Corporate Environmental Strategies in Transition Economies

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Abstract: A meaningful economic literature examines businesses' environmental management efforts expended during the economic-political transition in Central and Eastern Europe and the former Soviet Union. Over a similar time frame as this transition, many firms in developed countries were integrating environmental components into their business strategies and finding this integration profitable. A growing body of research explores this topic of "corporate environmental strategy". Given the rising importance of this topic in developed economies, its seems highly important to re-assess the literature on businesses' environmental protection efforts during the transition in order to explore corporate environmental strategy in transition economies where the business benefits may be less clear, e.g., domestic consumer pressure for better corporate environmental stewardship is limited. Given this lack of clarity, exploration of corporate environmental strategies in transition economies is important. Guided by a simple conceptual framework, this study reviews and assesses the full body of the empirical literature in order to explore the drivers behind corporate environmental strategies in transition economies. The study considers a broad array of drivers: internal factors, market pressures, government, civil society, and third-party lawsuits. The empirical evidence suggests a positive role for foreign ownership and foreign customer pressure and a stronger role for government factors: capacity to monitor, greater enforcement, permit issuance, and higher emission charge rates. Lastly, this study's review reveals that many key factors remain weakly explored, if not fully ignored, by empirical studies, such as investor pressure, domestic customer pressure, and corporate culture.

JEL Codes: L21, P28, Q01, Q50

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1. Introduction

Under central planning and communist rule, enterprises operating in the countries of Central and Eastern Europe (CEE) and the former Soviet Union heavily polluted the natural environment, leading to substantial environmental degradation. To some extent, public concern over this environmental degradation helped to incite citizens' efforts to topple the Communist regimes. At the start of the transition away from central planning and communism and towards market-based democratic political economies, most governments of Central and Eastern Europe and the Newly Independent States (NIS) regarded better protection of the environment as an important political issue and felt compelled to control better the pollution generated and emitted by enterprises, including air pollutant emissions, wastewater discharges, and toxic and hazardous waste. For those countries seeking to enter the European Union (EU), efforts to strengthen environmental protection, including policies designed to control enterprises' pollution, were especially important due to EU entrance requirements. As the transition proceeded, these efforts apparently led to dramatic declines in air pollutant emissions, wastewater discharges, and waste generation, along with meaningful improvements in environmental quality.

Given the legacy of the centrally planned economic structure, the economic transition promised many opportunities to exploit "win-win" investments in enterprises whereby new "clean production" would increase technical efficiency and lower the generation of pollutant by-products. Moreover, the emergence of markets, along with an increased orientation towards profit maximization and the hardening of budget constraints, during the economic transition held the promise of being able to exploit incentive-based environmental protection policies, such as

marketable permits and emission charges.[1] As important, given citizens' strong desire for an improved natural environment and greater access to information on environmental conditions and protection efforts, the political transition held the promise of an increased role for citizens and citizen groups, e.g., non-governmental organizations (NGOs). Despite the presence of these promising opportunities and the potential for synergies involving the unprecedented economic restructuring, dramatic political re-alignment, and substantial environmental policy reform, the transition failed to meet its potential and progress was definitely mixed across the CEE-NIS region.

A limited but meaningful economic literature examines the topic of environmental protection efforts during the transition period. This literature effectively places the transition into a proper context by assessing the legacies of communist rule and central planning and the evolving landscape as the transition proceeded towards a market-based, democratic political economy. Most important for the current study, some highly thoughtful studies empirically explore the environmental management efforts expended by and environmental performance generated by individual businesses that were operating in the CEE countries during the transition. Given the importance of businesses' environmental protection efforts, the number of empirical studies is surprisingly small. Thus, a review of these studies can make a contribution by exploring the lessons gleaned from the empirical literature collectively so that the whole is greater than the sum of its parts.

Over a similar time frame as the transition in Central and Eastern Europe and the former Soviet Union, many firms in developed countries were integrating environmental components into their business strategies and finding this integration profitable (Esty and Winston, 2006; Nidumolu et al., 2010). A large and growing body of research – both theoretical and empirical – explores the

[1] Emission charges had been imposed under central planning in nearly all of the transition countries. However, enterprises' orientation towards the meeting of output quotas and the strong presence of soft budget constraints, along with low charge rates, undermined policy effectiveness.

topic of "corporate environmental strategy". Given the rising importance of this topic in developed economies, its seems highly important to re-assess the literature on businesses' environmental protection efforts during the transition in order to explore corporate environmental strategy in transition economies where the business benefits may be less clear. For example, the domestic consumer pressure for businesses to serve as good environmental stewards is limited, i.e., demand for greener products is most likely weaker; thus, the benefits of stronger corporate environmental stewardship is perhaps questionable. Given this lack of clarity, an examination of corporate environmental strategies in transition economies seems quite useful.

As important, the literature on transition economies has paid special attention to the process of market-oriented reforms. Greater private ownership, a stronger orientation towards profit maximization, harder budget constraints, market competition, and openness to trade create powerful incentives for cost-reduction and innovation. The transition literature generally shows that market-oriented reforms give firms stronger incentives to minimize costs, but whether these incentives should improve environmental performance is unclear. On one hand, some efficiency improvements cut costs and improve environmental performance simultaneously. On the other hand, cost-minimization may involve a trade-off between abatement costs and pollution-related costs, such as emission charges (Earnhart and Lizal, 2006a). Given this trade-off, a broader assessment of corporate environmental strategies and their development over the transition seems warranted.

Moreover, during the transition, enterprises were jointly struggling to revise their business management efforts and environmental management efforts as the economic and environmental protection landscapes were changing simultaneously (Earnhart and Lizal, 2010). In light of the rising prominence of firms' efforts to incorporate environmental dimensions into their business strategies, the possible synergies between economic and environmental restructuring seems to demand greater

reflection.

For all these reasons, this study explores corporate environmental strategy in transition economies. Guided by a simple conceptual framework, this study reviews and assesses the full body of the empirical literature in order to explore the drivers behind corporate environmental strategies in transition economies. The study considers a broad array of drivers: internal factors, market pressures, government, civil society, and third-party lawsuits. The study defines corporate environmental strategy broadly to encompass a range of management decisions: environmental management practices (e.g., protocol for regularly scheduled self-audits); end-of-pipe treatment (e.g., installation of a sulfur dioxide "scrubber"); "clean production" investment; other management decisions relating less strongly to environmental concerns (e.g., human resource management); and efforts to "manage" the external pressure exerted by customers, investors, citizens, and government agencies.

This study remains useful even though much of the transition in Central and Eastern Europe and the former Soviet Union is complete. Insight from this study yields important lessons for other countries undergoing any transition away from reliance on the government's allocation of economic resources (Bluffstone and Sterner, 2006). As important, this study offers a special opportunity to examine more fundamental drivers of firm behavior because this major economic transition generates dramatic changes in fundamental firm-level behavioral parameters, such as production technology, customer base, regulatory pressure, and motivations for production (Garcia et al., 2009).

Moreover, this study permits an assessment of success because firms in the transition strongly invested in pollution control equipment and methods contributing to substantial environmental improvement (OECD, 1999; Garcia et al., 2009). Enterprise investment in pollution abatement and control was high; in 1995, the investment expenditures in the manufacturing sector as a share of

output was 1.2 % in Poland and 0.6 % in the Czech Republic as compared to 0.5 % in Germany (OECD, 1999). These investments apparently helped to lower pollution. Most visibly, stationary source air and water pollution was greatly reduced. Within a few years after the transformation began, emissions of the most important industrial air pollutants, such as sulfur dioxide, nitrous oxides, and particulate matter, had declined by 30 to 60 % (Bluffstone and Larson, 1997). Specifically, between 1990 and 1997, air pollutant emissions dropped strongly in Slovakia: particulate matter emissions from stationary sources dropped by 80 %, SO_2 emissions fell by over 60 %, and NO_X emissions fell by 45 % (Garcia et al, 2009). As another example, pollution fell greatly in Lithuania: industrial emissions of chrome and copper fell by 65 to 70 % between 1989 and 1994 and biological oxygen demand (BOD) discharges into surface water fell by about 90 % during the 1990s (Ministry of Environment of Lithuania, 2001). However, success was not uniform across the region. During the early transition period, only a small share of Russian enterprises adopted clean production methods or invested in pollution control equipment; consequently, the manufacturing sector's wastewater discharges and sulfur dioxide emissions fell but less than its output, causing the emissions ratio to rise (OECD, 1999).

The study mostly focuses on the early stage of the transition, regarded as the period between 1989 and 1998. Nevertheless, the study assesses the latter stage to some extent. During the early stage, most countries reformed their economies and environmental protection efforts dramatically and differences cleanly emerged between the advanced reform economies, such as Poland, and the slower-reforming economies, such as Russia. During this period, countries struggled the most mightily with the task of transforming centrally planned economies under communist rule into market economies under (more) democratic rule; between 1989 and 1998, most countries were laying the foundations for the rest of their transitions. Consistent with these points, economic

analysis of this period is more prevalent especially in the case of micro-level studies.

By design, this study does not examine corporate environmental strategies under central planning and communism especially since corporations as we generally understand them did not exist under central planning. Nevertheless, this study describes the context under central planning and communism in order to depict the transition from central planning and communism toward a market-based, democratic political economy.

2. Theoretical Framework

To guide the review of the empirical literature, this section first describes the scope of corporate environmental strategy and then presents a simple theoretical framework for understanding the forces driving corporate environmental strategy.

2.1. Scope of a Firm's Environmental Strategy

Broadly interpreted, firms' environmental strategies include a wide variety of possible actions. As the most obvious, firms may take abatement actions to lower (1) the amount of pollution that they create, i.e., pollution prevention, (2) the amount of pollution that they emit, i.e., pollution treatment, or (3) waste that they generate, i.e., waste minimization. As part of their pollution prevention efforts, firms may (1) adopt environmental management practices, which reflect mostly internal policies, procedures, and monitoring, or (2) implement entire environmental management systems, which may be certified by government entities [e.g., European Union's Eco-Management Audit Scheme (EMAS) program] or third parties [e.g., International Organization of Standards (ISO) 14001].[2] Additionally, in order to prevent pollution, firms may engage in "clean production", which improves production efficiency while reducing the amount of pollution generated as a by-product. Pollution treatment or "end-of-pipe abatement" takes many forms. As examples, a firm may treat

[2] See Prakash and Potoski (2006) for details on ISO 14001 certification.

its wastewater discharge stream by oxidizing the wastewater in order to reduce the extent of organic content, and a firm may treat its air pollution stream by "scrubbing" away sulfur dioxide using an electrostatic precipitator ("scrubber").

These abatement efforts should lead to better environmental performance, as evidenced in lower emissions, discharges, and waste. Judged against regulatory constraints, such as effluent limits, this better environmental performance leads to improved compliance. Since better performance and improved compliance represent outcomes of successful (or lucky) strategies, rather than strategies themselves, this study makes a distinction between strategic actions and strategic outcomes.

