Cover Letter

Title: Corporate Governance and Environmental Management Mechanism in the US and Japan

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Abstract:

Since the Earth Summit in 1992, sustainable development became the leading philosophy for governments and global firms. It should be pursued by developing countries as well as developed c1ountries. To solve environmental issues, the role of multinational enterprises which have worldwide operations is significant. The MNEs which have technological capabilities and environmental management system can contribute the reduction of impact. But, the approaches of firms to the environmental issues are different because of its different objectives, governance, and social requirements.

In this paper, we discuss how the corporate governance system influences environmental behavior and process. Firstly, two types of corporate governance approaches are examined. And the characteristic behavior of firms for environment is examined. Secondly, we show some evidence that different approaches of corporate governance show different pattern of environmental behavior.

It can be said that the objectives of corporation is defined by governance which is rooted upon the socio-economic conditions of society. So, the environmental investment is determined by corporate governance.

Examining the empirical data from US and Japan, we conclude that there are different governance approaches and causal mechanism for environmental management. It is not easy to reach achievement of economy and environmental preservation simultaneously. The causal mechanism indicates there is a different process between US and Japan. Porter mechanism which indicates that adequate policy stimulates innovations, then increase environmental performance and leads to economic performance cannot be achieved without radical change of governance system.

Keywords: Environmental management, Mechanism, US, Japan, Causal process

Corporate Governance and Environmental Management Mechanisms in the US and Japan

1. Introduction

Work on environmental preservation has focussed separately on individual issues such as global warming, declining biodiversity, desertification and damage to the ozone layer, but these approaches are now flowing together into a single comprehensive concept of ‘sustainable development’. This concept appeared in the 1987 report by the United Nations-appointed World Commission on Environment and Development.

Sustainable development, as agreed in general at the Earth Summit, seeks a way to realise economic development and environmental preservation simultaneously. In an academic field, M.Porter proposed a new view for environmental investment in business which is called Porter Hypothesis. He insisted that adequate regulation stimulates technological innovation and improve environmental performance. It then enhance the competitive advantage of firms and finally brings about economic performance. It is said to be necessary to achieve Factor 10 or 80-95% reduction of greenhouse gas compared to 1990 level(Schmidt-Bllek1994, ICPP 2007). To solve environmental issues such as global warming and bio-diversity, the role of firms as a main actor in economy is quite significant. This paper examines some characteristics of environmental management and its mechanisms in relation to corporate governance. We compare the data on environmental management in the US and Japanese firms and discuss its findings.

2. Definition of environmental management

The realisation of sustainable development requires a paradigm shift from the conventional means of economic activities and company management in pursuit of economic objectives as a guiding principle, to new ways of doing managing activities with care for environmental and natural preservation. This paradigm shift calls for changes in composition and supply flow of raw materials, manufacturing processes and product design, and finally demands a new economic system. Therefore, we can say that the transformation to environmental management is a system change. In this paper, a process of economic activity intentionally carried out to realise sustainability is called environmental management.
Since the concept of sustainable development was accepted as a leading principle of the world, firms are strongly expected to pursue environmental management. Triple Bottom Line, which indicates the positive commitment of firms in economy, society and environment, was introduced by J.Elkington in 1994.

Since the 1990s, the concept of ‘Triple Bottom Line’ has been stressed, companies are expected to fulfil certain duties, not just for economic prosperity, but also for social equity and environmental preservation.
We are going to examine how environmental management is characterised.

Holding sustainable development as a value premise and initiating programmes aiming towards its realisation constitutes environmental management. At one end of the spectrum, the ideal of sustainability is highlighted, but at the other end, environmental management conducted as economic activity can present limitations. Environmental management is carried out within the norm of sustainability and the realistic restrictions of corporate governance and economic system. To clarify this point further, we will examine environmental management from a perspective of corporate governance.

3. Approaches of corporate governance

Corporate governance is conceptually the control and running of a company. Generally, it is defined as relationships among the shareholders as investors, the board of directors, management and other stakeholders over control of the business (OECD 2004). There are broadly two separate views on corporate governance, and current environmental approaches by company management are also based on these. Because corporate governance indicates who holds company sovereignty and for what purpose business management should be carried out, the fundamental principle of corporate governance also determines environmental investment behaviour. Company's decisions reflect the objectives of the company's sovereignty, or those holding the adjudicating power.

These two views are called the shareholder approach and stakeholder approach. There are similar models of categorising corporate governance. Hall and Soskice, who have compared systems for corporate governance in their research on diversity of capitalism, categorise corporate governance into two types, 'coordinated market economy' and 'free market economy' (Hall and Soskice 2001). Another classification divides the German model (German-style capitalism or Rhine Capitalism) and the Anglo-Saxon model (American-style capitalism) (Streeck 2000, Zugehör 2003).

