Institutional and Resource Dependence Determinants of Environmental Management System Adoption in Thai Manufacturing Firms

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The increase in environmental problems has generated an increasing pressure by the public. The pressure is directed mostly towards industry because it is considered to be the main source of pollution and environment problems. This study explores and identifies groups of manufacturing firms in terms of the extent of their environmental management practices and investigates factors influencing level of environmental management system (EMS) adoption of manufacturing firms in responding to the environmental pressures. Based on an integration of institutional theory and resource dependence theory and literature reviews on environmental management, a conceptual model was developed showing that motivational, contextual and organizational factors are the main factors influencing the level of environmental management system adoption in manufacturing firms. Eleven hypotheses were posited to test the model

Of the 588 manufacturing firms that were mailed surveys, 239 (40.9%) returned completed questionnaires. Cluster analysis was used to classify the respondent manufacturing firms and multiple regression analysis was used to test the model. Results of cluster analysis indicated that the respondent firms were statistically classified into three groups with significant differences in terms of level of their efforts in implementing environmental management practices. The three groups are labeled as reactive firms, adaptive firms, and proactive firms..

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Results of hypotheses testing indicated that the level of environmental management system adoption of manufacturing firms in responding to the environmental pressures is significantly predicted by expected gain of social legitimacy, expected gain of economic competitiveness, perceived importance of external stakeholders (government, community, environmental organizations, and media), top management commitment on environmental management, firm size, and amount of export sales. It is also predicted by the degree of interconnectedness or the extent to which firms exchange environmental knowledge with others in an organizational field.

The results of the hypotheses testing and field research consisting factory visits and personal interviews suggest that government formulate environmental policies in favor of educating top management in manufacturing firms of the potential benefits of environmental management practices for their firms and how to achieve more successful implementation of the practices, increasing effectiveness in monitoring and enforcing environmental regulations, allocating attention and resources toward the smaller firms that have limited resources, using incentives to encourage manufacturing firms to adopt EMS and subsidizing their efforts in EMS implementation through grants, loans, tax credits and electricity cost reduction, and accelerating the adoption by recognizing and rewarding firms that move beyond compliance in their enforcement of regulations

1. Overview

Manufacturing firms have played a dominant role in economic development but, as a result, have been accused of being the main source of pollution and environment problems. The problems, including forces of customers, the public, the government, and other stakeholders, are increasingly demanding that manufacturing firms minimize any negative impact of their products and operations on the natural environment. Simultaneously, the pressures make manufacturing firms more concern about their products and operations and must incorporate environmental management into their policies (Rondinelli and Vastag, 1996: 106-122). Accordingly, the adoption of environmental management systems (EMSs) has become a necessity for every firm.

However, the environmental management systems that firms adopt in responding to the institutional pressures vary considerably. The variation is between integrating proactive environmental management systems into their overall firms strategies to reduce costs, improve efficiency, compete more effectively, and develop new products and services (Berry and Rondinelli, 1998: 1-13) to viewing regulatory compliance as a burden, trying to reduce its costs, and avoiding compliance with existing regulations.

We cannot achieve a thorough understanding of firm responsiveness to environmental pressures and cannot understand how environmental management systems can either support or fail to support environmental performance if we do not understand the factors that influence the decision to adopt environmental management systems. Thus, it is important to know what drives firms to adopt environmental management systems. And a theoretical approach for determining factors influencing the adoption, in this study, is an integrated theory of resource dependence and institutional theory.

2. Purpose of the Study

The purpose of this study is to explore and

identify groups of manufacturing firms in terms of the extent of their environmental management practices and investigate factors influencing level of environmental management system (EMS) adoption of manufacturing firms in responding to the environmental pressures.

3. Scope of the Study

The food industry is a manufacturing industry that processes raw or prepared animal, marine, and vegetable material into intermediate foods or edible products. It is one of the largest industry groups within the manufacturing sector of Thailand. With this large number of facilities, many different and large amounts of waste streams are generated. As such, in a world of increasing environmental awareness and public demands for institutional control or self-control, this is an industry under considerable social pressure and one in which the ability of organizations to align themselves with their natural environments will determine the quality and extent of their continued existence. This syudy, therefore, focuses on the food processing industry.

