

The Sustainability Theorem in the ESG Mechanism

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Abstract

The global market failures might cause critical crises fluently. The crises recognize us that the global communities have become to accompany the fragile global government failures. Even a small crisis has been experienced to grow into a grate scale of global crisis. We have to be more sensitive for many types of risk and to be more serious for preventing from various risks. The ESG (Environment, Society, Governance) methods is expected to clear up the swelling risks in economic, social and environment systems and to guide the integrated communities system to sustainability. ESG approaches are not only concerned with reducing risks but also with opening the door to improving economies and societies with the responsible investment on innovations. The ESG scheme should appear a new type of social reform to cover a large scope of communities. We provide a theoretical analysis by using a synthetic model for the system. The impact of the ESG scheme could be evaluated by cost benefit analyses. If the welfare analysis makes clear the social impact in the ESG methods, the approach in this paper could make a complete view on the reconstruction triggered by the ESG scheme.

The complete model focuses on the methods on communication and evaluation by the stakeholders for sustainability. In the model analysis, we argue that the ESG scheme could make foundation on the reforms for developing communities. The model analysis demonstrates that the ESG system could promote sustainability by activating the regional competitive and cooperative system, and that the methods of ESG present the guiding principles on investment for social innovation and sharing economies.

1. Introduction

The post industrial society tends to be declining the weight of large scale manufacturing industries in the world economies. The regions and the populations benefited from the economic growth are shrinking clearly¹. The globalized markets

¹ Richardson, H.W. and C.W.Nam (eds)(2014) research many types of the shrinking cities.

have not only enlarged market economies but also appeared diversified consumers and suppliers. The corporation should communicate not only with large members of several stakeholders but also even with some anonymous stakeholders. The multinational corporations must be confronted with fierily competition for the global market and with market and social risks not to be anticipatable. They may become more vulnerable on the business troubles and are afraid of turning into the passive mind. The rapidly growing market systems have been distracting social and natural infrastructures. Although we must restore the sustainable economical, social and environmental systems, the social and environmental issues are recognized as global market and government failures and increase negative pressures on them. The prospects of global economies become to be depressed by foggy and risk full issues deeply. Since the global economies seem to be trapped to turn into the slow downing trends apparently, we should attempt to clear up the cloud filled with many risks. The globally developed discussion on the sustainability seeks the construction of integrated global system for the sustainability².

The fiery competition gives rise to so many types of market failure in the global society. As multinational corporations tend to increase productions and sales in many countries simultaneously, the markets could not necessarily be controlled by a single stakeholder of the national government. Many governments attempt to control the global markets independently or separately. But we must confront with the new type of government failure caused by the lowering relative influence of the government to the enlarged global economy³. In the consequence of deregulation and liberalization the large scope of governmental facilities have been transferred partially to the private sector. Global communities might be located in a severe situation to obtain the sufficient provision of public goods⁴. As the relative weight of the private sector to the public sector has been increasing, the privatization was destined for activating multi stakeholders' societies and ought to be required to develop the theory of 'Public and Private Partnerships' ⁵. Consequently, this theory is closely connected with investigating the incentive mechanism to enlarge the cooperation among multi stakeholders. We suppose that the corporation in the ESG mechanism could proceed to

² UNEP FI and UN Global Compact (2006) present a discussion on the principle of responsible investment.

³ Tanaka (2010) and Tanaka (2011a) present a cooperative mechanism and innovating policy scheme in the global community.

⁴ Tanaka (2016a)and (2016b) explain provision of global public goods and governances of global communities.

⁵ Windrum and Koch (2008) and Cunningham and James (2011) discuss the innovation in public service.

sustainability by avoiding serious market and government failures. This proposition is referred as the sustainability theorem of ESG mechanism in this paper. We demonstrate the hypothesis by using welfare analysis of economics.

As the globalization proceeds, the inexperienced forms of market and the government failure appear in the world scale. The global market and government failures need to reform some concepts in the traditional research contexts. To make focus on the global market and government failure is a suitable and effective approach to cooperative framework in the global and the local multi stakeholder's societies. It is acknowledged among major countries that the global problems such as the climate change and the prolonging economic crises since 2008-2009 are the common targets to be solved. But the agreement to construct the framework of international cooperation depends on collective decisions by the result of compromise among many related countries. Although the firmly constructed cooperative framework is expected to perform effective and efficient policies for global market failures, actually there are many obstacles against the cooperative policy target. When we must seek the cooperative solution for the critical problems in the world, the global government failures might be apparent in many complicated matters. The twice financial crises 2011 and 2015 in Greek made the world financial market system unstable⁶. Governments, citizens and firms in all related countries must share a part of the burden for insolvent debts and construct cooperatively the mechanism to prevent the deterioration of the world economic society. If some problems of the global market failures become less complicate and are extinguished by the structural reform of the market mechanism, the effective policies for the government failure are achieved more efficiently⁷.

To maintain self-discipline in the enlarged global economy might improve the function of market mechanism⁸. The voluntary contributions by governments, citizens and firms are expected to repair the fragile parts of global markets and to improve the provision of global public goods such as the international fund scheme to stabilize the financial crisis. When each member behaves consciously to take own social responsibility, the mechanism of voluntary contribution seems to improve so many problems of global market and government failures. In this paper we argue that the theoretical framework of the ESG framework could make clear the reasonable

⁶ Precisely, instabilities of the financial system brought by the Greek problems have begun in 2010. In 2011, the second surge made a serious damage on the Greek economy.

⁷ Tanaka (2016a) proposes the appropriate shearing burden in the global crisis.