These categorisation theories have come about with discussions on the diversity of capitalism or comparative management studies. In particular, comparative system studies have made it clear that economic systems of different nations have different features depending on the local circumstances, indicating diversity of capitalism. Variations are noted in market function, decision-making criteria, employment system, relationship between companies, and method of corporate governance.

Like varied models of capitalism, categorised models of corporate governance should be understood as Ideal Typus. In reality, even in the same society, the corporate governance varies from company to company. Differentials in corporate governance are also found between nations. Not all companies are governed in the way exemplified in ideal models.

What differences can be found in corporate governance in different societies? We will look at how the modern corporation system has been formed as capitalism progresses. We will also consider how corporations today are carrying out environmental management, discussing environmental management from a perspective of the basic structure of corporate governance.

Historically, corporations originated in mediaeval Europe as a mechanism to concentrate capital. They make it possible to collect and hold a quantity of capital through limited liability system and securitisation. There is a trustor-trustee relationship established between capital investors (shareholders) and business executives. To ensure business is run with available capital and that payment is made smoothly according to results, a regulatory system for company administration is required, so shareholders' meetings and audit committees were instituted. In this case, the final authorisation of corporate governance is given to the investors, who are trustors. Legislation for such a modern corporation system was established in the UK, Germany, France, the US and Japan after the mid-19th century.

However, closer historical study reveals that corporate governance has not been uniform across nations or regions, but shows variations in content. Today, Japan, the US and European countries adopt different options for corporate governance. It is society, not shareholders, which confers fundamental legitimacy to corporate governance. Following the study of institutional economics, different society develop indigenous corporate governance. This paper takes the view that a company's environmental approach reflects corporate governance, the basic control structure of a company. Society develops indigenous pattern of corporate governance which then define the nature of environmental investment and behaviour.

Take a look at corporate governance in the light of the formation of a system and a culture. In the case of Japan and continental Europe, we generally find that the rules and values of social relationships have been built over a long period, and notice relatively dense relationship in accumulation of regional cultures and traditions. People have formed a tight local society with a long history of economic activities, and religious traditions and norm of values had accumulated as foundations. In Europe, the model of corporate governance for corporations was created in the process of a several centuries on top of such a social foundation, and the current European Union has been established on such a historical base.

In big German corporations in particular, a large part of shares are typically owned by banks, insurance companies and business companies, and tightly networked inter-firm relationships have been built. Workers have participated in business management quite extensively through legally supported *Mitbestimmung* (co-decision system). A system allowing harmonious labour-management relations is noticeable, and company management has focussed on relationality more than shareholder value. The German model is characterised by high levels of co-ordination and co-operation, so it is often called corporatism. It has created a corporate governance style unique to Germany, and become a distinctive economic order as it is defined by the country's socio-economic conditions. This economic order has demonstrated high wages and living standards, relatively small disparity and high international competitiveness.

As for the German model, or so-called German-style capitalism, the following features have been pointed out (Zugehör 2003).

①Tight network of inter-firm relationships centred on big banks that are creditors and major shareholders.

②Return on equity (ROE) is not the top priority.

③According to the *Mitbestimmungsgesetz* (law of co-decision system), board of Audit(Aufsichtsrat) is made up of representatives from both employees and management, and importance placed on the agreement of major stakeholders and employment security. Main banks, enterprise groups with capital relations, long-term business relationships, and the labour-management relation system emphasising employment security and labour-management negotiation are important elements representing the relationship described above.

In post-war Japan, due to *zaibatsu* dissolution and the purge of public services by directive of the Supreme Commander for the Allied Powers, ownership and management became separated in many companies, and company management was left in the hands of relatively young employees. As the development of a capital market was delayed, Japanese companies became increasingly dependent on indirect finance through bank loans, leading to the formation of enterprise groups with strong financial connections. This means that companies were run under weak shareholder control, with no priority given to investors' profit. In addition, fierce industrial disputes and reaction to democratic movement in the post-war period were a significant historical background for the creation of a business management system with harmonious labour-management relations. As noted above, Japan's economic system in many aspects had a similar economic situation to Germany.

By contrast, the US, with individualism and private ownership system as a basic social premise, established a New World capitalism through waves of emigrants who had discarded convention and institutions and sought freedom. Securing freedom and the rights of individuals, free competition in the market has become the guiding principle for the economy; one observer has noted "Individualism is an intrinsic aspect of American culture" (Morris et al 1994). Individualism functions with the right of freedom and ownership. A distinctive model of corporate governance was developed through these particular socio-economic grounds, which were significantly different from the circumstances underlying the formation of corporate governance in Europe and Japan. In the US, the individual's rights and freedoms are common social currency, through which market competition and corporate governance were developed.