Other business management decisions relate less strongly to environmental concerns but still fall under the umbrella of corporate environmental strategies. For example, a firm's management of its human resources may enhance its environmental stewardship efforts. By hiring younger workers, who are arguably more concerned about societal efforts to protect the environment, a firm creates a general corporate culture that values environmental stewardship. This type of corporate culture should facilitates the firm's efforts to manage its environmental concerns.

Lastly, firms may engage in strategic actions that attempt to control the external pressures exerted by a variety of stakeholders, such as customers, investors, workers, local communities, and government agencies. For example, to influence customer pressure, firms may engage in public relations techniques that paint the firms' environmental records and efforts in the best possible light. (In its worst form, firms may engage in "greenwashing" by appearing to implement better environmental management for the sake of "show" without any meaningful commitment to better environmental stewardship.) Or firms may disclose their environmental goals, successes, and failures to investors within environmental reports as part of or complement to their annual reports.

This study explores the full scope of strategic actions and outcomes.

2.2. Factors Driving Corporate Environmental Strategies

Using a simple conceptual framework, this study identifies and examines five main drivers of corporate environmental strategy: the firm's own internal factors, market pressures (output, input, and financial markets), government pressure, civil society pressure, and third-party lawsuits.

2.2.1. Internal Factors

The firm's internal factors, such as corporate culture and ownership structure, may strongly influence its environmental strategy. In the long run, of course, all of these factors are choice variables, the values of which must be explained by the firm's optimizing behavior within a given setting. In the short run, however, these factors are fixed and may significantly constrain a firm's environmental strategy choices.

Leadership is important. In developed economies, corporate environmental initiatives commonly flounder without CEO support. The same may hold for firms operating in transition economies. Beyond leadership, the corporate culture of a transition firm may influence its strategic environmental decisions. For example, firms are more likely to improve their environmental management when employees feel more engaged in the firm's mission.

Enterprise orientation also may substantially influence companies' strategies. Firms seeking to maximize profits should adopt any "win-win" production practice that is both cheaper and cleaner. Yet, many firms apparently ignore for too long untapped "win-win" opportunities (Porter and van der Linde, 1995). Organizational inertia, whereby firms are slow to adapt to changing conditions, represents one of the best explanations behind firms' delay in exploiting "win-win" opportunities. Enterprise orientation strongly influences organizational inertia by shaping whether a firm even views a reduction in costs as a "win". More generally, more profit-oriented enterprises most likely

seize win-win opportunities more quickly. Failures to seize win-win opportunities are eventually reflected in production inefficiency.

Ownership structure also matters, generally captured by the distinctions between private and state ownership and between domestic and foreign private ownership. The contrast between private and state ownership is challenging to explore. State-owned enterprises (SOEs) are particularly complex. They possess unusual political access and status so they may be better able to deflect pressures for environmental improvement from regulatory agencies, environmental NGOs, and local communities. In particular, regulatory agencies may possess less leverage over state entities. On the other hand, agencies, NGOs, and local communities may demand better environmental protection from public entities. In particular, SOEs may be showcased as flagships for their home countries, leading to better environmental performance than privately owned firms. As important, SOEs generally hold objectives that diverge from simple profit maximization. Specifically, one might anticipate that state-owned companies may place great importance on their employment levels or other labor elements, e.g., wages. This divergence reduces production efficiency. In addition, SOEs may incorporate environmental quality into their objective function since their owners, i.e., the government, presumably care about the environment. Thus, relative to private firms, the objectives of SOEs may cause more or less pollution. Lastly, SOEs generally enjoy better access to low-cost capital, which facilitates investment in new treatment and "clean production' technologies.

The distinction between domestic and foreign private ownership involves several elements because foreign ownership represents a nexus of factors. For example, foreign-owned firms may face more or less regulatory pressure than domestically owned firms depending on agencies' desires to attract foreign direct investment (FDI) relative to their desires to protect domestic companies. As important, foreign owners possess better access to external financing, along with state-of-the-art

technologies and cutting edge practices that are frequently more efficient and less polluting.

When assessing the distinction between domestic versus foreign private ownership, it is quite important to distinguish between national and multi-national companies. As a matter of fact, since foreign ownership relates to multi-national companies in nearly all cases, this study treats these two elements as identical: foreign owners are multi-national companies. Foreign-owned multinational corporations (MNCs) face complex incentives. While they may be able to get away with weaker environmental performance in transition countries, they face countervailing incentives to maintain a common environmental protocol across facilities so as to achieve global economies of scale and scope.[3] Use of a common environmental protocol helps foreign-owned MNCs to maintain their reputation and to export their products to customers in developed economies. Of course, these same factors also influence national companies, i.e., private domestic investors, but most likely differently. In particular, multi-national companies are generally more concerned about their reputation given the greater scope of their market. In this case, foreign-owned MNCs are expected to implement better environmental management than their domestic rivals.

Size also influences environmental strategies. Larger firms may be able to exploit scale economies. Pollution abatement technologies often involve large fixed costs, which may be difficult to justify for small firms. Generally larger firms enjoy better access to external financing, which allows larger firms to take advantage of profitable pollution-reduction opportunities. Size also facilitates division of labor and specialization so larger firms' employees are better able to seize

[3] In other words, MNCs face the choice between two contrasting options. As the first option, MNCs follow local de facto laws, which may be less stringent than their counterparts in developed economies and more weakly monitored and enforced than in developed economies. As the second option, MNCs implement environmental management practices beyond those required to meet local environmental protection laws, instead implementing practices consistent with their home country or the corporate guidelines designed for developed economies. Implementation of the second option implies that the facilities are overcompliant with local de facto laws.

environmental opportunities.

Budget constraints prove extremely important for transition firms. While hard budget constraints prompt firms to operate efficiently – by lowering costs and raising revenues through higher quality products, soft budget constraints enable inefficient behavior since firms can always cover their losses with infusions of state funds. Given their stronger link to governments, SOEs are more likely to face soft budget constraints.

Some firms, independent of their size and ownership structure, may lack access to external financing that would allow them to capitalize on their best environmentally innovative ideas. For these firms, internally generated funds prove critical for investing in environmentally related activities. Such liquidity constraints impede the adoption of successful environmental strategies. Thus, financial performance affects environmental strategies.[4]

A firm's capital stock endowment also affects its environmental strategy. First, the capital stock's vintage constrains or enables a firm's abatement efforts. Newer equipment generally embodies the latest technological improvements, which may facilitate the adoption of more or better environmental management practices. Second, the quality of a firm's capital stock, independent of vintage, shapes the presence of "win-win" opportunities in the form of "clean production". In particular, when the capital stock's quality is exceptionally poor, these win-win opportunities represent "low hanging fruit" for improving environmental stewardship.

Most industries have trade associations that facilitate information sharing and the coordination of policy advocacy. Typically industries under strong external pressure make greater use of their trade associations to deflect these pressures. This study considers these associations as

[4] From a different perspective, better financial performance may reflect better business management, which may spill over into better environmental management, i.e., business success breeds environmental success (Earnhart and Lizal, 2010).

a collective internal factor even though they clearly do not represent an individual firm factor. In essence, these associations serve as an extension of individual firms.

2.2. Markets

Markets also should influence corporate environmental strategies. This sub-section first assesses the role of product/output markets. Market structure may influence corporate environmental strategies. Firms facing greater competition may feel a greater incentive to innovate environmentally in order to distinguish its products from its competitors' products or reduce its costs relative to its competitors' costs. On the other hand, firms enjoying monopoly power may seek to retain this power through environmental innovation.

The importance of environmentally friendly products has clearly grown substantially since 1989. However, assuming that environmentally friendly products are normal goods, they have limited demand in transition markets. Thus, transition firms that export to developed countries are likely to pay more attention to the environment than firms that sell only domestically. In particular, participation in certification programs, such as ISO 14001 and EMAS, help firms to advertise the environmental friendliness of their products. Thus, transition firms that are more reliant on or more oriented towards exports should be more inclined to participate in such certification programs.

Customer pressure may extend through the supply chain. Downstream retailers selling in developed countries may require their suppliers in transition economies to adopt environmental management practices in a visible fashion. Most notably, retailers may require their suppliers to achieve ISO 14001 certification or its equivalent. (Generally this requirement is discrete in nature: the supplying company is either certified or not and the supplying company is either eligible to be a supplier or not.) Even if not required, large retailers exercise a powerful influence on suppliers's environmental management choices once the retailers decide to incorporate environmental quality

into the retailers' corporate strategies (Vandenbergh, 2007). Even production companies can influence their supply chain; many of the production firms adopting certified environmental management systems require their suppliers to certify also (OECD, 1999). Lastly, since some suppliers lie across international borders, trade opportunities should influence corporate environmental strategies.

This sub-section next assesses the role of financial markets. Environmentally sensitive investors may drive companies to improve their environmental management efforts and environmental performance by withholding funds when such efforts are not expended and environmental success is not achieved, thus, driving up the cost of external funds. In order to appease investors in a visible fashion, sometimes labeled as "signaling" (Johnstone and Labonne, 2009), firms operating in transition economies may participate in certification programs, e.g., ISO 14001. These firms are more likely to participate in such visible programs when they are more reliant on foreign direct investment.

Financial markets can also constrain environmental improvement. Countries with underdeveloped financial markets may lack the liquidity to allow firms to invest in profitable environmental opportunities.

Input markets also play a role. In particular, the labor market may provide incentives for environmental improvement. Most employees want to feel good about the company where they work. Consequently, companies can attract and retain employees by making environmental commitments consistent with employees' environmental values.

Energy markets can also influence corporate environmental strategies. Energy taxes motivate innovation in energy-saving activities and substitution away from energy and toward labor and capital. Yet energy subsidies motivate excessive use of the subsidized forms of energy and

discourage substitution. Fossil fuel subsidies are especially problematic since they lead to greater pollution.

2.3. Government

Government environmental protection policies, or the threat of them, drive many corporate environmental strategies. Specifically, firms' desires to comply with government policies can strongly influence environmental strategies. Engendering these desires demands the creation of a modern regulatory infrastructure that begins with clear and comprehensive environmental laws. Then these laws must be sufficiently enforced. These enforcement efforts demand regulatory capacity in the form of educated public employees and adequate monitoring of pollution. As important, environmental enforcement agencies must be willing to impose sanctions in the presence of environmental violations. This willingness is reflected in the relationship between a regulatory agency and the regulated community; this relationship may be adversarial or sympathetic. As the most extreme form of sympathy, a regulatory agency may be "captured". A sympathetic relationship involves influence peddling by which political operatives attempt to influence the decisions of environmental protection agencies. Under this relationship, agencies are less wiling to impose sanctions. In contrast to this political meddling, corruption involves outright bribery, physical violence, or worse. Corruption most likely undermines firms' desires to comply with environmental protection laws, e.g., agency officials ignore violations in exchange for bribes. (Even though unlikely, corruption may be used to induce compliance, e.g., agency officials threaten violators with physical violence.) If corruption is constrained, then the credible threat of meaningful sanctions should effectively deter violations of environmental protection laws.

