also suggests that the interactions between MNCs and local groups, such as corporations and institutions, create opportunities to diffuse their policies and practices.

Hypothesis 1: *MNCs from developing countries carry environmentally exploitative policies and practices that will negatively affect environmental policy and outcomes in developing countries.*

Due to variability in levels of development and political landscapes across countries, I further investigate my theory by looking at the variation in different host countries. The main concern is that developing countries are not all equal in their level of development and regulation of the environment. This is mainly due to the fact that

different levels of development attract a diverse range of foreign investors and also determine the ability a country has to regulate and influence those investors.

First, more recent studies have found that there is a relationship between the amount of investment from high-polluting industries and laxity of environmental regulations, (Xing and Kolstad 2002) supporting the hypotheses put forth in the pollution haven literature. High-polluting FDI from developing countries seems to be attracted to countries where the environmental performance index is weakest, seemingly further supporting the "pollution haven" hypothesis, and where there are stronger democratic processes. The underlying hypothesis is that environmental policies and practices have a strong effect on industrial location, and that they can induce capital movement to the developing country with weaker regulations.

Second, at various levels of development the negative effects of FDI may be mitigated because of changes in requirements and expectations of stakeholders. In the host country, weak environmental policies and performances attract FDI in high-polluting industries, and the need for economic growth means that lesser-developed countries will be laxer in the creation and enforcement of environmental policies. The Environmental Kuznets Curve (EKC) proposes that this is strongly driven by development goals, and that stronger environmental regulations and social expectations will only come as a country raises their level of development (Grossman and Krueger 1995; Yandle, Bhattarai, and Vijayaraghavan 2004; Panayotou 1993). Under this assumption:

Hypothesis 2: *The effects of high-polluting MNCs from developing countries will be mitigated as the developing host country progresses.*

Research Methods

Source effects theory suggests that different sources of economic flows carry with them varied ideas, corporate policies, and expectations for behavior based on where the flows come from (K. Zeng and Eastin 2007; Adolph, Quince, and Prakash 2017). This approach comes from the micro-economic theory of source effects—the technique of study in which research no longer only focuses on how much global economic flow a country receives, but rather *from where* the largest amount of global flows (foreign investment or trade) originates (Lane and Milesi-Ferretti 2008).

The primary goal of this study is to evaluate empirically the extent to which FDI from developed and developing countries differently affects environmental outcomes in developing countries. Using a country-year fixed effects regression model, I conduct a series of quantitative cross-national analyses of environmental outcomes. I use a panel data set[16] of developing countries from 2000 to 2015 in the middle- and low-income brackets, defined as developing countries by the United Nations (2017), see Appendix II for a list of source and host countries. The univariate statistics are laid out in Table 3.1 and include measures of trade, domestic investment, inequality, political regime (polity), gross domestic product (GDP), measures of GDP growth, and urban population growth. The correlation matrix is laid out in Table 3.2 and shows that none of the variables in the model are strongly correlated.

16 Panel data comes from the QoG Standard Dataset (Teorell et al., 2013), the World Bank (2018), and Greenfield Data Set ("FDIMarkets" 2016).

	Source	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
Dependent Variables						
Water Access (logged)	EPI	595	4.1	0.6	0.94	4.6
NOx (logged)	UN Stats	188	8.1	1.8	1	11.4
Deforestation (logged)	FAO	217	-0.44	1.02	-2.9	2.8
Air Quality Index	EPI	619	71.6	18	29	98.3
Independent Variables						
Developing Country FDI (% of total FDI)[17]	FDI Markets	619	0.41	0.35	0	1
Foreign Direct Investment (FDI) flows (percent of GDP, logged)	World Development Indicators (WDI)	595	1.1	1.0	-4.8	4.4
Domestic Investment (percent of GDP, logged)	World Bank	499	1	0.33	1.2	4.0
Inequality (GINI) coefficient	WDI	253	40.8	8.8	24	64
Trade (percent of GDP)	WDI	605	4.2	0.7	-1.8	5.3
Economic growth (logged)	WDI	565	1.5	0.77	-5	4.8
Population growth (logged)	WDI	563	0.36	0.8	-4.1	1.7
GDP per capita (logged)	WDI	612	7.9	1.0	5.5	9.6
Freedom House Polity IV	Freedom House	619	71.6	18.0	29	98.3

Table 3.1: Summary of Univariate Statistics (Source: Author, Data: QoG Standard Dataset and Greenfield FDI Data Set)

17 Manufacturing and extractive industries.

	Water Access	Air Quality	NOx	Deforest -ation	Developing FDI	Domestic Investment	FDI	GDP	HDI	Democracy	GDP Growth	Trade	Population Growth
Air Quality	0.14	1.00											
NOx	0.20	-0.35	1.00										
Deforestation	0.36	-0.32	0.08	1.00									
Developing Country FDI	-0.45	-0.07	-0.16	0.16	1.00								
Domestic Investment	0.07	-0.53	0.32	0.43	-0.16	1.00							
Foreign Direct Investment (FDI)	0.02	0.20	-0.28	0.07	-0.01	0.37	1.00						
GDP per Capita	0.67	0.51	0.24	0.00	-0.36	-0.04	0.05	1.00					
Human Development Index (HDI)	0.77	0.37	0.20	0.20	-0.34	0.13	0.17	0.87	1.00				
Democracy	0.12	0.38	-0.02	-0.22	0.02	-0.46	-0.25	0.30	0.15	1.00			
GDP Growth	-0.16	-0.28	0.22	0.10	0.07	-0.05	-0.34	-0.20	-0.13	-0.21	1.00		
Trade	0.01	-0.25	-0.40	0.04	-0.15	0.16	0.39	-0.26	-0.13	-0.35	-0.15	1.00	
Population Growth	-0.40	0.09	-0.32	-0.01	0.23	-0.09	0.13	-0.21	-0.32	-0.21	0.12	0.01	1.00
Inequality	0.01	0.42	-0.02	-0.12	0.01	-0.27	-0.07	0.15	-0.07	0.59	-0.36	-0.32	-0.18

Table 3.2: Correlation Matrix (Source: Author, Data: QoG Standard Dataset and Greenfield FDI Data Set)

Dependent Variable

For this study, I test the impact of FDI on environmental stewardship indicators: potable water access, air pollution (NOx), forest size, and air quality. These variables were chosen for four reasons: First, they are available in multiple years for a panel data analysis. Second, they represent the main three concepts of environmental stewardship: environmental quality, quantity, and access. Third, these variables reflect the impact of FDI on environmental issues throughout the developing country both directly, through their practices, and indirectly, through their lobbying efforts. Finally, these variables are also visible and salient to citizens, so there should be political awareness about their negative and positive consequences among the government, media, citizens, and other stakeholders, which means that action could be taken in these areas, depending on ability and need (Cao and Prakash 2010; Rudra 2011; Lim, Menaldo, and Prakash 2014).

The first dependent variable, classified as water access, reflects all the environmental components of access, quality, and quantity. It denotes the percentage of the population with access to water of a "potable" quality and of a quantity that the household needs for survival, i.e., at least 20 liters of water per person per day from an improved source within one kilometer of the dwelling (World Bank, 2007). Potable water access is a very salient subject to citizens, and it is also an important variable for the study of environmental stewardship (Jorgenson 2007; Rudra 2011; Teclaff and Teclaff 1985; Jorgenson 2006b; Cao and Prakash 2010; Bues and Theesfeld 2012; Bossio et al. 2012; Sebastian and Warner 2013; Liu et al. 2013). Green sources may have a positive effect, despite increased quantity use for both manufacturing and extractive industries,

because these companies bring and use technologies that protect the environment and improve environmental infrastructure by reducing water and air pollution. Non-green sources may have a negative effect, not only because they will use a large quantity of water, but they will pollute waterways more heavily than green sources (see Table 3). This value is logged to control for outliers and variance in the water data as can be seen in the summary of the data.

The second and third variables studied, air quality and pollution, measure emissions levels for different pollutants, the study of which is important to environmental stewardship, as well as pollution exposure, which directly affects citizens (Jorgenson 2007; Lim, Menaldo, and Prakash 2014; Jorgenson 2006a; Cao and Prakash 2010; Bernauer and Koubi 2009b, 2009a). Air quality is a measure of both air pollution exposure and exceedance (percent of population exposed) as well as household air quality. It also can indicate access to better technology and policy, or lack thereof. Air pollution is a measure of Nitrous Oxide (NOx), a pollutant that can lead to acid rain and smog and is assessed throughout the developing world due to its direct impact on the lives and health of citizens. Similarly, to water access, green sources of FDI have a negative effect on air pollution and a positive influence on air quality because they bring in better technology for quality control and they typically advertise and encourage better environmental practices and policies in their industry and consumers.

Finally, the study of forestry is important as many high-polluting MNCs have a negative effect on forests in developing countries. This variable quantifies the rate of deforestation, i.e., the rate of change in forest size in a country over time:

$$deforestation_{it} = (forest\ size_{it} - forest\ size_{it-1})/forest\ size_{it-1}$$

Forestry represents ecological withdrawals—the removal of natural resources—that an MNC may be taking to aid in production. Often, as production increase, the extraction of nonrenewable resources, i.e., deforestation, increases at an unsustainable rate (Long, Stretesky, and Lynch 2017). Ecological withdrawal is an unequal exchange, and many other goods, similar to forests, are extracted in one location, only to be consumed elsewhere as a result of globalization (Jorgenson 2008). Increases in FDI from developing countries could increase the unsustainable use of forests further, contributing to the overall ecological withdrawal problem. Developing countries would then be expected to have a negative effect on the rate of change (see Table 3.3).

	WATER ACCESS	AIR QUALITY	AIR POLLUTION	DEFORESTATION
DEVELOPED	+	+	-	+
DEVELOPING	-	-	+	-

Table 3.3: Expected effect of Independent Variable on Dependent Variables

Independent Variable

The independent variable is a measure of net inflows of greenfield foreign direct investment (FDI) in the manufacturing and extractive industries from developing countries,[18] as a percentage of total investment, lagged two years. Studies show evidence to suggest that FDI takes about two years to affect environmental outcomes as it can take time for predicted effects and project gestation (Neafie 2018; Rudra, Alkon, and Joshi

18 FDI is an investment in the managing stock of a company, measured by the World Bank of any purchase over 10 percent of controlling stock, outside of the investor's home country (2016).

2018). The total effect on environmental outcomes of increased investment from a developing country depends on the degree to which the developing country replaces investment from developed countries. The general form of this model follows an autoregressive process that is influenced by the two-year-lagged variable of investment context, $C_{i,t-2}$, representing developing country investment (j) into the developing country (i) as a percent of total investment:

$$C_{it-2} = \frac{FDI_{j \to i,t-2}}{FDI_{i,t-2}}$$

Foreign investment is a variables that sums to a fixed constraint, using this model I am able to parse out the compositional data—the percentage of investment from each country that makes up the yearly FDI flows into a developing country (Aitchison 2003). This variable represents the percent of total investment coming from a developing country; as the percentage of investment from other developing countries increases, it must logically reduce the share of investment from other countries.[19] Thus, the coefficient on this variable can be used to interpret the FDI-context effects of new increases in investment from a developing country, and it infers the aggregate estimates of investment context effects, ideally through changes in where investment comes from. The calculation is considered the more appropriate measure for this study for three reasons: First, bilateral Greenfield FDI data is available and has been recorded throughout a large number of developing countries since 2000, as compared to bilateral stock FDI numbers, which are harder to obtain. Second, Greenfield data reflects new projects that are built by the

19 There are examples of compositional data analysis across different areas of study in political science (Adolph, Quince, and Prakash 2017; Katz and King 1999; Lantz et al. 2014).

investing company, as opposed to capital investments or use of preexisting facilities. This gives a more accurate assessment of how FDI flows directly impact changes in environmental stewardship. The aggregate measure of FDI context is subject to a similar logic, and the percentage composition of FDI can be used to weight changes in exposure to other countries' standards. Third, Figure 3.2 shows that manufacturing and extractive sectors dominate FDI coming into developing countries.[20] These sectors have a larger impact on environmental resources, resulting in problems such as pollution and resource overuse (Bues and Theesfeld 2012; Jorgenson 2007; Roberts, Grimes, and Manale 2006).

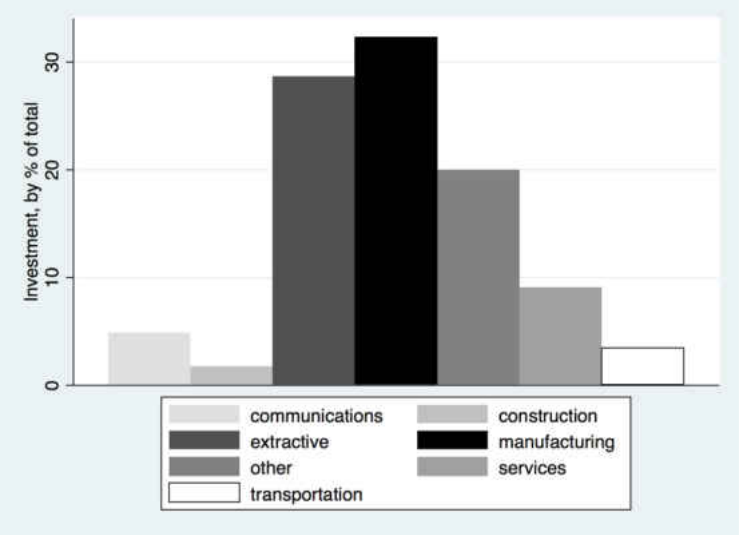

Figure 3.2: Capital investment into developing countries, 2003-2015 (Source: Author, Data: FDImarkets (2016))

20 This bar graph shows all Greenfield foreign investment from 2003 to 2015. Over 60 percent of investment that goes into developing countries is in the manufacturing and extractive sectors. The other section is made up of all other sectors, including shipping, hotels, and real estate groups.

Model 1: Source Effects and the EKC hypothesis

The following model assesses the effects of manufacturing and extractive Greenfield FDI on indicators of environmental stewardship in developing countries. The model uses year dummy variables to account for annual trends:

$$DV_{it} = \alpha + \beta_1 C_{it-2} + \beta_j year_i + \beta_k controls_{it} + \mu_i + \varepsilon_{it}$$

In these equations, DV_{it} denotes the effect on the environmental stewardship for every year data was collected. β_1 is the change in the DV when there is a one-unit change in C_{it-2}, which is the net inflows of FDI from developing countries into the developing country *i* at period *t-2*. $Year_i$ denotes a time dummy, ε indicates independent and identically distributed random errors, and $controls_{it}$ are the various independent variables that account for any extraneous factors which affect the parameters of interest. μ_i is the unobserved time-invariant country effects, such as policy or other institutional factors.