⁸ Bührs (2009) focuses on the implication of integrated index to manage sustainable communities.

solutions for the global market and government failures. This paper is organized as follows. The section 2 states the model of economics to analyze the sustainable mechanism in the ESG framework. The section 3 presents the two optimal conditions for the ESG corporations. The section 4 defines the conditions occurred in the unsustainable conditions and makes clear the welfare loss. To improve the altruistic coefficient and to decline risk coefficient are targeted in the ESG framework. Instinctively, ESG methods should promote communication and evaluation by the stakeholders. The interregional competition and cooperative synergy effects in the region induce global community to decrease the welfare losses. The section 5 demonstrates that the ESG methods could proceed with the innovative and the sharing social mechanisms cooperatively. The section 6 states some features indicating the development of ESG systems from the empirical research of Japan.

Tanaka (2004) presents a theoretical framework to evaluate CSR performance of corporations in the multi stakeholders' communities. Tanaka (2009) formulates the global business cycle model by using this framework and demonstrates that the global business cycles in the future could be explained by the balance of total marginal evaluations between positive and negative stakeholders. Tanaka (2011b) extends the model to analyze the sustainable global governance to prompt innovation of cities in the competitive and cooperative networks. Tanaka (2012) assumes that the social enterprise might seek not only the profit but also the social benefits shared with some stakeholders. The research supposes that the corporation certified by the ESG scheme could shear targets the part of stakeholders and the corporation and makes clear the conditions that the corporation certified by the ESG scheme yields innovative effects on the global market mechanism and social system. It is demonstrated that the corporation certified by the ESG scheme makes for-profit corporations contribute more effectively on provision of public goods in their activities of social responsibility. In this paper we assume that ESG scheme should encourage some types of sharing target between stakeholders and the corporation and argue that this approach is proved to decline the welfare losses.

2. An Economic Model Analysis of the ESG Framework

It seems to be relevant that we introduce the revised model of Tanaka (2004) as the fundamental model for the multi stakeholder communities. As the private sector has been expanding the influences in the economies and societies with the comparison of the government sector, some serious market failures could not be controlled by a single government. The stakeholders become cooperatively to prevent the corporations and the organizations from occurring a various forms of market failures. Tanaka (2009)

and Tanaka (2011b) demonstrate that this model is applicable to consider global business cycle and dynamic competition and cooperation between multi national corporations and the network of global cities. Competition may not only lead to the enlargement of the global market, but also take a large social cost such as environmental destruction and the unstable world market system. As the market and the society become globalizing, the social cost from the external economic problems should spread the great extent beyond many borders of countries. We need to decrease seriously the social cost and to construct the cost sharing scheme with many members of global community.

PRI (Principles for Responsible Investment) in 2006 declares that social responsible investment should respect factors in the fields of the environment, society and governance⁹. Tanaka (2012) makes clear that the articulated and sheared target could change the performance of the corporation¹⁰. The management certified by ESG scheme could prevent the deep damage on the society and propel the social innovation. The implication simply states that the ESG investment scheme is expected to encourage the society and the market and to promote the innovation in the multi stakeholder communities. Actually, the corporation must solve many social risks at the same time. The ESG scheme aims to develop a general method to improve sustainability of the many types of corporations. To decline the market failure it is inevitable that each organization should seek to construct the effective governance scheme.

We consider the effective policy to improve ESG investment by using a model analysis on multi stakeholder communities. Main features of the model are stated as follows. It is assumed that the organizations and the corporations as the objects for ESG investment perform business in the n multi-stakeholders communities. The stakeholders include employees, shareholders, regional governments, relating corporations and residents and others. The quantity of output and the private profit of the corporation are expressed by x and $\Pi(x)$. When the for-profit corporation contributes on the local community by creation of additional employment, the regional contributions outside the private benefits could be evaluated by the stakeholders such as the local governments. It is supposed that the for-profit corporation may not provide public goods and that a cooperative framework with other stakeholder such as public funds makes it possible to achieve the imperious social needs with a support of government. ESG investment is expected to enhance the voluntary contribution on

⁹ UNEP FI and UN Global Compact (2006) reveal the principles.

¹⁰ The social enterprise is assumed to obtain a particular social purpose to achieve with some stakeholders in the section 5.

social needs by the corporations.

The corporations are assumed to aim at maximization of own private profits. By considering the externality of production each stakeholder receives benefit or cost from the production of the corporation. It is assumed that stakeholders could affect the corporation to favor their own benefits by employing cooperative or hostile means. The government takes advantageous industrial policies to promote domestic production, The employees request to improve their working conditions and the consumers sometimes boycott the products. The efficient production of the corporation is restricted by traditional practices, voluntary agreements and regulatory enforcements by the stakeholders. To attain sustainability the corporation must carry communication to keep conditions between stakeholders. ESG promotes the communication in the fields of environments and societies to decrease the deadweight as the measures of the serious market failures. The corporation considers their social needs and makes effort on the improvements of social benefits with their needs as much as possible. The corporation might spend payment t_i for stakeholder i to clear the tasks or to follow the social requirement of i . Each requirement by i in the ESG scheme is evaluated by the appropriate agent in behalf of stakeholder i . For cost and benefit analysis, the payment t_i is evaluated in term of money.

