Internalisation of an externality and profitability:
Based on an empirical study of in the food industry

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Abstract
The objective of this research was to verify empirically that internalising externalities of private enterprises contributes to profitability on a long-term basis. One of the significant transitions of the economic environment globally at the beginning of this century has been the rapid economic growth of emerging countries. On the other hand, there is apprehension also about various social problems due to the rapid industrialisation of such emerging countries, or improvement in the living standard. Political-economist Malthus (1798) warned of such a drain on resources and energy, and the ravaging of the natural environment at the beginning of the nineteenth century. Present-day Malthusians warn of ruin because of the exhaustion of resources and environmental deterioration resulting from active business activity. This aims to tighten up regulations as "a governmental role" to the so-called "market failure." Mill (1848) introduced the concept of "stationary state" in the "philosophy of economics." On the other hand, Robert Solow (1956) highlighted the significance of technological progress as a factor of economic growth. In terms of the positive role of a private company, Porter et al. (2011) called it the strategy of shared-value creation. It is internalisation of the externality on a market transaction.

In terms of research methodology, statistical verification was carried out based on the sustainability statement, the various publicity materials and the financial data released by each company. In conclusion, when private enterprises adopt sustainability activity positively, a consumer value, corporate value and social value are expanded cyclically.

1. Introduction
The objective of this research was to verify empirically that internalising externalities of private enterprises contributes to profitability on a long-term basis. In order for a company to sustain growth rather than to pursue short-term profits, it is desirable to manage a relationship with various social stakeholders, and to continue developing within a society. Conventionally, such an activity of a business is classified as a corporate society responsibility (CSR). The conventional CSR activity was hardly positioned in the growth strategy itself. The main purpose of CSR was risk reduction when growing, and dispensation by partial reduction of profit. However, a CSR activity has come to be positioned more positively nowadays. A social activity is often an opportunity for growth in a company, and is regarded as a main business objective. Hence, the sustainable strategy of aiming at improvement in the triple bottom line which combines economic efficiency, sociality and the environment of the company has attracted attention.

As one of the big socioeconomic environmental transitions in which such a sustainable growth strategy came to attract attention, the extension of emerging countries can be highlighted. One of the significant transitions of the economic environment globally at the beginning of this century has been the rapid economic growth of emerging countries, such as those in Southeast Asia, South Asia, South America, the Middle East, Central and Eastern
Europe and Africa. For example, in Africa, although the economic growth in the northeast of the continent or the Republic of South Africa was achieved in the twentieth century, the future economic growth of the countries of Sub-Saharan Africa attracts attention now. In these latter countries, sickness and poverty spread following colonial rule, racial dispute, etc. Now, the huge natural resources, young population and high potential of infrastructure construction demand are of interest. At present, Chinese companies, as well as others, are leading the economic development. And in urban areas, the living standard is also improving quickly. On the other hand, there is apprehension also about various social problems due to the rapid industrialisation of such emerging countries, or improvement in the living standard. For example, there is increasing expenditure on important foodstuff and natural resources, growing environmental pollution and ever-widening economic discrepancy between the small number of wealthy and much larger population of poor people. The developing countries which once supplied raw materials such as foodstuff to developed countries are now turning into huge consumers. For example, the amount of consumption of foodstuff or natural resources in China has increased, and it has already become an importing country. Environmental pollutions including air pollution are also of significance lately. It is reported that food security or safety are threatened by unlawful production increase of foodstuff by some businesses.

Political-economist Malthus (1798) warned of such a drain on resources and energy, and the ravaging of the natural environment at the beginning of the nineteenth century. He described a scenario of poverty and ruin due to population increase and scarcity of food, and in order to prevent this, he endorsed population restraint. Present-day Malthusians warn of ruin because of the exhaustion of resources and environmental deterioration resulting from active business activity. The solution, they assert, is restraint of resource utilisation. This aims to tighten up regulations as "a governmental role" to the so-called "market failure." Mill (1848) introduced the concept of "stationary state" in the "philosophy of economics." If a stationary state is seen from outside, national income, expenditure, etc. are constant, but in fact, people are very active; there is continuous new technology and cultural reform, and people's interchange is also active. Mill's "stationary state" may be equivalent to today's "sustainable" concept. On the other hand, Robert Solow (1956) highlighted the significance of technological progress as a factor of economic growth. According to Solow, the crisis of a global environment can be overcome by "innovation." Although completely contrastive, each theory has valid aspects. A restraint according to a certain regulation as regards environmental problem may be a necessity. Furthermore, innovation is promoted by the efforts of private enterprises which want to clear environmental regulation. Innovation often requires technical accumulation, and since there is a factor of serendipity, the success of an innovation takes time. The company which succeeds in innovation which requires time and solves a social problem receives high praise socially, and achieves a sustainable competitive advantage. Therefore, it is internalisation of the externality on a market transaction.