4. Environmental Management Systems

Environmental management system generally refers to an interrelated bundle of environmental practices, including articulating environmental goals, training of personnel, gathering and analyzing environmental information, and reporting, monitoring and auditing environmental activities and performance. However, there has not been concrete agreement on the contents of environmental management systems. There are different focuses when researchers use the term environmental management systems in their studies.

Based on three different studies, Marguglio (1991), Dillon and Fischer (1992), and Henriques and Sadorsky (1999), this study identifies environmental management systems as three primary groups of practices that can determine environmental responsiveness of an organization to environmental issues: environmental policy and planning practice, environmental organization and responsibility practice, and environmental management control practice.

5. Motives for Environmental Management Systems Adoption

Several studies have identified motives for environmental management practices such as management commitment, environmental responsibility, and profitability (Petulla,1987); regulatory demands, cost factors, stakeholder forces, and competitive (Berry and Rondinelli,1998); values of senior management, perceived importance of environmental issues, availability of resources, and plant-level opportunities (Klassern and Whybark, 1999); customer pressure, peer pressure, stakeholder interests, improved performance and commitment toward management system(David Clark, 1999); legislation, stakeholder pressures, economic opportunities, and ethical motives, (Bansal and Roth,2000)

6. Organizational Theory and Environmental Management

The open systems perspective has been claimed as a superior way to describe organizational behavior in complex systems (Thompson, 1967).Under the open systems perspective, two organizational theories that have been developed in the study of environmental response to social pressure, and that can specifically explain phenomena in this study are institutional theory

and resource dependence theory. Although each theory has distinct conceptual foundations, it is their convergence that has the potential to illuminate organizational responses in terms of environmental responses to environmental demands and pressures

The central argument in institutional theory is that organizational response is constrained by the conscious or unconscious desire to conform to the expectations and accepted norms of the institutional environment (Meyer and Rowan, 1977: 340-363). Conformity confers legitimacy and stability, along with the support and resources necessary for survival. Resource-dependence theorists, on the other hand, view organizational actions as rational, deliberate attempts to reduce dependence on other organizations in the environment that control the critical resources they need (Pfeffer and Salancik, 1978). In contrast to the conformity emphasized in institutional theory, organizations have a flexible degree in adapting to their environment.

An integrated approach of these two perspectives suggests that organizations can formulate a range of responses to environmental pressures (Covaleski and Dirsmith, 1988: 562-587). Some organizations may choose passive conformity in the hopes of improving their social legitimacy and chances of survival. In contrast, other organizations may choose to assess the costs and benefits of conformity and may opt to actively alter their situation to make compliance less necessary. Oliver (1991:145-179) posited that organizations might pursue five broad strategies in responding to institutional processes. The five strategic responses suggested "vary in active agency from passivity to increasingly active resistance: acquiescence, compromise, avoidance, defiance, and manipulation" (Oliver, 1991: 151).

A deficiency of Oliver's original framework of the five strategic responses is that it identifies acquiescence is the highest level of responsiveness so it fails to adequately consider strategy beyond acquiescence, that is, a pro-active approach. Regarding the environmental management studies, manufacturing firms adopt a certain level of environmental management system as a strategy in responding to the institutional pressure and many firms employ environmental management proactively, and go beyond compliance to environment regulations, for instance the adoption of ISO 14001.

In the environmental management context, there has not been any information or data identifying that manufacturing firms can actively manipulate their institutional pressures or environmental pressures. Accordingly, similar to Goodsteins study (1994: 350-382), manipulation is not a viable strategy in the environmental management context and in this study.

Therefore, environmental management systems that manufacturing firms implement in response to institutional pressures or environmental pressures may be a strategy of proactivity, acquiescence, compromise, avoidance, or defiance.

Proactive strategy: Manufacturing firms may choose to become opinion leaders by developing their environmental management practices beyond the current environmental rules and regulations and other environmental demands, for instance the adoption of ISO 14001.