An important historical event in America regarding its model of corporate governance is said to be a court case between Ford and Dodge Brothers over management of the Ford Motor Company. The company had been very successful, along with the growth of the motor industry in America, and the company's founder, Henry Ford, sought to reinvest profits to expand business for the future growth of the company. Objecting to his plan and demanding shareholder profit-sharing, the Dodge brothers, who were large shareholders in the company, filed a suit against him. The Michigan Supreme Court made the following judgement in 1919:
" A business corporation is organised and operated primarily for the profit of stockholders. The discretion of the directors is to be exercised in the choice of means to attain that end" (Nevins and Hills 1957).

This judgement has become an important benchmark for controlling power in corporate governance as well as how company management should be carried out in the US. The corporate governance model of current US companies is consistent with the above judgement. Governance models once created are refined and systemically strengthened as the economy develops. The employment system, wages and rewards, business relationships, capital market and labour market have all taken shape accordingly.

4. Corporate governance and environmental behaviour

The shareholder approach is characterised by an emphasis on the lawful legitimacy of freedom and ownership of individuals, and within this framework, the corporate social role is defined. A company is founded with funds from investors, and the investors are as owners. As a consequence, shareholder value is pursued. On the other hand, the stakeholder approach is represented by Konosuke Matsushita's philosophy, 'a company is a public entity' (Konosuke Matsushita 1978). This ideal emphasises members creating a system as a corporate organisation. Particularly, in principle employees are regarded as partners in a co-operative system and as important participants in value creation. A company is defined as an organisational structure relying on socially diverse stakeholders, and corporate governance is key in such a context.

In short, the shareholder approach focuses on who owns the company, while the stakeholder approach centres on a viewpoint of company objectives, concerning for whom the company exists. Therefore, the basis for argument on the legitimacy of governance is very different between the two approaches.

Companies' environmental undertakings are determined according to economic system and principles of corporate governance, and these features are reflected in the implementation of environmental policy. Under such restrictive corporate governance, what kind of environmental programmes can be developed to realise sustainability? What kind of differences can the two governance approaches bring to environmental management? We will examine these major discussion points regarding environmental issue.

First, the different aims of environmental policy must be noted. The shareholder approach prioritises economic benefit to shareholders, so the environment is treated as a rather secondary matter or constraints. The shareholder approach is that economic activities in the market are determined based on the principle that shareholders have sovereignty. Therefore, this approach deals with decision-making for running corporations as well as nature as an object of economic activities, according to principles of ownership and free competition in the market. All resources obtained from the natural environment are goods exchangeable in the market.

When corporations are owned by shareholders, the objective of business management is maximisation of shareholder value. In corporations, due to the introduction of the limited liability system, shareholders' liability (liability for risk) is only for the amount invested, and unless legal regulations are in place, there is no liability for external diseconomy. Although the shareholder approach demonstrates a free economy in principle, this does not necessarily mean environmental programmes are disregarded. Every company operates business activities under market and social situations, so companies would rather accept environmental issues as a restrictive condition and seek administration enabling the minimisation of environmental costs without harming shareholder value. Tough public rules are more likely to be imposed on the shareholder approach because of its nature. Regulatory and compulsory environmental policy will be toughened against the behaviour inherent in the shareholder approach. Government and firms often conflict each other.

On the other hand, the stakeholder approach seeks to co-ordinate requests from each stakeholder, including their objectives, interests and security, and in principle, solutions agreeable to each party's interests regarding the economy, society and environment are explored. Nature is also one of stakeholder interests to be satisfied. As stakeholder approach emphasises co-ordination, it also allows some flexibility in dealing with the environment.

The second point concerns environmental cost. The shareholder approach typically adopts ROE as its evaluation criterion. As a result, and as it is often said that environmental measures entail increased costs, environment-related cost is regarded as inefficiency, and internalisation of the cost is rejected. However, the point has been made that "Almost certainly, environmental impact will need to be internalised in the future" (Hart 1995). It has also been suggested that environmental strategy will bring external stakeholders' perspective into product design and development. Regarding the costs categorised as external diseconomy, the OECD has also emphasised "Environmental damage costs must be internalised wherever possible" (OECD 1998). The past history of industrialisation brought unsustainable use of resources and environmental pollution, and the primary reason for that is that the cost of environmental damage (=external cost) was not included (=internalised) as a managing expense (Schmidheiny 1992). In the shareholder approach, unless the predominant principle of pursuing economic objectives is changed, realising a paradigm shift in individual companies and the market will be difficult. This is because, in any approach focussing on economic efficiency of capital as its sole criterion, it is logically impossible to find ways either to develop the organisational abilities required to tackle current environmental issues or even to contribute positively towards these causes.

Thirdly, in environmental strategy, the shareholder approach pursues capital efficiency and offers no particular vision of environmental protection. On the contrary, in the stakeholder approach, environmental protection becomes an obvious subject, as it is treated as a stakeholder requirement to be satisfied, such as the Triple Bottom Line measurements. Awareness of corporate social responsibilities for environment and society and the perception to accept generated external diseconomy as cost are relatively weak in the shareholder approach, but relatively strong in the stakeholder approach. Such difference leads to different behaviours; avoiding burden as external diseconomy or internalising cost. As already pointed out, for sustainable development, cost internalisation of external diseconomy created in economic activities must become a principle in solving environmental issues. It has been proposed that reduction of CO_2 emissions to curb global warming must be done through internalisation of cost.