In terms of the positive role of such a company, Porter et al. (2011) called it the strategy of shared-value creation. Creating shared value (CSV) within a company and a society can attract attention with the expansion of enterprise activity, as well as trans-nationalisation. CSV is a corporate strategy which aims to achieve sustainable growth on a long-term basis by coexisting with society rather than merely maximising short-term profits. For example, with regard to the conventional food industry, the trans-nationalisation of production has often provided developing countries with the possibility of exploiting cheap labour, leading to environmental pollution. In relation to CSV strategy, a company can support innovation in a production area and self-controlling improvement in earnings, while environmental protection and improvements in product quality can be promoted through sustainability. Generally,
raising the yield of foodstuff production and improving the safety of food tends to bring about an opposing result. Innovation is required in order to attain both simultaneously. Innovation in a production area may not simply be attained by introduction of existing technology from a developed country. If a production area develops actively and creatively, the efficiency and safety of production may be improved more. If a production district realises that a contrivance also leads to profit, it will be able to go into the self-controlling good expansion cycle. For this purpose, the multinational firms of developed countries need to change the strategy of concentrating on research and development and other managerial resources in a home country, and aim at a scale merit. It is required that a multinational firm adopts innovation in a production area positively over long-term basis. By such localisation, a multinational firm can be differentiated from the other company and a sustainable competitive advantage may increase.

Information disclosure about not only accounting information but also environmental or social effort is required as a social responsibility of enterprise, with regard to development of the discussion on sustainable growth. Also, there has been movement towards an international standardisation in relation to the format of information disclosure on environment and society. Moreover, the contents of the information to disclose are becoming wide-ranging year by year. The activity concerning the conventional sustainability of a company has been disclosed through a CSR statement. Nowadays, the various environmental and social activities, as well as CSR are released in information which constitutes a sustainability statement. However, in many previous empirical studies, the conventional corporate social responsibility (CSR) activity of a company has not always correlated with corporate performance. Each research finding may involve a positive correlation, a negative correlation or no correlation. The considerable differences in those previous research findings were related to the intermingling of industries, companies, activities or scales being. The stance in relation to a conventional CSR activity was often a derivative activity for a company to carry out business. However, a sustainable activity may be regarded as the strategy of finding a new market or raising competitive advantage. Companies which realise that sustainable activity is an opportunity to raise corporate value may also be increasing in number. Thus, definition of sustainable activity may be diversified by a company or industry, so that a sustainable activity is closer to the core business of a company.

In this research, attention is especially paid to the sustainability of the supply chain of international foodstuff as mentioned above. It is considered to be a key to sustaining the growth of a foodstuff company by adopting innovation on a long-term basis, in order to achieve expansion of production and improvement in "safety and security" simultaneously. The focus of the research is multinational large-scale corporations of the Japanese food industry, and the possible items of a sustainable strategy suitable for conditions peculiar to the food industry were investigated. In terms of research methodology, statistical verification was carried out based on the sustainability statement, the various publicity materials and the financial data released by each company.

2. Previous researches
2-1. CSR and firm profitability

First, previous studies on CSR and corporate performance are reviewed. A number of such studies have indicated that CSR and corporate performance are positively related. Waddock and Graves (1997) developed two hypotheses concerning the relationship between CSR and corporate performance: 1) if corporate performance was good, CSR would be addressed (the slack resource hypothesis); the company would see good earnings as a result of addressing CSR (good management hypothesis). Through analysis of data from a US firm, the relationship between CSR and corporate performance was found to be positive in both directions. According to McGuire et al. (1988), business results greatly influence the extent to
which a CSR policy is followed, meaning that consideration is given primarily to financial results and then to social responsibility. Moreover, in terms of the relationship between CSR and business results, they found that CSR is not directly linked to following strong business results, but that first risk is reduced and this then leads to high financial results in the future. Orlitzky et al. (2003) undertook a meta-analysis of approximately 52 empirical studies performed in relation to sociality, such as environmental countermeasures and financial business results in the 30 years after the 1970s. According to this study, there is a significant positive correlation between financial business results, price earnings and societal or environmental performance; their results also verify the existence of mutually complementary cause-effect relationships on the basis of a time series analysis.