The total amount of payments t is denoted by

$$t = \sum_{i=1}^n t_i.$$

The stakeholder i evaluates the performance of the corporation regarding requirement i by the function

$$V_i(x, t_i), i = 1, \dots, n.$$

The payment t_i is assumed to be effective and to satisfy the expression evaluated by stakeholder i .

$$\frac{\partial V_i(x, t_i)}{\partial t_i} > 0, i = 1, \dots, n.$$

The increment in the sites of medical service seems to enhance the benefit of the elders. The reconstruction of corporation could benefit the shareholders by rising the price of stock market, but might force employees the curtailed salary or employment. To analyze interrelation between stakeholders and the corporation the stakeholders are classifies into positive stakeholders and negative stakeholders. As the corporation increases the production activity x , the positive stakeholder raises the evaluation $V_i(x, t_i)$, but the negative stakeholder lowers the evaluation. The positive and the negative stakeholders are defined strictly to satisfy

$$\frac{\partial V_i}{\partial x} \geq 0 \quad (1, \dots, n_1) \quad \text{and} \quad \frac{\partial V_i}{\partial x} < 0 \quad (n_1 + 1, \dots, n).$$

The total evaluation is written by

$$\sum_{i=1}^n V_i(x, t_i).$$

Each stakeholder i is supposed to select the options for the corporation by considering the evaluation $V_i(x, t_i)$. If the corporation could keep communication with all stakeholders successively, and if it conceives the evaluations of all stakeholder preciously, the internal and external risks are controlled efficiently. Considering the asymmetric information between the corporation and stakeholders, the corporation could know only the part of the evaluation to be denoted by δ ($1 > \delta > 0$). Since the rate expresses the behaviors that the corporation considers the interest of the stakeholders, δ is referred as altruistic coefficient. As δ increases, the corporation tends to show more concern with the stakeholders and is probable to decide more favorable policies for the stakeholders. The stakeholders attempt to enhance δ by the efforts such as legislation, enforcement of standardization organization, promoting openness of publicity, fund or subsidy to provide public goods. The contribution of the stakeholder i to increase δ is indicated by the non-negative variable y_i . For examples, the publication of surveys and reports by the ESG funds is stated by y_i . The fund makes the corporation more concerns with stock markets and stock holders and is assumed to increase δ and could ensure the significance of ESG by estimating δ ¹¹. Also, the number of the ESG funds could be counted as y_i . It is assumed theoretically that δ is increasing function of total contribution y ($= y_1 + \dots + y_n$) in ESG investment. Inequality $\delta'(y) > 0$ is supposed to be satisfied.

3. Governance in the ESG Methods

The PRI (Principles of Responsible Investment) (2012) argues that a sustainable global finance should not only be efficient in economic terms but perform responsible investment for long term value creation in the enlarged fields including environment and society¹². The long term value creation of investments should cover the short term economic profits and spreading impacts on environment and society. The spreading impacts could not be owed by the particular corporation and evaluated by sharing values with many stakeholders. In the public private partnerships scheme the private

¹¹ GSIA (2014) reports that the strategies SRI indicate significant growth in “corporate engagement and shareholder action” and “integration” in 2012-2014.

¹² PRI(2012), *Responsible Investment and Hedge Funds: A discussion Paper*.
https://www.unpri.org/download_report/3972

cooperation commits to provide public goods with the cooperation of the public sector and could attain private and public benefits.

We formulate that the corporation maximizes the private profit $\Pi(x)$ under the framework of the long term sustainable management. The corporation aims own profit $\Pi(x)$ as well as the related values of stakeholders. When the corporation constructs trustily relations with stakeholders, it could reach easily the share values. The cooperative relationship among multi stakeholders to be sustainable requires the fairly managed framework evaluated by many stakeholders. To maintain the cooperation the corporation must achieve the requirement or the commitment with stakeholder i . The ESG corporation is expected to present explicitly the target α_i ($\alpha_i > 0$) regarding with stakeholder i . The stakeholder i could evaluates the impacts of the corporation on the based value α_i . The positive stakeholders take net social benefit but the negative stakeholders incur net social cost from the activities of the corporation. For negative stakeholder i , Φ_i indicates the net social cost which the stakeholder i ought to request payment, compensation, penalty, tax or other means for the corporation. For positive stakeholder i , Φ_i implies the net benefit which i is willing to pay cooperative offers to the corporation. To obtain mathematical consistency Φ_i is assumed that $\Phi_i \leq 0$ holds for positive stakeholder i , and that $\Phi_i > 0$ for negative stakeholder i . The negative stakeholders could reallocate the part of net social cost from the community to the corporation by some legal or direct enforcement procedures such as tax, penalty and regulatory means. The positive stakeholders offer actively the supports on the corporation depending on the net social benefit. The amount of Φ_i on the corporation means the incentive payment or penalty and is determined on the disparity between the target α_i and the evaluation V_i . For example, the agents to audit compliance and governance of the corporations should decide the penalty for inappropriate managements. If the environmental technology of the corporation is proved to be excellent in ESG evaluation, it could obtain advantage of incentives to promote investment such as investment tax credit, uprising stock market price and other subsidy for the products.

The corporation incurs the social benefit or cost Φ_i according to the evaluation of stakeholder i but could not obtain the accurate value in the situation of asymmetric information. Although the corporation estimates Φ_i approximately, the ESG index might improve the precision of estimation. In the starting point of the discussion, it is assumed that Φ_i is increasing function of $\alpha_i - V_i$. We will argue later that the improving precision of estimation by the ESG method is overlapped with the function of the governance. Governance is supposed to connect external needs with appropriate solutions efficiently. ESG methods to improve accurate estimation of the social benefit

or cost could focus on the reform of governance. By employing functional expression the inequalities $\Phi'_i > 0$, and $\frac{\partial \Phi_i}{\partial V_i} < 0$ are supposed to be satisfied for $i(1, \dots, n)$. Φ'_i means the marginal social cost or the marginal social benefit which is occurred by a unit of change in i 's evaluation V_i . The inequality implies that cancelling or promoting pressures from the stakeholders work differently in positive and negative externalities. That is, as the evaluation V_i improves, the negative stakeholders decrease pressure on the corporation, and the positive stakeholders increase the incentive benefit to support it. As in some cases the corporation could employ Φ'_i as an effective index of sustainability, Φ'_i is referred as risk coefficient. To pursue stable and efficient ESG scheme the corporation is assumed to aim at maximization of net benefit indicated by the following expression,

$$NB = \Pi(x) + \delta(y) \sum_{i=1}^n \{V_i(x, t_i) - y_i\} - t - \sum_{i=1}^n \Phi_i(\alpha_i - V_i(x, t_i)). \quad (1)$$

It is assumed that the corporation decides the production activity x and payment t_i for stakeholders $1, \dots, n$ to maximize the above objective function (1).