Model 2: Source Effects and the EKC hypothesis

I also want to consider whether the effects of high-polluting FDI on environmental outcomes vary between levels of development in the host country. To do this, I use the same country-year fixed effects regression model with an interaction between FDI and my measurement of development, the Human Development Index (HDI):

$$DV_{it} = \alpha + \beta_1 C_{it-2} + \delta_0 HDI + \delta_1 C_{it-2} * HDI + \beta_j year_i + \beta_k controls_{it} + u_i + \varepsilon_{it}$$

All parameters and variables remain the same except the inclusion of HDI as an interaction term, which illustrates how a developing country's high-pollutant FDI affects host countries at different levels of development. The HDI variable is a composite index of the basic dimensions of human development (UNDP 2018). Where β_1 is the change in environmental outcomes associated with a one-unit change in developing country high-polluting foreign investment (as a percent of total investment) and $\beta_1 + \delta_1$ is the change in environmental outcomes associated with a one-unit change in developing country FDI as HDI increases. All other variables remain the same.

Control Variables

To control for other factors that may affect environmental stewardship in this model, I will use control variables that help it to more accurately predict the effects of FDI. I use nine control variables to account for economic, social, and political factors that affect environmental stewardship, according to the literature linking it to political science and economics: net FDI inflows as a percent of GDP, domestic investment, gross domestic product (GDP), the Human Development Index (HDI), rapid economic growth, polity, trade, and inequality (GINI coefficient). *GDP, GDP growth,* and *population* variables are all logged, and they come from the World Bank's (2012) world development indicators list. When using Greenfield FDI, I control for net inflows of FDI as a percent of GDP in order to take into account the economic size of a country as compared to its investment levels, as countries with larger economies attract more FDI; this allows me to compare between countries and regimes more succinctly (Choi and Samy 2008). *Inequality* is measured by the GINI co-efficient, in which higher scores

represent lower levels of inequality. These variables are important in the literature as they have impacts on environmental stewardship and infrastructure within the country and, by controlling for them, I can further isolate the effects of FDI.

Results: OLS Model

Overall, Table 3.4 shows empirical evidence in support of my hypothesis that countries with higher foreign investment inflows from developing countries lead to a 'worse off' environmental stewardship situation, particularly in regard to water access and air pollution. These coefficients reflect whether developing country investors have a uniquely stronger effect than developed country investors. The strongest evidence for this is in the assessment of water access, where both the models with and without controls show strong evidence that developing country FDI is reducing water access more than developed country FDI.

Developing Country High-Polluting FDI on Potable Water Access

It would be expected that for every unit increase in developing country FDI, as a percentage of total FDI, potable water access would decrease by more than 0.03 percent on average, all other factors held constant (Table 3.4, column 2). The effect of high-polluting industry FDI from developing countries on water access is significant. A one standard deviation increase of developing country FDI leads to a decrease of about 1.4 percent of the population with access to potable water, all other factors held constant in this model. This indicates that FDI from developing countries slows the improvements to water access, even in the presence of political, environmental, and other economic controls in host countries. Developing country high-polluting investment may be using,

diverting, or polluting more water in comparison to developed country investment. This may be linked to technology that is not as sustainable and dumping of polluted water back into waterways.

Developing Country High-Polluting FDI on Air Pollution (NOx)

Increases of developing country FDI as a percent of total FDI raises the release of NOx on average by more than one percent compared to developed countries, all other factors held constant (Table 3.4, column 6). I find mixed results for the effect of developing country FDI on air pollution, with evidence suggesting there may be some greater negative effect of high-polluting industries on nitrous oxide (NOx) compared to developed country FDI in host countries. There is only a weak relationship between NOx and developing county FDI, which suggests that high-polluting FDI from developing countries may have an effect, but not a significantly large one, on increases in NOx releases in host developing countries.

Developing Country High-Polluting FDI on Air Quality Measures

According to this model (Table 4, columns 3 and 4), developing country high-polluting FDI may have only a small 'more negative' effect or not significantly different effect on measured air quality, compared to a developed country's FDI. Air quality is not found to be statistically significant, but the coefficients indicate that a developing country's high-polluting FDI could be having a more negative effect than developed country FDI. This may be because net high-polluting FDI flows are causing decreases in air quality and developing country high-polluting industries do not have an effect that is distinct from developed countries. While developing countries may not be having any

significant effect on air quality outcomes compared to developed countries, as expected from my hypothesis, the sign is still negative.

It is also important to note for air pollution measure that impacts are more localized. Air quality may have more significant differences if I could look at the more local level, at air quality levels affecting households near major polluters. It is possible that largely improvements in environmental infrastructure are washing out effects that certain localities are experiencing. Water access is able to capture this local effect problem with a national data set, air quality does not have the same possibilities with current available data.

Developing Country High-Polluting FDI on Deforestation Measures

The effects of developing country FDI on deforestation rates is not found to be statistically significant in the simplified model (see column 7 in Table 3.4), but there is a weak relationship in the second model that shows a positive relationship with deforestation. This indicates that FDI from developing countries is not hindering forest rates. However, overall FDI seems to have a negative effect on deforestation, which may be why I see this weak relationship between developing country FDI and deforestation. This means that as developing country high-polluting FDI increases, it may have a small positive or no effect on deforestation rates compared to all FDI.

Other Variables of Note Compared to FDI

Other variables exhibit outcomes that both agree and disagree with the literature when exploring the impacts of FDI but show the effect size of FDI in comparison. Net

FDI is an important variable to look at, especially as this model shows some evidence that disagrees with the overall literature.

First, FDI has a positive effect on water access when the percent of investment coming from developing countries is controlled for, increasing the access of potable water by about two percent of the population. This shows strong evidence to support my overall hypothesis that developing country FDI will make a host country worse off, in this case by slowing the positive effect that FDI may be having. This is in opposition to the literature that suggests that FDI has an overall negative effect (Rudra, Alkon, and Joshi 2018), but it may be because the model also controls for developing country net FDI. Net FDI flows have a significantly negative effect on air quality and deforestation, which makes it harder to tell if developing country FDI is significantly different. I hypothesized that developing countries would have a negative effect in comparison to developed countries, and this evidence suggests that FDI has a negative impact. However, while the effects of developing country FDI may be more negative, it does not appear to be significantly different than the negative effects of developed country FDI. Looking specifically at water access and air pollution, there is evidence to suggest that developing country high-polluting FDI may have a bigger impact, which could be cancelling out the positive effects of FDI when it is a compositionally large portion of all high-polluting FDI.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Water Access (logged)	Water Access (logged)	Air Quality	Air Quality	Air Pollution (logged)	Air Pollution (logged)	Deforestation (logged)	Deforestation (logged)
Developing Country	-0.029*	-0.031**	-1.24	-1.7	0.11***	0.014	-0.7	0.29*
FDI (lagged 2 yrs.)	(0.015)	(0.012)	(2.35)	(1.1)	(0.032)	(0.016)	(0.45)	(0.16)
Net FDI (lagged 2 yrs.)	0.02**	0.013*	-2.53**	-0.67	0.027	-0.0053	-0.19	-0.07
(% of GDP, logged)	(0.008)	(0.007)	(1.13)	(0.66)	(0.023)	(0.0066)	(0.14)	(0.053)
GDP per capita	0.29***	0.54***	-10.9	1.1	-0.49	0.43***	0.62	-0.61
(lagged 2 yrs., logged)	(0.067)	(0.17)	(12.9)	(11.0)	(0.33)	(0.11)	(0.86)	(0.44)
Democracy	0.0061	0.0044	0.47	1.31***	-0.013	0.0023	-0.057	0.017
	(0.0048)	(0.005)	(0.56)	(0.33)	(0.052)	(0.0049)	(0.054)	(0.021)
Inequality	-0.0035**	-0.0095***	1.24**	0.82**	-0.0042	-0.0038	0.11	0.048
	(0.0017)	(0.0028)	(0.56)	(0.36)	(0.0074)	(0.0026)	(0.07)	(0.043)
Domestic investment		-0.00055		0.0092		0.00015		0.099
		(0.0013)		(0.086)		(0.001)		(0.053)
Development Index		0.054		-118		0.17		-6.99*
		(0.76)		(72.4)		(0.78)		(75)
Rapid Growth		-0.0094**		0.81		0.00061		0.13**
(logged)		(0.0044)		(0.6)		(0.0083)		(0.051)
Trade		0.042		1.34		-0.031		-2.1*
(% of GDP, logged)		(0.1)		(2.79)		(0.068)		(0.46)
Population Growth		-0.008		-0.94		-0.098**		-0.22
(logged)		(0.013)		(1.12)		(0.042)		(0.17)
Constant	2.0***	0.045	105.0	95.6	15***	6.23***	0.09	15.1**
	(0.56)	(1.35)	(101.0)	(77.9)	(2.6)	(1.15)	(9)	(5.7)
Observations	162	96	163	96	80	51	89	38
R-squared	0.66	0.75	0.41	0.44	0.69	0.97	0.44	0.87
Number of Countries	58	42	58	42	41	32	24	13

Table 3.4: Impact of Developing Country High Pollution FDI on Environmental Variables (with controls) (Source: Author, Data: FDI Markets ("FDIMarkets" 2016) *QoG Standard Dataset* (Teorell et al. 2018)*). Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Second, democratic investment does not show any significant impact on environmental variables. This shows that FDI has a more significant impact in developing countries than domestic investors, and that FDI may remove the effects of domestic investors and local communities that may seek "greener" methods of production (Jorgenson 2007; Young 1997). This indicates that FDI is a better indicator of access to environmental issue outcomes in developing countries and has a stronger effect than domestic investment.

Third, the impact of trade is not as robust as previous studies have indicated, particularly in comparison to FDI, nor is it in the direction expected from previous studies (Rudra, 2011). The only significant consequence of trade is on forest land area and indicates that it has a positive influence on deforestation. Additionally, while its influence on water access, air quality, or pollution are all insignificant, the signs indicate the possibility that trade could have a marginally positive effect on the overall environment.

Results: Interaction Model

In Table 3.5, I evaluate the extent to which host countries are able to counter the effects of developing country high-polluting foreign investment through better institutional development and changes in priorities as the countries progress. The results from this model show support for the EKC hypothesis, that developing countries are able to counter effects from non-green FDI as infrastructure improves with development. There is strong evidence in my study that development mitigates the influence of FDI on some environmental resources. For potable water access and NOx emissions (air

pollution), developing countries are able to mitigate the negative effects. However, I do not see these same results in the relationship between development and deforestation rates.

Development and Potable Water Access

Potable water access in developing countries has a positive increase, approximately 0.002 percent, for each unit change in the Human Development Index (HDI). A positive value for the effect of the interaction term implies that the more developed a country is, the more positive the impact of developing country FDI on potable water access. These findings show that when there is more developing country FDI received at low levels of development, there is less access to potable water. As nations progress, however, these effects are mitigated. These results indicate that institutional change as a country develops could be moderating the negative results of foreign investment seen in previous models.

Development and Air Pollution (NOx)

Similar results are seen in air pollution, where increases in the percent of investment of high-polluting sectors is mitigated by development. At higher levels of development, the state is mitigating the negative effects on environmental resources. This supports the EKC literature that as a country develops it become easier to address environmental problems because the preferences of society shift to prioritize environmental issues, and it becomes more viable financially and technologically.

	(9)	(10)	(11)	(12)
VARIABLES	Water Access (logged)	Air Quality	Air Pollution (logged)	Deforestation (logged)
Interaction term	0.0023*	0.013	-0.0054***	-0.038***
Developing FDI*HDI	(0.0014)	(0.15)	(0.001)	(0.0023)
Developing Country FDI	-0.0019*	-0.026	0.0042***	0.03***
(lagged 2 years)	(0.00097)	(0.11)	(0.00067)	(0.018)
Development Index	0.028	-114.0	0.26	-14.2
	(0.76)	(70)	(0.77)	(10.3)
Domestic investment	-0.00088	0.0074	-0.0018*	-0.089*
	(0.0015)	(0.083)	(0.00094)	(0.046)
Net FDI (lagged)	0.013*	-0.67	-0.017***	-0.23*
(% of GDP, logged)	(0.0076)	(0.67)	(0.0029)	(0.13)
GDP per capita	0.47**	0.69	0.47***	4.16
(logged)	(0.18)	(12.5)	(0.01)	(4.26)
Democracy	0.0047	1.31***	0.0033	-0.19**
	(0.005)	(0.33)	(0.0033)	(0.09)
Rapid Growth	-0.0069	0.82	0.0071	-0.17
(logged)	(0.0045)	(0.66)	(0.0052)	(0.13)
Trade	0.025	1.25	0.025	2.1*
(% of GDP, logged)	(0.1)	(2.98)	(0.058)	(1.1)
Population Growth	-0.0055	-0.92	-0.066**	0.22
(logged)	(0.014)	(1.09)	(0.03)	(0.22)
Inequality	-0.0096***	0.82**	-0.0018	0.25***
	(0.0029)	(0.36)	(0.0023)	(0.085)
Constant	0.69	99.2	5.53***	-6.9
	(1.45)	(96.7)	(1.1)	(35.6)
Observations	96	96	51	95
R-squared	0.75	0.44	0.98	0.63
Number of Countries	42	42	32	41

Table 3.5: Multiple regression interaction of the effect of FDI on environmental resources dependent on Development Index (Source: Author, Data: QoG Standard Dataset (Teorell et al. 2018)*). Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Development and Deforestation Rates

The interaction term for deforestation indicates that there is a negative relationship between environmental improvement and FDI at higher levels of development. This suggests that the effects of high-polluting FDI on deforestation rates might not be mitigated by development. This may be because forests are used at the same

rate or higher regardless of the level of development, which may be linked to higher levels of consumption, no matter the rate of FDI.

Conclusions

Foreign direct investment from developing countries to other developing countries is on the rise around the world. Often the relationship between investment and resource use and pollution is overlooked by policymakers and local stakeholders because of economic growth. This chapter highlights the problems that developing country FDI may have on the environment in other developing countries, caused by the diffusion of poor corporate policy and practices. Increasing FDI in high-polluting manufacturing and extractive sectors places a strain on the least developed by limiting access to potable water, increasing air pollutants, such as NOx, and decreasing forest size. In contrast, increases in economic development can mitigate these negative effects. I find evidence from different environmental resources that supports my contention that anticipated negative impacts of developing country FDI hold, primarily at levels of low development, slowing positive changes to environmental resources.