On the other hand, Mahapatra (1984) and Jaggi and Freedman (1992), amongst others, found a negative relationship between CSR and corporate performance. According to Mahapatra (1984), eco management (or social responsibility) and financial business results are negatively related. Aupperle, Carroll and Hatfield’s (1985) study indicated CSR and corporate performance are not related. Similarly, Ullman (1985) observed no significant trend between CSR and corporate performance and McWilliams and Siegel (2000) found that CSR has a neutral impact on corporate performance.

Vogel (2005) noted that no decisive conclusion has been reached about the relevance of social responsibility for revenue in a company. It has not yet been proved whether more responsible action suits the self-interests of all companies or whether CSR always takes a margin of the profit. Moreover, the direction of the correlation between CSR and profit is undetermined. Financial success may be a cause of social responsibility or an effect. The various study results reported here suggest that there may be high potential for a positive relationship between CSR and corporate performance in general, but it could be negative, or the two could be unrelated. To date, there is no positive established theory.

2-2. sustainability

According to Hart (2007), “sustainability” is a keyword in shareholder value, which leads human beings to a sustainable society. The umbrella term “sustainability” covers many different ways of thinking, issues and concepts and modes of practice. The degree of involvement can be described using a 2x2 matrix: the first axis is today/tomorrow and the second axis is internal/external an organisation. A strategy and a return are considered for each of the four quadrants:

1) Today/internal: pollution prevention (reduction of cost and risk).
2) Today/external: product stewardship, reputation, fairness.
3) Tomorrow/internal: clean technology (innovation, repositioning).
4) Tomorrow/external: the BOP (growth, route).

Pollution prevention involves reducing waste or emissions resulting from the current business activities of the company, and thus reducing cost and risk. Product stewardship is a strategy covering not only the company but all stakeholders in a supply chain. Many multinational firms have confronted problems with fairness in relation to the whole supply chain through consumer strikes, labour disputes in emerging countries, etc. Clean technology is not the continuation of conventional industrial waste suppression technologies. For example, the structural design of products which can easily be disassembled is included in this. The innovation of internal capability which changes the ways of thinking and routines of a company dramatically and results in a repositioning of the use of sustainable technology is necessary. The BOP market is essential in order to take the lead and meet the need for future economic growth. The majority of large-scale corporations which have targeted rich customers in developed
countries are indifferent to BOP needs and cannot manage this huge market of four billion people. Successful cases are rather exceptional.

2.3. creating shared value

Porter et al. (2011) described the difference between conventional CSR and a CSV strategy, taking fair trade as an example. Shared value is not about personal values. Nor is it about “sharing” the value already created by firms—a redistribution approach. Instead, it is about expanding the total pool of economic and social value. A good example of this difference in perspective is the fair trade movement in purchasing. Fair trade aims to increase the proportion of revenue that goes to poor farmers by paying them higher prices for the same crops. Though this may be a noble sentiment, fair trade is mostly about redistribution rather than expanding the overall amount of value created. A shared value perspective, instead, focuses on improving growing techniques and strengthening the local cluster of supporting suppliers and other institutions in order to increase farmers’ efficiency, yields, product quality and sustainability. This leads to a bigger pie of revenue and profits that benefits both farmers and the companies that buy from them. Initial investment and time may be required to implement new procurement practices and develop the supporting cluster, but the return will be greater economic value and broader strategic benefits for all participants.

Porter et al. (2011), furthermore, described use of resources, the procurement and location strategy, which seems to be useful in order to consider the sustainable strategy of the food industry. Regarding resource use, heightened environmental awareness and advances in technology are catalysing new approaches in areas such as utilisation of water, raw materials and packaging, as well as expanding recycling and reuse. The opportunities apply to all resources, not just those that have been identified by environmentalists. Better resource utilisation—enabled by improving technology—will permeate all parts of the value chain and spread to suppliers and channels. Landfills will fill more slowly.

