

# Managing the Indirect Effects of Environmental Regulation and Performance Measurement

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## ABSTRACT

Sustainable development has always been the top agenda of many governments. Especially, the concept of ‘*Ecological Civilisation (EC)*’ is gaining substantial attention from China’s new leaders. However, regional government officers may manipulate or change top level policy in order to suit their own interests or if they are unable to meet the varied pressures of achieving the set measures. Thus, policy makers can unwittingly cause a negative or positive impact on the firms or regional development through the implementation of EC regulations and the requirement to measure, monitor and report performance measurement (PM) information. This can potentially have significant consequences for the firms, the industry sector, and China as a whole. The aim of this research is to explore and evaluate previous work focusing on the relationship and links between regulation and PM. This research will make a significant knowledge contribution to the emerging and yet important area in EC related research. A good understanding of the linkages between PM and EC will assist policy makers to better formulate suitable regulatory control mechanisms at the field level. Moreover, they may take the PM and EC linkages into consideration when setting policy frameworks by minimizing the negative effects and take advantages of the positive consequences.

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## 1. INTRODUCTION

Sustainable development has always been the top agenda of many governments. Especially, the concept of ‘*Ecological Civilisation (EC)*’ is gaining substantial attention from China’s new leaders. However, regional government officers may manipulate or change the top level policy in order to suit their own interests or if they are unable to meet the varied pressures of achieving the

set targets. For example, it was reported that in 2010 there were a plethora of enforced blackouts in many cities where hospitals, schools, and traffic lights had their power cut off when the local government failed to meet the tough energy and emissions targets set by the central government in 2006.

However, the unintended effect of environmental regulations could also be found outside China. For example, Goulder *et al.* (2012) point out that in response

to the climate change, 14 states in America took a series of initiatives to limit greenhouse gas emission per mile. The unintended effect was that the large car manufacturers in the 14 states decided to relocate to other states which have lower emission control. Because the restriction has largely decreased the profit margin of the large-car manufacturer, they chose to move out of the regulated states rather than devoting to innovation on reducing emission.

Clearly, EC regulation can cause unforeseen consequences, i.e., firms will try to circumvent the regulations to avoid the high costs of compliance or behave opportunistically. However, what are the scope and extent of the impact? What are the links between regulation and performance measurement? Abilities to understand the links between regulation and performance measurement are vital—especially the unintended consequences on regional and firms performance. However, the evidence found in the existing literature that has focused on the unintended consequences of regulation and performance measurement appears to be sparse. This paper aims to explore the link between regulation and performance measurement. It is intended that the findings of this research can be used: 1) to assist our conceptual understanding of the unintended consequences of regulation and performance measurement at the regional and firm level; and 2) to guide regulators in policy making by showing the issues and opportunities that exist as a result of regulation and performance measurement.

This research is expected to make a significant contribution to the knowledge of the emerging, and yet important area in EC related research. A good understanding of the linkages between performance measurement and EC will assist policy makers by providing knowledge about the unintended consequences and how policy might take these into consideration when setting policy frameworks by minimizing the negative effects and take advantages of the positive consequences.

## 2. UNINTENDED CONSEQUENCES OF REGULATION AND PERFORMANCE MEASUREMENT

A review of literature only managed to identify a small number of articles that mentioned unintended consequences of performance measurement and regulation. Only a few of these journals actually concentrated on the unintended consequences as the main focus for research (Adcroft and Willis, 2005; Brigham and Fitzgerald, 2001; Humphreys and Francis, 2002; Shaffer, 1995; Tan and Rae, 2009). The remaining research mainly mentioned the presence of unintended consequences (Meyer, 2004; Powell *et al.*, 2012; Unahabhokha *et al.*, 2006). The majority of the literature located has been very specific in its focus and has been carried out on a case-by-case basis.