Acquiescence: Manufacturing firms may comply with environmental rules and regulations in order to elevate their legitimacy and protect them from public criticism and the financial penalties of noncompliance.

Compromise: Manufacturing firms may be

confronted with conflicting institutional demands such as the conflict between institutional expectations that demand firms to minimize environmental impacts and internal organizational objectives that try to minimize their cost. Therefore, for example, firms may tend to conform to at least the minimum standards of environmental regulation required by the government agencies.

Avoidance: Organizations may exit the domain within which pressure is exerted (Hirschman, 1970). In the environmental context, for example, manufacturing firms may move their firms to an alternative location where rules and regulation are lenient or environmental pressures from the community are weak. An example would be moving out from a pollution control area or moving into an industrial estate.

Defiance: Manufacturing firms may ignore environmental regulation and demands particularly, when the potential for law enforcement of government agencies or other environmental pressures are perceived to be low.

7. Hypotheses

This study posits that the levels at which organizations adopt environmental management systems to respond to institutional pressures will depend on three primary factors, namely: motivation factor; contextual factor; and organizational characteristics. The hypothesized variables are drawn from the integration of institutional forces and organizational dependency

7.1 Motivation Factors

Several studies have identified motives for corporate environmental responsiveness; these include regulatory compliance, competitive advantage, stakeholder pressures, ethical concerns, critical events, and top management initiative and commitment (Lampe, Ellis and Drummond, 1991: 527-537; Lawrence and Morell, 1995: 99-126; Vredenburg and Westley, 1993: 495-500; Winn, 1995: 127-161). The motives suggest that organizations may be environmentally responsive to comply with social legitimacy, to build better stakeholder relationships, and to acquire economic wealth and competitive advantage (Bansal and Roth, 2000: 717-736).

1) Expected Gain of Social Legitimacy

Manufacturing firms are likely to respond or adopt environmental management systems to conform to environmental issues in order to gain legitimacy. Therefore:

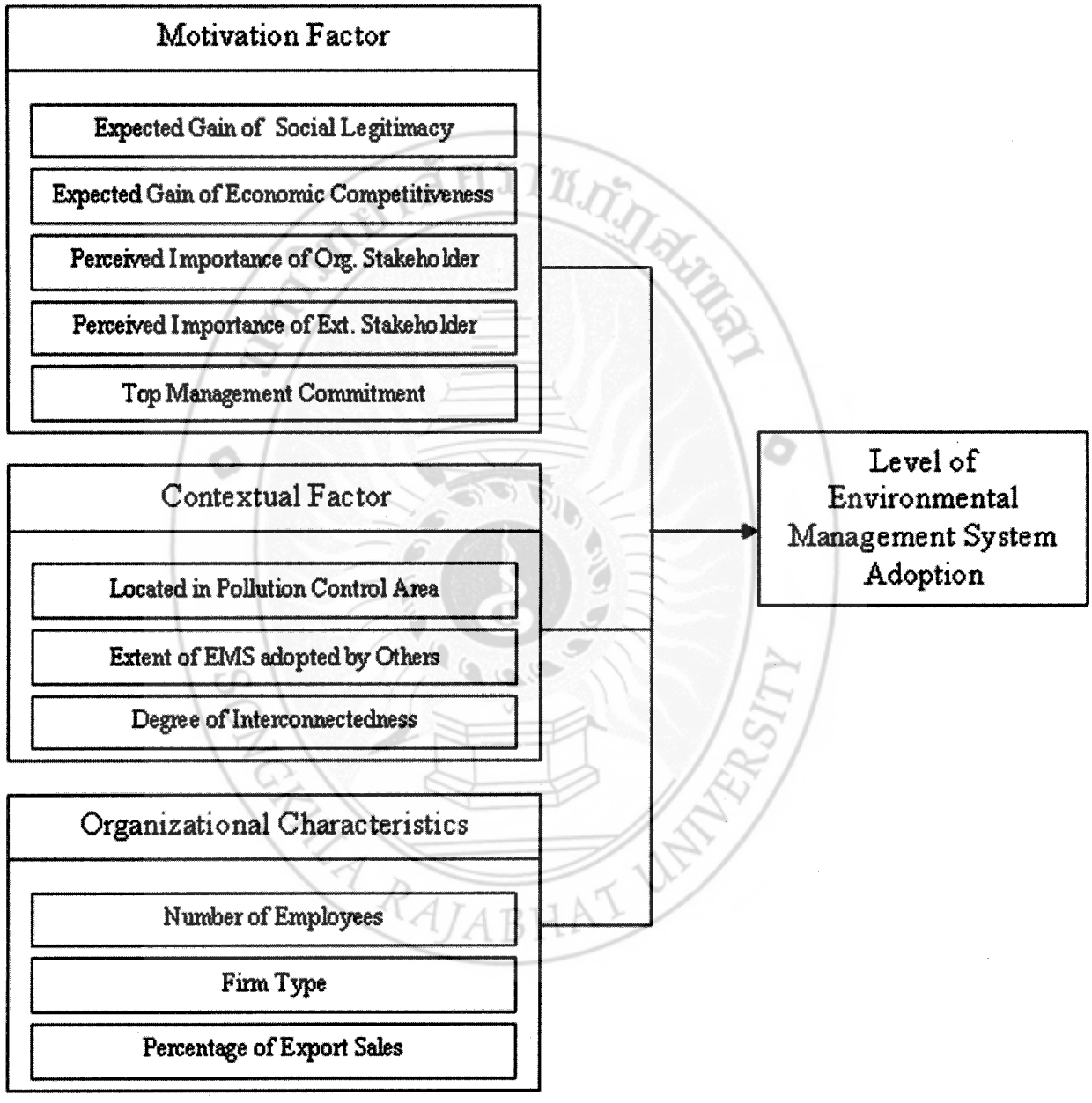
Hypothesis 1: The greater the degree of social legitimacy expected to be attainable from environmental management system by a manufacturing firm, the greater its level of environmental management systems adoption.