The first order maximization conditions of (1) with regard to the for-profit corporation are stated by

$$\frac{d\Pi}{dx} = \sum_{i=1}^n -(\delta(y) + \frac{d\Phi_i}{d(\alpha_i - V_i)}) \frac{\partial V_i(x, t_i)}{\partial x}, \quad (2)$$

$$\frac{\partial V_i}{\partial t_i} = \frac{1}{\delta(y) + \frac{d\Phi_i}{d(\alpha_i - V_i)}}, i = 1, \dots, n. \quad (3)$$

The fundamental conditions (2) and (3) describe formally the optimal behavior of the ESG Corporation. The ESG solutions satisfying (2) and (3) are denoted by x^*, t_1^*, \dots, t_n^* .

The activity of the ESG corporation is satisfied with the expression (2) that the private marginal profit indicated is equalized with the social marginal cost of multi stakeholders society. According to (3) the corporation must keep the payment for stakeholders so that marginal evaluation is equal to the inverse sign of the summation of the altruistic and the risk coefficients. Considering that the practice of ESG is expected to influence the terms of (2) and (3), it is discussed clearly that the reform of ESG methods makes the integrate effect on economic, social and environmental performances and communication and compliance with stakeholders.

4. The Impact Analysis of ESG

4-1. Two Coefficients and Welfare Losses

Possibly, the corporation might bring some market failures and government failures. As the markets are integrating into a global market, the deadweight losses caused by the two failures grow in the large scale and cannot be curtailed by even single government. The purpose of this section demonstrates that the mechanism of ESG is considered by the economic model for sustainability.

When the altruistic coefficient and the risk coefficient are equal to one and zero for each, the corporation is supposed to obtain sustainability. The condition of sustainability is stated by

$$1 = \left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right), i = 1, \dots, n. \quad (4)$$

The condition of the sustainability exhibits the unit value of (3). The sustainable condition implies the following situations. It is assumed that the conditions $1 \geq \delta \geq 0$ and $\Phi' \leq 0$ are satisfied. When the corporation could not keep sustainability, the value of (3) increases from the one. Figure 1 depicts explicitly the condition of sustainability. The marginal evaluation of stakeholder i and the condition of sustainability is expressed by the curves AB and EH. The expression (3) exhibits sustainable contribution by the corporation t_i^* . Unsustainable condition moves the

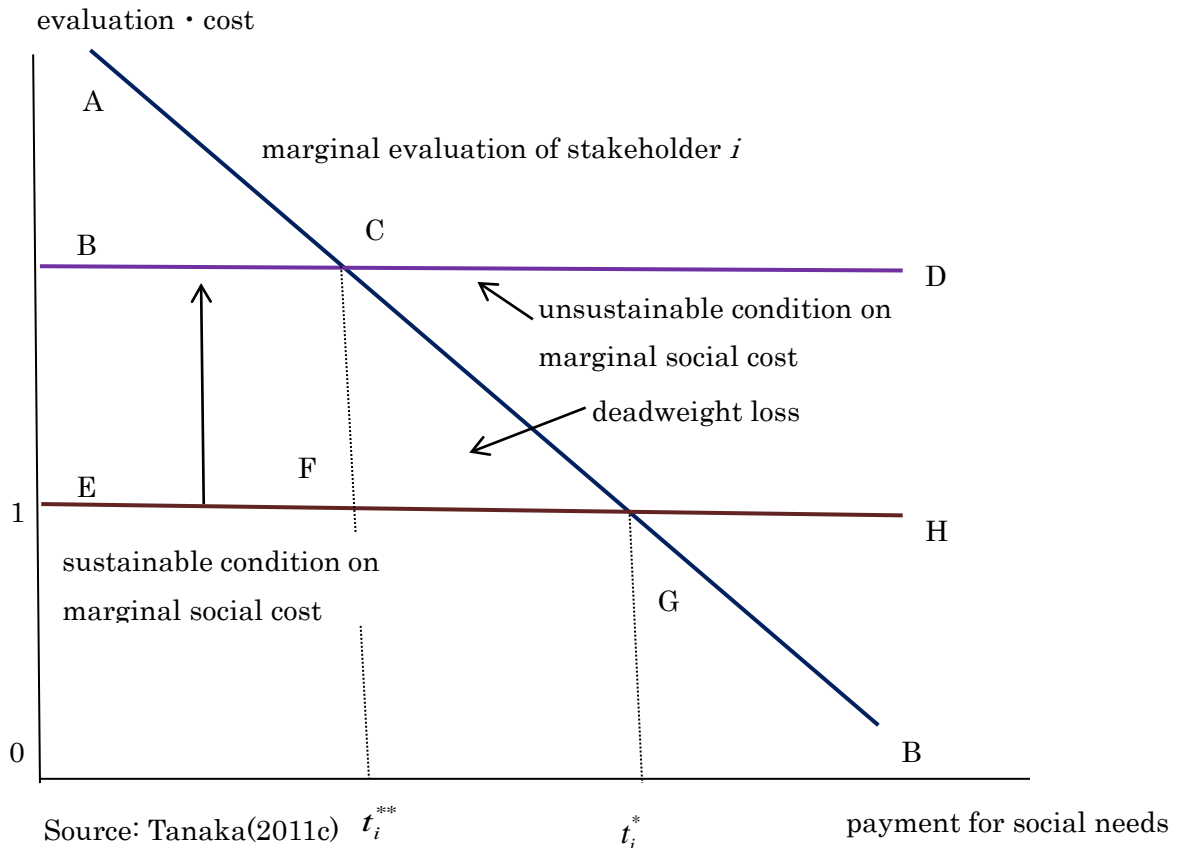


Figure 1. Sustainability and deadweight loss curve EH upward to the curve BD. Unsustainable contribution of the corporation is stated by t_i^{**} . The deadweight loss in unsustainable condition could be exhibited by the area of the triangle CFG.