Corporate environmental strategies are also shaped by the choice of environmental policy. For example, emission charges provide stronger incentives for innovation than do effluent limits

since limits offer no regulatory reward for going beyond compliance; this point notwithstanding, limits may facilitate incentives for overcompliance by establishing a reference point for other sources of external pressure, such as investors and customers. A tradable emissions permit system similarly provides stronger incentives for innovation than do effluent limits.

Over time countries' environmental protection efforts have been shifting away from traditional mandatory policies, such as effluent limits and toward voluntary policies and environmental information disclosure programs. In general, voluntary policies divide into two categories: negotiated agreements and voluntary programs. In a negotiated agreement, the regulatory agency and a firm (or an industry group) jointly identify environmental goals and the methods of achieving these goals. Under a voluntary program, participating firms agree to expend efforts to achieve program goals established by the regulatory agency; in exchange, the participating firms may receive technical assistance, reduced scrutiny in the form of inspections and enforcement, or favorable government publicity.

In contrast to most environmental policies, environmental disclosure programs, such as firm-level environmental scorecards (e.g., China's Greenwatch), do not require a full regulatory infrastructure. Instead, agencies merely gather data on firms' environmental management efforts and/or environmental performance (including compliance with environmental laws), frequently based solely on self-reporting by firms, and then disseminate these data publically. This data collection and dissemination eliminates the need for costly inspections and enforcement as long as the disclosure facilitates non-governmental pressure through channels discussed above and below: output/product markets, input markets, and civil society (Powers et al., 2011).

Beyond these standard influences, companies may undertake strategic action in order to alter future government policy choices. First, firms may voluntarily engage in pollution abatement to

preempt stricter, thus more costly, policies (Maxwell et al., 2000). Second, a firm (or subset of firms) may voluntarily reduce its pollution in order to secure a cost advantage over its competitors by prompting adoption of a tighter regulatory standard with which the firm is better to able to comply. Third, collectively firms may voluntarily adopt an abatement technology in order to limit the regulatory agency's willingness to impose stricter future policies because abandonment of the voluntarily adopted technology would be premature, i.e., impose excessive costs.

2.2.4. Civil Society Pressure

Civil society pressure, often labeled as "private politics" or "civil regulation", is increasingly important. In particular, NGOs have been gaining influence over firms' environmental strategies. In some cases, NGOs are useful partners of firms, allowing firms to convey credibly the quality of their environmentally friendly products to "green" consumers. Yet, in most cases, NGOs work to punish environmentally irresponsible firms by reducing the firms' market shares or driving up costs. In these cases, a firm can potentially raise itts profits by engaging in better environmental management and improving its environmental performance. As important, a firm may employ a corporate environmental strategy that attempts to preempt or shape "civil regulation" in much the same way a firm uses its environmental strategy to influence government policies (Lyon, 2010). Independent of NGOs, local communities may also exert pressure on firms to expand their environmental management efforts and improve their environmental performance.

The power of civil society pressure depends upon civil liberties, such as freedom of speech, an independent press, and access to environmental information. These civil liberties potentially provide powerful mechanisms for channeling new information and preferences to corporate decision-makers (Garcia et al., 2009). In many ways, these mechanisms represent critical elements of civil society.

2.2.5. Third-Party Liability

Similar to regulatory pressure to comply with environmental protection laws, the threat of third-party lawsuits should influence corporate environmental strategies. Since lawsuits impose a form of legal sanction, they induce firms to reduce the harm caused by their activities.

3. Presence of Potentially Influential Factors in Transition Economies

The preceding section identifies the factors that potentially influence the corporate environmental strategies of firms operating in transition economies. The rest of the study assesses the apparent influence of these factors on firms' strategic decisions. As the first component in this assessment, this section depicts the presence of potentially influential factors in transition economies. Clearly, factors cannot influence strategies if they are not present. Given the very nature of transition economies [i.e., they are transitioning from centrally planned economies to market economies], it is critical (1) to depict the presence of these factors during the centrally planned period just before the beginning of the transition period, (2) to depict the change in the presence of these factors as the transitions unfolded, and (3) to compare the presence of these factors to developed market economies. This study bases its depiction and comparison on evidence as much as reasonable, while relying on previous studies' impressions and the author's own impressions to complete the depiction and comparison.

3.1. Highlighted Differences between Transition and Developed Economies

Given the better understanding of developed economies, this section first highlights the differences between transition economies and developed economies. The prevalence of state-owned companies is one of the more prominent differences. Of course, the prevalence of state-owned companies shrinks quickly over time as the transitions proceed. Other important differences pertain to the strength of external pressures faced by polluting companies; these pressures include regulatory

pressure, consumer pressure, investor pressure, and NGO or local community pressure. Regulatory pressure is probably weaker in transition economies due to the more sympathetic nature of the relationship between the regulatory agency and the regulated community stemming from the greater political power of economic ministries, which represents a legacy from the centrally planned and communist period. Consumer pressure is weaker in transition economies since the willingness-to-pay for "green goods" is smaller in transition economies than in developed economies. Investor pressure is weaker in transition economies since capital markets are less developed than in developed economies. NGO pressure and local community pressure is weaker in transition economies because less information is disclosed publicly, along with other factors associated with civic societal development. The last prominent difference relates to firms' capital stock endowments. The benefits of lowering pollution by improving production efficiency in the form of "clean production" is most likely greater in transition economies due to the historical distortion of physical capital towards more polluting industries under central planning and limited access to state-of-the-art technologies under communist rule (Earnhart and Lizal, 2007). Table 1 provides a simple assessment of these highlighted differences along with other comparisons.[5]

3.2. Detailed Depiction of Transition Economies and Comparison to Developed Economies

This second sub-section depicts in detail the presence of potentially influential factors in transition economies, using the preceding centrally planned period as a reference point, and compares the presence of each factor to its presence in developed economies.

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[5] Even though this study does not assess developing economies, transition and developing economies share common elements. Both aspire to economic growth and integration into the world economy, initially possess underdeveloped legal systems, face financial constraints, possess an abundance of win-win investment opportunities, and face rapid transformation that should facilitate systemic changes, e.g., institutional development (Panayotou, 1997). Yet strong differences distinguish the two types of economies in the realm of environmental protection, such as the government's capacity to monitor ambient conditions and pollution and the historical use of emission charges.

This study distinguishes between two categories of transition economies based on the extent of reform as defined by the European Bank for Reconstruction and Development (EBRD, 1996). The advanced reform countries include Croatia, Czech Republic, Estonia, Hungary, Latvia, Poland, Slovakia, and Slovenia. The slower-reforming countries include Albania, Bulgaria, Macedonia FYR, Romania, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kryrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.[6]

The study makes this distinction based on the conclusions of two macro-level studies. As the more important study, Hughes and Lovei (1999) demonstrate that advanced reform countries provided a clear and sustained reduction in emission intensities of key air pollutants while the slower-reforming economies did not. These authors support this distinction with anecdotal evidence.

Vikuna et al. (1999) strengthen this general conclusion – reform leads to better environmental protection – by examining both advanced reformed and slower-reforming countries (Armenia, Azerbaijan, Bulgaria, Hungary, Kyrgyzstan, Latvia, FYR Macedonia, Poland, Russia, Slovakia, Slovenia, Ukraine) and demonstrating the following points. First, Vikuna et al. (1999) demonstrate a strong relationship between environmental improvement [which is evidenced in two ways: (1) the composition of manufacturing output shifting towards less-polluting activities (cleaner manufacturing) and away from pollution-intensive activities, and (2) the reduction in energy composition per unit of value added] and the following factors: (1) price liberalization, (2) trade and foreign exchange reforms, (3) enterprise restructuring, and (4) privatization reforms. Second, Vikuna et al. (1999) demonstrate that an amplification of the environmental regulatory regime, as measured

[6] It may not be surprising that all of the Newly Independent States (NIS), which represent the former Soviet republics with the exception of the Baltic states, reformed more slowly. These countries faced additional complications: disintegration of economic and political links stemming from the break-up of the Soviet Union, greater difficulty of establishing new monetary and fiscal systems, lack of commercial traditions, lack of access to expatriate communities with capital, and greater relicance on the collapsed East European trading bloc (Hughes and Lovei, 1999; Uhlenbruck et al., 2003; Henriques and Sadorsky, 2006).

by percent of GDP devoted to environmental funds, causes a shift towards less-polluting activities. (The authors claim that extra-budgetary environmental funds may proxy well for revealed regulatory effort since the funds' main sources are pollution fines, emission charges, waste disposal fees, and energy taxes.)

These two macro-level studies represent the only empirical studies of corporate pollutant emissions in the slower-reforming economies. In particular, no micro-level empirical studies explore corporate environmental strategies in the slower-reforming countries. Accordingly, the study's confidence in the assessment of the slower-reforming countries is considerably lower than its confidence in the depiction of the advanced reform countries.

3.2.1. Internal Factors

This sub-section begins its assessment by exploring the presence of internal factors. *Corporate Leadership:* Under central planning, the manager of an enterprise had meaningful but limited control over an enterprise's operations including its environmental management. During the transition, the role of leadership in guiding corporate environmental strategies grew as evidenced in three studies. Henriques and Sadorsky (2006) surveyed Hungarian businesses in 2003 and assessed the influence of management on environmental management practice decisions; 41 % of businesses perceive the influence of management to be very important. Based on a survey of Slovenian companies in 1998, Rojšek (2001) demonstrates that 57 % of companies perceive top management as a source of pressure for better environmental performance. Ten years later in 2008, Čater et al. (2009) use a survey of Slovenian companies to demonstrate that the average company's environmental efforts receive moderately strong support from their top management and the average company's top management is strongly committed to environmental preservation (on a scale of 1 to 5, where 1 identifies the statement as "not at all true" and 5 identifies the statement as "completely

true", the average reported values are 3.8 and 3.4, respectively). Despite these demonstrations, the study concludes that the presence of this factor remained stronger in developed economies generally.

Corporate Culture regarding Environmental Protection: Under central planning, the culture regarding environmental protection was absent if not hostile. During the transition, a more protective corporate culture developed. According to Knez-Riedl (2004), 65 % of surveyed Slovenian enterprises in 2003 identify "care for a healthy environment and the health of people" as a reason for engaging in "environmentally responsible" activities. Yet, based on a survey of Slovenian companies in 1998, Rojšek (2001) reveals that only 18 % of companies perceive employees as a source of pressure for better environmental performance. Three years later in 2001, Čančer (2002) use a survey of Slovenian enterprises to demonstrate two similar points: only 19 % of enterprises identify "environmental awareness of employees" as a "cause for environmental activities at their enterprises" and the "expectations of employees" represent only a "weak" cause behind the "increasing influence of the environment on business" decisions.[7] Thus, corporate culture remained less prevalent than in developed economies.