2) Expected Gain of Economic Competitiveness

Manufacturing firmes are likely to adopt environmental management practices and systems when they anticipate that the adoption will enhance economic competitiveness. Therefore:

Hypothesis 2: The greater the degree of economic competitiveness expected to be attained from environmental management system by a manufacturing firm, the greater its level of environmental management systems adoption.

Figure 1 Conceptual Framework



2) Expected Gain of Economic Competitiveness

Manufacturing firmes are likely to adopt environmental management practices and systems when they anticipate that the adoption will enhance economic competitiveness. Therefore:

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3) Perceived Importance of Stakeholder

As stakeholders become more concerned about environmental issues, then, it can be posited that perceived importance of these stakeholders is likely to influence organizational responses to environmental issues. According to Henriques and Sadorsky (1996: 381-395), there are two groups of stakeholder: (1) organizational stakeholders, and (2) external stakeholders.

The first group, organizational stakeholders, includes those who are directly related to an organization and have the ability to impact its bottom line directly. This stakeholder group includes customers, suppliers, employees, and shareholders. The second group comprises of regulatory stakeholders, community stakeholders, and the media.

Hypothesis 3a: The greater the perceived importance of organizational stakeholders to a manufacturing firm, the greater its level of environmental management system adoption.

Hypothesis 3b: The greater the perceived importance of external stakeholders to a manufacturing firm, the greater its level of environmental management system adoption.

4) Top Management Commitment

Petulla (1987: 167-183) argued that an important factor that led towards the development of environmental management is strong commitment by the president or CEO to environmental compliance.Without the support of top management, firms are less likely to adopt a high degree of environmental management practices and systems. Therefore:

Hypothesis 4: The greater the level of top management commitment to environmental responsibility in a manufacturing firm, the greater its level of environmental management system adoption.