Environmental and social factors are evaluated by the related stakeholders. The related stakeholders seek the corporation to improve the altruistic coefficient and to enhance accuracy of estimation on the evaluation. In the environmental field, performances of factors such as water, low carbon technology, biodiversity are evaluated by the related stakeholders. Many nonprofit organizations are willing to watch or audit corporation performances of social issues such as fair trade, compliance and others. We should notice that the deadweight loss might occur in all field observed by the stakeholders. ESG framework targets enhancement of the altruistic coefficient and lowering the risk coefficient to decline the welfare loss. We should employ suitable methods for improvement of the two coefficients. The construction of sharing information by the corporation and stakeholders might have effects on the improving the altruistic coefficient. The strict observation mechanism that targets to enhance performance of the corporation in environment and social issues seems appropriate to lower the risk coefficients. The both methods represent the basic methods to attain the sustainable framework of ESG.

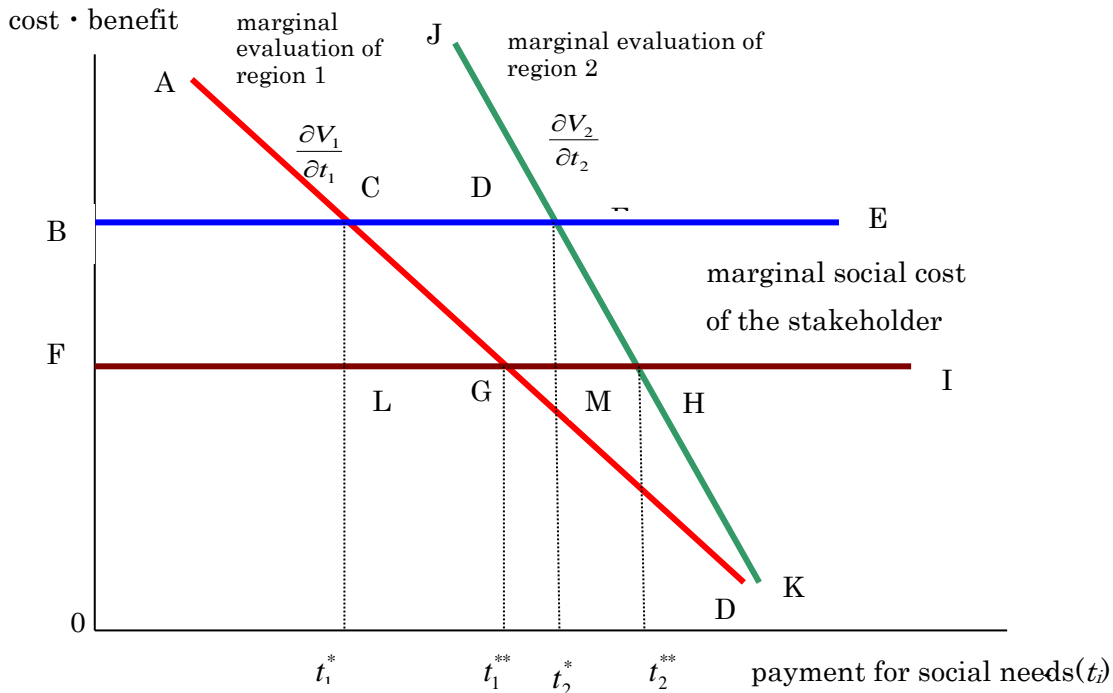
4-2. Competition, Cooperation and ESG

Although EGS is designed to achieve sustainable corporations, we should consider the mechanism to attain the sustainable condition of ESG. In particular, the competitive and cooperative mechanism between the corporation and the stakeholder is expected to facilitate ESG methods to reach sustainable situations. The ESG methods seem to form the intimate core group shearing trust by each other. We illustrate that the regional development should proceed in this mechanism¹³. We suppose that stakeholder 1 and 2 mean the two regions and that the risk coefficient could be estimated at the same approximately in the beginning. The expression (3) is transformed into

$$\frac{\partial V_1}{\partial t_1} = \frac{\partial V_2}{\partial t_2} = \frac{1}{\delta(y) + \frac{d\Phi_i}{d(\alpha_i - V_i)}}, i = 1, 2. \quad (5)$$

¹³ We revise the investigation in Tanaka (2011c) to focus on the mechanism complement the ESG scheme. Tanaka (2011b),(2013)and(2014) consider the regional theoretical framework in the net works of global cities.

Although the corporation contributes t_i such as tax burden and employments for regions, t_i appears diversification in many regions. Figure 2 shows that the complementary mechanism with incentives by competition facilitates ESG methods. Figure 2 is depicted to add a new evaluation curve with Figure 1. The marginal evaluations of region 1 and 2 are exhibited by the curves AD and JK. In the beginning the unsustainable situations satisfied with (5) are indicated by points C and D. The two equilibrium payments t_1^* , t_2^* are located with a long distance. The corporation contributes more in the region 2 than in the region 1. The corporation is supposed to locate the head office in the region 1 and to construct the large production cite in the region 2. And the region 2 evaluates the performance of the corporation greater than the region 1. Possibly the corporation makes different types of contribution on the two regions as a result of bargaining. This unsustainable situation could be replaced by the sustainable solution, fortunately. Since the alternation is depend largely on the willingness of the corporation, we must make clear the cost benefit of the corporation by using (3).