Enterprise Orientation: A wealth of evidence indicates that enterprises in centrally planned economies often paid little attention to economic efficiency; for example, many enterprises neglected plant maintenance and used outdated production methods (OECD, 1999). This lack of focus on efficiency stems partially from the enterprises' orientation. Under central planning, businesses did not seek to maximize profits or minimize costs. Instead, they strongly worked to meet centrally dictated output targets without overshooting by too much (Earnhart, 1999, 2000b). Consistent with this strong focus on meeting output targets, enterprises hoarded labor along with other inputs. Given

[7] On a scale of 1 to 9, where 1 means "the most important" and 9 means "the least important", 48 % of enterprises reported a value of 7 or higher regarding "expectations of employees" as a "cause for the increasing influence of the environment in business".

this legacy, state-owned enterprises and perhaps formerly state-owned enterprises (especially if any meaningful remnant of state ownership remained) continued to emphasize employment during the transition. This point notwithstanding, during the transition, businesses improved their efficiency partially through privatization (OECD, 1999; EBRD, 1997) and by re-orientating towards the objective of profit maximization. This re-orientation may be reflected in the pressure to reduce energy and material use in order to reduce costs, which may motivate improved environmental management. Based on a survey of firms in four polluting sectors of six transition economies in 1998, the importance of this pressure for motivating improved environmental management averaged 2.6 on a scale of 0 to 5 (Bluffstone and Sterner, 2006).

Despite this improvement, this study concludes that a profit-maximizing orientation is less prevalent and inefficiency is more prevalent than in developed economies in general due to the stickiness of long established managerial regimes [i.e., the considerable inertia created by the former managerial regime] (Garcia et al., 2009) and the legacy of inefficient industries (Hughes and Lovei, 1999). This inertia and legacy are most prominent in the Newly Independent States (NIS) where during the 1990s governments were largely unwilling to cut the traditional ties between enterprises and state and continued to protect enterprises from competition and bankruptcy (Hughes and Lovei, 1999; Gaddy and Ickes, 1998; OECD, 1999). In these countries, privatization did not create effective corporate governance (OECD, 1999) because privatization gave enterprise "insiders", especially former managers who were appointed under communism, strong powers over enterprise management without adequate oversight from other stakeholders, such as shareholders and creditors (OECD, 1999). Put differently, due to the delivery of 'scam privatization" that transferred ownership to former employees or managers without meaningful changes in economic incentives, firms were less interested in profit maximization and enterprise restructuring and more interested in "pure survival",

rent-seeking, maintaining employment, avoiding taxes, and retaining good relationships with government officials (Hughes and Lovei, 1999; Gaddy and Ickes, 1998; EBRD, 1998). Under these conditions, enterprise managers were unlikely to "pay great attention to environmental requirements" (OECD, 1999, p. 160).

Enterprise orientation is influenced by the nature of ownership – domestic versus foreign. While strategic foreign investors were more inclined to restructure enterprises, some private investors, namely domestic banks and investment funds, did not push strongly for restructuring perhaps because these entities possessed poor corporate governance structures at the time (OECD, 1999; EBRD, 1998).

Ownership Structure: Under central planning, state ownership was strongly prevalent. For example, 97 % of economic activity in Czechoslovakia was generated by state-owned enterprises in 1989 during the last year of the Communist regime (Earnhart, 2000a). During the transition, many state-owned enterprises were fully or at least partially privatized early in the process. Mass privatization schemes were implemented, if not mostly completed, by the mid-1990s in several transition economies. By 1998, most CEE countries and several NIS countries had privatized important shares of their large industrial enterprises (OECD, 1999) and the private sector accounted for at least 50 % of GDP in all CEE countries and about half of the NIS countries (EBRD, 1998). Still, the presence of state ownership remained higher in transition economies than in developed market economies.

The distinction between domestic and foreign ownership is also important. Under central planning, foreign ownership was minimal. During the transition, many state-owned enterprises were purchased fully or partially by foreign entities as part of privatization efforts, as conditions for foreign investments improved (Hughes and Lovei, 1999). Foreign companies also started their own

businesses. Multinational corporations most likely represent a large proportion of this foreign ownership. The role of foreign ownership seemed sizable. Based on a survey of 1,000 potential foreign corporate investors in CEE countries, more than 75 % stated that they utilized headquarter country environmental management standards even though these standards were stricter than those in their countries of investment (Klavens and Zamparutti, 1995; World Bank, 1994; Garcia et al., 2009). For example, Tetra Pak, the Swedish packaging company, built facilities in several CEE and NIS countries and required all of these facilities to adopt environmental management systems similar to its world-wide operations (OECD, 1999).

Relative to the minimal presence of foreign ownership, under central planning, the presence of foreign ownership during the transition seemed prominent. Based on this impression, the importance may be described as greater than in similarly situated developed economies where ownership control has been addressed for many decades.

Similar to foreign ownership, FDI was not important under central planning. During the transition, international commercial contacts increased in the form of FDI. Central and Eastern European countries experienced significant FDI during the transition, with an estimated $ 70 billion flowing into the region in the 1990s (Bluffstone and Sterner, 2006). In particular, Hungary received over $ 16 billion in FDI during the 1990s, with annual investment averaging between 4 % and 5 % of GDP (Bluffstone and Sterner, 2006). Flows of FDI to CEE and NIS increased steadily between 1990 and 1997 reaching $ 17 billion in 1997, falling to about $ 15 billion in 1998 during the financial crisis in NIS economies (EBRD, 1998). Within this total, a small number of countries had received the great majority of these flows: Czech Republic, Hungary, Poland, Russia, and Kazakhstan. In per capita terms, FDI flows to Hungary and Poland had exceeded those to many developing countries, while the flow to Russia was quite low (OECD, 1999).

Scale of Operation: Under centrally planning, many state-owned enterprises were large if not huge. During the transition, these large enterprises – whether still under state ownership or privatized – were broken up in order to improve domestic competition. Thus, the average enterprise is certainly smaller in the transition period than under centrally planning. Nevertheless, the residual enterprises may be smaller or larger than enterprises in developed economies. Moreover, *de novo* private enterprises may be smaller or larger than their counterparts in developed economies.

Type of Budget Constraint: Under central planning, most enterprises faced soft budgets (Kornai, 1980; Bluffstone and Larson, 1997). During the transition, budgets hardened as direct subsidies and finance subsidies were eliminated, especially in the advanced reform economies (Hughes and Lovei, 1999), and bankruptcy laws were developed quickly in most CEE countries but applied more slowly in some CEE countries (OECD, 1999). In the slower-reforming economies, especially the NIS countries, during the 1990s, budgets remained reasonably soft as governments shielded enterprises from market forces by providing indirect subsidies in the form of loans from government banks and tolerating large tax and payment arrears (Hughes and Lovei, 1999; Gaddy and Ickes, 1998; OECD, 1999). NIS countries were slow to establish and implement bankruptcy provisions. As a consequence, by 1998, unprofitable enterprises outnumbered profitable ones in Russia, and, as late as 1999, no large industrial enterprise in any NIS country had entered bankruptcy (OECD, 1999). More specific to environmental strategies, governments delivered waivers for pollution charges in order to support the charged enterprises. Overall, this study concludes that budget constraints were reasonably soft in the slower-reforming economies but moderately hard in the advanced reform economies yet still softer than in developed economies.

Access to External Financing: Under central planning, access to external financing was not important. However, during the transition, as businesses turned to external sources beyond the state

bank for financing, access to external financing proved highly important. Many transition firms lacked any meaningful access to external financing due to less developed financial markets; for these enterprises, a liquidity constraint was strongly binding. For example, capital markets were thin, if not extremely thin, in Lithuania during the transition; consequently, virtually all environmental investment capital was internally generated (Bluffstone, 1999). As another example, the amount of environmental investment was strongly linked to profitability in the Czech Republic between 1993 and 1998 (Earnhart and Lizal, 2006a). As a third example, Hungarian firms that attempted to raise substantial funds for new equipment found it difficult to obtain bank support (Whiteley and Czaban, 1998; Henriques and Sadorsky, 2006). Nevertheless, as financial markets developed, access grew but remained less than in developed economies.[8]

Capital Endowment: Under central planning, the endowment of production capital was sizable but the quality of this capital was low; in particular, the capital equipment was obsolete and polluting (Hughes and Lovei, 1999; Bluffstone and Larson, 1997). As one reason for the failure to update capital equipment, restrictions on foreign investment limited access to newer, and most likely cleaner, production technologies (Bluffstone and Larson, 1997). This endowment of obsolete equipment left over from the centrally planned period implied that the transition offered many opportunities for win-win investments, whereby "clean investment" improves the financial bottomline, by lowering costs and/or raising revenues through higher quality goods, and lowers pollutant emissions (Bluffstone and Larson, 1997). Put differently, outdated technologies and

[8] As discussed in Section 2, financial performance may directly influence environmental performance. Under central planning, financial performance was not meaningful for nearly all enterprises given the strong focus on meeting output targets. However, during the transition, enterprises were jointly struggling to revise their financial management strategies and environmental management strategies as the economic and environmental protection landscape was changing simultaneously (Earnhart and Lizal, 2010). Thus, firms may have been able to exploit opportunities for successful financial management to breed successful environmental management. These opportunities remained more prevalent than in mature market economies.

processes were evident and opportunities for "win-win" investments were quite common (Bluffstone and Larson, 1997, p. 2). Nevertheless, most firms in the transition economies did not exploit these win-win opportunities (OECD, 1999). Most likely, win-win opportunities remained more prevalent in the transition economies than in developed market economies.

Industrial and Trade Associations: Under central planning, industrial and trade associations were few in number and mostly powerless. During the transition, the importance of these associations grew. Most importantly, several international business associations promoted clean production and environmental management system adoption in CEE and NIS countries (OECD, 1999).[9] Despite this involvement, the presence of industrial associations remained weaker than in developed economies.

3.2.2. Markets

This section next assesses the presence of market-based factors. As the first category of market pressure, this section assesses product / output markets.

Market Structure: Under central planning, domestic competition was severely limited. In the transition, domestic competition grew quickly as state-owned or formerly state-owned large-scale conglomerates were broken up (EBRD, 1995) and *de novo* private enterprises were born. Nevertheless, domestic competition most likely remained weaker than in developed economies. To an even greater extent, under central planning, import competition was severely limited. During the transition, import competition grew dramatically and quickly (OECD, 1999) and may have become comparable to developed economies.

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[9] For example, the International Network for Environmental Management opened chapters in eight CEE countries in the 1990s, disseminating information and establishing twinning arrangements between CEE and West European businesses (OECD, 1999). As another example, the World Business Council for Sustainable Development established several national associations in CEE countries (OECD, 1999). Other examples include the Czech Environmental Management Centre, the Slovak Association of Industrial Ecology, and the Chemical Industry Association of Hungary (OECD, 1999).