Fourthly, the two approaches also differ in the ideal of environmental accounting, causing a huge difference in environmental accounting method. The shareholder approach adopts a monetary accounting system centring on the evaluation of market value, while the stakeholder approach stresses a physical accounting method aiming at the mitigation of environmental impact. The former opts for market-oriented behaviour in order to maximise shareholder value, so monetary measurement becomes the biggest concern and the only method for evaluation. On the contrary, the stakeholder approach emphasises a material accounting method that allows measurement of environmental impact reduction in order to meet requirements of stakeholders with varied interests, including job security, life security, social welfare and environmental preservation.

We must note that the two approaches are represented as Ideal Typus. As mentioned earlier, a model of corporate governance in any nation or region was not always fixed, i.e. EU countries or Japan did not always adopt the stakeholder approach in their history. The development of capitalism started in Europe, and expanded to the US and Japan. In fact, the governance structure in a modern corporation, consisting of relationships among shareholders, board of directors and management, was basically the same in the legal system of each nation, apart from nations like Germany, where a co-decision system was implemented. We should also note variations in the stakeholder approach. Although Germany and Japan, or Germany and Italy, are equally called co-ordinated market economies, it has been found that they vary in employment system, inter-firm relationships and corporate governance (Hall and Soskice 2001).

The current shareholder approach has become more noticeable since the 1990s, as investment companies and financial organisations dealing with pension funds became more influential in the capital market. The trend has intensified with economic globalisation. The Enron and Worldcom scandals in 2001 were seen as failures of corporate governance, and to restrict management power considerably, the Sarbanes Oxley Act was established in the US in 2002. Aiming to reform corporate governance, the law, also known as the Public Company Accounting Reform and Investor Protection Act, demands tougher accountability for internal control and stipulates strict obligations and penalties. As a result, the shareholder approach has become more dominant in a capital market where ownership and free competition are highly regarded.

Together, the expanding capital market with accelerating free competition, plus the shareholder approach of corporate governance, only serve to create greater distance from the sustainable society ideal. Since the 1990s, triple bottom line reporting or corporate social responsibility has been stressed in the international movement tackling global environmental issues. In addition, the gap between the shareholder and stakeholder approaches has also widened.

In the stakeholder approach, some ambiguity is seen in the structure and function of corporate governance. Among multiple stakeholders, who can exercise controlling power, and how? Or, through co-operation of multiple stakeholders, what kind of controlling power is exercised in practice? It is difficult to explain these points about the stakeholder approach. Also, what kind of criteria should be applied to the results-based payment or decision-making process is unclear. It is hard to say that the structure of an organisation's administration and the criteria for corporate behaviour are clearly defined. Although the stakeholder approach in its nature is relatively compatible with sustainable society, large-scale systemic reform is required to realise the paradigm shift towards a sustainable society.

So a new model of corporate governance, distinct from existing models, is needed to take us towards sustainability. One view suggests the possibility of a socio-economic system where the two approaches are integrated into a hybrid model (Zugehör 2003); another sees that the gap between the two existing models is widening(hall and Soskice 2001). Whichever is more likely, it is hard to say that the two basic patterns of corporate governance are sufficient in themselves to realise a sustainable society. Also, we must ask how the environment can be brought into corporate governance and company management? A clear process must be created. Both approaches need to be complemented by environmental policy until they can competently deliver environmental programmes for sustainability.

Table 1. Comparison of the two approaches to environment

Item	Shareholder approach	Stakeholder approach
Corporate governance	Market-oriented	Relation-oriented
Pursued value as objective	Shareholder value	Stakeholder value
Criteria for management	ROE (return on equity)	Triple bottom line
Focussed efficiency	Capital efficiency	Distribution efficiency
Stability of organisation and employment	Relatively low	Relatively high
External diseconomy	No internalisation	Internalisation
Relationship with environment	Conflicting	Harmonious
Environmental strategy	Not obvious	Obvious
Focussed accounting system	Monetary accounting system	Physical accounting system
Social responsibility	Relatively narrow range	Relatively wide range

(Source) Author

5. Samples and analysis

1) Samples

To obtain empirical data, we conducted questionnaire survey in Japan and the US in 2007. Number of samples which are usable are 318 in firms and 162 in the US. Effective response rate is28.9% and 16.7% respectively. As for the industry classification, these samples were divided into assembly type industry and raw material /living-related industry. In Japan, each number of sample are152 and 166 respectively. On the other hand , it is 70 and 92 in the US respectively.

