



## Analysis

# Corporate Participation in Voluntary Environmental Programs in India: Determinants and Deterrence

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## ABSTRACT

This article examines the motivations for firms in India to participate in voluntary environmental programs (VEPs) using a unique data set of cement, power and steel industry for the year 2012. It examines the effects of regulatory, societal, market and internal factors in influencing voluntary environmental behavior. To this objective we estimate both, ordinal (Ordered Probit) and cardinal (Poisson) models. We find that the firm size, its location, export orientation, and intangible valuation have a positive and significant relationship with the number of VEPs undertaken by the firm. The MNC status of the firm has no impact while the debt equity ratio and average age of the firm has negative impact on the adoption of VEPs.

## 1. Introduction

India has extensive regulations for environmental compliance; the lack of enforcement has resulted in increasing pollution from the industries (Kumar and Managi, 2009). The non-compliance has been attributed to high cost of mitigation. The command and control (CAC) type regulations result in high marginal abatement cost and the probability of being caught is so low that the firms prefer to stay non-compliant. Hence studying the determinants of voluntary corporate environmental management of the firm in an economy like India will help the regulator in formulating efficient policies (Priyadarshini and Gupta, 2003). Alternative policy options are much needed that are simple, effective and economically less burdensome on the polluters and regulators.

Voluntary environmental programs (VEPs) are being encouraged by the regulators to supplement the traditional CAC regulation to create incentives for the corporates to embrace flexible, self-regulated programs that are cost effective and easier to implement (Potoski and Prakash, 2013). The limited regulatory resources with the enforcement agencies and increasing public concern about environmental protection and industrial safety push policy makers to consider VEPs complementary to traditional command-and-control regulation (Arimura et al., 2008; Anton et al., 2004). These programs have been extensively used in the US (> 87 VEPs) and Europe (> 300 VEPs) (Morgenstern and Pizer, 2007). Several studies have been done to identify the drivers and benefits of the above programs in developed economies and not

much study has been done in developing countries (Earnhart et al., 2014). This study aims at filling this gap in understanding the determinants and deterrence for corporates to implement multiple VEPs in India.

There is extensive literature analyzing the determinants of corporates' participation in the VEPs in developed countries. Regulatory and market pressures are considered to be the main determinants of participation of the firms in the VEPs (Khanna, 2001). Khanna and Damon (1999) study the motivation for participation in 33/50 program and find that public recognition and potentially avoided costs of liability and compliance provided strong incentives for participation. Khanna and Anton (2002) state that threat of liabilities and market based pressure from consumers, investors and competitors are significant motivators for the adoption of a more comprehensive environmental management system (EMS).

Nakamura et al. (2001) show that the key drivers for implementation of ISO 14000 by the Japanese firms are its size, the average age of the employee, export ratio and the debt ratio. Prajago et al. (2012) studying the motivation and incentive for ISO 14001 certification of the firms in Australia find that under the external pressure an organization will only comply with the regulation. A positive relationship between the internal motivation factor and the certification was primarily driven by the organizational objective of maximizing its economic, social and environmental benefits. Environmental reporting is an important voluntary initiative by the firms. Firm informs the stakeholders about its environmental performance and hence it creates incentive to develop

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**Table 1**  
Voluntary environmental programs.

Voluntary environment program (VEPs)	Type	Firm	Regulators	Indian VEPs
Unilateral commitments e.g.: Responsible care, EMS policy, voluntary environmental reporting, water conservation, TQM, ISO 14000.	Voluntary, No target or timeline defined.	Initiated by firms based on its corporate or industry commitment.	Regulators don't have much role to play.	Corporate environmental policy, ISO 14000, GRI and WBCSD reporting, Water resource management, TQM
Public voluntary schemes e.g. EPA 33/50 program, ISO 14000 supported by government program, Eco mark program.	Voluntary but targets defined	Firm Voluntarily participates in the program.	Regulator initiates the program but doesn't mandate the firm. They only provide some form of recognition or award to the firms participating in the program.	
Negotiated agreements e.g. ROHS and ELV program in EU,	Voluntary but target and timeline defined	Firm commits to meeting a voluntary targets within specified timeline	A regulator oversees the program and monitors the progress. This may be legally binding agreement in future.	CDM projects, CREP implementation

Source: adapted from [Khanna \(2001\)](#).

innovative approach to reduce emissions ([Arimura et al., 2008](#)). [Ziegler and Rennings \(2004\)](#) after examining the EMS implementation in German manufacturing facilities report that the firms are driven by the incentive to improve their corporate image as a green firm.