Customer Pressure: Regarding customer pressure, the assessment distinguishes between domestic consumers and foreign consumers and between customers purchasing intermediate goods and customers purchasing final goods (i.e., location within the supply chain). Under central planning, domestic consumers exerted nearly zero pressure, while foreign consumers exerted limited pressure regardless of their location in the supply chain. During the transition, the potential for pressure exerted by domestic consumers grew as domestic consumers learned more about firms' products and were better able to appreciate "green goods". Nevertheless, the study concludes that domestic customer pressure in the transition economies remained smaller than in developed economies because the demand for green products appears lower.

More important, the pressure exerted by foreign consumers grew dramatically during the transition. In particular, foreign consumers in Western Europe exerted substantial pressure on export-oriented firms. For example, EU importers put great weight on ISO 14001 certification when choosing trade partners (Bellesi et al., 2005; Garcia et al., 2009). The increase in foreign consumer pressure stems from the dramatic rise in trade as the transition economies removed the involvement by ministries and state-owned former trading monopolies in trade (EBRD, 1995). Growth in total export earnings averaged almost 9 % during the 1993 to 1998 period in the CEE transition economies; by 1999, the share of exports to the West had increased by 67 % (Bluffstone and Sterner, 2006). Consistent with this growth, economies of Central and Eastern Europe were increasingly looking outward and westward for markets (World Bank, 2000). In general, many CEE and NIS countries quickly re-oriented their exports towards Western Europe and away from the countries of the former COMECON (OECD, 1999). Nevertheless, this section concludes that foreign customer pressure in the transition economies remained lower than in developed economies.

As the second type of market pressure, this section assesses the role of financial markets.

Under central planning, financial markets did not meaningfully exist so investors were irrelevant. During the transition, financial markets developed but slowly, though substantially faster in those countries entering the EU. Consequently, the markets remained thin for most of the transition period and remained less developed than in developed economies. Nevertheless, the importance of investor pressure exploded as savvy foreign investors entered the financial market. Foreign investor pressure in the advanced reform economies eventually almost rivaled foreign investor pressure in developed economies to some extent.

As the final category of market pressure, this section assesses input markets.

Labor Markets: Under central planning, the availability of skilled workers was reasonably high (Vikuna et al., 1999) and these skilled workers had the capacity to work on environmental management. During the transition, firms had the opportunity to draw upon these skilled workers (Vikuna et al., 1999; OECD, 1999). While workers' skills most likely grew over the transition, they remained lower than in developed economies. Moreover, under central planning, the willingness of employees to work for environmentally undesirable firm at higher wages or work for environmentally desirable firm at lower wages was irrelevant as central planners strongly controlled the allocation of labor resources. While workers' discretion to exploit any willingness most likely grew during the transition, given the legacy of central planning, this study suspects that the willingness remained weaker than in developed economies.

Energy Market: Under central planning, energy prices were substantially subsidized, which led to excessive use of fossil fuels, causing excessive emissions of related by-products, such as sulfur dioxide (Bluffstone and Larson, 1997). During the transition, energy subsidies were curtailed especially in the advanced reform economies (Hughes and Lovei, 1999; Vikuna et al., 1999). Eventually, these subsidies in the advanced reform economies became generally comparable to

developed economies but the subsidies remained higher in the slower-reforming economies.

3.2.3. Government

This section next assesses the presence of government-based factors.

3.2.3.1. Regulatory infrastructure

This assessment begins with an examination of regulatory infrastructure.

Institutional Development: Under central planning, government efforts to protect the environment were woven into the existing ministerial fabric or lacked real power. During the first half of the 1990s, ministries of environment were established where they did not previously exist (Bluffstone and Sterner, 2006) or Western-style environmental protection agencies were created as replacements (Garcia et al., 2009); in particular, environmental inspectorates were strengthened in order to implement better enforcement (Bluffstone and Sterner, 2006). Still, while many CEE countries had strengthened their environmental policy instruments, along with their enforcement mechanisms, by 1999, progress was slow in most NIS countries (OECD, 1999). While the developments in CEE countries seem to indicate a stronger interest in environmental protection, some argue that even the CEE transition governments' top priority was not the environment but the economy (Lynch, 2000). For example, Kosztolanyi (1999) and Henriques and Sadorsky (2006) claim that the Hungarian government held no genuine interest in the environment but chose to improve environmental protection only in order to join the EU. These experts implicitly conclude that success in environmental protection was driven by EU accession despite the lack of public support and government interest in the environment. Since the governments' intention need not factor into the analysis, this study remains agnostic on this point.

Capacity to Monitor Polluters, Pollution, and Ambient Conditions: Under central planning, monitoring capacity was reasonable in most countries. At the start of the transition, most countries

were collecting a large volume of environmental data; however, data quality was generally uncertain, data were incomplete and generally neither synthesized nor analyzed, and information was rarely disseminated publicly (OECD, 1999). During the transition, monitoring capacity grew. Many transition countries greatly improved the quality of their environmental monitoring data in most cases by creating national institutions and networks (OECD, 1999). Additional ambient and emissions monitoring systems were put in place or existing systems were strengthened even though monitoring remained less than perfect (Garcia et al., 2009; Bluffstone and Sterner, 2006); in particular, monitoring data were increasingly used for enforcement purposes (Garcia et al., 2009). In the advanced reform economies, monitoring capacity became comparable to developed economies though some experts believe that the regulatory capacity of CEE transition countries was quite limited (Bluffstone and Sterner, 2006) even though their own evidence on monitoring and enforcement seems to contradict this belief. The presence was weaker in the NIS countries because the southern NIS countries in Central Asia and Caucasus started the transition with weak monitoring systems and most NIS countries were not as quick to reform their systems partially due to drastic budget cutbacks (OECD, 1999).

Usefulness of Environmental Protection Laws: Under central planning and communism, environmental protection laws were "weak" (Hughes and Lovei, 1999; OECD, 1999). Governments refined and strengthened these laws at the beginning of the transition in most countries (OECD, 1999). Many CEE countries "approximated" their environmental legislation with the EU standards in order to join the EU (Bluffstone, 1999). These approximated laws became compliant with EU standards by 2004 or 2007 for all EU entrants. Laws in the slower- reforming economies remained less useful than their counterparts in developed economies.

Relationship between Environmental Regulators and Regulated Community: Under central

planning, this relationship was definitely sympathetic especially since most enterprises were state-owned. It was difficult to establish an adversarial relationship when both entities were operated by the state. In essence, the state agency was protecting state-owned enterprises, which takes a flavor of "regulatory capture". However, environmental protection agencies shared a sympathetic relationship with state-owned regulated companies mostly due to the agencies' politically weaker positions vis-a-vis the economic ministries protecting the interests of state-owned companies (Earnhart, 1997). During the transition, the relationship became more adversarial in the advanced reform economies as environmental inspectorates were strengthened in most countries (Bluffstone and Sterner, 2006). In contrast, during the transition, the relationship in the slower-reforming economies remained meaningfully sympathetic. In general, the relationship was generally less adversarial than in developed economies especially given the continued presence of state-owned enterprises or formerly state-owned enterprises and the legacy of protecting such entities, even when no economic ministries served as political opponents in the transition period.[10]

Corruption within Environmental Protection Agencies: While most likely present under central planning and during the transition, corruption was much less important than the openly sympathetic relationship between environmental agencies and the regulated community. Regarding corruption within state institutions generally, many CEE governments by 1999 had established restraints on the levels of general corruption, along with other basic elements of state government that support market economies, such as security of property ownership and a reliable, impartial

[10] At a higher level of interaction, foreign investors could have explicitly or implicitly pressured governments to implement weaker environmental protection efforts. Yet, according to OECD (1999), this concern did not materialize in the 1990s: advanced reform countries have supported both high FDI levels and effective environmental protection (EBRD, 1998). Two prominent reasons exist: (1) many countries were seeking to enter EU, which prompted both economic and environmental policy reforms, and (2) many investors established manufacturing facilities in the CEE region to "gain access to the region's markets rather than to set up 'export platforms'" (OECD, 1999, p. 162).

judiciary (OECD, 1999). In contrast, corruption was a severe problem in many NIS countries during the early transition period of the 1990s (OECD, 1999). Notably business surveys rated the NIS countries as among the world's most corrupt countries (EBRD, 1997). This corruption discouraged domestic and foreign direct investment (OECD, 1999), which most likely undermined firms' environmental protection efforts.

Regulatory Monitoring – Inspections: Under central planning, regulatory agencies did not regularly monitor polluters but did not fully ignore them either; in general, monitoring was low. During the transition, the frequency of inspections grew substantially and quickly. By the late 1990s, the frequency of inspections in the advanced reform economies seemed comparable to the frequency in some developed economies. For example, based on a sample of 2,393 firms operating in six advanced reform economies of Central and Eastern Europe in 1998, Bluffstone and Sterner (2006) reveal that the average interval between inspections for firms that are monitored is only 5.4 months and 5.2 months, respectively, in the case of water pollution and air pollution. Nevertheless, a substantial percent of firms were not inspected during the sample period: 21 % and 26 %, respectively, in the case of water pollution and air pollution. Since the late 1990s, the extent of monitoring has only improved in the studied transition economies. Thus, this study concludes that the extent of monitoring in the advanced reform economies became comparable to the extent in some, if not most, developed economies. In contrast, monitoring in some NIS countries was handicapped during the early transition; for example, the number of environmental inspectors in Moldova fell by about 50 % between 1990 and 1995 and many inspectorate offices lacked modern monitoring equipment (OECD, 1999).

Environmental Enforcement: Under central planning, regulatory agencies did not strongly sanction polluters for violations of government policies, such as effluent limits, but did not ignore

violations either; in general, enforcement was low. During the transition, enforcement grew substantially and reasonably quickly thanks to the creation or strengthening of environmental agencies (Garcia et al., 2009). Early in the transition most CEE countries created or strengthened environmental inspectorates and introduced new enforcement tools along with strengthening the legal basis of existing tools (OECD, 1999). For example, early in the transition, Poland gave environmental inspectors the right to conduct unannounced inspections and the authority to shut down a factory in the face of major violations (OECD, 1999). Still, enforcement of permits was impeded in the early transition by factors such as the reliance on self-reported data and some inspectorates' lack of formal procedures to address non-compliance (OECD, 1999). In order to improve enforcement effectiveness in the face of these impediments and a growing number of polluting enterprises, especially small and medium-sized enterprises, some countries identified and targeted the worst and/or largest polluters (OECD, 1999). In general, enforcement in the advanced reform economies was substantive even in the transition period (Garcia et al., 2009) and became arguably comparable to most developed economies as CEE countries entered the EU in the mid-2000s. In contrast, enforcement in the NIS countries was extremely difficult during the transition (OECD, 1999).

3.2.3.2. Government Environmental Protection Policies

This section next assesses the policies implemented by environmental protection agencies starting with non-voluntary programs.