Source: Tanaka(2011c) p34

Figure 2. Regional competition and ESG

It is assumed that the multinational corporation is not operated in the single country or region but for own interests could move production sites freely over the countries. The corporation might locate the head office in the region offering the low rate of corporation tax. At the same time, it selects to obtain high profit the business office in the central business district with high rents of office and salaries of employer.

It is demonstrated that competition and cooperation among the stakeholders and the corporation could lead solutions into the sustainability. We consider competitive process among two corporations A and B. The regions 1 and 2 are composed by different combinations of the stakeholders. The marginal profits $\frac{d\Pi}{dx}$ by the corporations A and B are depicted by curves CM and EL. In the model analysis, we assume that the stakeholders in (3) are classified into n_1 negative stakeholders and n_2 positive stakeholders.

$$\frac{d\Pi}{dx} = \sum_{i=1}^{n_1} -\left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)}\right) \frac{\partial V_i(x, t_i)}{\partial x} + \sum_{i=n_1+1}^{n_1+n_2} -\left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)}\right) \frac{\partial V_i(x, t_i)}{\partial x} \quad (6)$$

Considering the definitions with positive and negative stakeholders, the signs of the first and the second terms in the right side of (6) are positive and negative. When the

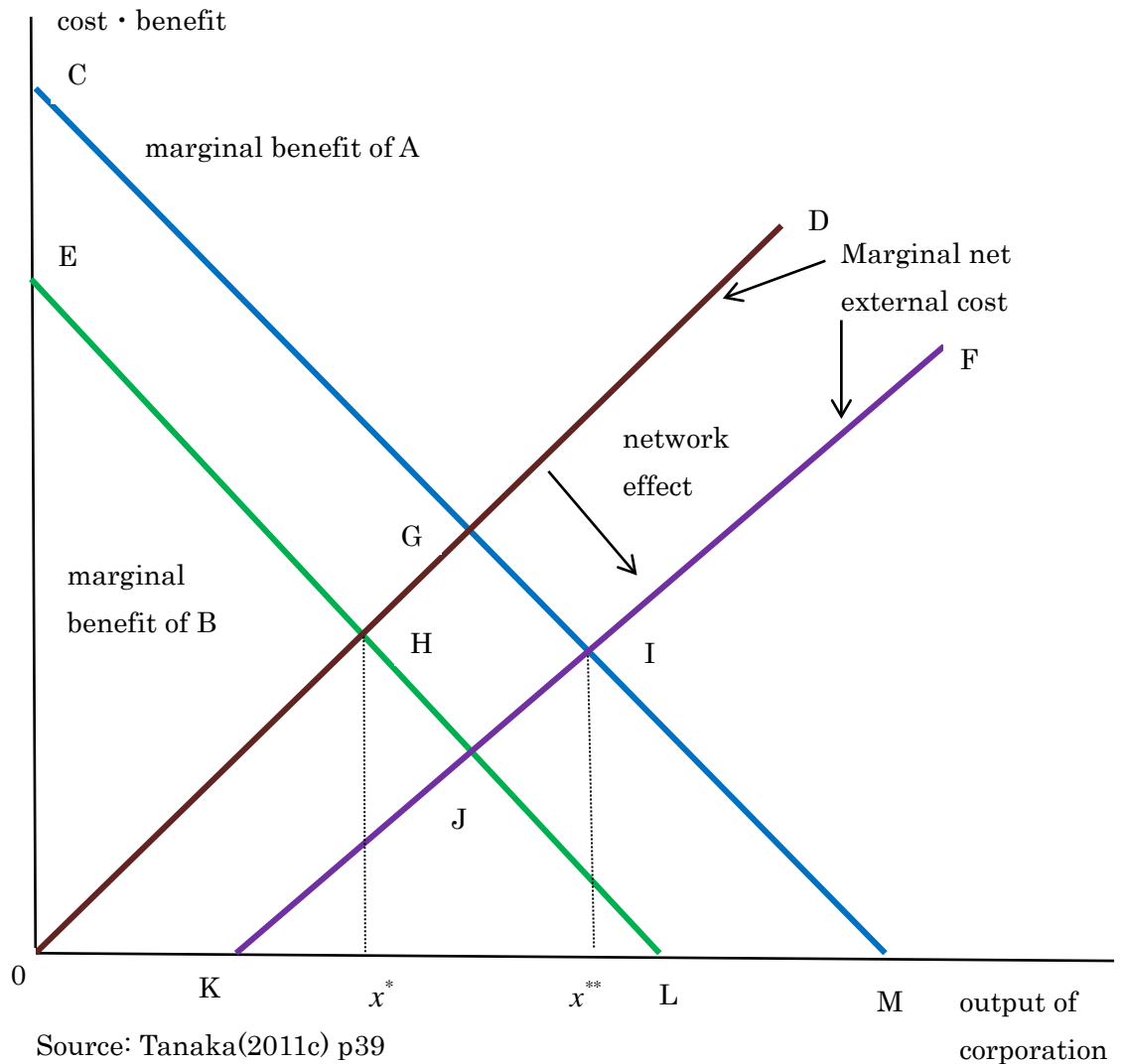


Figure 3. Net benefit of corporation

shift of the negative into positive stakeholders occurs, the absolute value of the first term increases larger than the growth rate of the second term, the marginal net external cost curve OD move rightward to KF. It is assumed that the relative advantage between the two regions 1 and 2 could be expressed by the comparative analysis between the curve OD and KF. Tanaka, H. and C. Tanaka (2016) present the empirical research on the regional development to promote industrial evolution in Tokyo.

The region 2 is supposed to take the privileged advantages for the both corporations. The advantageous business environment expressed by the net marginal external cost curve KF by comparing the curve OD in the region 1. However A prospects more profitable than B significantly. The surpluses welfare of A and B are presented by areas the pentagon COKI and EOKJ. A could obtain the extra surplus showed by the area of the pentagon CEJI and the incentive to reduce the risk coefficient. A is willing to advance in the competition of B to achieve sustainable contribution t_2^{**} in Figure 2. The region 2 accepts the location of A with privileged condition. The corporation B losses the region 2 and locates business site in region 1 with small contribution t_1^{**} in Figure 2. The small contribution of B is caused by the reduced surplus exhibited by area OKJH. The ESG methods could promote the mechanism of competition and communication toward sustainability.