My findings are generalizable across the developing country-developing country foreign investment relationship. The finding that FDI from developing countries has negative effects on environmental stewardship has consequences for several different literatures, most particularly the "race to the bottom" and "race to the top" literature. I find that it is not necessarily a case that FDI inherently causes either, but a matter of where the investment comes from, and that some FDI may create a "race to the bottom" but other FDI may create a "race to the top." For example, in the case of potable water,

on average, developing countries receive about 40% of their FDI from developing countries, which could have adverse effects for more than 1.5 percent of the population. This means that FDI from developing countries is slowing infrastructure improvements that host countries make in providing potable water access, thus creating a "race to the bottom" in countries that are not equipped to manage public goods. That strengthens the argument that the source of global flows matters for policy and practice in developing countries.

These findings also indicate that developing countries can overcome the impact of negative global economic activities as they progress. Similar to developed countries, they can have a positive effect on environmental stewardship through the creation of strong institutions and changing materialistic values, both of which can lead to the expansion of potable water access and increased air quality. There is a need for further study comparing developed and developing countries' ecological institutions over time as well as the impacts on environmental resources management; this would allow for an evaluation of the differences in how investment groups interact with countries at various stages of development.

The logic of the source effect argument may also hold insights for other resources subject to overuse or pollution. Arable land, forests, and fisheries have attributes similar to water and air quality; they are consumable goods that impact the lives of the citizens in a state. It may be interesting to see if developing country FDI and developed country FDI have different impacts in these areas. Adolph et al. (2017) has suggested that Chinese trade has an effect on labor policy; this holds true regarding FDI and environmental impacts as well. However, there needs to be further study into whether it is China alone

or whether other developing countries are bringing policies and practices that have a negative effect in developing countries with them as well. It seems as though expanding multinational corporations are influencing policy and practice in developing countries, but it seems that developing country globalization may be motivating poorer environmental outcomes than globalization coming from other, more developed, sources. Further studies would also be able to identify if development is leading to more sustainable practices in the absence of effective management regimes.

CHAPTER IV: CHINESE FOREIGN DIRECT INVESTMENT AND THE ENVIRONMENT IN DEVELOPING COUNTRIES: A CASE STUDY OF CHINESE MULTINATIONAL CORPORATIONS GOING TO AFRICA

Introduction

Does FDI from China influence environmental outcomes in African countries? The steady increase of Chinese foreign direct investment abroad since 1994, especially through its Belt and Road Initiative (BRI), makes understanding its environmental impacts particularly important. Large investments by Chinese corporate investors give them the power to influence both environmental policies and outcomes in many developing host countries. FDI is recognized as an important mechanism for the diffusion of environmental regulatory standards, norms, and industrial practices (Prakash and Potoski 2007; M. Delmas and Montiel 2008). Until recently, most major investment sources have been located in the Global North, where there are higher regulatory standards, which are a reflection of the post-material values of those societies.[21] However, China, an emerging investor in a large share of African projects, has standards that are markedly lower than other major foreign investors, and even some African host countries. If companies are diffusing their environmental standards abroad, is China exporting poor environmentalism?

[21] See Boesso and Kumar (2009) as well as Frooman and Murrell (2005) on the role of stakeholders in influencing corporate practice and policy.

China receives a lot of attention as a foreign investor; it has been known as a destination for FDI for a long time, but now its investment abroad has grown substantially. Figure 4.1 shows how Chinese investment flows, which have steadily increased 20.5% per year since 2003, compare to United States investment in Africa between 2003 and 2017 (China-Africa Research Initiative 2019). China is now one of the largest outward investors, and the announcement of the BRI comes with over one trillion dollars in investment into infrastructure projects internationally (Batabyal 2019). This has generated conversation on what this means for regulations, norms, and industrial practices around the world.

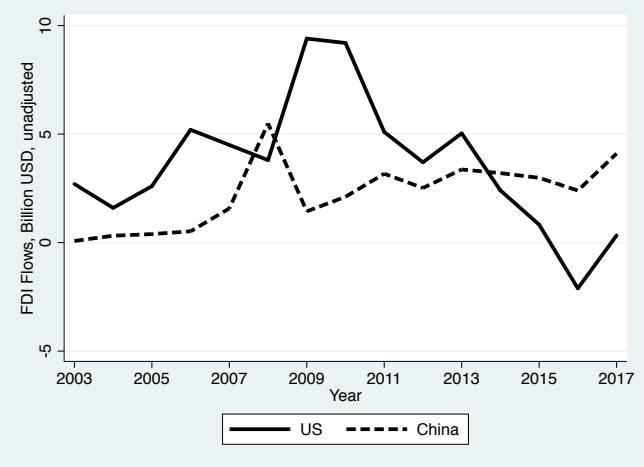

Figure 4.1: Chinese and US Investment in Africa, 2003-2017 (Source: Author, Data: (China-Africa Research Initiative 2019)*)*

I examine the theory of a Chinese source effect, the impact of investment from China on the domestic ecological resource practices and pollution levels of host countries. It is largely believed that foreign investment undermines environmental

infrastructure, which provides potable water and manages pollution in towns and cities, in African countries that cater to Chinese multinational corporations (MNCs). Scholars have noted the importance of China as a major investment partner (Shen 2013), but this discussion does not examine the mechanisms about why and how Chinese investment would lead to different outcomes nor does it isolate the effects of Chinese FDI in local markets. Building on previous chapters, this section looks for evidence of the mechanisms by which Chinese FDI contributes to declining resource access and pollution which undermines environmental infrastructure. Using quantitative study, I examine why Chinese MNCs might be bad for environmental infrastructure in developing countries and examine the consequences of Chinese investment on African countries' environmental outcomes, which would directly impact the environmental infrastructure. This study offers insights in assessing how Chinese corporations' role as a leading investor in manufacturing, extraction, and agriculture shapes environmental outcomes across Africa.

This research builds on previous studies of FDI, which explored how it influences environmental regulation, practices, and norms in host countries. First-generation FDI studies focused on its role in creating a "race to the bottom" by the diffusion of policies and practices that were bad for local environments and through the treatment of developing countries as pollution havens—locations to export polluting industries (Levinson and Taylor 2008; Frey 2003; Gallagher 2006; Jorgenson 2007; Leighton, Roht-Arriaza, and Zarsky 2002). Second-generation FDI literature developed arguments that contradicted the first generation. This literature claimed that the evidence that FDI relocates to pollution havens is inconclusive, and that MNCs have a "halo effect,"

improving technology, education, and regulation of supply chains (Garcia-Johnson 2000; Mercado 2000; Prakash and Potoski 2007; Eskeland and Harrison 2003). These conflicting literatures agree that MNCs are creating avenues for the exchange of regulations, practices, and norms, but they vary on whether these regulatory inclinations have a positive or negative impact.

As a broader contribution to political-sociological studies, my research looks more closely at foreign influences on environmental policy and practice because of the impact that changes to environmental infrastructure have on low-income groups, particularly in developing countries. Inward FDI impacts key resources that are vital for the environmental infrastructure in the countries where they invest, i.e., water, air, and resource access; many of the large MNCs, like those from China, have operational demands that affect environmental infrastructure improvements because they demand more access to resources and increasing pollution levels (Moyo 2012). As a result, these changes in resource access and increases in pollution directly impact the poor more than the rich because they cannot afford to mitigate their exposure (Rudra, Alkon, and Joshi 2018; Sun, Kahn, and Zheng 2017; Le Blanc 2008). By understanding better if one investor has a more significant effect on the government's ability to provide sufficient environmental infrastructure improvements, regulators will be able to adjust and provide for societal needs.

Is Chinese FDI slowing environmental infrastructure improvement? I test the impact of Chinese FDI on the main components of environmental infrastructure improvement: potable water access and pollution levels. My argument develops over three parts: First, I review the literature on the source effects mechanisms that cause

regulatory preferences to vary as well as the cross-country diffusion of regulatory policy, norms, and industrial practices. This section explores why and how the variation in these matter for environmental outcomes in the host country. Second, I look more closely at Chinese corporations and how their environmental policies and practices vary. Finally, I test my hypothesis that stronger ties with companies from countries with weaker environmental records, such as China, may be of concern to regulators and other stakeholder groups trying to protect in the environment. I use a large-N panel country-year fixed effects regression model and find evidence to suggest that Chinese FDI is slowing infrastructure improvements in developing countries.

Literature Review: FDI and the Environment in Developing Countries

A theory of source effects has components in two actors: the source country and the host country (see Figure 4.2). The former has stakeholders and regulators that influence the corporation's green policies, and the latter has laws and social actors that interact with the corporation, providing opportunities for influence of the corporation on the state, and the state on the corporation. Variation of institutions and society in either component may change the environmental outcomes in a country receiving FDI. Here, I will examine the key features that affect policies and practices in the source country, which filter down to the recipient country directly through MNCs that operate in the host country and change environmental outcomes.

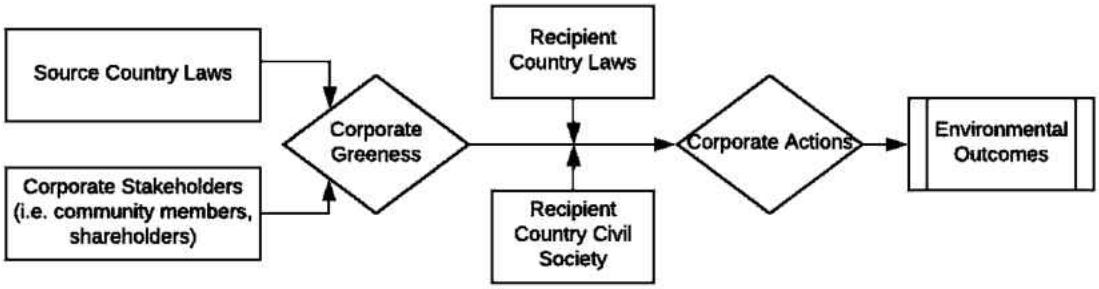

Figure 4.2: Source Effects Flowchart (Source: Author)

Source Effects: How does corporate environmental policy vary?

Many different literatures discuss where corporate policy and practice come from and what external forces cause them to change. MNCs are largely considered to be driven by the goal of maximizing profits and shareholder value, but they are also influenced by stakeholders that seek to change corporate norms and discount rate—the current value of future monetary flows (Falkner 2005; Freeman 2010; Frooman 1999). External stakeholder groups—including shareholders, consumers, regulators, community members, and so on—build links to corporations over time; these connections may sway business decision-making, either through direct or indirect methods (Falkner 2005; Gunawan 2007; Sotorrío and Sánchez 2010; M. A. Delmas and Toffel 2004). Influence may take the form of requests to the corporation to change its strategies, consumer habits, or regulations that make a strategy more costly, all of which impact revenue and shareholder value. As a result of these actions, corporate costs and benefits may shift and the strategic choices of the company change.

This paper outlines three important mechanisms at play in the relationships between external stakeholders and corporations that increase or decrease corporate greenness: (1) societal values, (2) regulation, and (3) competition. All three of these mechanisms are based on the premise that corporations will only protect the environment if the cost is less than the benefits they may receive.

Societal values and corporate greenness

Corporate policies reflect the external world because of stakeholder influence; business and sociological theory suggests that the stakeholder influence model reflects a society's material values, which are largely focused on goods that advance economic growth. The theory also suggests that it is only when a society has achieved a certain level of development that it will begin to focus on post-material values (Inglehart 1997). These are things often taken for granted during the economic growth stage of development, e.g., the environment. The literature often describes this phenomena as the Environmental Kuznets curve (EKC), an inverse U-shaped relationship between pollution and economic development: as states grow economically, pollution will increase in low-income economies until they reach a tipping point, after which pollution decreases (Andreoni and Levinson 1998). For the purposes of this study, this means that corporations pollute unless they are incentivized by society (which affects monetary motivations of corporations) to stop polluting, and society will only push environmentally beneficial practices when economic growth has reached such a point that citizens feel that they can focus on post-material values.

Essentially, this generates an expectation that foreign investment with relatively poorer environmental policies more often comes from less-developed countries in which the public is more concerned with economic growth. We can assume that the corporations, in this instance, are less focused on creating and promoting greener practices. Additionally, in countries where the market is controlled by the government and there is limited access for society to influence them, companies may exhibit weaker policies as well. These illiberal market practices mean that there may not be greener policies even at greater levels of development because societal pressures and other types of influence may be limited by government and market controls.

Regulation and corporate greenness

Corporate practices are also influenced by the regulations in their source country, which force them to change policies and practices at home and abroad or face fines that negatively affect their profit margins. Regulatory policy is largely influenced by society or the selectorate—the group of people who are responsible for giving the policymakers power—that keeps the government in power (Grossman and Krueger 1995; Panayotou 1993; Seldon and Song 1994; Yandle, Bhattarai, and Vijayaraghavan 2004), which means that, for effective regulations of corporations to exist, the level of development and the ability of society to access regulators play a critical role.

Social and political theory find that developing countries' laws and institutions have historically failed to take into account the need to make economic development compatible with environmental protection (Abers and Keck 2013; Conca 2006; Huitema and Meijerink 2009; Molle and Wester 2009; Andreoni and Levinson 1998).

Policymakers perceive economic growth as the highest priority because the selectorate prioritizes it over environmental protection, and the regulators must convince them to support any regulation enacted if they want to maintain that power (Mulligan, Gil, and Sala-i-Martin 2004; Stigler 1971). This means that countries will have more green laws created and implemented in societies where the selectorate believes that the environment should be preserved.

The selectorate varies with the type of government. It is often the case that democracies that have a larger selectorate and more access points for marginalized populations, who are more affected by poor environmental resource management and pollution, will have more successful environmental policies (Li and Reuveny 2006). In contrast, negative impacts on environmental resources are particularly acute in countries with large marginalized populations, who are unable to mobilize and lobby governing officials for environmental reforms, i.e., illiberal/authoritarian states. When there are weak legal frameworks for environmentalism in their source country, MNCs will establish weak environmental policies and practices.

This means that (1) levels of development play a role in the regulation of the environment, and (2) levels of democracy and public participation in the regulatory process will change the environmental policies that exist. As a result, I would expect that corporate practices will be more regulated when they come from a developed, liberal democratic country.[22]

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[22] Regulation may also come at the international level, but they are limited in both scope and enforcement mechanisms. Often, they only work if implemented by the source country or other countries that do business with the violating corporation. International regulation may play a role in making corporations greener, but it is inconclusive as an effective tool.