Facility Permits with Effluent Limits: Similar to developed economies, environmental protection agencies imposed permits with limits on industrial point sources of pollution as their primary policy tool under central planning and during the transition. However, the countries did not use permit-specified limits in isolation. Under central planning and during the transition, countries

in Central and Eastern Europe and the former Soviet Union combined facility-level permits with pollution charges levied on reported emissions (Bluffstone, 1999; Bluffstone and Larson, 1997).[11] In general, the permit systems in the advanced reform economies became comparable in scope to those in developed economies. To support this claim, the appendix describes in more detail the policy package implemented in transitional Lithuania, as depicted in Bluffstone (1999).

Emission Charges: Paradoxically, countries in Central and Eastern Europe and the former Soviet Union used emission charges under central planning (in combination with permit-specified limits) during a time period when developed economies used permit-specified limits in isolation as their primary protection policy (Bluffstone and Larson, 1997).[12] Even though these emission charge systems had the potential to generate cost-effectiveness under central planning, the charge rates were regarded as too low to induce even effective pollution control. As important, soft budget constraints severely limited the power of a monetary incentive-based mechanism. In many cases, enterprise budgets specifically included line items for the payment of emission charges (Earnhart, 2000a). During the transition, countries in Central and Eastern Europe and the former Soviet Union continued to combine facility-level permits and emission charges. These countries improved their emission charge systems during the transition (Bluffstone and Sterner, 2006) so that emission charges represented an important, if not key, part of environmental policy systems (Vincent and Farrow, 1997; Bluffstone, 1999). As part of these revisions and improvements, charge rates were raised substantially (Earnhart and Lizal, 2007). While widely used during the transition, charge

[11] See Bluffstone and Larson (1997) for a thorough assessment of the combined permits with pollution charges systems in 10 countries of Central and Eastern Europe and Russia; within this book, Vincent and Farrow (1997) provide an excellent summary of the country-specific systems' key features; see Table 2.1 on pages 34-35.

[12] The timing of introduction varies across countries. Some countries, such as Czechoslovakia, introduced emission charge systems as early as the 1960s and 1970s; in contrast, Russia did not begin introducing its system until 1989 (Bluffstone and Larson, 1997).

systems were not comprehensive; for example, during the transition in Lithuania, charges applied to only 151 of the 800 regulated pollutants (Bluffstone, 1999). Under both economic systems, emission charges were superimposed on the effluent limits within a two-tier system: a lower charge rate imposed on pollution at or below the effluent limit and a higher charge rate (or rates) imposed on pollution above the effluent limit (Bluffstone, 1999; Vincent and Farrow, 1997). In a few cases, the lower charge rate was set at zero (e.g., Hungary, Bulgaria). In half of the cases, a single higher rate existed; in the other half, multiple higher rates existed.[13] In general, the use of emission charges was comparable to, if not greater than, their use in developed economies. However, the charge rates in some transition economies appeared lower than in some developed economies (Bluffstone, 1999).

Other Incentive-based Policies: To the author's best knowledge, no other incentive-based policies have been used meaningfully in the transition economies.

Government-based Voluntary Programs: The implementation of government-based voluntary programs focused strongly on technical assistance (e.g., clean production demonstration projects) and environmental funds. This technical assistance generally involved NGOs; however, national governments, outside governments, and international bodies also played meaningful roles.[14] Environmental funds were also prominent in most CEE/NIS countries. Interestingly, these two efforts were not generally connected as environmental funds often favored end-of-pipe pollution control investments over clean production projects. Otherwise, the author is not aware of substantive government-based voluntary programs in the transition economies.

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[13] See Bluffstone and Larson (1997) for a thorough assessment of the combined permitted limit-pollution charge systems in 10 countries of Central and Eastern Europe and Russia; within this book, Vincent and Farrow (1997) provide an excellent summary of the country-specific systems' key features; see Table 2.1 on pages 34-35.

[14] For example, the Norwegian Society of Chartered Engineers, with support from the Norwegian government, trained local clean production experts in four CEE/NIS countries (OECD, 1999).

Information Disclosure Programs: The use of government-based information disclosure programs in the transition economies was limited during the early stage. As one of the few examples, Poland identified and distributed a list of "worst polluters" (OECD, 1999). Still, Bluffstone and Sterner (2006) report that emissions of 24 % of the surveyed firms in Bulgaria, Hungary, Lithuania, Poland, Romania, and Slovakia were reported through government-based information disclosure programs or by the firms themselves. Later in the transition, some CEE countries, such as Poland and the Czech Republic, had developed pollutant release and transfer registers. Overall, the use of government-based information disclosure programs was less than in developed economies.

3.2.4. Civil Society

This section next assesses the presence of a civil society. The assessment begins with the basic factors underlying a civil society: freedom of speech, independent press, and access to environmental information. Under central planning and communism, these factors were minimally present. In particular, the communist regimes placed limitations on civic activities and the dissemination of information (Hughes and Lovei, 1999). Collectively, these features represent arguably the most crucial difference between the former East and the West (Garcia et al., 2009). During the transition, civil liberties – freedom of speech, press, and association – increased, while the availability of information widened and public awareness about pollution and health risks rose. In particular, information on pollution became more widely available after 1989 (Garcia et al, 2009). Most CEE countries greatly expanded the quantity of environmental information provided publicly by producing annual reports, posting data on internet sites, and constructing indicators in order to present data more clearly (OECD, 1999). As part of this progress, some CEE countries passed laws to strengthen the public's right of access to environmental information. [See Earnhart (1998) for

analysis of the relevant Czech law.] While the presence of these factors grew quickly during the transition, they remained less prevalent than in developed economies.

These underlying factors helped to support environmental non-governmental organizations (NGOs). Under central planning and communism, environmental NGOs were few but not absent. During the transition, many environmental NGOs were formed after 1989 (Garcia et al., 2009). By 1997, the Hungarian-based Regional Environment Centre had identified 3,000 environmental NGOs in Central and Eastern Europe. While some NGOs were internationally based, some were home grown. Some NGOs provided technical assistance; for example, the World Environment Centre, which is based in the US, helped establish clean production centers in 9 CEE countries (OECD, 1999). However, the establishment of environmental NGOs was not uniform across the region; for example, environmental groups were not well organized in Hungary as late as 2005 (World Markets Research Centre, 2005; Henriques and Sadorsky, 2006). Even when well organized, environmental groups did not always play a major role, such as the case of environmental groups during most of the 1990s in the Czech Republic (Earnhart and Lizal, 2007). Despite the increase, environmental NGOs remained less prevalent in transition economies than in developed economies.

In addition to environmental NGOs, external pressure from civil society could have been applied by local communities. Under central planning and communism, the role of local communities for prompting businesses to improve their environmental management was minimal to non-existent. During the transition, this role grew. For example, public protests against air pollution from Bulgarian metal smelters encouraged enterprises to install better control equipment (OECD, 1999). However, the presence of active community groups was not very strong during the transition in Central and Eastern Europe (Henriques and Sadorsky, 2006) because public support for environmental protection was declining in Central and Eastern Europe as the realities of post-

Communist life set in (Lynch, 2000) and was perhaps even greater under Communist rule (Lynch, 2000; Henriques and Sadorsky, 2006). In addition, past limitations on civic activities and dissemination of information may have stunted, if not undermined, the creation of mechanisms for bringing public pressure to bear on environmental issues (Hughes and Lovei, 1999). Consequently, local community pressure remained less prominent than in developed economies despite the presence of a highly educated citizenry and meaningful urbanization, two factors that generally improve the ability of citizens to organize themselves.

3.2.5. Third-Party Liability

As the final potential influential factor, this section assesses the presence of third-party liability. Under central planning, third-party liability played no role at all. During the transition, this role did not grow to any meaningful level in any country to the authors' best knowledge.[15]

4. Empirical Evidence of Firms' Responsiveness to Factors in Transition Economies

Finally, this study explores the empirical evidence of firms' responsiveness to potentially influential factors in transition economies. Previous micro-empirical studies exclusively examine countries within the set of advanced reform economies. For the slower-reforming economies, this study must rely upon anecdotal evidence along with two macro-empirical studies: Hughes and Lovei (1999) and Vikuna et al. (1999). While the study is able to explore conceptually both compliance and "beyond compliance", the study is not able to examine efforts to go "beyond compliance" in the transition economies based on empirical studies since no such study examines compliance status; a single study, Bluffstone (1999), examines the extent of compliance, as measured by the ratio of actual emissions to permitted emissions, but does not distinguish between overcompliance and non-

[15] See Earnhart (1998) for an assessment of this role in the Czech Republic under central planning and during the early transition period.

compliance, which is admittedly difficult.

4.1. Internal Factors

This section begins by exploring firms' responsiveness to internal factors based on empirical evidence.

First, a firm's leadership may influence corporate environmental strategies. Based on one study, greater internal pressure applied by management improves the likelihood of adopting five of eight individual environmental management practices available to Hungarian businesses in 2003; management-based internal pressure does not influence the remaining three practices (Henriques and Sadorsky, 2006).

Second, to the author's knowledge, no empirical study provides evidence on the role of corporate culture regarding environmental protection efforts.

Third, enterprises' orientation may be reflected in a pressure to reduce energy and material use in order to lower costs. One study demonstrates that increases in this pressure improve the likelihood that transition firms adopt three of six environmental management practices: internal air pollution monitoring, ISO 14001 certification, and wastewater treatment (Bluffstone and Sterner, 2006). Although not specific to environmental strategies, Gaddy and Ickes (1998) demonstrate that the "survival/rent-seeking" orientation of firms operating in the "virtual economies" of the Newly Independent States negatively affected plant and equipment spending, i.e., investment, as firms felt little need to improve their productivity because they were supported by the government with soft credits. This relationship, according to Hughes and Lovei (1999), severely limits improvements in environmental performance because productivity improvements were associated with win-win outcomes. Moreover, OECD (1999) claims that firms in NIS countries overlooked opportunities for clean production activities due to the central planning legacy of increasing output extensively (i.e.,

more inputs) rather than intensively (i.e., with productivity improvements).