Tan and Rae (2009) point out that the relationship

of regulation and performance measurement is an area relatively unexplored. Their review found that strong links exist between regulation and performance measurement at firm level, in which regulation can have significant impact on the performance of the firm and the performance measures it uses. It might also be argued that the outcomes of performance measures can influence regulation. Moreover, from the research, they identified that regulation impacts on the firm on different levels and has influence on the performance measurement systems used by the firm, from the strategic level to the individual employee level.

Regulation and performance measurement can impact on the firm in different ways. Tan and Rae (2009) argue that the impact can be dependent on firm size, the environmental context the firm sits in and the social context the firm has located itself in. They further argued that in addition to this, the short-term implications of regulation and performance measurement on the firm can be very different when comparing with the long-term implications. For instance, it could be said that in the short-term, regulation and performance measurement increases costs and reduces efficiency both for a large firm and a small firm. The impact of increased costs and reduced efficiency is much greater for the smaller firm. Larger firms may see no significant difference. However, it is argued that in the long-term, firms will attempt to find ways to reduce the costs and increase efficiency (reduce the impact of regulation) through process improvement and innovation but this will be achieved a lot quicker by the bigger firm who has more resources to dedicate to these type of activities.

## 3. RESEARCH DESIGN AND METHODOLOGY

The study of the unintended consequences of regulation and performance measurement has relatively little theoretical background. Thus, in order to gain more insight into the issue, a series of case studies were carried out. The aims of the case study were to understand the scope, extent, and causes of unforeseen consequences of EC regulations. More specifically, the objective was to understand what regulatory control is better to achieve EC compliance. Case study research is especially appropriate for studying the unforeseen impacts of regulation. Many researchers (Eisenhardt, 1989; Meredith, 1998) point out the strengths of case research, especially for allowing researchers to: A, documenting a phenomenon within its organization context; B, exploring the boundaries of a phenomenon; and C, integrating information from multiple sources.

Three Chinese firms are selected. These cases have been selected for a number of reasons. First, they are willing to share their experiences in dealing with EC regulatory control. Second, they include some of the dynamic experiences of growth and meeting environmental regulation challenges in local and global markets

Chinese firms in recent years. This variety in the cases was a deliberate research design strategy chosen to increase the external validity of the study's findings, and to assure that the findings were generalizable and not specific to any one type business or market (Yin, 1994). Synopses of the three firms (A, B, and C) are provided in Table 1.

#### 4. FINDINGS AND DISCUSSION

In our analysis, three main themes emerged from the case studies were: regulatory control, indirect effects, and dysfunctional of performance measurement. In the following, each theme will be explored in more in-depth.

##### 4.1 Regulatory Control

One of the main issues highlighted by the participants in all three cases is the issue of regulatory control. The EC environmental regulatory system involves a complex set of laws and guidelines enforced by federal agencies and their various state and local affiliates. The aim of the regulatory system is to protect the environment and public from environmental hazards or industrial wastes. However, participants in case C point out that when regulated firms fail to conform to the EC rules prescribed by law and administered by the controlling agency, the results can be dire. A director in case A argued out that it is important to examine the regulatory control mechanisms at the field level and how regulated firms respond to these control attempts.

The concerns raised by the participants in the case studies echo the findings in the literature. Gilliland and

Manning (2002) point out that conformance, which is difficult to achieve in many interorganizational settings, is particularly problematic in a regulatory context because of the ideological differences that exist between agencies and firms. These differences in ideology pertain to issues, such as the role government regulators, should play in meeting public policy goals and the high perceived cost of compliance to mandated standards. One manager in case B pointed out that many firms view EC regulatory legislation as overly broad, complex and conformance is tedious and cumbersome. In light of that, many firms will try to circumvent the regulations to avoid the high costs of compliance.

Thus, given the context of Chinese social structure, one of the participants point out that social control theory (Ellickson, 1987; Gibbs, 1989) maybe useful in explaining issues in which the interests of environment intersect with the interests of firms. Table 2 shows the three elements of EC regulatory control system (Ellickson, 1987; Gilliland and Manning, 2002). Thus, to ensure EC regulation compliance, all three elements of control system need to be studied further. One of the managers in case A pointed out that by considering compliance and opportunism, it is only possible to investigate both intended and unintended effects of EC regulation, i.e., the extent to which firms willingly comply or behave opportunistically to avoid discovery.