Unlike developed countries, the studies examining the motivation for participation in the VEPs in developing countries are scant.<sup>1</sup> [Dasgupta et al. \(2000\)](#) study 236 Mexican firms to understand the determinants of the implementation of the VEPs and find that the amount of regulatory pressure through inspections; exposure to public scrutiny through stock market presence; plant size; being part of multi-plant company and workforce education as the significant determinants of participation.

[Potoski and Prakash \(2004\)](#) examine the causes of variation in adoption rate of ISO 14000 across 59 countries using cross-sectional data. [Gavronski et al. \(2008\)](#) studies the motivation and benefits of the ISO 14001 certifications for the Brazilian firms. The key driving factors identified are reaction to the expectation of the stakeholders, proactive in addressing the future business concerns, legal concerns and the internal pressure within the organization. Similarly, [Tambunlertchai et al. \(2013\)](#) analyze the role of foreign direct investment and export orientation for a firm in acquiring ISO 14000 in Thailand. Note that much of the studies related to developing countries are confined to analyzing the determinants of ISO 14000 or a single VEP. We intend to study the determinants of comprehensive adoption of the VEPs, which is a combination of eight VEPs in India for the three highly polluting industries.

This paper seeks to examine the motivations for Indian firms for adopting the VEPs and focuses on explaining the observed diversity in the adoption of various VEPs collectively rather than the decision to adopt individual programs. It analyses the industries that are highly polluting and more likely to feel external pressure from the regulator and society: cement, steel and power. These three sectors (industries) account for about two-third of total CO<sub>2</sub> emission in India in 2013 from direct energy consumption ([Garg et al., 2017](#)). Note also that India is the fourth and second largest producer of iron and steel and cement respectively in the world.

To explain differences in the number of voluntary programs adopted by the firms we estimate Ordered Probit and Poisson models. Since the number of voluntary program is non-negative and discrete in nature, the selection of Ordered Probit and Poisson models suits the best. We find that along with the usual regulatory and market pressures, in the Indian economy there are some unique determinants and deterrence to the adoption of the VEPs.

This paper makes several contributions to the existing literature on corporate environmental management. First, this might be the first

attempt in a major emerging Asian economy econometrically evaluating the determinants and deterrence of comprehensive corporate environmental management. Second, it considers three major industries namely cement, steel and power which are the backbone of economic growth and the main source of industrial pollution, especially in an emerging economy. Third, it uses a unique firm level data set prepared by extracting the information from the regulators using Right to Information (RTI) Act. Lastly, for finding the determinants of voluntary environmental practices it employs both ordinal and cardinal measures, i.e., Ordered Probit (PO) and Poisson models.

Rest of the paper is organized as follows: The next section describes the VEPs followed by the Indian firms in the cement, power and steel sectors. [Section 3](#) discusses the conceptual framework for the determinants of the VEPs and it is followed by a description on the data used in the study. Empirical strategy adopted in the study has been described in [Section 5](#). [Section 6](#) discusses the econometric results and the paper closes in [Section 7](#) with some concluding remarks.

## 2. Voluntary Environment Programs (VEPs) in India

The VEPs provides firm with two types of benefits. Firstly, the VEPs allow the varied stakeholders to join the process of assessing, rewarding and sanctioning the firms' environmental stewardship. Secondly the VEPs are flexible and allow varying stringency level across programs, allowing the firms to choose from various VEPs based on its stringency and the firm's ability to comply with the same ([Potoski and Prakash, 2013](#)). In countries where the regulation and enforcement is weak the firms differentiate themselves on environmental stewardship by participating in a VEPs ([Borzell and Risse, 2010](#)). The past studies have classified the VEPs under three categories depending on the level of regulatory intervention that influences the firm. [Table 1](#) illustrates the types of voluntary environmental programs (VEPs).

The first type of the VEPs is the unilateral programs, which firm implements on its own without any regulatory pressure. Adoption of such programs is driven by the incentive to improve the profitability through increase in revenue and improving the efficiency through decrease in operational cost. The revenue incentive would be driven by the customer's preference for the green products wherein the customer gives priority and willingly pays a premium for the green products/firms. The second type of the VEPs is the public voluntary scheme wherein the regulator initiates the program, which is not mandatory and at the end of the program provides the participants awards or recognition that acts as an incentive for the firm to differentiate against the competitors and create a positive image with the regulators. The third type of VEPs are initiated and monitored by the regulators. There is a probability that such program may be mandated in future. In India, most of the VEPs until recently have been limited to environmental policy and ISO 14000 certification.

<sup>1</sup> For surveys of literature related to the adoption of the VEPs in developing countries see [Blackman \(2010\)](#) and [Earnhart et al. \(2014\)](#).

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