Competition and corporate greenness

Studies also claim that competition can result in changes to corporate policy and practice. They posit (1) that competition can correct market failures around the environment and enhance social welfare; (2) that corporations will try to create a comparative advantage through better and more effective policies and practices, and other companies will try to catch up; and (3) that policies will converge and raise the level of environmental regulation (see Bernauer & Caduff, 2004; OECD, 2007). However, there is a lot of debate over whether competition and free trade leads to the creation of better or worse policies (Vogel and Kagan 2002).

Corporations are more likely to develop environmental technologies or standards beyond the rest of the industry's capabilities when it provides them some form of financial or reputational benefit. This leads to regulatory competition, where corporations compete based on their ability to influence regulation and society through technological developments. This works when there are multiple companies competing for market size. When competition creates better environmental regulation, technology, and corporate policies in the source country, there is more public concern over environmental issues, active rent-seeking for stricter regulations, and more sustainable and environmentally friendly performance strategies by corporations (Bernauer and Caduff 2004). This is only possible in an open market with competition, and markets without it would not have an opportunity to develop better environmental practices and policies.

Through these three mechanisms—society, regulation, and competition—corporations are influenced to create environmentally friendly norms, values, and social behaviors. These then become nationalized and internalized in corporations through formal and informal processes (Powell and DiMaggio 1991). These then evolve into the level of environmental greenness a corporation will carry with them when they invest abroad.

Source Effects: Chinese Multinational Corporations

To illustrate the general theoretical argument of source effect, I consider the case of China, a newly industrialized country that is still developing, but is the source of increasing amounts of FDI to developing countries. With the introduction of the Belt and Road Initiative (BRI), investment by China into developing countries is expected to grow even further. This increasing investment may be problematic as it is largely in the high-polluting non-financial sector (Yu 2014) and comes from a country that has long been considered lax in its enforcement of environmental regulations due to economic growth and development goals (Economy 2010). My focus in this section is on exploring how FDI from China may be one underexamined variable contributing to environmental problems in developing countries, particularly its role in aggravating pre-existing challenges to environmental infrastructure improvements. This section will examine Chinese corporations and the three mechanisms from socio-economic theory that would most influence their environmental behavior—society, regulation, and competition.

Societal values and Chinese corporate greenness

Chinese companies see pollution and resource use as unintended consequences of corporate strategy because companies do not incur high costs and sanctions for their chosen strategy. There are two reasons for this: First, there is no strong emphasis on post-material values. China largely still sees itself as a developing nation that needs economic growth to raise the standard of living for Chinese citizens. During these periods, the citizens of developing nations will continue to focus on material values that increase economic growth and expansion, until such time as people start to feel they can focus on post-material values, i.e., environmental protection (Inglehart 1990). This is reflected in the policy choices of Chinese corporations that focus on economic growth, and which will even downplay any environmentally beneficial changes that may impact economic gains (Fryxell and Lo 2003).

Second, China lacks a strong domestic environmental lobby or civil society to constrain corporations because the government suppresses civil society and community stakeholder groups that would be able to voice dissent over environmental policy (Shinn 2016). The Chinese government has been criticized for not opening up dialogue with the public on environmental issues, as the United States and EU do in order to provide responsible environmental care (*Chemical Week* 1996). Even if the public were to seek action, the organizers of the environmental groups are arrested or suppressed by powerful interest groups representing large state-owned enterprises (Kahn and Yardley 2007; Zhang 2015).

The absence of social pressure and weak organization over environmental issues further dissuades Chinese corporations from creating strong environmental policies as the corporations lack the incentives to change their strategies.

Regulations and Chinese corporate greenness

Chinese corporations are also affected by the regulatory environment. However, despite the existence of such legislation, there has been a lack of strong implementation and enforcement mechanisms (Economy 2010). Starting in 1989 with the adoption of the Comprehensive Environmental Protection Law by the Standing Committee of the People's Republic of China, the government has shown commitment to producing laws that protect and improve the environment. However, implementation and enforcement of these laws at the municipal and provincial level have been weak and lacked oversight (Compagnon and Alejandro 2013). Local policymakers are less concerned with environmental laws than with economic growth that can influence their political power and rank in the Chinese government. Consequently, when new regulations have been put into place, the local leadership has not shown a willingness to enforce national regulations in order to meet economic goals (Kahn and Yardley 2007; French 2007; Shinn 2016), and companies that are important for economic growth are not expected to observe environmental laws that interfere with their production.

Considerable evidence shows Chinese corporations face few environmental constraints (A. L. Wang 2015). In 1995, China made an environmental protection law to clean up the Huai, but it was largely unsuccessful as businesses continued to dump pollutants into the river and were not punished for the violations (Watts 2010, 159; Hua

2009). The government has even created directives to stop environmentally poor behavior abroad by creating policies for Chinese outward foreign investments; however, these policies were also written with no enforcement apparatus (Jia and Bo 2013). Additionally, since its inception in 2008, the Ministry of Environmental Protection (MEP) has imposed rules on the steel industry and state-run oil companies that have been largely ignored, and the MEP has no power to make those companies comply (Wong 2015). Even the courts have not been a constraint on corporate environmental practices and prioritize economic growth over environmental protection (Stern 2014). The courts are often only a tool for the officials to promote environmental protection needed by the government at strategic intervals (Qie 2013). This lack of institutional constraint can lead Chinese corporations to adopt more environmentally exploitative strategies.

Competition and Chinese corporate greenness

Chinese corporations also face problems in developing better environmental preferences due to a lack of competition that incentivizes environmentally beneficial practices. Before 2007, Chinese competition was limited, and regulation in China did not discourage monopolies of industry and manufacturing (Owen 2008). This lack of competition may have had a negative impact on corporate green policies and practices. Additionally, a study of Chinese corporations found that there has been no link between competition in China and the development of more environmentally beneficial policies and practices by corporations largely because the Chinese corporations are protected by the government from foreign enterprises (H. Lin et al. 2014).

As a result, Chinese companies lack motivation from external sources to promote environmentally beneficial policies. Company managers are constrained by the expectation to facilitate the growth of the Chinese economy over sustainable practices (Fryxell and Lo 2003), and the cost of implementing these environmentally beneficial policies overshadows the benefits the corporation could receive. The sustainability reports from Chinese MNCs show that these companies often lack environmental goals as well as a dedicated environmental department that could develop them, and they fail to have meetings about the environmental impacts of their projects (Kaplinsky, McCormick, and Morris 2007). Without stakeholder or institutional constraints to promote sustainable practices, decisions for the good of the company and the general economy may be environmentally exploitative. Regulators in developing countries where these MNCs invest must be concerned, then, that these practices are brought into their countries and have a negative effect on their environmental outcomes.

Host Country: How does FDI affect the environment in host countries?

When MNCs enter a host country, they carry these practices with them and will affect outcomes through their actions and influence over local stakeholder groups. Developing countries, compared to those that are already developed, tend to allow MNCs more latitude in terms of pollution and resource use, exchanging environmental conditions for economic benefits. Evidence suggests that developing country governments weakly govern foreign investors because they are under pressure to dilute regulatory standards and undermine enforcement in order to make the political and economic environment more open for foreign corporations who bring technology, jobs,

and other economic advancements (Bellos and Subasat 2012; Bellos 2010; Bues 2011; Hu, Deng, and Zhang 2013; Pandya 2010).

Foreign MNCs affect the environment through two key mechanisms. First, MNCs directly impact the environment through manufacturing and production, which may produce pollution or use large amounts of resources (Doytch and Uctum 2016; Jorgenson 2007). Many studies find evidence to suggest that the intensification of the global economy increasingly puts pressure on natural resources, such as water and air quality (Neafie 2018; Rudra, Alkon, and Joshi 2018; Cao and Prakash 2010; Grimes and Kentor 2003; Jorgenson 2007; Perkins and Neumayer 2008; Rudra 2011). The second mechanism is through the influence that MNCs have on local domestic corporations, both directly and indirectly, through civil society and other stakeholder groups. Corporations actively and intentionally disseminate their business ideas because they consider themselves "agents of change" or "norm entrepreneurs" (Barnet and Muller 1974; Dashwood 2012; Garcia-Johnson 2000; Laidi 2008). Both of these mechanisms are pathways by which MNCs may influence environmental outcomes.

China in Africa: Panel Analysis Model

To test my hypothesis that Chinese MNCs are diffusing exploitative practices, I evaluate the impact of Chinese FDI on two important parts of environmental infrastructure: water access and pollution control. To do this, I use a panel data set of more than 45 African countries from 2003 to 2017. Since January 2006, when China announced its new China-Africa Policy, China has been building more trade and investment relationships on the continent. Just one year after this relationship was

announced, investment increased 35%, from $6,344.5 million USD in 2006 to $8,549.7 million USD in 2007 ("FDIMarkets" 2016). These amounts have continued to grow and create opportunities for Chinese companies to disseminate their policies and practices into African countries. This section will review the case selection of Africa, and then discuss the variables that were chosen, before introducing my model.

Case Selection

I focus on African countries because they (1) are part of the Belt and Road Initiative and data is available to evaluate how changes in Chinese investment are affecting environmental outcomes, and (2) are locations that will prioritize economic growth over environmental protection, giving a more accurate idea of the impact that Chinese companies are having. This is particularly important because Africa has been receiving more and more Chinese investment, largely in the high-polluting, non-financial sectors. This is demonstrated in Figure 4.3: almost 70% of investment during this period is in manufacturing and extractive industries. Many African countries are also largely dependent on investment for economic growth and development (Adams 2009) and, in many cases, lack strong institutions that could counter environmentally exploitative behavior.

African countries often have strong environmental policies but weak capacity for implementation of those policies. For example, Ethiopia, Mali, and Mozambique all have enacted a wide range of legal, political, and institutional frameworks in regard to the environment because they take environmental protection very seriously (Shinn 2015). Mali has even established the national Agency for Environmental and Sustainable

Development (Shinn 2015; Drakenberg and Cesar 2013). Mozambique also has several laws and policies that safeguard the environment and has signed many major multilateral environmental agreements (Wingqvist 2011). However, studies find that these countries still have weak capacity for implementation, monitoring, and enforcement due to poor legislation and low levels of budgetary allocation (Shinn 2015; Wingqvist 2011; Shinn 2016). Implementation is often made harder because the laws and regulations are spread throughout various governmental departments and numerous pieces of legislation. For example, Zambia's commitment to environmental protection is scattered across more than 33 different pieces of legislation and across multiple ministries (Shinn 2015). This lack of cohesion and enforcement may allow countries with less environmentally beneficial behavior to have a larger impact in Africa.

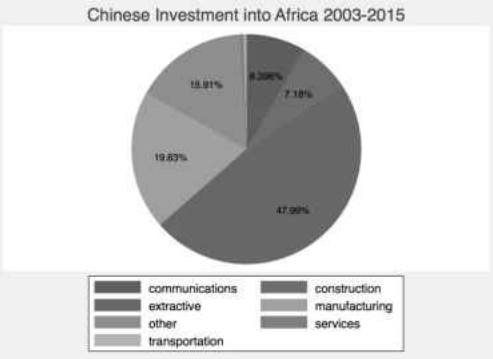

Figure 4.3: Chinese investment into Africa, by sector (Source: Author, Data: ("FDIMarkets" 2016)*)*

Dependent Variables

For this study, I test the impact of Chinese FDI on the environment in developing countries as proxied by potable water access, air quality, and measures of air pollution

(PM 2.5, NOx, and CO2). These variables were chosen as they are likely areas to be impacted by foreign direct investment and, when they are overused or polluted, directly affect the lives of citizens; this section will review these variables more closely as well as why they were selected.

Potable Water Access

First, potable water access is the percent of the population with access to clean water from an improved source, such as a well. This has been used as a variable to represent access to natural resources of a certain quality and quantity in multiple studies (Rudra 2011; Neafie 2018; Rudra, Alkon, and Joshi 2018). Water is a resource that would elicit a response from the citizens who rely it to be at a minimum "potable" quality and of a quantity, i.e., at least 20 liters of water per person a day from an improved source within one kilometer of the dwelling (World Bank 2007). Chinese MNCs, largely in the extractive and manufacturing sectors, not only demand more water but are more likely to pollute water as well (Doytch and Uctum 2016; Jorgenson 2007). This value is logged to control for outliers and variance in the water data (this can be seen in the summary of the data). I estimate water models with and without a lagged dependent variable to ensure serial autocorrelation is not impacting my findings (Achen 2001).

Indoor and Outdoor Air Pollution

Second, I look at measures of emissions that affect air quality and pollution levels. The study of emissions is important to environmental stewardship as it measures air quality and pollution exposure, which directly affect citizens. More than five million premature deaths a year are linked to air pollution, mostly in developing countries (World

Health Organization 2005; World Bank & Institute for Health Metrics and Evaluation 2016). The inclusion of these variables isolates a pollution problem that is linked to health issues in rural and socio-economically disadvantaged communities (Bernauer and Koubi 2009a; Jorgenson 2007; Bernauer and Koubi 2009b).

The measurements used to look at indoor and outdoor air pollution are air quality, nitrous oxide (NOx), and carbon dioxide (CO2). The air quality measure represents changes in indoor and outdoor particulates. It is derived from the environmental protection index and includes measurements of particulate matter 2.5 and pollution that directly impact citizens in their living and working environment (Hammond et al. 1995). The other variable is the emission of outdoor air pollutants, specifically NOx and CO2 and the measurements for this came from the United Nations Statistics Division. They are derived from data on energy, industrial and agricultural production, waste management, and land use (UN Stats 2019).

These variables can impact the health of citizens (as well as the economic health of a country, which relies on healthy citizens to contribute to society), such as air pollution, which negatively affects agricultural production (Agrawal et al. 2003; Tai, Martin, and Heald 2014) and labor productivity (He, Liu, and Salvo 2019). Chinese MNCs in non-financial sectors tend to be in higher-polluting industries that affect indoor and outdoor pollution levels by increasing NOx and CO2 and decreasing the air quality index.

Independent Variable

The independent variable of interest is a measure of net inflows of Chinese foreign direct investment (FDI), which marks the compositional change in FDI over time, versus FDI stock amounts which do not reflect new changes to the environment that may result from new facilities or an increase in production. I used a recently compiled data set from the John Hopkins Center China Research Center (China-Africa Research Initiative 2019) on bilateral FDI flows from China to Africa. This measurement is appropriate for this study because Chinese flow data is available and has been recorded in Africa by the Chinese government since 2000. I will control for total FDI and domestic investment flows as well to further isolate the Chinese FDI flows as the source of changes to the environmental infrastructure. As these flows increase, Chinese investment plays a more influential role in the host state and society. This provides a more accurate assessment of how FDI flows directly impact changes in environmental stewardship.