Firm size measured by the number of employees is classified as shown in the Table 2. For the structural equation modelling, samples are divided into more than 1000 employees and less than 1000. As a result,in Japan, It is 162 and 156 samples respectively. In the US, 92 and 75 samples respectively.

Table 2 Sample classification by firm size

Size of firm(employee)	Japan	US
100-less than 300	42	52
300 –less 1000	114	23
More than1000	162	92

2) Concepts and indicators

a) External factor. This is the concept which influences environmental management from outside. Government, community and customer are main outside stakeholders. From these outside stakeholders, we set three operational indicators for external concept ; government requirement, community requirement, and customer requirement. These observable variables are measured in 5 points scale.

b) Environmental strategy. Strategy is a decision making rules and framework which integrate goals , policy and a series of activities into consolidated system. It defines the choice of policy and direction of actions. We use as an operational variables priority of environmental management and organizational initiatives which include top leadership, voice of environmental mangers and employee participation.

c) Organization. Third concept is organization which consists of technological environmental practices and managerial system. The former include the practices of development and design, manufacturing , and waste /recycling The latter includes obtaining the certificates of ISO14001 , environmental reporting, and adoption of environmental accounting. These are measured as adopted, preparing, and not preparing.Each is give score as 3, 2 and 1 respectively.

d) Environmental performance.

This is the result realized or expected from the environmental behaviour. WBCSD showed several indicators for environmental performance. As it is difficult to obtain data of waste water, air exhausted and CO2 emmission from individual firms, in this paper ,we used score of perception on these indicators in the 5 points Likert type scale .

e) Economic performance. This is the outcome of activities in the economic terms. ROA, ROE, and Tobin'q are often used in the analysis regarding Porter hypothesis. We used perception data to get consistency of variables and indicators. Likert type 5 Points scale were used to measure the degree of activities in the indicators of economic effects, cost benefit, customer relationship, joint problem solving, and customer claims.

3) Results

Figure 1 shows the total results of 318 and Figure 2 shows the results of analysis by industry and by firm size in Japan. From this results, we find that there is a M type causal relationship in Japanese firms among main concepts of framework.. That is, there is a significant positive relationship between external factor and environmental strategy, between environmental strategy and organization, between organization and environmental performance, and between environmental performance and economic performance. This figure indicates the causal process from external factor and economic performance. And it shows the process of environmental management to achieve both economic and environmental performance.

The results of analysis of US firms are also shown in Figure 3 in total and Figure 4 by industry and firm size. Firstly, it is clear that organization does not have significant relation with external factor. Rather it is recognized that external factor is positively related with environmental strategy . Secondly , there is not significant relationship in any industry and size between organization and environmental performance. This implies that organizational effort to decrease the environmental impacts cannot be recognized causally.

(Insert Figure 1-4 here)

6. Discussion

Viewing this result with corporate governance as an institutional base, we can infer two facts from this result. Firstly, there is a significant relationship between external factor and environmental strategy in Japan and US. But, the impact from external factor to organization is not significant in Japan in all cases and in the US by industry and by firm size. With this results, it is clear that environmental strategy plays important role in the development of environmental management. Then we need to examine the meaning of this impact of environmental strategy on innovation of environmental technology and performance.

In Japanese firms with stronger stakeholder approach, external pressure on environmental management is recognized stronger than US. Then, company's policy and strategy reflect more this pressure in their action. But, many evidences in innovation study reveal that there are by and large process innovations and incremental innovations.

On the other hand, In the US firms, organization does not have significant relation to environmental performance. In total and big firms sample, there is a negative relation between them. In the US, even though the environmental strategy is recognized as a important factor, it does not mean a positive organizational practices to environmental performance. That is, there is limited practices to improve environmental performance. In the corporate governance with shareholder approach, firms tend to be passive to improve environmental performance since any environmental investments incur cost and decrease the profit for shareholders. As a result, strong regulation are generally needed to force environmental behaviour.

Secondly, we should examine the relation of environmental strategy to innovation. Strong perception of external factor by management is reflected in the strategic policy. The evidence indicates that, in Japan, firms tend to face the environment with incremental innovation to improve eco-efficiency, as shown in cost reduction and quality improvement through Total Quality Management. This is consistent with the findings by institutional economics which point out that coordinated corporate governance tends to focus on incremental innovations. On the contrary, in the US firms, even though external factor has positive impact on environmental strategy, it does not lead to substantial environmental behaviour to improve performance. Typically, the practice like ISO14001 is low in the US firms.

Thirdly, Porter hypothesis is not supported by our evidence. Substantial process to decrease the environmental burden is that external gives impact on strategy and it needs to influence actions and environmental performance. Therefore, it does not support the existence of mechanism that regulation stimulates innovations, and then leads to better performance environmentally as well as economically.