Fourth, this section explores the influence of ownership structure. Empirical evidence reveals that the extent of private ownership may not be influential and may even undermine corporate environmental success. Private ownership, as measured by the percent of all shares owned by private entities, does not influence the likelihood of a transition firm adopting an environmental plan and the likelihood of establishing an environmental department (Garcia et al., 2009). As a tighter definition, the ownership share of private domestic investors does not influence the likelihood of adopting any of six environmental management practices available to transition firms in 1997 (Bluffstone and Sterner, 2006). Constructed more broadly, private ownership does not influence the ratio of air pollutant emissions to permitted emissions in the case of sulfur dioxide and carbon monoxide (Bluffstone, 1999). More important, greater private ownership actually increases nitrous oxide emission ratios, implying that greater state ownership lowers nitrous oxide emission ratios (Bluffstone, 1999). Only in the cases of particular matter and magnesium emissions does greater private ownership lower emission ratios (Bluffstone, 1999). Similar to the second conclusion, greater private ownership leads to higher air pollutant emissions from Czech companies during the early transition period of 1993 to 1998; in particular, greater state ownership lowers emissions relative to all types of private ownership especially investment funds and strategic investors (Earnhart and Lizal, 2006a; Earnhart and Lizal, 2007). Lastly, one study examines the indirect effect of state versus private ownership on air pollutant emissions via the combination of ownership's direct effect on profitability and profitability's direct effect on emissions (Earnhart and Lizal, 2007); results reveal that the direct and indirect effects of ownership are reinforcing and that the indirect effect swamps the direct effect: the indirect effect of state ownership reflects roughly 95 % of the

total effect on emissions.[16]

Within the category of private ownership, empirical evidence demonstrates that domestic and foreign ownership may or may not influence environmental strategies differently. The presence of foreign ownership does not influence the likelihood of a transition firm adopting an environmental plan and the likelihood of establishing an environmental department (Garcia et al., 2009). However, the presence of foreign ownership, as measured by the location of the head office, improves the likelihood of adopting five of eight individual environmental management practices available to Hungarian businesses in 2003; foreign ownership does not influence the remaining three practices (Henriques and Sadorsky, 2006). Constructed as an ownership share (with private domestic investors as the benchmark), one study reveals that the extent of private foreign ownership does not influence the likelihood of adopting any of six environmental management practices available to transition firms in 1997 (Bluffstone and Sterner, 2006). However, using the same dataset, Andonova (2003) demonstrates that foreign ownership improves the likelihood of transition firms implementing two environmental management practices: (1) audit, waste minimization, or pollution prevention program and (2) management steps consistent with ISO 14001 standards. Nevertheless, Andonova (2003) demonstrates that foreign ownership does not influence "clean production", as measured by the percent of plant and equipment replaced with clean production technology. Lastly, increased foreign ownership does not influence air pollutant emissions differently than any or all domestic ownership forms (Earnhart and Lizal, 2006a).

FDI appears influential based on a single study. Greater FDI improves the likelihood of

[16] Two related studies examine ownership concentration (based on the share owned by the largest shareholder), which serves as a proxy for the owner's ability to control an enterprise manager; results demonstrate that greater ownership concentration leads to lower air pollutant emissions, indicating that a manager's improved ability to control costs is more important than an owner's improved ability to control costs (Earnhart and Lizal, 2006a; Earnhart and Lizal, 2007).

adopting a subset of six environmental management practices available to transition firms in 1997, with an especially strong relationship to environmental planning (Bluffstone and Sterner, 2006).

Fifth, empirical evidence reveals that scale of operation may influence corporate environmental management strategies. The average Czech firm in the early transition period enjoys economies of scale regarding control of air pollutant emissions (i.e., as production rises, the effect of production on emissions falls) and all sectors face the same form of scale economies [Earnhart and Lizal, 2006b; Lizal and Earnhart, 2011]. However, further research reveals that the relationship between production and air pollutant emissions changed as the transition proceeded and air protection laws tightened in the Czech Republic: prior to 1997, the average firm enjoys economies of scale, but in 1997, the average firm enjoys economies of scale only at lower production levels while facing diseconomies of scale at sufficiently high production levels (Lizal and Earnhart, 2011). After controlling for firm-specific effects, results show that (1) firms in some sectors face neither economies nor diseconomies of scale and (2) firms in some sectors first enjoy economies of scale but later face diseconomies of scale as production increases, while this distinction grows as the transition proceeds (Lizal and Earnhart, 2011). Moreover, larger Slovenian companies implement better developed corporate environmental strategies (Čater et al., 2009). Similarly, larger Slovenian enterprises are more likely to adopt a certified EMS; reduce material usage, packaging, and waste; and engage in environmental record-keeping, reporting, and benchmarking (Knez-Riedl, 2004).

Sixth, to the author's best knowledge, no empirical study explores the type of budget constraint – hard versus soft.

Seventh, to the author's best knowledge, no empirical study explores access to external financing directly. However, empirical evidence reveals that financial performance may be influential. Three studies demonstrate that greater profitability leads to lower air pollutant emissions

(Earnhart and Lizal, 2006a; Earnhart and Lizal, 2007; Brzobohatý and Janský, 2010). However, greater financial performance improves the likelihood of a transition firm adopting only one of eight individual environmental management practices potentially adopted by Hungarian businesses surveyed in 2003; financial performance does not influence adoption of the remaining seven practices (Henriques and Sadorsky, 2006). Moreover, greater economic performance, as measured by value added, which reflects both returns to investors and returns to labor, actually increases air pollutant emissions (Earnhart and Lizal, 2010).

Eighth, empirical evidence demonstrates that a firm's physical capital endowment may not influence corporate environmental strategies. The vintage of firms' capital equipment, as measured by the age of equipment, does not influence the likelihood of a transition firm adopting an environmental plan and the likelihood of establishing an environmental department (Garcia et al., 2009). Other evidence suggests that "win-win" investments did not influence the broad-scale reduction in firm-level air pollutant emissions in the Czech Republic (Earnhart and Lizal, 2008).

Ninth, no empirical study examines the role of industrial and trade associations. However, OECD (1999) concludes that clean production programs, which were sponsored by international business associations along with NGOs and a variety of governments, had an important effect on environmental improvement in only two transition countries during the 1990s.

4.2. Markets

This section next assesses the empirical evidence on the effectiveness of market-based factors at influencing corporate environmental strategies. First, this section assesses the role of product or output markets. No empirical study directly addresses the effect of market structure, i.e., extent of competition, on corporate environmental strategies. However, empirical evidence reveals that increased import competition may have prompted enterprises to restructure, as demonstrated through

increased labor productivity and modified product mix (EBRD, 1997), and enterprise restructuring may have been expected to improve environmental management (OECD, 1999).

This section also assesses the role of customer pressure, while distinguishing between domestic consumers and foreign consumers where possible. Empirical evidence reveals that consumer pressure in general may not influence corporate environmental strategies. As measured by businesses' self-reported perceptions, consumer pressure does not influence the likelihood of adopting any of eight individual environmental management practices available to Hungarian businesses in 2003 (Henriques and Sadorsky, 2006).

Moreover, evidence supporting the role of foreign customer pressure is mixed. Greater export orientation, as measured by the proportion of exports to total production, increases the likelihood of a transition firm adopting an environmental plan and establishing an environmental department (Garcia et al., 2009). However, only mixed evidence supports a link from export orientation to "clean production", as measured by the percent of plant and equipment replaced with clean production technology (Andonova, 2003). In addition, export orientation does not influence (1) the presence of an audit, waste minimization, or pollution prevention program or (2) the presence of management steps consistent with ISO 14001 standards (Andonova, 2003). As additional contrary evidence, greater export orientation, as measured by the scope of a facility's market (local, national, regional, and global), improves the likelihood of adopting only two of eight individual environmental management practices available to Hungarian businesses in 2003; greater export orientation actually reduces the likelihood of adopting one practice (employment of environmental criteria in the evaluation and/or compensation of employees); export orientation fails to influence the remaining five practices (Henriques and Sadorsky, 2006). As measured by firms' self-reported perceived importance for motivating improved environmental management, greater foreign market

pressure increases the likelihood of adopting three of the six practices available to transition firms in 1997, namely, the following practices: presence of an environmental departments; efforts to obtain ISO 14001 certification; and presence of audit, waste minimization, and/or pollution prevention programs (Bluffstone and Sterner, 2006). However, the same study reveals that greater export orientation, as measured by the percent of main product that was exported, improves the likelihood of firms adopting only one practice (Bluffstone and Sterner, 2006). More important, greater export orientation, as measured by the percent of total exports that went to the EU, undermines the likelihood of firms adopting one of the six environmental management practice decisions (Bluffstone and Sterner, 2006).

Second, this section explores the influence of financial markets. Based on empirical evidence, investor pressure does not appear influential. As measured by businesses' self-reported perceptions, investor pressure does not influence the likelihood of adopting any of eight individual environmental management practices available to Hungarian businesses in 2003 (Henriques and Sadorsky, 2006). No empirical study explores the link from the extent of financial market development to corporate environmental strategies.

Third, the author is not aware of any empirical studies exploring input markets, such as the labor market and energy market.

4.3. Government

This section next assesses the empirical evidence regarding the role of government.

4.3.1. Regulatory infrastructure

This sub-section begins by examining regulatory infrastructure. First, empirical evidence reveals that the government's basic capacity to monitor polluters, pollution, and ambient conditions appears influential. The requirement of a firm to self-report its pollutant emissions to the regulatory

agency improves a firm's likelihood of adopting all six environmental management practices available to transition firms in 1997 (Bluffstone and Sterner, 2006).

Second, while no study explicitly explores the usefulness of environmental protection laws, which is arguably a great challenge, one study explores firms' self-reported perceived importance of expected future regulations for motivating improved environmental management. Greater importance improves the likelihood of adopting three of six environmental management practices available to transition firms in 1997, namely, the following practices: audit, waste minimization, and pollution prevention programs; environmental planning; and internal water pollution monitoring (Bluffstone and Sterner, 2006).

Third, while no empirical study explores the relationship between environmental regulators and the regulated community and its influence on corporate environmental strategies, one study explores businesses' self-reported perception of "public authority-based external pressure". This factor fails to influence the likelihood of adopting any of eight individual environmental management practices available to Hungarian businesses in 2003 (Henriques and Sadorsky, 2006).[17]

Fourth, no empirical study explores the role of corruption within environmental protection agencies.

Fifth, limited empirical evidence reveals that inspections influence corporate environmental strategies. Greater monitoring, as measured by the average number of wastewater inspections per year and average number of air inspections per year, improves the likelihood of adopting most environmental management practices available to transition firms in 1997 (Bluffstone and Sterner, 2006). Moreover, increased monitoring frequency lowers the ratio of actual magnesium emissions

[17] The study's authors report that the environmental regulatory structure in Hungary is complicated, implying that this set of results need not generalize.

to permitted magnesium emissions (Bluffstone, 1999). However, monitoring frequency does not influence the emission ratios of the other four studied air pollutants: nitrous oxides, sulfur dioxide, particular matter, and carbon monoxide (Bluffstone, 1999). As further evidence, greater inspection frequency improves the likelihood of adopting two of eight individual environmental management practices available to Hungarian businesses in 2003; however, inspections do not influence the remaining six practices (Henriques and Sadorsky, 2006).

Sixth, enforcement appears quite influential based on empirical evidence. Greater enforcement – as measured by (1) warnings for water and air pollution, (2) orders to reduce air pollutant emissions or wastewater discharges, (3) plant closure, and (4) noncompliance fines – improves the likelihood that a transition firm (1) adopts an environmental plan and (2) establishes an environmental department (Garcia et al., 2009). In particular, more warnings, more fines, and more orders increase the likelihood of department establishment; more orders improve the likelihood of environmental plan adoption (Garcia et al., 2009). Greater enforcement, based on a composite measure of the same enforcement actions, also improves the (1) likelihood of adopting an audit, waste minimization, or pollution prevention program and (2) likelihood of adopting management steps consistent with ISO 14001 standards (Andonova, 2003). In addition to environmental management practices, greater enforcement improves the use of "clean production", as measured by the percent of plant and equipment replaced with clean production technology (Andonova, 2003).