Regarding procurement, the traditional playbook calls for companies to commoditise and exert maximum bargaining power on suppliers to drive down prices—even when purchasing from small businesses or subsistence-level farmers. More recently, firms have been rapidly outsourcing to suppliers in lower-wage locations. Today, some companies are beginning to understand that marginalised suppliers cannot remain productive or sustain, much less improve their quality. By increasing access to inputs, sharing technology and providing financing, companies can improve supplier quality and productivity while ensuring access to growing volume. Improving productivity will often trump lower prices. As suppliers get stronger, their environmental impact often falls dramatically, this further improves their efficiency. Outsourcing to other locations and countries creates transaction costs and inefficiencies that can offset lower wage and input costs. Capable local supplier’s help firms avoid these costs and can reduce cycle time, increase flexibility, foster faster learning and enable innovation. Buying local includes not only local companies but also local units of national or international companies. When firms buy locally, their suppliers can get stronger, increase their profits, hire more people and pay better wages—all of which will benefit other businesses in the community.

Regarding location, until now, many companies have thought that being global meant moving production to locations with the lowest labour costs and designing their supply chains to achieve the most immediate impact on expenses. In reality, the strongest international competitors will often be those that can establish deeper roots in important communities. Companies that can embrace this new locational thinking will create shared value.

3. Hypotheses
The aim of this research is to verify quantitatively the relationship of the sustainability activity and profitability in the food industry. According to previous researches, conventional philanthropic activities or environmental activity were not often correlated with improvement in the financial result of a company. Various activities are included in conventional philanthropic activities. For example, they are granted by re-distribution of profits, the activity for avoidance of sudden risks, such as a suit, etc.

The sustainability strategy in this research is distinguished from conventional CSR, such as the risk-hedge aim. The sustainability strategy is considered to be a growth strategy as a main business by a business firm. Below, the relationship of each component and revenue is clarified. That is, conventionally, social problems, such as the safety of food and economic discrepancy between wealth and poverty, were the responsibility of governments, for example, regulation and support. However, the social problem can serve as a business opportunity for the sustainable growth of a company. It is possible to cover a social problem on the surface and temporarily by government regulation or economic support. However, when a company achieves innovation for the solution of a social problem, this may be solved through sustainability and fundamentally. This is the so-called internalisation of externality. The high cost for pollution removal, which is imposed on a company by regulation, is reduced by innovation, and can improve profitability. Innovation requires long-term effort. Once a company finishes an innovation, for the other company to catch up will also take time. Therefore, an innovation serves as a sustaining competitive advantage. And the company which solves such a social problem may be able to get high praise from consumers or local people. As a result, the company may be able to achieve high profitability on a long-term basis and stability.

According to previous research on sustainability, the component is classified into the following:
1) Today/internal: pollution prevention (reduction of cost and risk).
2) Today/external: product stewardship (reputation, fairness).
3) Tomorrow/internal: clean technology (innovation, repositioning).
4) Tomorrow/external: the BOP (growth, route).

The component of the sustainable strategy of a multinational firm in the food industry is categorised using this previous research. As a presupposition, the viewpoint of the sustainability strategy in this paper is improvement in long-term corporate earnings, and belief that social value can be raised simultaneously.

The first category is pollution prevention. Considering the food industry, it is a sustainability strategy connected to the production or distribution of food. Generally, in order to increase the production of food, the amount of agricultural chemicals used is increased. A production cost can be lowered if the efficiency of production can be improved by using a natural revival mechanism appropriately, without increasing excessively the use of agricultural chemicals. The increase of agricultural chemicals may of course increase production easily. However, if it continues to destroy a natural ecosystem, the production itself may become difficult on a long-term basis. In order not to use agricultural chemicals but instead adopt a natural revival mechanism, the time and effort of many researchers are necessary. However, if it is realisable, it can become a sustainable competitive advantage. To expand the production of food, large water resources are needed. In order to realise food production increase, construction is necessary and this at a great cost. Reduction in expense is possible if the amount of water used can be reduced by technological innovation.

Of course, it is not only improvement in the revenue of a company that is of importance, but also social problem-solving, in order to reduce the use of agricultural chemicals and to raise the utilisation performance of water resources. The use of agricultural chemicals will threaten human health along various paths in the food chain. Moreover, a natural
ecosystem may be destroyed if surrounding forest land continues to be cut down to increase food only for humans. The environmental impact can be lessened by reducing the use of agricultural chemicals and continuing to sustain a natural ecosystem. Therefore, the following hypotheses are formulated:

H1. The company which adopts innovation and reduces use of agricultural chemicals in food production increases revenue on a long-term basis.