7. Conclusion

Firms in Japan and US have different backgrounds for environmental programmes, and their active environmental policies also vary. Each region or nation has undertaken its own environmental programme according to its distinctive corporate governance model and economic system. Companies and their economic, social and cultural base cannot be separated. Therefore, the environmental management practices and investment are deeply related with its institutional system. The decision of environmental management is done with the control of governance.

Since the 1990s, the two approaches of corporate governance have made a firm step towards sustainability. Triple bottom line or global compact as a broad basis of management became a guideline for international firms. However, companies have been taking on environmental measures under the restrictions of their corporate governance and economic system. Our results of analysis showed that the mechanism of environmental management is obviously different in Japan and the US. In Japan, as a stakeholder governance approach suggests, firms commit more clearly than US in environmental management. However, in both cases further reform is needed to achieve progress towards a sustainable society since we do not find any sufficient means to achieve sustainability. Making and strengthening environmental policy still has crucial importance.

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Appendix. Details of the questionnaire survey

1=Strongly disagree, 3=Neither agree nor disagree, 5=Strongly agree; 2, 4 are intervals

GOV: Governmental environmental regulations and mandates require significant efforts to meet.

COM: The community's demand for environmental performance is strong.

CUS: Customers demand a product / service that is environmentally friendly.

LDS: Leadership on environmental issues by top management is strong.

PAR: Participant of employees in environmental issues is strong.

VOI: Person in charge of environmental issues has a strong "voice" in the organization.

PRI: Environmental impact is a priority when making business decisions.

ISO: Your company has obtained ISO14001 certification. Yes=1, No=0

REP: Your company has an environmental report or a sustainability report. Yes=1, No=0

ACC: Your company has adopted environmental accounting. Yes=1, No=0

PRO: Your company makes an effort to improve environmental performance in the manufacturing process.

DSG: Your company produces eco-friendly design products.

RCY: Your company implements reuse and recycling practices.

WWAT: The level of waste water treatment in your company is good.

WAIR: The level of air emissions reduction in your company is good

CO2E: Your company is active in reducing CO_2 emission.

STA: Your company's market base consists of stable, long-term customers.

CLA: Customers complain about you company's products and performance.

(In this study, we use inverse score of CLA, 1→5, 5→1)

SOL: Your company often cooperates with buyers to solve problems.

BEN: The company's efforts to improve environmental practices have had a positive effect on financial benefit.

OVER: Financial returns from environmental efforts outweigh costs of such efforts.

