Introduction

Introduction to Symposium 'Environmental Management in Transition'

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Without making any claim of causation, the evidence of reduced impacts on the natural environment is strong and widespread. Since the collapse of communism and central planning, air emissions and wastewater discharges have declined dramatically in most, if not all, of the transition countries in Central and Eastern Europe. This decline is well documented in the individual papers of this symposium. For example, in the Czech Republic, economy-wide air emissions of particulate matter (PM), sulphur dioxide (SO₂), nitrous oxides (NO_x), and carbon monoxide (CO) declined dramatically over the 1990s, as shown in Figure 1 (Earnhart and Lizal, 2006). Similarly, in Slovakia, air emissions of particulate matter from stationary sources, such as manufacturing facilities, declined by 80% over the 8-year period between 1990 and 1997 (Bluffstone and Sterner, 2006). Evidence of the adoption of innovative ways for achieving these reductions in pollution in Central and Eastern Europe is less apparent. As a welcome contribution, two studies in this symposium provide basic information on the prevalence of innovative environmental management practices in Central and Eastern Europe, in addition to analysing the use of these practices.

Similar to the transition economies of Central and Eastern Europe, the political economic systems of developing countries, especially those in Latin America, have historically provided only limited incentives for facilities to limit their impacts on the environment. While these countries possess strong *de jure* environmental protection laws, the political economic systems lack the regulatory capacity to monitor compliance with these laws and to enforce non-compliance in order to induce future compliance. (This same concern of

Figure 1: Air pollutant emissions in Czech Republic.

regulatory capacity also applied to the early years of transition in the economies of Central and Eastern Europe and most likely still applies to certain economies in the region.) In the absence of strong regulatory capacity, environmental protection agencies have been seeking alternative means of inducing facilities to reduce their impacts on the environment.

This symposium addresses environmental protection in both transition and developing economies. First, it examines facilities' responses to incentives in the context of a transition economy. As a strong counterpart to facilities' willingness to respond to incentives, this symposium also examines facilities' abilities to respond to incentives for limiting facilities' impact on the natural environment.

To examine facilities' willingness to respond to incentives, two studies in this symposium – Bluffstone and Sterner (2006) and Henriques and Sadorsky (2006) – attempt to identify empirically the driving factors behind facilities' adoption of certain types of environmental management practices. Examples of environmental management practices include the use of internal or external audits, which allow facilities to systematically and routinely assess their operations and generation of by-products, and the provision of environmental training to their employees. The adoption of these environmental management practices represents 'environmental behaviour'. In contrast to environmental behaviour, 'environmental performance' captures the actual impact on the natural environment: emissions of air pollutants into the atmosphere, discharges of wastewater into surface water or groundwater, and the generation of solid, hazardous, or toxic wastes. Thus, while environmental behaviour strongly influences environmental performance, in that better environmental behaviour is expected to improve environmental performance, these concepts are not identical.

To examine facilities' abilities to limit impacts on the environment, one article in this symposium – Earnhart and Lizal (2006) – attempts to identify empirically whether economies of scale or diseconomies of scale are present in the control of air pollutant emissions.

A number of previous empirical studies examine the factors affecting a facility's decision to implement environmental management practices in developed economies (eg, Henriques and Sadorsky, 1996; Anton *et al.*, 2004). Other empirical studies examine the factors affecting a facility's ability to control its pollution levels in developed economies (eg, Laplante and Rilstone, 1996; Brännlund and Löfgren, 1996). However, few previous empirical studies examine these issues in transition or developing economies (eg, Bluffstone, 1999). In this regard, the three empirical studies in this symposium clearly contribute to this growing literature.

This symposium also examines facilities' responses to alternative regulatory instruments. In particular, one article in this symposium – Blackman *et al.* (2006) – theoretically examines facilities' responses to the use of voluntary environmental agreements; these responses represent environmental behaviour. In developing countries, the purported purpose of this instrument is to induce compliance with mandatory environmental protection laws. The specific provisions of voluntary agreements (1) obligate facilities to invest in pollution control efforts needed to comply with existing regulations within a certain period of time and (2) obligate environmental authorities to grant a grace period from non-compliance sanctions, a period in which facilities are expected to implement the aforementioned investments. Voluntary agreements also obligate environmental authorities to invest in their regulatory capacity to enforce environmental protection laws. While these provisions represent legal obligations, facilities are free to enter into the agreements at their own discretion. With the purpose of improved compliance in mind, environmental protection authorities in several developing countries, especially Latin America, have implemented many voluntary environment agreements over the past two decades. As documented by Blackman, Lyon, Sisto (2006), between 1995 and 2003, over 50 voluntary environmental agreements were signed by industrial associations in Colombia, and between the 1990 and 2000, ten voluntary environmental agreements were signed by over 600 firms in Mexico.

Previous studies of environmental protection in developing countries examine the presence of weak regulatory capacity and connect this presence to the prevalence of non-compliance with environmental protection laws (World Bank, 1999). Yet, these studies provide only informal analysis. Moreover, previous empirical studies of environmental behaviour in developing countries examine standard regulatory mechanisms or utilise

only weak proxies of alternative incentive-based mechanisms (eg, Pargal and Wheeler, 1996). On both counts, the one theoretical article of this symposium formally examines environmental behaviour in response to an alternative, voluntary regulatory tool, while examining its ability to improve welfare relative to the use of a more conventional, mandatory regulatory tool.

As demonstrated, this symposium examines environmental behaviour and environmental performance in the transition economies of Central and Eastern Europe and developing economies, especially those located in Latin America. Within this general theme, each of the articles examines a particular demonstration of environmental behaviour or performance.

Bluffstone and Sterner (2006) empirically examine the adoption of environmental management practices by facilities operating in Bulgaria, Hungary, Lithuania, Poland, Romania, and Slovakia during the years of 1997 and 1998. Their study focuses on facilities in industrial sectors that are expected to face serious pollution problems, such as energy and mining. As the main driving factors behind the adoption of environmental management practices, their study keys on privatisation, export orientation, public pressure, and environmental regulation.

Henriques and Sadorsky (2006) also empirically examine the adoption of environmental management practices, in this case, by facilities operating in Hungary during the year of 2003. Henriques and Sadorsky (2006) examine the adoption of individual environmental management practices in isolation, for example, whether or not a facility provides environmental training to its facility without any reference to its possible adoption of audits. They also examine the comprehensiveness of facilities' environmental management practices by estimating the number of practices adopted.

Earnhart and Lizal (2006) empirically examine the level of air pollutants emitted by firms operating in the Czech Republic for the years 1993–1998. This particular study focuses on the effects of production on emissions in order to assess whether firms face economies and/or diseconomies of scale with respect to pollution control. As important, this study assesses whether certain production sectors face different scales of production – economy or diseconomy – than other sectors.

Blackman *et al.* (2006) theoretically examine the use of voluntary environmental agreements in the context of a developing economy, where institutional capacity of both a federal environmental regulator and a local environmental regulator is questionable. In particular, their study examines a facility's investment in pollution control efforts in response to the signing of a voluntary environmental agreement. In order to assess the usefulness of this alternative regulatory approach, Blackman *et al.* (2006) also examine a facility's investment in pollution control efforts in response to the imposition

of a more conventional and truly mandatory regulatory mechanism: a system of emission charges. Regardless of the regulatory mechanism used, the local regulator must decide whether or not to invest in its institutional capacity, which affects a facility's own investment decision. Thus, the study analyses the interaction between a local regulator and a regulated facility.

These four articles are shown below.

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