H2. The company which adopts innovation and reduces the amount of water resources used in food production increases revenue on a long-term basis.

The second category is product stewardship. When considering a sustainability strategy from the viewpoint of a business, it is important that there are customers first of all. That is, an innovation requires an expense, and if revenue which exceeds an expense is expected, a company will adopt innovation. In all probability, as regards product stewardship in the food industry, it is food safety and security which consumers feel is of value. Thus, in a production area, the safety and security of food is specified to consumers and the source of food becomes clear. It is expected that consumers consider this to be of high value and customers increase in number, so that the production area adopts innovative cultivation methods, such as reduction of agricultural-chemicals use, strict supervision of a raw material, organic agriculture, etc. Furthermore, if the production area is philanthropic, in terms of nature conservation, a good relationship may be built with consumers with higher social consciousness. If such customers increase in number, the company can promote innovation in the development or supply of safe and secure food. This leads to increase in social-problem solving, namely, protection of the natural environment. Therefore, the following hypotheses are formulated:

H3. The company which clarifies the area of food production, and promotes the safety and security of food, increases revenue on a long-term basis.

The third category is Clean Technology. Considering the food industry, it is an innovation in terms of improving resources efficiency, such as food and materials. To improve resources efficiency, not only reduction of waste in the productive process of food but also its recycling can be considered. In addition to food, as an object of recycling, water resources, the containers or labelling and packaging materials in a distribution process are also considered. Furthermore, innovation in reuse by commercialisation of waste is also possible. It is possible for a company to produce, reduce a distribution cost and improve profitability by these innovations. Of course, reducing food and other rejections and improving resources efficiency leads to a reduction of the public cost in waste disposal. This also leads to a reduction in environmental impacts in, for example, a production area, and to the creation of a shared value.

Alternatively, innovation in the reduction of the environmental impact in a production or a distribution process is considered. For example, there is reduction in CO2 emissions, use of renewable energy, etc. If a company succeeds in innovation which reduces CO2 emissions, secondary revenue may be achieved through emission trading. And although this may lead to a direct upturn in the factor of cost, use of renewable energy raises good reputation of consumers, contributes to sales indirectly and may improve profitability. Therefore, the following hypotheses are formulated:

H4. The company which adopts innovation in the improvement of resources efficiency in terms of food or materials in food production or distribution increases revenue on a long-term basis.

H5. The company which adopts innovation in the reduction of environmental impact in food production or distribution increases revenue on a long-term basis.

Finally, the fourth category is a BOP business. As regards BOP business in the food industry, assistance for the production area in emerging countries can be considered. The conventional aim of trans-nationalisation of the production area in the food industry was often
only about obtaining a cheap workforce. However, if a production area makes efforts to improve the productivity and safety of food autonomously, via the transfer of technology or monetary assistance to a production area from a multinational firm, it may succeed in the original innovation which took into consideration the local traits. The workers of the production area will try hard if higher earnings can be gained from innovation. And if food of a higher quality is more efficiently produced by the self-controlling innovation of a production area, this can contribute to the profitability of a multinational firm. If the living standard of a production area improves, a new market may soon spread. Of course, this leads to solutions for various social problems in a developing country, such as correction of the economic discrepancy and eradication of sickness or ethnic conflict, and can create shared value with a society. Therefore, the following hypotheses are formulated.

H6. The company which assists the production area of an emerging country in food production increases revenue on a long-term basis.

4. Verification
4-1. The verification approach

The aim of the present study is to verify empirically whether the company which adopts sustainable strategy improves profitability on a long-term basis. This is based on the latest public information that the company discloses in the food industry. In order to evaluate global sustainability activity including a BOP business as an object of verification, a Japanese multinational firm was selected. Furthermore, the companies which have released sustainable activity positively were selected. As a result, the large-scale corporations which have a margin in managerial resources were selected. Moreover, it takes a long time for the achievement of sustainable activity accompanied by a long-term innovation to be reflected in revenue. Since it was necessary to evaluate long-term achievement until an activity is reflected in revenue, the analytic period covered was 10 years. The sustainability activity and financial achievement from 2002 to the 2012 fiscal year were compared. Therefore, the enterprise which underwent significant transition in structure, business category, etc. in these 10 years was excluded from the analysis. As a result of the above sorting, 22 companies which met all the conditions were selected for analysis.