I use the net annual Chinese FDI flows to these African countries, lagged by two years. Generally, FDI ramifications are expected to be delayed as any changes to the status quo takes time. Other studies have found a two-year gap to be sufficient for measuring FDI flow impacts on natural resources because the effects of FDI are not immediately realized as the corporation needs to build factories and establish itself. (Rudra 2011; Rudra, Alkon, and Joshi 2018; Neafie 2018). This has the additional benefit

of controlling for reverse causality.[23] I also adjust total FDI and domestic investment by two time periods to capture the consequences of Chinese FDI accurately.

Model: Chinese FDI in African Countries

I employ both country and year fixed effects in my regression model to conduct a series of quantitative cross-national analyses of Chinese FDI on environmental outcomes. The model uses year dummy variables to account for annual trends from 2005 to 2015 and country fixed effects to account for any country-specific factors not accounted for in my model. The univariate statistics are laid out in Table 4.1; my matrix correlation is laid out in Table 4.2 and includes my measures of trade, domestic investment, inequality, political regime (polity), gross domestic product (GDP), measures of GDP growth, and urban population growth. Each model includes all African countries for which the environmental variables and FDI data were available, with control variables.

The following model assesses the consequences of Chinese FDI on natural resources in African countries:

$$DV_{it} = \alpha + \beta_1 Chinese\ FDI_{it-2} + \beta_1 FDI_{it-2} + \beta_1 Domestic\ Investment_{it-2} + \beta_j year_i + \beta_k controls_{it} + u_i + \varepsilon_{it}$$

[23] Even if poor environmental conditions are attracting FDI from emerging economies like China, by lagging my independent variable by two time periods, I am isolating the effect that it is having on environmental outcomes in the future.

	Observations	Mean	Std. Dev.	Min	Max	Source
Water Access (logged)	502	4.26	0.25	3.38	4.60	World Development Indicators (WDI)
Air Quality Index	463	74.21	11.29	47.09	98.34	Environmental Performance Indicators (EPI)
NOx (logged)	188	8.07	1.81	3.08	11.42	UN Stats
CO2 (logged)	282	8.25	1.70	4.88	13.13	UN Stats
Particulate Matter (PM 2.5) (logged)	329	3.59	0.56	2.20	5.32	UN Stats
Chinese FDI Flows	624	0.05	0.22	-0.82	4.81	SAIS-CARI
FDI flows (% of GDP, logged)	550	1.18	1.25	-6.30	4.44	WDI
Domestic Investment (% of investment, logged)	522	23.53	9.01	2.23	74.61	World Bank
GDP per capita (logged)	589	7.18	1.11	5.36	9.92	WDI
Human Development Index	606	0.52	0.11	0.29	0.80	WDI
Democracy (Polity IV)	618	5.34	2.47	0.42	10.00	Freedom House
Rapid Economic growth (logged)	545	1.48	0.72	-2.49	4.81	WDI
Trade (% of GDP)	568	4.28	0.42	2.95	5.74	WDI
Population growth (logged)	610	0.79	0.56	-2.68	1.53	WDI
Number of Countries	47	47	47	47	47	

Table 4.1: Summary of Univariate Statistics (Source: Author, Data: QoG Standard Dataset (Teorell et al. 2018) *and SAIS-CAIR China FDI data* (China-Africa Research Initiative 2019)*)*

	Water Access	*Air Quality Index*	*NOx*	*CO2*	*PM 2.5*	*Chinese FDI Flows*	*FDI flows*	*Domestic Investment*	*GDP per capita*	*Human Development Index*	*Democracy*	*Rapid Economic growth*	*Trade*
Air Quality Index	0.534	1											
NOx	-0.2315	-0.3842	1										
CO2	0.1514	0.3712	0.4927	1									
Particulate Matter (PM 2.5)	-0.2744	-0.4926	0.3376	-0.0598	1								
Chinese FDI Flows	0.1059	0.095	0.1522	0.3311	-0.0033	1							
FDI flows	-0.2162	0.063	-0.0955	-0.0106	-0.0983	0.021	1						
Domestic Investment	-0.1087	0.3118	-0.1408	0.2119	0.0849	0.0161	0.2421	1					
GDP per capita	0.4611	0.8277	-0.2262	0.5177	-0.1845	0.1744	0.1768	0.4547	1				
Human Development Index	0.5911	0.8281	-0.2125	0.5117	-0.3966	0.1403	0.0997	0.3462	0.8746	1			
Democracy	0.4048	0.1329	-0.1082	0.0381	-0.4455	0.1489	-0.0318	-0.1833	0.069	0.1507	1		
Rapid Economic growth	0.0257	-0.0933	0.0072	0.0007	0.0364	-0.0793	0.0553	-0.2153	-0.0554	-0.112	0.0249	1	
Trade	0.1732	0.514	-0.4373	-0.0143	-0.3515	-0.1012	0.4116	0.2533	0.4504	0.3897	0.1168	0.0557	1
Population growth	-0.5351	-0.5591	0.2534	-0.2129	0.4403	-0.1283	0.0502	0.0213	-0.4361	-0.5801	-0.3613	0.0972	-0.2831

Table 4.2: Correlation Matrix (Source: Author, Data: QoG Standard Dataset (Teorell et al. 2018) *and SAIS-CAIR China FDI data* (China-Africa Research Initiative 2019)*)*

In this equation, DV_{it} denotes the effect on the environmental dependent variables for every year data was collected. β_1 is the change in the DV when there is a one-unit change in $Chinese\ FDI_{it-2}$ (the net inflows of Chinese FDI into the developing country i at period *t-2*). This measurement also privileges flows over measures of FDI stock; I use them because they capture more recent investments and will more accurately reflect changes in the environment outcomes introduced by new flow sources. $Year_i$ denotes a time dummy, ε denotes independent and identically distributed random errors, and $controls_{it}$ are the various independent variables that account for any extraneous factor that affect the parameter of interest. μ_i is the unobserved time-invariant country effects, such as policy or other institutional factors. A Woolridge test for autocorrelation between my dependent and independent variables found no autocorrelation in any of my models (Woolridge 2010).

Controls

I employ eight additional independent variables to control for other factors that impact environmental outcomes in African countries in all of my models: FDI flows, gross domestic product (GDP), economic growth, domestic investment as a percentage of GDP, population growth, democracy, development index, and trade.

Both FDI flows and domestic investment as percentages of GDP are used as controls to isolate the effects of Chinese FDI. Domestic investment is measured as gross fixed capital formation (GFCF), formerly known as gross domestic direct investment. This variable controls for any changes in domestic level investment in fixed assets that might be captured by increased foreign-controlled manufacturing; meaning, that if

investors from the host country are also investing into these industries, they may seek their own environmentally exploitative or beneficial methods of production which must be controlled for, so that it is not captured in my other coefficients (Jorgenson 2007; Young 1997). FDI[24] as a percentage of GDP is a World Bank measure that similarly captures the impacts of FDI that may be exploitative or beneficial; this is used to ensure that I am not conflating Chinese FDI with FDI from other sources.

Trade is a standard variable to use as a control with FDI. Rudra (2011) finds that trade has a negative effect on access to potable water; thus, *trade* as a percentage of the GDP is included in this model as it may possibly have negative consequences on other environmental resources as well. The use of both trade and FDI is important in the ongoing debate over which is truly more robust in decreasing resource access. This control is not lagged as, in Rudra's study, trade's impacts are seen with more immediacy.

I also included five variables that would be expected to affect potable water access: *gross domestic product (GDP*), *economic growth, levels of democracy, Human Development Index (HDI) score,* and *population growth*. *GDP* is linked to the Environmental Kuznets curve (EKC) literature and should be controlled for because the relationship between GDP and pollution is an inverted U, meaning that at certain levels of GDP, pollution is rising and, for certain levels of GDP, it is falling (Andreoni and Levinson 2001). I control for this variable using GDP per capita, logged because it is not a linear relationship. *Economic growth* is measured as logged GDP growth and accounts for pressures that rapid industrialization has on natural resources, particularly in low

[24] FDI is an investment in the managing stock of a company, measured by the World Bank of any purchase over 10% of controlling stock, outside of the investor's home country (2016).

regulatory environments where it could severely reduce resources and increase pollution levels rapidly (Grossman and Krueger 1995). The Freedom House (2019) dataset is used to control for levels of democracy, determined by a 10-point scale that measures the level of democracy from less (0) to more (10) democratic. Democracy should be associated with greater access to resources and lower pollution levels, as members of society have more access points to communicate with the government when they are dissatisfied with the environmental situation and would be motivated by a reduction in potable water to use those access points (Winslow 2005). The *Human Development Index (HDI)* variable is a composite index of the basic dimensions of human development (UNDP 2018), and controls for levels of development in the country that may not be accounted for in other measures. Finally, *population growth* is used because fast-growing populations may put increased pressure on a state's infrastructure, resulting in decreased access to potable water (Khan and Siddique 2000; Rudra 2011; Jorgenson 2007). These variables are important as they have impacts on pollution and resources access, as well as the institutions that provide infrastructure within a country; they are included to further isolate the effects of Chinese FDI.

Lastly, in my water access model, I include a *lagged water access variable* in the time period, which controls for any previous infrastructure or water flows prior to the testing period. Rudra (2011) also employs this method in order to isolate *t* changes in access to potable water when trying to capture the impact of trade flows. Its addition does not change the sign or magnitude of the findings. [25]

25 I also tested my model without the lagged dependent variable and found the direction and magnitude not substantially changed, thus finding no evidence that this variable had any adverse effects on my model (see Achen, 2001).

Results

Overall, Table 4.3 supports the hypothesis that Chinese FDI slows environmental infrastructure improvements because they are diffusing environmentally exploitative practices. These coefficients also show that Chinese investors have a more robust effect across environmental indicators than FDI from other sources, domestic investors, trade, and the local economy. The strongest evidence is from water access, air quality, and CO2, where the models hold up with and without controls, showing strong evidence that Chinese FDI may contribute to reduced water access and indoor air quality as well as increased CO2 emissions.

Chinese FDI and Potable Water Access

My first model, Table 4.3 column 1, shows how Chinese FDI slows potable water access in African countries. The data includes the period from 2005 to 2015 for 43 countries with an average of nine years per country because of lagged variables. The numbers indicate that the impact of Chinese FDI on water is not particularly large, only decreasing water access by 0.03 percent on average for every billion dollars invested. This finding does indicate, however, that FDI from China slows improvements to water access, even in the presence of political, environmental, and other economic controls in developing countries. This model was tested for robustness (see appendix), and the significance of Chinese FDI on water remains even when using the environmental protection indices for water access. The R-squared is particularly high for this model (R2=0.997) because I am controlling for lagged water access, which is a strong predictor of future water access. However, controlling for this further isolates the impacts of Chinese FDI in these countries.

VARIABLES	(1) Water Access (logged)	(2) Air Quality Index	(3) NOx (logged)	(4) CO2 (logged)
Chinese FDI Flows	-0.00034**	-0.36***	0.0085***	0.034**
(lagged 2 years)	(0.00017)	(0.11)	(0.0026)	(0.015)
FDI (% of GDP)	0.000043	-0.23	0.0099	-0.024*
(lagged 2 years)	(0.00025)	(0.14)	(0.0097)	(0.013)
Domestic Investment	-0.000109**	0.088	-0.0019*	0.002
(lagged 2 years)	(0.000053)	(0.059)	(0.0011)	(0.0038)
GDP per Capita	0.004	-5.09	0.026	1.2***
(logged)	(0.0034)	(5.14)	(0.21)	(0.341)
Human Development	-0.02	-42.21	0.44	-4.17
Index	(0.028)	(47.32)	(1.85)	(3.12)
Democracy	-0.00018	0.056	-0.003	-0.006
	(0.00027)	(0.30)	(0.01)	(0.024)
Rapid Economic	-0.00012	-0.22	0.0066	0.015
Growth (logged)	(0.00017)	(0.17)	(0.018)	(0.016)
Trade (% of GDP)	-0.00025	0.039	-0.23*	0.13
	(0.0012)	(1.33)	(0.12)	(0.096)
Population Growth	0.000096	-1.51	0.011	-0.12
(logged)	(0.00078)	(1.69)	(0.043)	(0.16)
Water Access (logged,	0.95***			
lagged)	(0.01)			
Constant	0.20***	128.8***	8.573***	1.21
	(0.04)	(47.37)	(0.78)	(1.64)
Observations	396	331	146	226
R-squared	0.997	0.37	0.19	0.60
Number of Countries	43	45	43	45

Table 4.3: Country and Year Fixed Effects Regression Model of the effect of Chinese FDI on environmental resources in African Countries (Source: Author, Data: China-Africa Dataset (China-Africa Research Initiative 2019) *and QoG Standard Dataset (Teorell et al. 2013)). Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Additionally, it has to be noted that while Chinese FDI has a negative effect on water access, domestic investment does as well. Some studies suggest that domestic investors and local communities may seek "greener" methods of production (Jorgenson 2007; Young 1997); however, the evidence is more in line with the EKC literature that suggests that countries will pollute until they have reached a certain level of development. When domestic investment and Chinese investment are also controlled for in the model, FDI as a percent of GDP does not affect water access. This confirms my

hypothesis that Chinese FDI has a more robust impact on resource access than FDI from other sources and may be what was driving FDI outcomes in other studies, see Neafie (2018).

Chinese FDI and Air Pollution

Table 4.2, columns 2-4 demonstrate how changes in FDI flows from Chinese companies change indoor and outdoor pollution. This set of models confirms that Chinese FDI decreases air quality for both indoor and outdoor pollution, which indicates that more people are being exposed to particulate matter and pollution in African countries when Chinese FDI increases. The effects on air quality are found to be negative, indicating that FDI from China could be having a negative influence on particulate matter and pollutants in the air, i.e., causing levels of particulate matter to rise through production processes. My model also finds that the levels of NOx and CO2 rise with increased Chinese investment. The results for CO2 hold up in my robustness checks and are particularly interesting given that FDI from other sources reduces CO2 levels in African countries. This shows that despite other investment having environmentally beneficial consequences, Chinese FDI has environmentally harmful impacts and may be prohibiting or reversing infrastructure improvements.

In the models on air pollution emissions, there are a few control variables that behave consistently with the literature. Domestic investment seems to align with the writing on domestic investors and green methods, where it appears to have a negative effect on NOx. This is probably due to its links to acid rain, which may make it a more salient issue with stakeholders, who would want to see it reduced. In addition to domestic investment, trade also has a positive impact on air pollution.