4.3.2. Environmental Protection Policies

This section next assesses the policies implemented by environmental protection agencies starting with mandatory programs.

First, based on empirical evidence, the imposition of facility-specific permits with effluent limits appears influential to some extent. The requirement for a firm to hold a pollution permit for

some or all of its facilities improves the firm's likelihood of adopting individually half of the environmental management practices available to transition firms in 1997; for example, this requirement improves the likelihood of adopting an audit/waste minimization/pollution prevention program (Bluffstone and Sterner, 2006; Andonova, 2003). In addition, a requirement to hold a formal permit does not influence "clean production", as measured by the percent of plant and equipment replaced with clean production technology (Andonova, 2003). Limited evidence also suggests that tighter emissions limits, in combination with higher emission charge rates, reinforced with the threat of inspections, fines, and plant closures, lead to lower air pollutant emissions (Earnhart and Lizal, 2008).

Second, empirical evidence reveals that emission charges influence corporate environmental strategies. Higher charge rates lower the ratio of actual emissions to permitted emissions for five key air pollutants: nitrous oxides, sulfur dioxide, particular matter, carbon monoxide, and magnesium (Bluffstone, 1999). Other evidence suggests that higher emission charge rates, in combination with tighter emission limits, lower absolute air pollutant emissions (Earnhart and Lizal, 2008).

Third, to the author's knowledge, no study explores the use of other incentive-based policies.

Fourth, to the author's knowledge, no study explores government-based voluntary programs.

Fifth, empirical evidence reveals that information disclosure appears influential. Greater public disclosure, as measured by whether the public is informed about pollutant emissions by the firm itself or a government agency, improves a firm's likelihood of adopting nearly all of the six environmental management practices available to transition firms in 1997 (Bluffstone and Sterner, 2006). Similarly, greater public disclosure, as measured by whether or not a firm appeared in reports about industrial pollution in the media (which could be connected with a government-based

information disclosure program), improves the likelihood that a transition firm adopts an environmental plan and establishes an environmental department (Garcia et al., 2009).

4.4. Civil Society

This section next explores the empirical evidence regarding the role of civil society. First, no empirical study examines the factors underlying civil society: freedom of speech, an independent press, and access to environmental information.

Second, empirical evidence reveals that environmental NGOs did not appear influential. One empirical study of the Czech Republic concludes that environmental NGOs applied no meaningful pressure and provided no meaningful assistance for explaining the substantial reduction in firm-level air pollutant emissions (Earnhart and Lizal, 2008). One empirical study of Hungary purposively excludes this factor as an explanatory variable due to the lack of importance (Henriques and Sadorsky, 2006). However, a broader category of community pressure, that includes pressure from NGOs, finds a positive role (Andonova, 2003); see immediately below.

Third, based on empirical evidence, local community pressure may or may not prove influential. As measured by businesses' self-reported perceptions, community pressure does not influence the likelihood of adopting any of eight individual environmental management practices available to Hungarian businesses in 2003 (Henriques and Sadorsky, 2006). However, greater broad-based community pressure, which measures pressure exerted by NGOs, consumer groups, media, and other community action, improves a firm's (1) likelihood of adopting an audit, waste minimization, or pollution prevention program and (2) likelihood of adopting management steps consistent with ISO 14001 standards (Andonova, 2003). Still, this broader measure does not influence "clean production", as measured by the percent of plant and equipment replaced with clean production technology (Andonova, 2003). As the most mixed evidence, greater civic groups

pressure, as measured by the self-reported importance of this pressure for motivating improved environmental management, improves the likelihood of firms adopting only one of six environmental management practices yet undermines the likelihoods of firms adopting two practices (Bluffstone and Sterner, 2006).

4.5. Third-Party Liability

As the final potentially influential factor, this section explores the role of third-party liability. The author is aware of no study examining this factor.

5. Conclusions

This study of corporate environmental strategy casts a broad net for exploring firms' strategic actions. Corporate environmental strategic actions divide into these categories: (1) pollution prevention, including both environmental management practices and "clean production", (2) pollution treatment, and (3) management of external pressure. Successful pollution prevention and pollution treatment should lead to better environmental performance including greater compliance. A successful environmental strategy in the form of pollution prevention can lower a firm's internal production costs and position the firm to exploit emerging "green" markets, while also improving environmental performance and increasing the extent of compliance. A successful environmental strategy in the form of pollution treatment provides similar benefits but most likely does not lower production costs. A successful environmental strategy can also control external pressure. For example, a successful environmental strategy can slow the development of a political issue, encouraging citizens and politicians to focus on other, more salient concerns. Specifically, it can deter the organization of new activist groups desiring to address the issue and preempt legislation.

To date, however, the economic literature, based on the studies reviewed here, has severely constrained its scope of analysis. In particular, the empirical literature on transition economies

focuses strongly on environmental management practices and environmental performance. Only one empirical study examines clean production (Andonova, 2003) and only one study examines pollution treatment (Bluffstone and Sterner, 2006). Moreover, only one study explores compliance. Specifically, Bluffstone (1999) examines the extent of compliance with effluent limits. Regrettably, this study does not additionally examine compliance status. As important, this study does not examine "beyond compliance", which is admittedly difficult to explore. The remaining studies of environmental performance examine emissions without reference to any legal limit. Not a single study examines the management of external pressure. Thus, the topics of clean production, pollution treatment, compliance with effluent limits, and external pressure management remain ripe for research.

The conceptual framework also identifies drivers of corporate environmental strategies. The empirical literature on transition economies covers well several of these drivers, such as ownership structure, while covering other drivers only weakly and ignoring the remaining drivers. Given their weak coverage, future research should explore more the following drivers: enterprise orientation, leadership, investor pressure, emission charges, and pressure from local communities and NGOs. Given their lack of coverage, future research should explore the following drivers: corporate culture, budget constraints (hard versus soft), trade associations, domestic consumer pressure, pressure from intermediate good versus pressure from final good consumers, labor and energy markets, and third-party lawsuits. Certain drivers are unexplored but challenging to address: strength of environmental laws, regulatory capacity including corruption and the relationship between the regulator and the regulated community, and civil society's underlying factors (e.g., information access).

Lastly, the empirical literature on transition economies does not cover the full extent of the transition period or the full geographical scope of the transition region. The transition period roughly

divides between the initial stage (1989-1998) and the latter stage (1999-present). The transition region divides between advanced reform transition economies, such as Poland and Hungary, and slower-reforming transition economies, such as Russia and Albania, as defined by the European Bank of Reconstruction and Development (EBRD, 1996). Based on this study's review, only a single study – Henriques and Sadorsky (2006) – explores the latter stage of transition using substantive statistical analysis. Two additional studies explore Slovenian firms in the latter stage of transition using only sample means tests to explore a very small set of explanatory factors (Čater et al., 2009; Knez-Riedel, 2004). As important, no meaningful study explores micro-level data on firms operating in the slower-reforming transition economies, to the author's best knowledge. Thus, future research should explore firms operating in slower-reforming transition economies and explore more strongly the latter stage of the transition period.

Table 1

Presence of Influential Factors: Comparison between Developed and Transition Economies

Economic System Types: D = Developed, T = Transition

Presence Ratings: L = Low, M = Medium, H = High

Category	Factor	D	T
Internal	Leadership	H	L
	Corporate Culture		L
	Enterprise Orientation: Profit-Maximizing (vs Other)	H	M
	Ownership Structure: State (vs Private)	L	M
	Ownership Structure: Foreign (vs Domestic)	L	M
	Foreign Direct Investment	L	M
	Scale of Operation: Large (vs Small)	M	M
	Budget Constraint: Hard (vs Soft)	H	M
	Access to External Financing	H	M
	Capital Stock Endowment	H	M
	Industrial / Trade Associations	H	M
Markets: Product	Market Structure: Domestic Competition	H	M
	Market Structure: Foreign Competition	H	M
	Customer Pressure: Domestic	H	L
	Customer Pressure: Foreign	H	M
	Customer Pressure: Intermediate Good	H	M
	Customer Pressure: Final Good	H	M
Markets: Financial	Investor Pressure	H	M
	Extent of Financial Market Development	H	M
Markets: Input	Labor: Availability of Skilled Environmental Workers	H	H
	Labor: Compensating Differentials – Environmental Desirability	M	L
	Energy: Properly Priced	M	L
Civil Society	Underlying Factors: Freedom of Speech / Press, Access to Information	H	M
	Environmental NGOs	H	M
	Local Community Pressure	H	L
Government	Regulatory Infrastructure: Basic Capacity	H	M
	Regulatory Infrastructure: Laws	H	M
	Regulatory Infrastructure: Relationship – Adversarial (vs Sympathetic)	H	M
	Regulatory Infrastructure: Absence of Corruption	H	H
	Regulatory Infrastructure: Inspections	H	H
	Regulatory Infrastructure: Enforcement	M	M
	Mandatory Policies: Permits and Limits	H	H
	Mandatory Policies: Emission Charges	M	H
	Mandatory Policies: Other Incentive-Based Policies	L	L
	Voluntary Programs	M	L
	Information Disclosure	M	L
3rd Parties	Third-Party Liability	H	L

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Appendix

This appendix describes in more detail the government policy package implemented in transitional Lithuania based on Bluffstone (1999). As with most countries, during its transition, Lithuania combined facility-level permits and pollution charges levied on reported emissions monitored through periodic spot-checks. As evidence of this monitoring, air polluters were checked on average every 6.3 months in a sample of 366 enterprises randomly drawn from all point-source air and water polluters reporting emissions to the Lithuanian Ministry of Environmental Protection in 1994. As the most important section of facility-specific permits, each permit imposed an annual facility limit that specified the target emissions of each permitted pollutant in tons per year. These limits were renewed every five years but changed infrequently. The base set of facility-specific limits were designed to achieve ambient air quality goals and were consistent with "good environmental performance". However, the protection agency also used temporary limits. Any firm judged to have no hope of meeting its base limit could apply for more lenient temporary limit if it also agreed to carry out plans to achieve the base limit within some agreed period of time; thus, the agency offered flexibility during the transition towards tighter limits. In the late 1990s, approximately one-third of all air polluters faced less stringent temporary limits; given this prevalence, the use of temporary limits perhaps represents a sign of laxness. Even base limits were not uniformly applied. Instead, base limits were tailored to each facility based on these factors: (a) effect on airshed based on disperson models, (b) facility size, (c) product type, (d) vintage, (e) production technologies, and (f) qualities of existing end-of-pipe controls. This tailoring presumably reflects an attempt to improve the benefits from improved ambient air quality and minimize aggregate abatement costs.