7.2 Contextual Factors

1) Location within Pollution Control Area

The influence of legal mandates for natural environment control will vary from one area to another area. According to The Enhancement and Conservation of National Environmental Quality Acts (NEQA) 1992, any local area that appears to be affected by pollution problems which will cause health hazards to the public or adverse impact on the environment will be designated as a "pollution control area (PCA)" in order to be able to control, reduce and eliminate the pollution. Firms located in these areas will be more strictly monitored, inspected, and controlled by additional rules and regulations (Part 3 Chapter IV, NEQA, 1992). The higher coercive force to firms located in PCAs compared to firms not located in the PCA leads them to seek ways of making sure that their environmental control performance conforms with the rules and regulations. Therefore:

Hypothesis 5: Manufacturing firms located in pollution control areas are likely to adopt higher

levels of environmental management systems than those located outside the pollution control area.

2) Extent of EMS Adopted by Others in the Same Province.

Firms are likely to be more responsive to natural environmental pressures or to adopt higher levels of environmental management practices and systems when there are more firms in the same province or area that have already adopted environmental management systems. Therefore:

Hypothesis 6: The greater the level of environmental management systems adopted by other manufacturing firms in the same province or district, the greater the likelihood of environmental management system adoption by a manufacturing firm in that province or area.

3) Degree of Interconnectedness

Interconnectedness refers to the number of relationships between individuals in an organizational field. Firms that have a higher degree of environmental relationships with others are likely to accept environmental norms, to have more environmental responsibility, and therefore, are likely to adopt higher levels environmental management practices and systems. Therefore:

Hypothesis 7: The greater the degree of interconnectedness of a manufacturing firm, the greater its level of environmental management system adoption.

7.3 Organizational Characteristics

1) Firm Size

Larger organizations are argued to have greater resources and larger scales of operations to create organizational slack for innovation-search behavior (Greening and Gray, 1994: 488; Russo and Fouts, 1997: 534-560) and may be subject to greater public scrutiny, prompting greater social responsiveness (Greening and Gray, 1994: 467-498). Therefore:

Hypothesis 8: The greater the size of a manufacturing firm, the greater its level of environmental management system adoption.

2) Firm Type

Research has indicated that public sector organizations are more responsive to institutional pressures relative to social issues than those in the private sector (Ingram and Simons, 1995: 1472). It is reasonable that those firms that are publicly listed will encounter significantly greater environmental pressures and will be more responsive to the pressure that than those which are not. Consequently, they are likely to adopt higher levels of environmental management practices and systems.

Hypothesis 9: Publicly held firms are more likely to adopt a higher level of environmental mana gement systems than privately held organizations.

3) Percentage of Export Sales

Exporting firms are responsive to natural environmental concerns because of their policies of developing their environmental management practices and systems in order to be able to gain access to foreign markets. Therefore:

Hypothesis 10: The higher the percentage of export sales of a manufacturing firm, the greater its level of environmental management system adoption.

8. Research Design

This study principally employs a sample survey research using a sample of Thai food manufacturing firms. Of the 588 firms that were

mailed surveys, 239 were completed and returned, yielding a response rate of 40.9 percent. In addition, field research consisting of factory visits and personal interviews were used to supplement and extend the findings of the survey research. Research variables were defined and operationalized. Variables were measured with a series of seven-point likert-type items adapted from previous studies. The scale for each composite variable was tested for reliability and validity. The reliability was assessed by using Cronbachs alpha and it was found that all reliability measures were above the recommended value of 0.7. The validity was assessed by using factor analysis and it was found that all the factor loadings were greater than the cutoff point of 0.5

9. Results

Cluster analysis was used to classify respondent firms. The result showed that respondent firms were classified into three distinct groups regarding environmental management practices and systems. The three groups were classified as reactive, adaptive, and proactive, respectively

.Firms in the reactive group were likely to adopt the lowest level of environmental management practices. They did not expect that they would gain any benefits, both in terms of social legitimacy and economic competitiveness, from EMS adoption. They perceived that institutional pressures such as environmental pressures from stakeholders and norms were not very important to them on EMS adoption decisions.

The adaptive group included firms that tended to adopt environmental management practices voluntarily. They expected that they could gain some benefits, both in terms of social legitimacy and economic competitiveness, but not sales increases and foreign market expansion, from EMS adoption and they perceived that environmental pressures from stakeholders were moderately important to their environmental management decisions.