I find that increases in Chinese investment lead to increases in NOx, which suggests that the rise in releases may have a small increase in NOx in the host country affecting pollution and acid rain. However, my robustness checks, see Appendix III, show Chinese investment having an insignificant effect on NOx. This may be because there is only a weak relationship between Chinese investment and NOx or because there are only a few data points associated with NOx as many of the countries in this data set have only just begun to record NOx emissions.

In terms of CO2, there is a strong negative effect of FDI on CO2 overall. This further strengthens my argument because, as Chinese FDI displaces other FDI, it may be contributing to more emissions by using dirtier practices. This model indicates that while FDI as a whole helps by decreasing CO2, possibly through the inclusion of better corporate policies and practices, investment from individual countries may not always share this trait. Additionally, in this model, GDP per capita has a negative effect on CO2. This is consistent with the EKC literature that finds that CO2 increases while countries are developing (Yandle, Bhattarai, and Vijayaraghavan 2004; Selden and Song 1994). As a result, investment from China may be intensifying CO2 emissions that were already rising in African countries.

Discussion

My findings show that, Chinese FDI may be negatively impacting some environmental resources. At the most basic level, the impacts of Chinese FDI may be mediated through the domestic political variables of a country. As discussed, these variables may be influenced by whether the country is more developed, and many of the environmental institutions in developing African countries are not yet highly

institutionalized and have little power to affect change. Investors entering these countries thus have more power to influence policies and practices that are not yet established, and institutions will struggle to keep up with the quick systemic changes caused by increasing investment (Acemoglu, Johnson, and Robinson 2001). These negative effects lead to substantial political and environmental costs for African countries if they do not have sufficient institutions to overcome the consequences of international economic flows.

Investment from China is influencing water and air resources in African countries, which have a direct impact on the access of individuals to these resources for their own livelihood. Chinese FDI decreases potable water access in African countries, which is further compounded by domestic investment that is also slowing water access. This could be problematic in African countries that are trying to provide more and improved sources of water access. In the case of air pollution, domestic investment and FDI from other sources are having a positive effect on CO2 and NOx, reducing overall emissions, but Chinese FDI may be increasing them. This is important for regulators at the local and international level who want to set policies or encourage better practices.

This evidence suggests that policymakers in African countries must be concerned with the effect that new investment projects from China may have on the environment. I find strong evidence to suggest that China is impacting the environment in Africa and that there is a distributional effect of emerging markets investing in other emerging markets. The changing make-up of investment to countries still in development comes with problems that may not be eternal but could create a momentary "race to the bottom" that will hinder development.

Conclusion

This study provides evidence to suggest that the "race to the bottom" literature may still be relevant in the analysis of globalization and environmental outcomes. However, it highlights how the environmental culture at the source of investment is the most important indicator for policy and performance abroad. I identified where and how the economic relations with certain countries can lower standards of policy; in this case, the focus is on FDI flows from China. I also show that economic flows cannot be understood by aggregated data and more refined studies are needed; one way to do this is through the method I have used here: dyadic investment flows. This is important for policymakers who need to better understand the consequences of incoming investment in order to manage it. Overall, it appears that this disaggregated form of FDI is important, as I find evidence that suggests that measures of FDI flows from particular countries have different outcomes than aggregated FDI. This demonstrates that the original source of investment matters for a host country's economic and sociological development.

Further study should explore the Chinese relationship in these countries over time, as EKC research suggests that China may be reaching a 'tipping point. Chinese corporations are being pressured to begin prioritizing green environmental behavior in the future, both domestically and internationally (Mang 2013). In 2008, the State Environmental Protection Administration was promoted to the Ministry of Environmental Protection and placed under control of the State Council (the chief administrator in China), giving it more regulatory power, and Chinese citizens have been allowed to bring more environmental cases against corporations to the Chinese court system. The Chinese government has also taken a more active role by encouraging companies to follow better

environmental practices when investing abroad through more stringent enforcement mechanisms (Mang 2013). Additionally, international organizations have been pushing the Chinese government to improve the oversight and regulation of companies' environmental performances abroad (OECD 2007a). This indicates that behavior may change, as shifts in regulation and development of post-material values cause Chinese corporations to reevaluate the cost-benefits of environmental strategies.

CHAPTER V: CONCLUSION

I have traced the movement of corporate environmentalism from source countries to developing host countries. Over the last 15 years, FDI has come from more diverse sources, and as a result the levels of corporate environmentalism have changed based on the source of investment. This change in pattern has sparked a debate over whether these changes in who is investing are affecting the impact that foreign direct investment (FDI) has on environmental outcomes in developing countries. My dissertation finds evidence to suggest that developing country FDI is worse than developed country FDI.

Evaluating the Propositions

Proposition 1. *Corporate environmentalism reflects economic development and demands from stakeholders who are more likely to prioritize environmental policy when they reach a high level of economic growth, and development is stable. Green corporate environmentalism will increase in more developed countries when stakeholders share norms that prioritize environmental issues thereby making corporate environmentalism greener when development levels are higher and less green when development levels are lower.*

In chapters 2 and 4, I evaluate the relationships between stakeholders and corporations, and how different political, economic, and social institutional environments can change the behavior of multinational corporations (MNCs). I find that (i) corporate environmentalism does look different between countries at higher and lower levels of development; and, (ii) manufacturing and extractive industries from different source countries, while sharing common indices prescribed by international and domestic

regulatory institutions, do have varied approaches to what information they provide in corporate social responsibility reports and their self-reporting policies and practices. Despite beliefs that all corporations would look the same because they share a common goal, to maximize profit, evidence in these reports shows that there are other factors influencing the internal norms of the corporation.

Evidence in these reports shows that developed countries do have greener policies and that they take more action on the environment both at home and abroad. These sustainability reports are the dialogue between the company and the source stakeholders and reflect the relationship between these two groups. Companies from more developed source countries want to show stakeholder groups that they are in line with the social norms that will benefit them by reputation and, in turn, economically. In these reports, they communicate the ways they participate in dialogue with different stakeholder groups, cooperate with different groups, pursue their lobbying efforts, and use the tools for measuring and implementing environmental practices.

On the other hand, the reports from developing source countries look distinctly different. Companies do not communicate as much information to their stakeholder groups, and often report weaker environmental goals, if any at all. The companies are influenced by economic growth and profit maximization with less influence on them to have greener corporate environmentalism. Corporations demonstrate a lack of progress in specifying their environmental policies and often must report many more environmental fines in their financial reports.

In Chapter 2, I show that not only do my findings confirm that developing countries are less green, but that this phenomenon is being largely driven by political and

economic institutions. The economic institutional environment in a capitalistic, market-based system that prioritizes economic growth over all non-material values, i.e., the environment, during development. Non-material values may be expendable while economic growth is taking place. As a result, natural resources are exploited for overuse and polluted. Evidence of this was found to be driving poor corporate environmental policies and practices.

Additionally, political institutional environments are playing a role in corporate environmentalism. Chapter 2 also finds that corporations are affected by the political regimes in the countries they come from, and that corporations from democratic countries may be greener than those from non-democratic countries. This is because democratic countries are more strongly influenced by the citizens who may vote them out of office; as a result, they may make stronger environmental regulations and put more pressure on corporations to behave in more environmentally friendly ways. The companies themselves may not be more or less green if left to their own devices, but because they interact in these institutional environments, they are influenced to behave differently or lose profits.

In Chapter 4, evidence from studying Chinese corporate environmentalism illustrates the links between institutional environments (political, economic, and social) and the environmental strategies that corporations choose. Even managers in Chinese corporations understand the importance of green corporate environmentalism but must prioritize economic growth over environmental practices (Fryxell and Lo 2003). The Chinese corporations put much less emphasis on the environment in their corporate

policies and practices, and profitability of the company is emphasized by society, the market, and the government.

In sum, corporate environmentalism is higher in more developed countries, and it is largely being driven by economic and political institutional environments. This agrees with the existing literature that higher levels of economic growth shift social norms and lead to a prioritization of the environment. This reflects the higher level of economic growth at the source that is largely driving variations in corporate policy and practice at the source.

Proposition 2. *The level of green corporate environmentalism an MNC carries may affect environmental outcomes in the developing host country. MNCs diffuse their source country environmental policy and practice into the developing host country, MNCs from green sources should have a positive effect while MNCs from non-green sources will have a null or negative effect, depending on the current policies in the host developing country.*

The second proposition—that imported corporate environmentalism can adversely affect developing country environmental outcomes depending on the source—is supported. This means that environmental infrastructure improvements, increasing potable water access and air quality, may be slowed or stalled when investment is largely coming from a country with a poor environmental record. Chapters 3 and 4 explored different aspects of environmental infrastructure, i.e., water access, air pollution, and found evidence to suggest that these important areas of infrastructure are being negatively affected by FDI from a developing country source. They found that this negative impact may be counteracted by development in the host country, or investment from more

developed societies that have greener values. So, it may be possible that as host countries develop, they may attract greener FDI, that will allow them to develop stronger standards.

Chapter 3 finds evidence to suggest that as developing source FDI increases, some environmental aspects decrease. Developing source FDI may be going to locations where environmental performance is lower because there is a lack of developed source FDI and less competition, but even in these cases, there is some evidence to suggest they are slowing or stalling infrastructure improvements around potable water access and pollution. This study finds that the environmental performance level lowers in relation to the increase in investment from countries that lack green environmentalism.

Evidence from the Chinese case study in Chapter 4 does support Proposition 2. In the case of investment coming from China, increases in Chinese FDI as a percent of total investment leads to lower water access and poorer air quality. This can be linked to Chinese corporations carrying with them poorer environmental standards than companies from other places where the standards are higher. Research on Chinese corporations indicates that their policies and practices are less green, and the managers even admit to behavior that does not push green technology and innovation if it would hurt financial gains (Fryxell and Lo 2003; Economy 2010). If companies from developing countries, like China, with poor environmental track records are investing abroad, it is very likely that these investments are also diffusing poor environmental policies and practices.

Proposition 3. *FDI from non-green sources can adversely impact the poor's access to natural resources and the levels of pollution they are exposed to; as a result, the poorer and less developed a country, the more negative the impacts of MNCs from non-green sources. At lower levels of development, the governments will be influenced by MNCs*

over citizens, who may not be able to overcome collective action problems to lobby for stricter government regulations.

FDI from developing source countries appears less "green" in developing host countries, and the environmental issues that are affected the most are those that impact the most vulnerable populations. My findings in Chapters 3 and 4 indicate that globalization is perpetuating dependency and under-development (Valenzuela and Valenzuela 1978). In Chapters 3 and 4, evidence of globalization influencing environmental infrastructure is apparent, particularly in the areas of potable water access and air quality. The wealthy in these countries are often not as affected, as they can afford to move or acquire the resources that they need; the most vulnerable are the marginalized communities who lack the political influence to prevent being affected and do not have enough money to gain better resources (Rigby and Wright 2013; Flavin 2012; Hickey and Bracking 2005; Gilens 2012). These groups then become more dependent on foreign investors and the government to provide the goods they need.

Chapter 3 found evidence to suggest that countries that are poorer and less developed are more heavily impacted by FDI from sources with poor environmentalism. This study also found that higher levels of development do allow states to overcome this problem and improve their environmental situation. This means that as developing countries progress more, they have to be concerned with shifts in resource pattern usage that may have negative effects on air, water, and forests. For example, I find consensus that air quality and water access do improve as development increases and that the effect of having more FDI in the developing host country does less harm in host country's with higher levels of development. However, not all environmental resources are positively

affected, and there is evidence to suggest that the depletion of forests increases even as development causes other environmental problems to decrease. The findings from this chapter further supports my third proposition in two ways: (i) that at different levels of development the effects of FDI on environmental resources are different; and, (ii) that countries at the lowest levels of development are the most affected by adverse environmental conditions brought by FDI with a poor environmental record.

Developing country environmental challenges are reported every day in the media and are often associated with rapid urbanization, population growth, and changing lifestyles. This dissertation introduces a new perspective by examining how international economic variables affect environmental outcomes in developing countries, particularly those that are marked by socioeconomic cleavages like aspects of air quality and water access. This paper identified how countries may be more or less vulnerable to developing source FDI, but also how developed source FDI may have positive outcomes on environmental outcomes and improve the situations of vulnerable populations. It is also evident that increased economic growth, in the form of GDP and other aspects of development, have a positive effect on these vulnerable populations.

Conclusion: Source Effects

This dissertation added to the literature on the role of non-governmental actors in a transnational role as diffusers of policy and practice. This study looked at the everyday behavior of multinational corporations, which play a role as environmental regulators when their policies and practices dictate the behavior of an industry. Evidence of this was apparent in my study where the policies and practices an MNC carries with them are linked to the environmental outcomes in the states where they invest. This finding has

consequences for several different literatures, most particularly the "race to the bottom" or "race to the top" literature, suggesting that FDI may not cause either. Instead, it matters where FDI comes from in order to determine if the effects will be beneficial or not to the developing host country.

Developed countries are often promoting a "race to the top." The findings show some evidence to indicate that developing countries are being negatively influenced by the global economic activities of other developing countries; however, they are being positively influenced by developed countries that raise levels of environmental protection. This research confirms the findings that developed country FDI has a positive influence on developing countries. This is most likely because developed source FDI carries with it technologies and introduces stronger polices that could be used to expand potable water access and increase air quality.

I find that developing countries are more in line with the "race to the bottom" hypothesis of globalization. On average, developing countries receive an equivalent of about 40% of their FDI from other developing countries, and it is increasing with each year. This means that for now FDI from developing countries is slowing infrastructure improvements that developing countries are otherwise making in providing potable water access, and it is creating a "race to the bottom" in countries that are not equipped to manage public goods. However, the evidence also suggests that over time the material values of source countries change, and that while they NOW have less green corporate environmentalism this may not be the case in the future. The question is: can host countries wait for the source country to become greener if they are currently ruining the environment?

I have shown data to suggest that the theory of source effects is important to our larger study on the impacts of FDI (Adolph, Quince, and Prakash 2015). The source effects literature, taken together with the evidence I have shown in this dissertation, provides preliminary evidence that FDI sources do cause environmental outcomes to vary and indicates that continued investigation of disaggregated FDI is needed. I believe the framework developed in this paper provides a useful foundation for such research. I focus on how corporations from a variety of places develop diverse ideas about environmentalism, and I show how those ideas are transferred to the developing host country. This study has shown evidence to suggest that it is not the FDI a state receives, but rather from where that FDI comes from that is important.

Further Study

In this study, I have isolated the dependent variable 'environmental impact' to help further understand the intersection of the international and the domestic. I anticipate that these findings are generalizable across developing source countries and in different policy arenas as well, such as labor. My case study on China only briefly touched on the institutional variation that can be seen at the source of investment. These same factors in environmental, political and social institutional environments could also be tied to different areas, i.e. labor, or other issue areas where ignoring issues of the environment often go hand in hand with poor working conditions.