5. Shearing Economies and ESG Investment

In the previous sections we investigated the mechanism that for-profit organizations perform social responsibility to improve their sustainability. In recent years we could observe the remarkable progress in the fields of industrial communication technology. The new industrial innovation is expected to attain social needs more precisely without the market mechanism¹⁴. By using the progressing technology the public goods could be delivered to and evaluated by each resident efficiently. The highly progressing communication mechanism could enhance the new types of the sharing economies and improve the development of ESG investment¹⁵. The promising effect of ESG investment derived from the technological innovation is focused by developing the theory of social enterprise based on Tanaka (2012)¹⁶. In sharing economies some

¹⁴ Rifkin (2014) prospects the resources saving societies promoted by the evolutionary progresses in new technologies.

¹⁵ Theoretical analysis on the corporations certified ESG could support partially the theory of shearing economies proposed by McLaren and Agyeman (2015). We consider the shearing theory later in this section.

¹⁶In the theoretical framework the social enterprise defined by Tanaka (2012) is applicable for the corporation certified by the ESG methods. We demonstrate that the

stakeholders obtain the common target and information for more enlarging scope in the society. In the binging it is suitable to introduce formal definition of the social enterprise. Many authors commonly define that the social enterprise pursues social needs or aims as well as the private profit¹⁷. For the theoretical analyses this paper supposes that social enterprise is performed by for-profit organization to achieve a particular kind of social purpose directly¹⁸. In this formulation each stakeholder is assumed to pursue social needs such as education, medical service, social security service, environmental protection, creation of employment. It is possibly to become efficient that the stakeholders construct the non-profit organizations to achieve social needs¹⁹. In this case the social enterprise would be the integration of for-profit and non-profit organizations. However, the corporation certified by the ESG methods in this paper includes other types of integration of for-profit organizations and local governments, inhabitants²⁰. The corporations to be obliged with the requirements by the stakeholders might increase in the ESG scheme. We will investigate the corporations to perform the principles of ESG, and ESG typed social enterprise is willing to maximize the summation of social needs $V_1(x, t_1)$ that is represented by the main object of stakeholder 1 and private profits $\Pi(x)$. Formally, net social benefit NB_{ESG} that the corporation certified by the ESG methods to maximize is expressed by (7). The formula of social responsibility (1) on the for-profit organization is replaced by (7) for the corporation certified by the ESG methods.

$$NB_{ESG} = \Pi(x) + V_1(x, t_1) + \delta(y) \sum_{i=2}^n \{V_i(x, t_i) - y_i\} - t - \sum_{i=2}^n \Phi_i(\alpha_i - V_i(x, t_i)). \quad (7)$$

Although many types of the corporation certified by the ESG methods might exist, as an example, we consider the following process to form the organization. At the beginning the non-profit organization which aims to develop manpower takes a part of the job training service of the public sector. If the private provision of public goods is allowed to enlarge, the organization could carry the activity with expected proceeds. It is reasonable for the organization to construct the organization that is able to provide the public service according to the own decision. The organization initiates the for-profit business in the related field and creates the new opportunity for employment

of the two terminologies are neutral on reasoning in the analysis.

¹⁷ Oster (2010) presents some significant examples.

¹⁸ Becchetti, L. and C. Borzaga (2010) discussed the back grand of the approach completely.

¹⁹ The approach from non-profit organization are explained in Holland and Ritvo (2008), Neff and Moss (2011) and others.

²⁰ In the case that some types of stakeholders might construct the social enterprise, the indexed number of stakeholders in extended to more than one.

in the local community. The organization is willing to decide the corporation certified by the ESG methods. In expression (7) the corporation certified by the ESG methods is supposed to provide public goods t_1 for the social needs profit from the profit of the business section. In this case the corporation certified by the ESG methods is the integration of the for-profit organization and the non-profit organization of the stakeholder 1. The stakeholder 1 evaluates social activity of the integrated organization by $V_1(x, t_1)$. The stakeholder 1 could obtain some direct methods to control the corporation, and it need not employ any external pressure which is assumed in the ESG model of the previous section. The evaluation or rating on ESG performance of the corporation from an external organization framework is presented by $V_1(x, t_1)$. The development of $V_1(x, t_1)$ is likely to become the significant target in the ESG methods. The equality $y_1 = 0$ is supposed to hold. The first order conditions of maximization are expressed by (8) ~ (10).

$$\frac{d\Pi}{dx} = -\frac{\partial V_1(x, t_1)}{\partial x} - \sum_{i=2}^n \left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) \frac{\partial V_i(x, t_i)}{\partial x}, \quad (8)$$

$$\frac{\partial V_1}{\partial t_i} = 1, \quad (9)$$

$$\frac{\partial V_i}{\partial t_i} = \frac{1}{\delta(y) + \frac{d\Phi_i}{d(\alpha_i - V_i)}}, i = 2, \dots, n. \quad (10)$$

By comparing the expression (8) ~ (10) with (2) and (3), we could make clear the characteristics in both the social enterprise and the corporation certified by the ESG methods. The solutions for the the corporation certified by the ESG methods to be satisfied with (8),(9),(10) are indicated by

$$x^{**}, t_1^{**}, \dots, t_n^{**}.$$

The public goods provision credited with ESG is supposed to obtain some types of background. The expanding global economies have produced increasing demands for public goods coping with the structural changes of global communities. However, under the pressure from financial markets to restore the budget balance, the governments are obliged to provide public goods with minimal governmental spending. The increasing competition of market economies might demand not only to curtail employments in some conventional industries but also to restore the balancing structure in global economies. It is imperative social needs to pursue the sustainability of global community. To stabilize and to vitalize the global economies the public goods for the general service such as enlargement of employment and social security must be provided sufficiently. On the other hand, the prompt movements of capital beyond the

border of states have caused competition among states to obtain investments. Private capitals should be invested directly to provide general public service for the communities. If the ESG mechanism makes the effective foundation for the corporation to take social business, the communities will attain the imperative public goods easier than the before. Voluntary provision of public goods is expected to enlarge and to promote sustainability of communities.