4-2. Appraising of sustainability activity

Each sustainability activity was analysed as regards the multinational firm of the food industry selected, in order to verify each of the abovementioned hypotheses. Sustainability activities were extracted from the sustainability statement, the CSR statement, Press Releases, or company homepage of the preceding 10 years of each company. A sustainability activity is text information, although the financial measurement can obtain the information expressed numerically. Therefore, the context of the various statements of each year was read; when there was a positive enrolment about each sustainable activity, this was categorised as 1, and when other, this was categorised as 0. As a standard set to 1, the activity which has a positive enrolment by 3/5 or more time periods in the preceding 10 years was set to 1.

4-3. Verification result

The following statistical analyses were conducted for the hypothetical verification. In a statistical analysis, a valuation of the abovementioned sustainability activity serves as an explanatory variable. Also, the rate of change of the sales amount of the preceding 10 years in the financial statements of each company serves as the objective variable. First, since the sustainability activities written in the sustainable statement varied, they collected explanatory variables by the principal component analysis. The correlation analysis was conducted between
each principal component and an objective variable after it. SPSS ver.21 by International Business Machines was used for each statistical procedure.

1) Principal component analysis

Four principal components were extracted as a result of the principal component analysis of an explanatory variable. Accumulation of the sum of squares of the loading dose of four principal components was 79.959%. The first principal component consists of items, such as clarification of a production area, reduction of the use of agricultural chemicals, reduction of the amount of water used and assistance for an overseas food production area. This first principal component can be called "safety and security of food". The second principal component consists of items such as recycling of disposal water, recycling of container packaging and commercialisation of waste. This second principal component can be called "recycling reuse". The third principal component consists of items such as reduction of CO2. This third principal component can be called environmental impact. The fourth principal component consists of items such as use of renewable energy. This principal component can be called energy.

2) Correlation analysis

Next, the correlation analysis of each of the abovementioned principal components and the rate of change of the revenue of the preceding 10 years, which is an objective variable, was conducted. The result of the correlation analysis is a passage of table 1 (* indicates 5% of the significance level). As a result of the analysis, both the first principal component and the second principal component correlated with the revenue significantly. On the other hand, the third principal component and the fourth principal component were not significantly correlated with revenue.

<table>
<thead>
<tr>
<th>the principal component</th>
<th>correlation coefficient</th>
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<tbody>
<tr>
<td>1. safety and security of food</td>
<td>.530*</td>
</tr>
<tr>
<td>2. recycling, reuse</td>
<td>.533*</td>
</tr>
<tr>
<td>3. environmental impact</td>
<td>.032</td>
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<tr>
<td>4. energy</td>
<td>.283</td>
</tr>
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Table 1. the result of the correlation analysis

5. Discussion

1) Consideration of a statistical-analysis result.

Each of the abovementioned hypotheses is verified based on a statistical-analysis result. First, the "food safety or security" principal component, which is the first principal component, came to possess three of the abovementioned hypotheses, pollution prevention, product stewardship and a BOP business. And the first principal component was correlated with the revenue. It is very interesting that the factors of pollution prevention, product stewardship and a BOP business were closely related statistically. When a company considers a sustainability strategy, it is necessary to satisfy consumers' needs. Consumer purchase is promoted because consumers recognise the production area and the source of food and perceive that they are of reasonable price. It is considered that the decrease of agricultural-chemicals use and nature conservation relate closely to whether consumers feel that production area or the source of food are proper. Innovation is necessary in order to perform agricultural-chemicals reduction and nature conservation without a superfluous upturn of cost. Such innovation is considered to be easy to achieve when a production area responds to the environment and real conditions actively. Furthermore, consumers may feel empathy towards the active social-problem solving in the production area by a food manufacturing firm, and this may increase purchase. Such links lead to the growing improvement of corporate value, and improvement in social value. Thus, the hypotheses 1, 2, 3 and 6 were verified.
Next, the "recycling reuse" principal component – the second principal component – is related to Clean Technology in the abovementioned hypotheses. Recycling and reuse of waste tend to contribute to rising costs in a company. If recycling and reuse are compulsorily performed by governmental regulation through Pigovian tax, etc., it should become a decrease-in-income factor at least in the short term. However, it is desirable that recycling and reuse have positive influence on long-term revenue in the results of this statistical analysis. In order to overcome a regulation, a company may adopt various innovations, and this may be making it contribute to revenue on a long-term basis.