Further study into the comparison between developed country and developing country investment and their impacts on environmental resources management and globalization is needed to discuss the difference in the way that investment groups

interact with developing countries and how this may be regulated domestically or internationally.

APPENDICES

APPENDIX A: CORPORATE ENVIRONMENTAL SUSTAINABILITY INDEX (CESI) CODE BOOK

The Corporate Environmental Sustainability Index (CESI) is a measure of overall progress towards environmentally sustainable practices by a corporation. The operationalization of corporate environmentalism, through sustainability reports, provides important insight into the rationale that drives internal MNC environmental policy and practice. This index provides a composite profile of corporate environmental stewardship based on a compilation of 9 variables made up of 40 indicators derived from corporate sustainability responsibility literature. Good environmental stewardship practices are pivotal to an international companies' ability to positively influence environmental policy and practice abroad.

This analysis uses the Global Reporting Initiative (GRI) indicators, and the indicators and variables from the literature that reports on corporate environmental disclosures. The issues incorporated and variables used were chosen through extensive review of this literature, assessment of the available reports from global companies, and rigorous analysis. While these indicators do not provide a definitive vision of corporate sustainability, they do form a tool for the systematic evaluation and ranking, by score, of corporate environmental policies from different countries, both within and across different industries that will build on the existing literature. The higher a company's CESI score, the better position it is in to utilize and promote favorable environmental conditions at home and abroad, now and into the future.

The Data

This data set was created to define corporate greenness through the environmental sections of corporate sustainable responsibility (CSR) reports. CSR reports are independent corporate editorials in which companies "self-report their corporate greenness" (Lyon and Maxwell 2003). The aim of this data is to make a comparative data set specifically on corporate greenness using content analysis methods.

Corporate greenness are the activities and policies undertaken by the company to improve the environment through research, technology, and practice. This includes creating goals, having socially responsible investing, and impact investing—investing in activities and events that educate and change the environmental landscape. This code book seeks to define greenness through the activities and goals a corporation assumes, as defined by the literature.

CSR reports are used by companies to voluntarily publicize environmental actions that make them look comparably better to stakeholders (Clarkson, Overell, and Chapple 2011). Influencing the CSR reports are international organizations who have created guidelines, making CSR reports one of the most effective tools for companies to communicate their environmental disclosures (GRI 2011). These reports include activities and policies that a corporation wishes to advertise to their shareholders and larger community; they also simultaneously publish financial reports which prevent companies from hiding environmental fines or lying about the money spent on environmental research and technology. Coding of CSR reports is made easier through the domestic and international regulatory agencies that create guidelines and policies that

pressure corporations to include certain information, and increase the legitimacy and credibility of what is included (Lock and Seele 2016; Di Giuli and Kostovetsky 2014).

Country and Time Coverage

In this data set, CSR reports from around 2016 are included. Reports from 2016 are prioritized, however, if no report was issued in that year or the company only does bi-annual reports 2017 is included. I relied on a stratified random sampling method to choose the companies examined in this data set. I wanted to make sure I included countries from both developed and developing nations, the full list of countries included in the data set is in Table i.

Source	Count
UAE	1
China	11
India	3
Brazil	1
Russia	1
Indonesia	1
Azerbaijan	1
South Africa	1
Czech Republic	1
Taiwan	2
Ireland	1
Italy	2
Netherlands	2
Malaysia	1
United States	11
France	3
United Kingdom	3
Germany	6
South Korea	3
Thailand	1
Japan	8

Table i: Country list

Thematic Categories and Coding Rules

Table ii displays the full list of the five thematic categories and the indictors that are coded on (1,0) scale, either this item is present, or it is not. This section will go through each of those categories and explain the coding rules. Each indicator is a yes/no question (with further clarification provided below) and will be scored 1 for yes, 0 for no. As these coding rules were developed using a priori coding methods the source of the variable is exhibited in column three, with the citation of the literature that uses a similar variable or discusses the use of such a variable as a way to indicate greenness or sustainability.

Environmental Planning and Policies (EPP)

Green corporations have a substantial amount of green policies and practices. Environmental planning and policy (EPP) is a measure of the presence and extent to which corporations create general guidelines that outline their environmental principles, rationale, and philosophical underpinnings (Jose and Lee 2007). Clarkson et al. (2008) suggest that greener corporations will have proper planning, structure, and leadership, and they will inform stakeholders of their achievements through their CSR reports. Green environmental policy has two key ingredients: (1) goals to engage in environmental sustainability and (2) a plan of action to commit to those goals (Jose and Lee 2007). External actors monitor corporate claims to make sure that the information they present is accurate and reliable; this increases the legitimacy and credibility of the information included (Lock and Seele 2016; Di Giuli and Kostovetsky 2014). The following indicators were developed from the literature on environmental practice and policy. :

- (EPP03) Does the company prioritize sustainability over profitability?

    - The corporation has a baseline where they've began to prioritize sustainability over profitability. This is not motivated by government policy or regulation, but could be motivated by stakeholders, e.g., the company is choosing to be more sustainable even though there is no regulation telling them to do so. This can include an emphasis on expenditures to improve the environment that will not increase profits; or changes to their corporate goals to be more sustainable.

- (EPP01) Does the company have clear tangible goals?
    - Corporate environmental practice is considered green if the company expresses clear tangible goals to be achieved. This includes an impact reduction goal (emissions or pollutants) as a percent of current emissions or pollutants, as an amount that they set to achieve.
- (EPP12) Do stakeholders participate in the CSR process?
    - The corporation invites stakeholders to participate in the creation of these goals. This allows stakeholders to actively engage or give feedback on the corporations CSR reports. An example of this is the External Citizenship Advisory Panel from Exxon.
- (EPP02) Do the goals have deadlines?
    - There is a deadline for these goals to be achieved, this can be any type of deadline (by a certain year, or within 10 years), but it must have an end date by which the goals are supposed to be achieved.
- (EPP11) Has the corporation enacted environmental management systems (EMS)?

    - EMS is a framework designed to help a corporation achieve its environmental goals. It consists of reviewing, evaluating, and improving the corporation's environmental performance. It implies a continual improvement of corporate policies and implementation.
- (EPP05) Does the company audit the environmental performance throughout the company, including global facilities (verified to a reasonable level of assurance)?
    - These could be audits run by outside companies or internal to the company. This not only includes their manufacturing/extractive processes but can also include auditing not just their pollutants but also sustainable office practices, electricity, etc. Not only in the host country but also in their global locales.
- (EPP07) Do all locations follow the same policies and practices?
    - The global locations must be expected to meet the same goals and policies as the corporate headquarters. The global locations do not have less stringent goals or expectations for sustainable practices.
- (EPP04) Does the company audit the product lifecycle for sustainability?
    - This means that the company is concerned about the source of the materials all the way to consumption/use. The company actively assesses these goals and looks at the sustainability both upstream and downstream. This may include assessing customer use, the production of any materials the corporations outsource, etc.
- (EPP06) Does the company have an environmental committee or department?

    - \It must be separate from health and safety or be a substantial presence in the health and safety department. Executive level committees are acceptable. This show there is prioritization of the environment and not just secondary to the current duties of the health and safety departments.
- (EPP08) Does the company have an executive-level environmental manager?
    - This could be a president/vice president/chief environmental officer. This is again to show the prioritization of the environment as important to the company.
- (EPP10) Does the company have a training programs to teach employees how to be more sustainable?
    - This can be any form of environmental training to encourage more sustainable practices in employees.
- (EPP09) Does the company invests in research for their environmental technologies internally?
    - This includes money used in their own lab or given to any private research center that is developing more sustainable technologies by only for their own use.

External Organization Policies (EOP)

Greener CSR should also include measurements of external organization involvement. This can include involvement with regional, industrial, or international organizations that are largely voluntary. Having more open involvement with external organizations can give more credibility to CSR reports as they are usually increasing their transparency by reporting their internal goals and policies to outside evaluations.

Additionally, the approval of CSR reports from international organizations can open or close international markets to MNCs and even prompt local regulators to increase regulations (GRI 2011). As a result, the external organization policies (EOP) section measures how MNCs work with environmental international organizations and other environmental industry groups. To measure this, the indicators show the relationship between the MNC and external green organization:

- (EOP01) Does the company invest in research for environmental technologies externally?
    - Most companies that have started to prioritize environmental polices might invest in their own technologies, but some might also invest in universities or think tanks to also do this research. When they invest in universities or think tanks to do this research it shows a willingness to invest in environmental technology that might benefit those outside of the corporation.
- (EOP08) Does the company participates in an industry environmental organization?
    - More often corporations will be in industry level organization before international organization. The environmental goals and policies at this level are specific to the needs of the industry.
- (EOP04) Are they a member of an international environmental organization?
- (EOP02) Does the corporation share their experiences with international organizations/business group?

    - This must be the sharing of environmental data with some internationally recognized organization or business group facilitating business sustainability.
- (EOP06) Do they promote and recognize research from international environmental stewardship bodies?
    - i.e., the United Nations Sustainability Goals. Does not require partnership with the organization.
- (EOP03) Do they partner with Non-Governmental Organizations (NGOs) to promote and disseminate environmental information?
    - This indicator shows that not only is the corporation interacting with the organization, but it is promoting and disseminating the information that they are given from the NGO. This can include putting this information in their CSR reports or linking to further environmental information. Will mention their partnership with the NGO in the report.
- (EOP05) Have they been recognized by an international or regional body?
    - An international or regional organization has recognized the efforts of the corporation to be sustainable or to reduce their pollution. This must be an international or regional award and not within a country, i.e., SEAL Award, World's Most Ethical Companies, CIEEM Awards.
- (EOP07) Do they promote environmental stewardship in suppliers?
    - Not only monitors upstream sustainability, but actively encourages suppliers to use sustainable practices.
- (EOP10) Do they promote environmental stewardship in industrial peers?

- (EOP11) Do they chair/co-chair an industrial group on the environment?
    - Or any other leadership role in an industrial or international level group/committee/organization.
- (EOP09) Did the company found an environmental organization?
    - This could be at the national, regional, or international level.

Reporting Policies (REP)

Reporting is a variable measuring part of the EMS system and gives feedback for how transparent the company is: the more transparent the greener. This is measured through the disclosure of the information, companies who want to appear green offer (historical) data on their environmental emissions and pollution (Jose and Lee 2007; Clarkson et al. 2008; Takahashi and Meisner 2012). The greener companies may verify their reporting practices and numbers, compare their practices to their environmental goals, and are as transparent as possible about their environmental behavior. This variable uses different reporting indicators to indicate the greenness of the CSR report:

- (REP01) Does the company have environmental data in the CSR?
    - Presents data on environmental practices from the current year and may include energy consumption, water use, CO2 emissions, pollutant or chemical releases etc. Data on at least two of these factors must be present.
- (REP02) Do they present any of the environmental data relative to industrial peers or industrial average?
    - This is to comparatively show their environmental impact compared to their larger industry.

- (REP03) Is the data given as a historical trend?
    - Data presented must be from at least the last 5 years.
- (REP04) Is the data reported relative to corporate targets?
    - Could show their data in comparison the targets from the previous year. Could be shown has a percent of goal achieved. Only possible if a tangible goal had been stated.
- (REP05) Is the data presented in absolute and normalized forms?
    - Data is not just given in absolute terms, the raw number or net impact, but also in normalized form such as the relative impact given changes in production. If pollution/emissions went down but was caused by overall production decreases this is not a change in policy/practice.
- (REP06) Is the data presented at disaggregate levels?
    - Not only is data at the entire company level but is also presented at disaggregate levels including factor level, regional/geographic segment level, etc.
- (REP07) Is the data certified by an external third party?
    - Only possible if environmental data is given in numeric and/or financial terms. Must specifically have the environmental data checked.
- (REP08) Does the company use global initiatives/standards as a baseline to report environmental impacts (GRI, ISO, etc.)?

Community and Social Policies (CSP)

Community and social policies show a company's external commitments to the environment outside of their own corporation. The more green a company is the more

they meet the needs of all their stakeholder groups now and into the future(Hockerts 1999, 32). These companies show more accountability and transparency by showing how they are institutionalizing stakeholder communication and programs that meet the needs and demands of stakeholders (Schaltegger and Burritt 2000; Bolívar Rodríguez 2009). These MNCs will be taking up community initiatives, advertisement, and environmental clean-up programs that would be extoled in their sustainability reports and would be reporting the success of these programs (Jose and Lee 2007). Using Fishkin and Luskini's (2005) outline of deliberation as a baseline, this indicator has measurements for stakeholder policies and practices that are informative and comprehensive:

- (CSP02) Does the company conduct public forum to assess company impacts?
    - This is any open public forum to provide community response to corporate activities. An example of this is the "Open to the Public Day" by Petro China, in which people can assess the impacts of Petro China activities.
- (CSP14) Does the company set up public forums to assess future projects in an area?
    - The company sets up feedback opportunities for future projects that are going into an area.
- (CSP04) Does the company fulfil their statutory requirement to report to their stakeholders?
    - Company must provide information to their stakeholders through their disclosure statements. This is fulfilled when a company is meeting its statutory requirements at the international or domestic level.

- (CSP05) Does the company put out environmental reports or updates more than once a year?
    - Greener companies may put out reports multiple times a year, going beyond regulatory standards.
- (CSP03) Is there a bi-directional communication mechanism for shareholders?
    - The company must communicate with shareholders and allow them to respond back. This could be email, telephone, etc. Any bi-directional communication device.
- (CSP06) Is there a "mailbox" to receive **public feedback**?
    - This is an email, phone number or physical address where all stakeholders may address problems with the company. This "mailbox" can be used by anyone to leave feedback related to the environment for companies.
- (CSP07) Does the company show evidence that they react to stakeholder wants/needs?
    - The company reports evidence to show that they are reacting to stakeholder wants or needs. This could be direct responses to public feedback or communication with different stakeholder groups.
- (CSP08) Does the company allow or plans to allow stakeholder groups to be active in the environmental disclosure process?
    - The company has a forum, group, or feedback mechanism for stakeholder groups to provide direct response to the environmental sections of the CSR report.