##### 4.2 Indirect or Unintended Consequences

The definition for unintended consequences by Oxford English Dictionary is 'an activity that has produced a consequence that was not planned with any intent or purpose.' The result is something which could have a

**Table 1.** Case background

Case	Primary business and activity	Headquarter	Annual turnover (Yuan)
A. Housing developer	Design and build housing estates in China, Africa, and Asia.	Beijing, China	>2 billions
B. Machinery manufacturer	Testing, manufacturing, and design of advanced turning machines.	Beijing, China	>100 millions
C. Medical equipment manufacturer	Testing, design, manufacturing, and after sale services. Mainly to hospital and private clinics.	Shanghai, China	>500 millions

**Table 2.** Environmental regulatory control system

Element	Description
Regulatory controller	A regulatory agency with legally granted authority to administer the rules of control and force compliance on firms within its jurisdiction.
Informal control	Using interpersonal norms, social instruction, religions practice, and flexibility in consideration of the situation to influence firms to adhere to the environmental rules.
Formal control	A strict interpretation of EC guidelines. Any violations will not be tolerated, i.e., offences will be punished under the environmental rules.

Adapted from Ellickson (1987) and Gilliland and Manning (2002).  
 EC: ecological civilisation.

positive or negative effect on the firm and its environment. Thus, one of the participants argued that it is vital to understand the meaning and also the causes of unintended consequences. Without which, it may be difficult for policy makers to develop effective EC regulations. Merton (1936) pointed out five possible causes of unanticipated consequences as:

- Ignorance: Not able or capable to anticipate everything which lead to incomplete analysis.
- Error: Past habits influence or incorrect analysis of the problem.
- Immediate interest: Current priority may override long-term interests.
- Basic values: Certain actions may be prohibited even if the long-term result might be unfavorable.
- Self-defeating prophecy: Find solutions before the problem occurs due to fear of some consequences or uncertainties.

Table 3 briefly summarises the various reported unanticipated effects in literature. Clearly, there are plethora examples in literature to highlight that deliberate changes to a system can have unintended consequences, when these effects beyond the control of policy makers who introduced them.

#### 4.3 Dysfunctional of Performance Measurement

In the case studies, concerns have been expressed about negative unintended effects of performance measurement on unmeasured aspects of regulation. One of the managers pointed out that to ensure EC compliance successfully only measures with little room of inducing unintended adverse consequences should be used for accountability purposes. This view is echoed in Ridgway (1956) seminal article that pointed out that firms experience dysfunctional consequences of performance measurements due to indiscriminate use or from insufficient knowledge of the full effects and consequences.

One participant pointed out that ‘at one time, there is no doubt that many firms fall short of full compliance in EC regulations. They believe fines due to violation of EC regulations or laws were just a small cost of doing business.’ Many firms believe they could use measures to skirt EC laws.

A list of possible dysfunctional consequences causes of poor EC regulations performance measurement systems in firms gathered from the case studies is shown in Table 4.

## 5. CONCLUSION AND FURTHER RESEARCH IMPLICATIONS

This research identified three main themes that underpin the indirect effects of EC regulations and performance measurement, which could be of vital lessons to EC regulation research.

### 5.1 Regulatory Control

Due to intense competition, firms will go all out to reduce costs in order stay competitive in the market place. In light of this, some firms will try to circumvent the EC regulations to avoid the high costs of compliance. Thus, without a good understanding of the indirect effects or regulatory control, the enforcers’ use of formal control may increase the level of opportunist conduct. The findings of this research show that social control theory (Elickson, 1987) could be used to understand or manage how firms are skirting EC laws. By considering compliance and opportunism, it is only possible to investigate both intended and unintended effects of EC regulation, i.e., the extent to which firms willingly comply or behave opportunistically to avoid discovery.