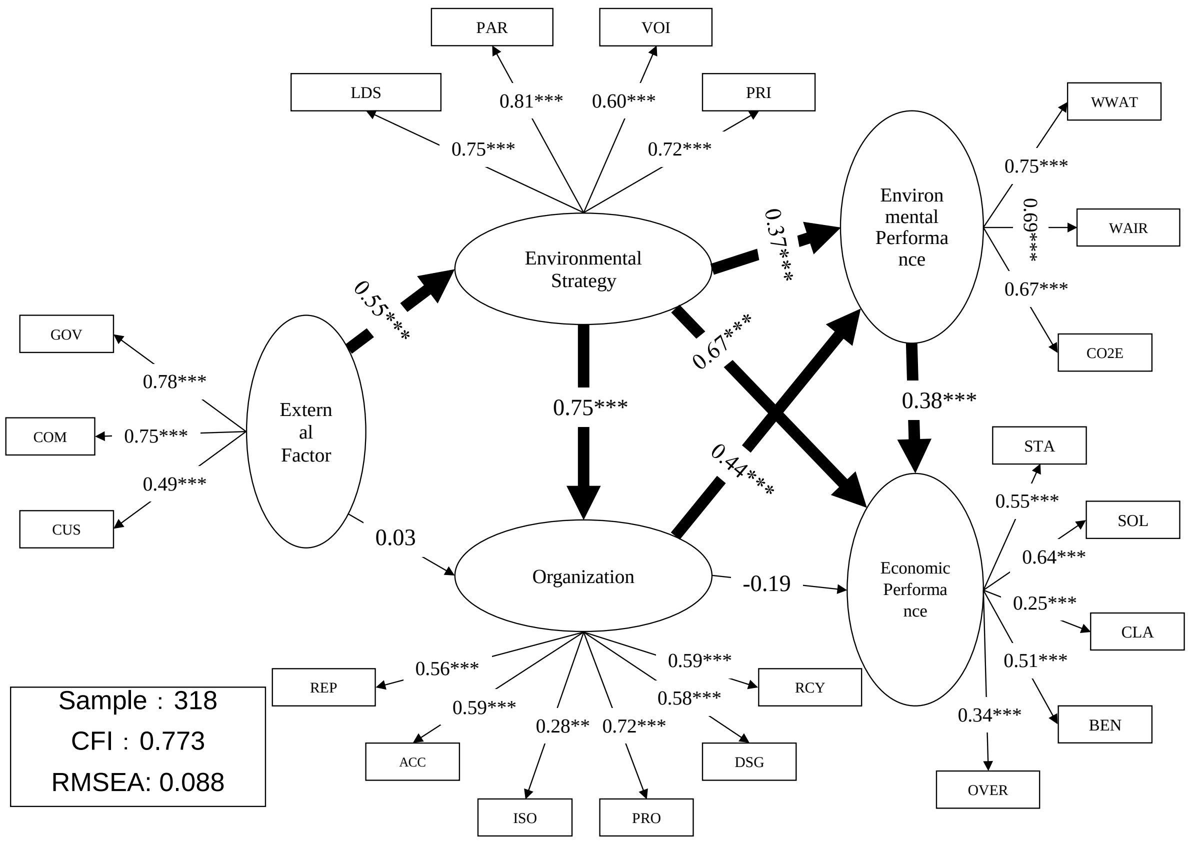

Figure. 1 Japan, all

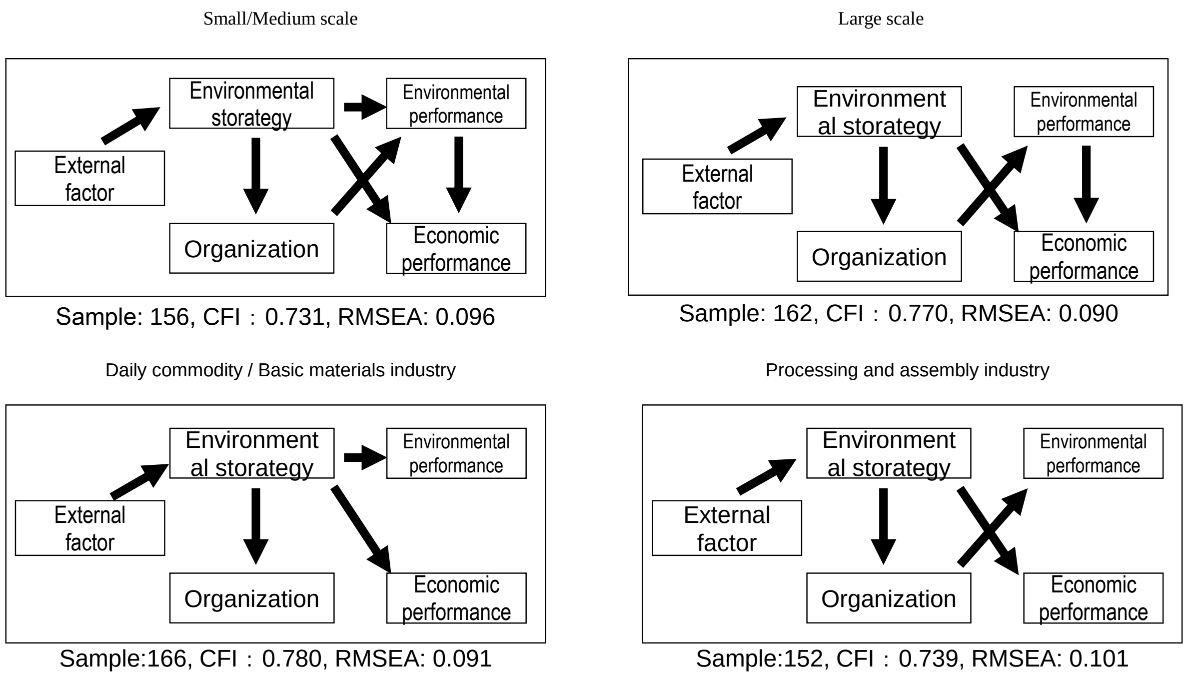

Figure. 2 Japan, by scale, by type of business