- (CSP01) Does the company have an environmental stewardship campaign for downstream sustainability?
    - This type of campaign seeks to inform consumers of how to use the product sustainably.
- (CSP12) Does the company have an environmental education advertisement campaign?
    - The company engages in advertisement to educate the community on sustainability or environmental issues.
- (CSP09) Does the company have goals or initiatives at the community level?
    - This could be any environmental activity at the community level that the company plans to partake in, i.e. will plant a certain number of trees, will have so many environmental forums, etc.
- (CSP13) Does the company report on the achievements of these goals or initiatives?
    - The company reports on their ability to meet these goals, across multiple sites.
- (CSP10) Has the company set up environmental programs at the community level?
    - This must be an actual program that the company has set up (not just a donor), this could be a program to plant trees, clean up trash, etc.
- (CSP11) Has community program across at least two different operating sites?
    - These community programs are not only in their own country.

Regulatory Policies (REG)

Regulatory Environment Policies (REG) is an indicator of compliance with environmental regulation and participation in the regulatory process. Greener companies report their political actions, and the times that they lobby or promote environmentally friendly policies to governments (Jose and Lee 2007). The companies have to report any fines, so it is easy to asses if they have complied. This variable uses different regulatory engagement indicators to indicate the greenness of the CSR report:

- (REG06) Does the company break any laws?
    - The company is within legal requirements and has not faced any fines from pollution or emissions violations.
- (REG01) Does the company's policy exceed regulatory standards?
    - The company goes beyond regulatory requirements at the national/international level.
- (REG08) Does the company change policy to continually exceed regulatory standards?
    - The company actually strives to improve environmental practices and policies above the regulatory requirements.
- (REG02) Is corporate reporting in compliance with external regulations?
    - The company follows any national or international guidelines in its reporting processes (i.e., ISO or domestic regulatory)
- (REG03) Does the company participation in any strategic relationships with government departments?

    - The company may report that it works with domestic regulatory agencies to provide data or work with them on environmental issues. This can be any level of interaction with the government.
- (REG04) Does the company attend any political forums/seminars on environmental issues?
    - The company participates in government run forums or seminars at any level of government.
- (REG05) Does the company offer environmental expertise to the government?
    - The company specifically works with the government on environmental issues and shares their expertise. This is a higher level of interaction and involves sitting on or working directly with environmental committees.
- (REG07) Does the company promote increased environmental requirements?
    - The company works with the government to create more comprehensive regulations.

TITLE	CODE	SOURCE
External Organization Policy	**EOP**	
Invests in outside companies/organizations to promote environmental technology.	EOP01	Clarkson et al. (2008); Hahn and Kühnen (2013)
Share's company environmental experience with international organizations/businesses	EOP02	Hahn and Kühnen (2013)
Partners with Non-Governmental Organizations (NGOs) to promote and disseminate environmental information	EOP03	Hahn and Kühnen (2013)
Is a member of an international environmental organization	EOP04	Hahn and Kühnen (2013)
Recognized for sustainability efforts by international organization	EOP05	Hahn and Kühnen (2013)
Promotes and recognizes research from international environmental stewardship bodies.	EOP06	Hahn and Kühnen (2013)
Promotes environmental stewardship in suppliers (upstream sustainability)	EOP07	Jose and Lee (2007); Wolf (2014)
Participates in an industry related environmental organization;	EOP08	Clarkson et al. (2008); Hahn and Kühnen (2013)
Founded an industry environmental organization;	EOP09	Clarkson et al. (2008); Hahn and Kühnen (2013)
Promotes solutions to environmental issues in industry peers;	EOP10	Hahn and Kühnen (2013)
Chairs/co-chairs an industrial group on the environment	EOP11	Hahn and Kühnen (2013)
Environmental Planning and Policy	**EPP**	
The company expresses clear tangible goals to be achieved	EPP01	Jose and Lee (2007); Clarkson et al. (2008)
There is a deadline for goals to be achieved;	EPP02	Jose and Lee (2007); Clarkson et al. (2008)
Policy prioritization puts an emphasis on sustainability over profitability;	EPP03	Jose and Lee (2007); Clarkson et al. (2008)
Company policy includes assessment of product lifecycle goals	EPP04	Clarkson et al. (2008); Hahn and Kühnen (2013)
Internal audits of environmental performance throughout the company; Performs verification audits on all global facilities	EPP05	Clarkson et al. (2008); Hahn and Kühnen (2013)
An environmental committee or department	EPP06	Jose and Lee (2007); Clarkson et al. (2008)
Entities abroad are subject to the same environmental policy as the headquarters	EPP07	Clarkson et al. (2008); Hahn and Kühnen (2013)
Executive level of Environmental Manager	EPP08	Jose and Lee (2007); Hahn and Kühnen (2013)
Invests in the development of environmentally friendly technologies for their own use;	EPP09	Clarkson et al. (2008)
Employee environmental training programs	EPP10	Clarkson et al. (2008)
Employs Environmental Management Systems (EMS)	EPP11	Jose and Lee (2007); Clarkson et al. (2008)
Policy includes direct input from stakeholder groups.	EPP12	Clarkson et al. (2008); Hahn and Kühnen (2013)
Regulatory Policy	**REG**	
Policy is based on exceeding regulatory standards, not just meeting minimum requirements;	REG01	Scherer and Palazzo (2011); Clarkson et al. (2008)
Corporate reports are in compliance with external regulations (national, ISO, GRI)	REG02	Scherer and Palazzo (2011); Hahn and Kühnen (2013)
Participates in strategic cooperation with government departments	REG03	Scherer and Palazzo (2011); Hahn and Kühnen (2013)

Attends political forums/seminars	REG04	Hahn and Kühnen (2013)
Offers company expertise to governments	REG05	Clarkson et al. (2008); Hahn and Kühnen (2013)
Is in accordance with legal requirements	REG06	Scherer and Palazzo (2011); Hahn and Kühnen (2013)
Promotes increased environmental requirements	REG07	Scherer and Palazzo (2011); Hahn and Kühnen (2013)
Improves goals to EXCEED political requirements	REG08	Scherer and Palazzo (2011); Hahn and Kühnen (2013)
Reporting	**REP**	
Data on environmental practices is presented	REP01	Clarkson et al. (2008); Hahn and Kühnen (2013)
Data relative to industrial peers or industrial average is presented	REP02	Clarkson et al. (2008); Hahn and Kühnen (2013)
Data is given as a historical trend (shows comparisons with at least 5 years of past data)	REP03	Clarkson et al. (2008); Hahn and Kühnen (2013)
Data is reported relative to corporate targets	REP04	Clarkson et al. (2008); Hahn and Kühnen (2013)
Data is presented in absolute and normalized forms	REP05	Clarkson et al. (2008); Hahn and Kühnen (2013)
Data is presented at disaggregate levels (i.e. factory, business unit, geographic segment)	REP06	Clarkson et al. (2008); Hahn and Kühnen (2013)
Company environmental reports are certified by an external third party	REP07	Clarkson et al. (2008); Hahn and Kühnen (2013)
Uses global initiatives to report on environmental issues (GRI, ISO, etc.)	REP08	Clarkson et al. (2008); Hahn and Kühnen (2013)
Community and Social Policy	CSP	
Promotes consumer environmental stewardship.	CSP01	Hahn and Kühnen (2013)
Corporation conducts public assessments of environmental impacts	CSP02	Hahn and Kühnen (2013)
Bidirectional communication with stakeholders	CSP03	Herzig and Schalteggar (2006); Hahn and Kühnen (2013)
Fulfills statutory information disclosure to shareholders (legal requirements from state or international bodies)	CSP04	Clarkson et al. (2008); Herzig and Schalteggar (2006)
Issues reports and announces results on (at least) an annual basis	CSP05	Wolf (2014); Herzig and Schalteggar (2006)
Has a dedicated to “mailbox” to receive public opinion	CSP06	Herzig and Schalteggar (2006)
Reacts to stakeholder wants/needs (shows evidence that some change was made due to stakeholder feedback)	CSP07	Wolf (2014); Herzig and Schalteggar (2006)
Stakeholders have an active role in the environmental disclosure practice (forum, stakeholder group, etc.)	CSP08	Wolf (2014); Clarkson et al. (2008); Herzig and Schalteggar (2006)
Has a set of initiatives or goals at the community level	CSP09	Hahn and Kühnen (2013)
Set up community environmental programs (such as a community clean up, tree planting), company must be founder not participator/donor	CSP10	Hahn and Kühnen (2013);
Partners with local community programs (across at least two different operation sites)	CSP11	Hahn and Kühnen (2013)
Has an environmental advertisement program	CSP12	Hahn and Kühnen (2013)
Reports on outcomes/success of environmental community outreach	CSP13	Hahn and Kühnen (2013)
Sets up community engagement forums for future projects	CSP14	Hahn and Kühnen (2013)

Table ii: List of Variables for Calculating Corporate Greenness

APPENDIX B: CHAPTER 3 COUNTRY LISTS

Source Developing Countries

Afghanistan
Algeria
Angola
Argentina
Armenia
Azerbaijan
Bahamas
Bangladesh
Barbados
Belarus
Bermuda
Bolivia
Bosnia-Herzegovina
Botswana
Brazil
Bulgaria
Cayman Islands
Chile
China
Colombia
Costa Rica
Cote d'Ivoire (Ivory Coast)
Cuba
Dominican Republic
Ecuador
Egypt
El Salvador
Ethiopia
Georgia
Ghana
Guatemala
Haiti
Honduras
India
Indonesia
Iran
Iraq
Jamaica
Jordan
Kazakhstan
Kenya
Lebanon
Macau
Macedonia
Malaysia
Mauritius
Mexico
Morocco
Myanmar (Burma)
Namibia
Nigeria
Pakistan
Panama
Peru
Philippines
Russia
Rwanda
Samoa
San Marino
Serbia
Seychelles
South Africa
Sri Lanka
Sudan
Syria
Tanzania
Thailand
Tunisia
Turkey
Uganda
Ukraine
Uruguay
Venezuela
Vietnam
Yemen
Zambia
Zimbabwe

Host Developing Country List

Cuba
Haiti
Dominican Republic
Jamaica
Dominica
Grenada
St Lucia
Mexico
Belize
Guatemala
Honduras
El Salvador
Nicaragua
Costa Rica
Panama
Colombia
Venezuela
Guyana
Ecuador
Peru
Brazil
Bolivia
Paraguay
Argentina
Albania
Montenegro
Macedonia
Bosnia and Herzegovina
Bulgaria
Moldova
Russia
Ukraine
Belarus
Armenia
Georgia
Azerbaijan
Equatorial Guinea
Gambia
Burkina Faso
Liberia
Sierra Leone
Ghana
Togo
Cameroon
Nigeria
Gabon
Chad
Congo
Democratic Republic of Congo
Uganda
Kenya
Tanzania
Burundi
Rwanda
Djibouti
Ethiopia
Eritrea
Angola
Mozambique
Zambia
Zimbabwe
Malawi
South Africa
Namibia
Lesotho
Botswana
Madagascar
Mauritius
Seychelles
Morocco
Algeria
Tunisia
Libya
Senegal
Benin
Mauritania
Sudan
Iran
Turkey
Iraq
Egypt
Syria
Lebanon
Jordan
Yemen
Afghanistan
Turkmenistan
Tajikistan
Kyrgyzstan
Uzbekistan
Kazakhstan
China
Mongolia
India
Bhutan
Pakistan
Bangladesh
Myanmar
Sri Lanka
Nepal
Thailand
Cambodia
Laos
Vietnam
Malaysia
Philippines
Indonesia
Papua New Guinea
Micronesia
Niger
Cote d'Ivoire
Guinea

APPENDIX C: CHAPTER 4 ADDITIONAL TABPLES

Additional Tables

VARIABLES	(1) Water Access (logged)	(2) Air Quality Index	(3) NOx (logged)	(4) CO2 (logged)
Chinese FDI Flows (lagged 2 years)	-0.000434** (0.000165)	-0.190* (0.0975)	-0.000732 (0.00213)	0.0402*** (0.0144)
FDI (% of GDP) (lagged 2 years)	-5.08e-05 (0.000218)	-0.275 (0.176)	0.0216 (0.0133)	-0.00663 (0.0175)
GDP per Capita (logged)	0.00234 (0.00203)	-5.012* (2.779)	0.0262 (0.0275)	0.605*** (0.113)
Trade (% of GDP)	-0.00125 (0.00119)	0.573 (1.288)	-0.240** (0.101)	0.162 (0.105)
Water Access (lagged)	0.959*** (0.00933)			
Constant	0.174*** (0.0407)	105.8*** (23.39)	8.814*** (0.404)	3.116*** (0.851)
Observations	482	405	166	248
R-squared	0.997	0.302	0.123	0.566
Number of Countries	47	49	44	45

Table iii: (Robustness Check) Country and Year Fixed Effects Regression Model of the effect of Chinese FDI on environmental resources in African Countries (Source: Author, Data: China-Africa Dataset (China-Africa Research Initiative 2019) *and QoG Standard Dataset (Teorell et al. 2013)). Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

VARIABLES	(1) Water Access (logged)	(2) Air Quality Index	(3) NOx (logged)	(4) CO2 (logged)
Chinese FDI Flows	-0.000322*	-0.335***	0.00855***	0.0390***
(lagged 2 years)	(0.000162)	(0.0906)	(0.00267)	(0.0145)
FDI (% of GDP)	5.09e-05	-0.227	0.00935	-0.0233*
(lagged 2 years)	(0.000245)	(0.137)	(0.00854)	(0.0131)
Domestic Investment	-0.000110**	0.0840	-0.00188*	0.00177
(lagged 2 years)	(5.24e-05)	(0.0585)	(0.000971)	(0.00386)
GDP per Capita	0.00252	-8.166	0.0572	0.875***
(logged)	(0.00300)	(7.055)	(0.136)	(0.226)
Democracy	-0.000144	0.0877	-0.00356	-0.00335
	(0.000238)	(0.259)	(0.00959)	(0.0217)
Rapid Economic	-0.000114	-0.199	0.00616	0.0176
Growth (logged)	(0.000170)	(0.164)	(0.0183)	(0.0155)
Trade (% of GDP)	-0.000351	-0.0620	-0.231*	0.150
	(0.00128)	(1.372)	(0.123)	(0.0995)
Population Growth	2.72e-05	-2.013	0.0126	-0.148
(logged)	(0.000753)	(1.652)	(0.0447)	(0.165)
Water (logged)	0.953***			
(lagged)	(0.0102)			
Constant	0.196***	130.8**	8.580***	1.343
	(0.0438)	(51.05)	(0.813)	(1.473)
Observations	396	331	146	226
R-squared	0.997	0.355	0.185	0.591
Number of Countries	43	45	43	45

Table iv: (Robustness Check) Country and Year Fixed Effects Regression Model of the effect of Chinese FDI on environmental resources in African Countries without HDI (Source: Author, Data: China-Africa Dataset (China-Africa Research Initiative 2019) *and QoG Standard Dataset (Teorell et al. 2013)). Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

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