On the other hand, neither the environmental impact principal component, which is the third principal component, nor the energy principal component, which is the fourth principal component, was linked much to improvement in revenue. While hypothesis 4 was verified, hypothesis 5 was rejected. CO₂ emission rights trading may be an excellent idea. However, in practical terms, it may hardly change consumers' buying behaviour and may not be connected so much to the innovation of the company. Only by the amount of CO₂ being re-allocated by the pecuniary transaction, the whole amount of emissions does not lessen. Such an environmental-protection scheme following the Kyoto Protocol includes various problems, such as confrontation between developed countries and a developing country, and thus further knowledge may be necessary. Solution for an energy problem is also very difficult. In particular, there was a terrible nuclear power plant disaster in Japan recently, and the direction of the energy problem was greatly changed in this decade. Renewable energy is still technically immature and there has been a large cost increase in power supply. Solutions for these problems will still be required from further political and technical effort.

2) Qualitative analysis by a case study

Finally, in addition to a quantitative analysis, the case study of one of the companies investigated quantitatively is carried out.

The KIRIN group formulated the procurement guideline and acting programme for the ecological preservation of a raw-material producing country in 2013. It is a countermeasure for the tea beverages that are the main items of KIRIN, which uses the quarter of the tea import volume from Sri Lanka to Japan. KIRIN provides financial support so that the plantation which grows the tea leaf can acquire an international certification of ecological preservation, and it expands the procurement from a certification plantation.

That is, according to "the sustainable bio-resource procurement guideline", upon which KIRIN decides, large-scale plantation from illegal deforestation is avoided, and raw material is supplied from the plantation and forest which acquire an international third party certificate. In the "bio-resource utilisation acting programme" based on the guideline, the procurement standard and the goal were each set up for three items of tea, paper, or a printed matter, and palm oil. What is focused on most is a countermeasure against the tea beverage in which Kirin Beverage has a great share. KIRIN evaluates the sustainability of a tea plantation and procurement from the plantation of high sustainability. The annual inspection of progress is carried out. As regards paper or printed matter, all the containers or labelling and packaging materials will be changed in order to conform to guidelines by 2015. The whole quantity of palm oil will be adapted to an international certification by 2015. In terms of the procurement of tea, KIRIN not only sorts out the plantation of a place of purchase, but also supports the third party certificate. A total of five million yen will be allocated to four plantations in Sri Lanka as a first phase in 2013. Funds are used on training, such as talented-people education, so that RA certification can be acquired. An international NPO Rain Forrest alliance (RA, City of New York, U.S.) examines RA certification from the viewpoint of protecting tropical rain forests, wild animals, and fountainheads. The number of plantations in Sri Lanka where Kirin Beverage
purchased tea leaves was about 130 as of 2012. About 40 percent of these have already acquired third party certificates, such as RA. KIRIN supports plantations and expands the ratio of a certification plantation. From this survey, the efforts of, for example, the KIRIN group have been confirmed in many companies which have expanded revenue on a long-term basis.

6. Conclusion, research limitations, further research

The objective of this research was to demonstrate empirically that the sustainability activity of private enterprises contributes to revenue on a long-term basis. The main focus was the food industry, which is one of the industries closely related to the natural environment and human lifestyle. In the past, in the food industry, raw materials in large quantity and at a low cost were often supplied, without thinking of the importance of the natural environment overseas and the work environment of a production area. However, in order to realise sustainability, raw material which is of high quality and safe to use made it necessary to consider the natural environment, work environment and personnel training in a production area. As a result of such effort, the food business can achieve sustainable profit by providing consumers with safe products that are low cost and good quality. Various social concerns, such as economic discrepancy in a production area, are also solved, and the shared value of a company and society is created. The same conclusion was drawn from the quantitative and qualitative analysis of this research.

In previous empirical studies on CSR activity and financial results, correlations were not always coherent. A contribution of this research is focus on the sustainability activity of a food business, and clarifying the effect of sustainability activities on revenue. When private enterprises adopt sustainability activity positively, unlike a simple redistribution of profits, a consumer value, corporate value and social value are expanded cyclically. The implication of this research is a message to a business administrator, for example. A business administrator may have confidence in the investment in a sustainability activity because good circulation with a sustainability activity and profitability is clear empirically.

As research limitations, the survey was limited to the major multinational firms in Japan, and there were not many survey samples in this research. A future objective is to extend the survey and to make a comparative study between the companies of various countries.

References