Finally, the proactive group included firms that appeared to favor adoption of environmental management practices and saw environmental management systems as a tool for raising their competitiveness. They expected that they could gain benefits, both in terms of social legitimacy and economic competitiveness, particularly sales increases and foreign market expansion, from EMS adoption and they perceived that the environmental pressures from stakeholders were quite important to their environmental management decisions.

Applying the above findings of firm classification and their environmental management practices with environmental management strategies as proposed earlier in this study, it can be argued here that in responding to institutional pressures concerning environmental issues the reactive firms are likely to pursue a combination of avoidance and defiance strategies. On the other hand, adaptive firms pursue a compromise strategy and proactive firms pursue a combination of acquiescence and proactive strategies.

Regression analysis showed seven hypotheses out of eleven were supported which indicated that the level of environmental management system adoption is predicted by expected gain of social legitimacy, expected gain of competitiveness, perceived importance of external stakeholders, top management commitment on environmental management, number of employees, and amount of export sales. It is also predicted by the degree of interconnectedness or the extent to which firms have environmental relationships with others in an organizational field.

The findings generally support the contention that organizations do not respond uniformly to institutional pressures, but rather adopt varying strategies that depend on the nature of institutional pressures forced on them (Oliver, 1991: 145-179) and that degree of conformity is a strategic choice that depends on the nature of the pressures, as well as on organizational interests in maintaining legitimacy, support, and economic viability (Dowling and Pfeffer, 1975: 122-136). The findings are also consistent with previous studies (Goodstein, 1994: 350-382; Greening and Gray, 1994: 467-498; Oliver, 1991: 145-179) that organizational responsiveness to environmental pressures is influenced by causal expectations underlying such pressures, dependence on constituents who exert the pressures, congruence between environmental demands and organizational goals, and exposure to environmental institutions.

10. Implication

This study makes many important managerial and policy implications. First, the results of this study are of interest to managers faced with decisions regarding environmental management systems. There is a conflict regarding environmental management practices. While some view environmental management practices as a 'cost of business' or the costs exceed benefit (Walley and Whitehead, 1994: 46-52), others argue that the practices enhance cost reduction and competitive advantage (Porter and Van der Linde, 1995: 120-134). This study is a step in the direction toward resolution of the conflict. The results of this study indicate that manufacturing firms anticipate that they can gain competitive advantage when they adopt environmental management systems. This finding, then, can assure the managers that the adoption of environmental management systems will reduce their operation cost and gain competitive advantage.

Second, this study provides an understanding of what factors influence the adoption of environmental management systems. This understanding will help explain and anticipate what activities should be engaged in and where the resources should be allocated. Interestingly, this study indicates that top management has a strong influence on the adoption whereas coercive mandates from the government regulators have not been successful in dealing with environmental enforcement. This finding, then, can suggest that governmental policies be directed at educating and persuading top management in manufacturing firms of the potential benefits of environmental management practices for their firms and how to achieve more successful implementation of the practices In addition to the results of the qualitative study, it can be suggested that government agencies increase efficiency, effectiveness, transparency, accountability and co-ordination in monitoring and enforcing environmental regulations.

Additionally, the study also indicates that the environmental information firms received increases the likelihood of adoption of environmental management systems and that government agencies are one of the most important sources of environmental management information for manufacturing firms. Therefore, it might be suggested that the government agencies should be continually supported to be able to disseminate environmental management knowledge and technology and provide it to the manufacturing firms. A respondent firm suggested that the government establish an environmental management center to work on those activities.

Fourth, the finding that larger firms were

more likely to adopt environmental management systems than smaller firms can suggest that governments allocate their attention and resources toward the smaller firms that lack the required resources for implementing environmental management systems.

Finally, the findings from the qualitative study suggest that government 1) use incentives to encourage manufacturing firms to adopt environmental management systems and subsidize their efforts in EMS implementation through grants, loans, tax credits and electricity cost reduction, or stimulate the efforts by helping them bear the costs rather than by fining them for not complying with regulations; and 2) accelerate the adoption by recognizing and rewarding firms that move beyond compliance in their enforcement of regulations.

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