### 5.2 Indirect Effects

This research identified various sources of anti-

**Table 3.** Unanticipated effects identified in literature

Effect	Description	Reference
The placebo effect	Widely reported in medicine. A doctor’s belief in the treatment casts large positive effects on the patient. The result is a powerful remedy, where the intervention in fact has no material effect, but the belief by the participant does.	Hart (1999)
The Hawthorne effect	The effect of simply being studied. The effect did not depend on the particular expectation of the researchers, but that being studied caused the participants to improve their performance.	Parsons (1974)
The halo effect	The effect of uncontrolled novelty, i.e., participants perform differently (to be more alert or otherwise perform differently) because of the novelty of the treatment.	Thorndike (1920)
The Pygmalion effect	A self-fulfilling prophecy. Teachers’ expectations of pupils can strongly affect the amount of development they show.	Rosenthal and Jacobson (1968)
The John Henry effect	The opposite of the Hawthorne effect: it is when a supposedly control group, that gets no intervention, compares themselves to the experimental group and through extra effort gets the same effects or results.	Saretsky (1972)

**Table 4.** Categories of poor measures

Category	Dysfunctional consequence	Example
Myopia view	Concentrate on immediate or short term issues at the expense of important long-term considerations	Firms pumped industrial waste water deep into the underground in order to reduce the cost of waste water treatment.
Measurement fixation	Too focus on meeting the targets at the expense of wider EC laws	The introduction of ‘odd and even’ licence number restriction to limit gas emission in Beijing had led to the enlargement of second car market, i.e., a household will buy second cars (have both odd and even licence number plates) for emergency use.
Misinterpretation	Employees fiddle the data (creative accounting or fraud) to meet the EC measures.	In 2010, plethora enforced blackouts in many southern cities in China where hospitals, schools, and traffic lights had their power cut off when local government failed to meet the tough energy and emissions targets set by the central government.
Tunnel view	Mainly focusing on the set measures and ignoring (or neglect) other important but unmeasured aspects of EC regulations.	No free plastic bags in shops and supermarkets had led to the explosion of unregulated market where free plastic bags is available.

EC: ecological civilisation.

pated effects research in literature that could help researchers to better understand the nature of unintended consequences. It highlights that any changes to a system can have unintended consequences, when these effects are beyond the control of policy makers who introduced them. The result could have a positive or negative effect on the firm and its environment. Thus, future research into indirect effects should pay attention to the various sources identified in this research.

### 5.3 Dysfunctional of Performance Measurement

Literature is abound with panacea on how to achieve competitive advantages with performance measurement systems. However, many firms experience dysfunctional consequences of performance measurements due to indiscriminate use or from insufficient knowledge of the full effects and consequences. This research identified a few categories of dysfunctional consequences of performance measurement systems. Thus, further research in this area is necessary for a better understanding of how behaviour may be oriented toward better accomplishment of EC regulations.

Based on a sample of three firms, this study is small in scope. As in any qualitative study, the results, while rich in individual in-depth cases, are not statistically significant. Moreover, the analyses were based on retrospective data, which might have introduced an additional source of bias resulting from retrospective sense making on the part of our informants. We rigorously limited this bias to a minimum level using qualitative research methodology by using multiple informants and triangulation, i.e., using other source of data from published documents in the company websites and independent publications.

Nevertheless, this in-depth study does represent a first step to empirically examine the indirect effects of

environmental regulation and performance measurement. Though based on only three cases, this research provides rich data and external validity of the research, thus enables the findings to be generalisable to firms in other countries. A better insight into current Chinese firms behaviour toward EC regulations will not only help their Western counterparts to collaborate with them better, but will also greatly enrich the understanding of regulatory control, indirect effects, and dysfunctional of performance measurement systems.

The scope of the study was limited, and as a result the data collected on the benefits, weaknesses, and unintended consequences have been far from comprehensive. Further research (more case studies) would seek additional evidence for the identified themes. A heavily regulated industry sector (such as mining) may be used for the study to flesh out some of the themes and issues that are identified in this research.

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