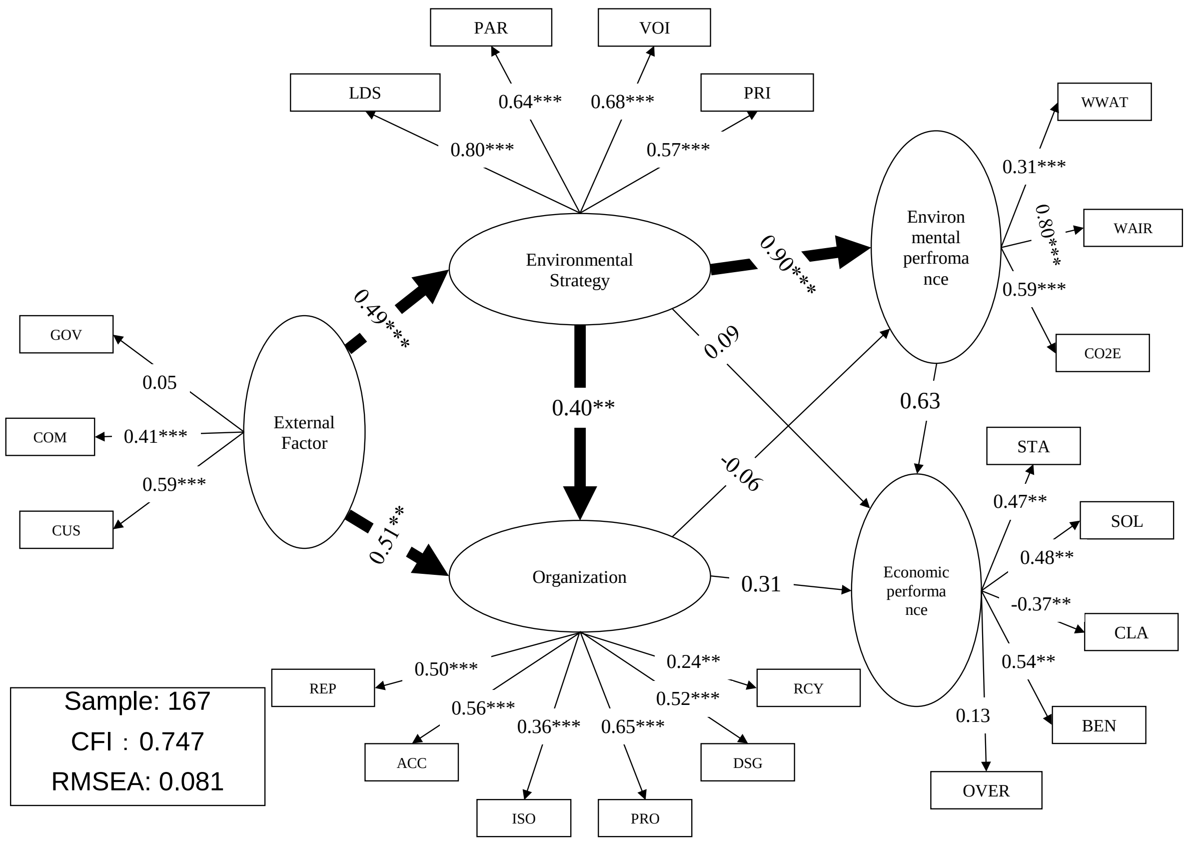

Figure. 3 U.S. all

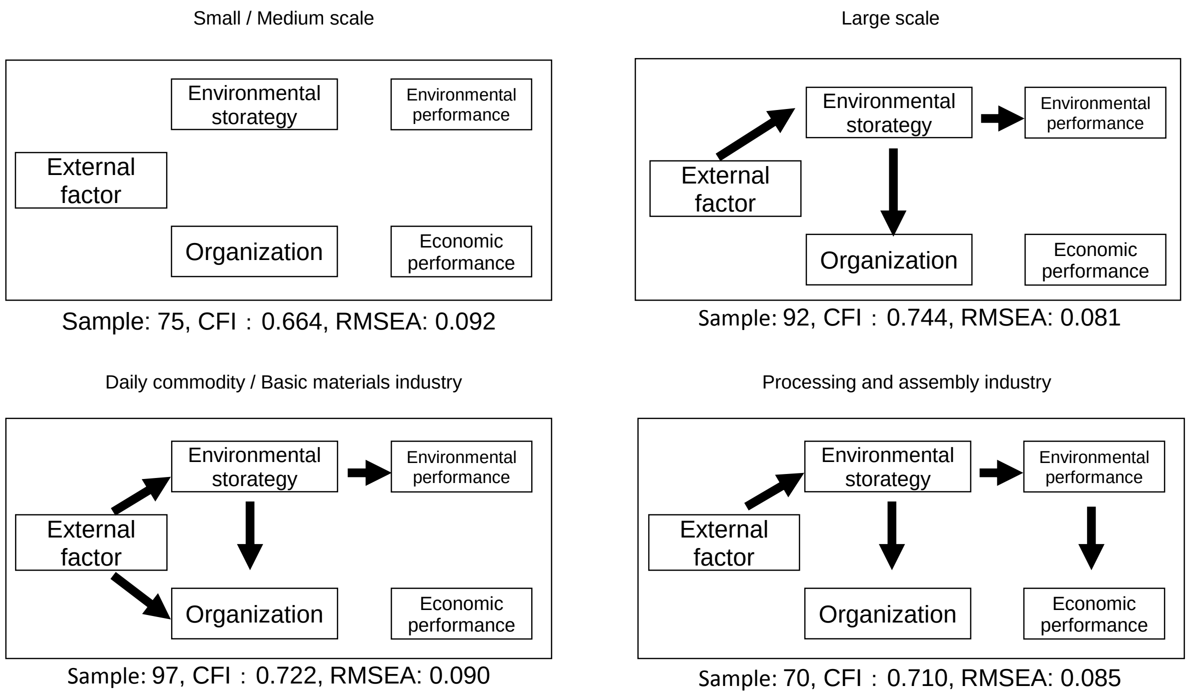

Figure. 4 U.S., by scale, by type of business