It is assumed that the corporation certified ESG methods seeks to perform private profit as well as the social needs in the joint venture with stakeholder 1. Comparing (8) with (2), we could identify the two types of the corporation certified by the ESG methods. The first type of social enterprise has targeted to achieve the public goods in the field such as medical service support for the handicapped and scholarship fund. To emphasize the implications of our analysis we state the following assumption.

Assumption 1. The activities are acknowledged to be valuable in our society, but do not obtain large impact on social change. In this case we could suppose that the second term of (8)

$$-\sum_{i=2}^n \left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) \frac{\partial V_i(x, t_i)}{\partial x}$$

is approximately same amount with the counter part of (2).

To simplify the analysis we suppose that our community is not enough altruistic for the mission and the activities are not one of the key factors for the social structural change. Formally, we state the condition as the following inequality.

$$0 < \left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) < 1 \quad . \quad (11)$$

Supposed that stakeholder 1 is positive stakeholder for the corporation, we obtain the inequality for any x .

$$-\frac{\partial V_1}{\partial x} < -\left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) \frac{\partial V_1}{\partial x} \quad (12)$$

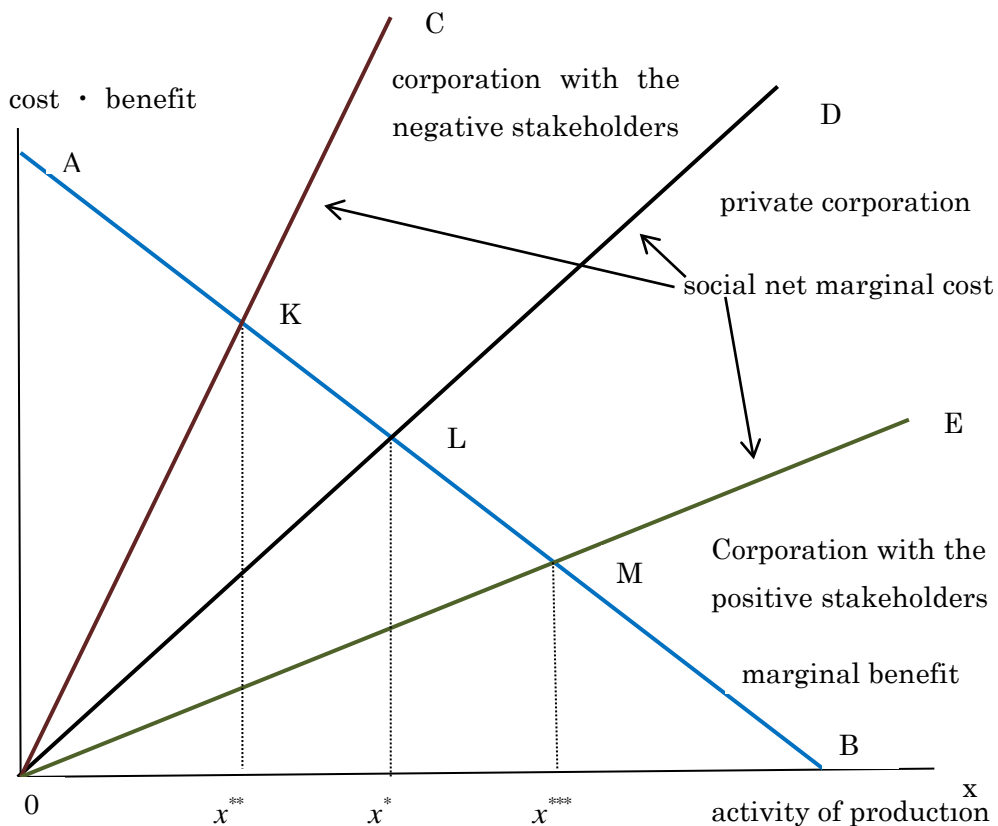
On the contrary, we could verify that the inverse inequality (13) is satisfied with the negative stakeholder for any x .

$$-\frac{\partial V_1}{\partial x} > -\left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) \frac{\partial V_1}{\partial x} \quad (13)$$

It is appropriate to explain visually the relation obtained above by employing Figure 4. The vertical axis shows cost and benefit and the horizontal axis depicts activity of production. The optimal point for private corporation are indicated by the point L. Reminding that corporation with the positive stakeholders shifts net social marginal

curve OC downwardly to curve OE, joint corporation with the positive stakeholders could operate higher level of production than private corporation alone. That is, positive stakeholders could expand production connected with their social needs by funding the suitable corporation. The equilibrium point for the corporation with the negative stakeholders is assured to be point M. By the similar reasoning as given above we conclude that negative stakeholders could decrease production activity against the achievement of their mission by a joint corporation. For example, to preserve environmental conditions NGO initiates new environmental business with the pollution emitting corporation. The results demonstrated previously are stated by Proposition 1.

Proposition 1. The corporation certified ESG methods organized by stakeholder and for-profit corporation could control private production activity according to own interest. The negative stakeholder decreases the private production and the positive stakeholder increase production from the production of the for-profit corporation alone. This type of performance could occur in broader scope of the corporation as the ESG mechanism becomes to be constructed firmly.



Source: Tanaka (2012)

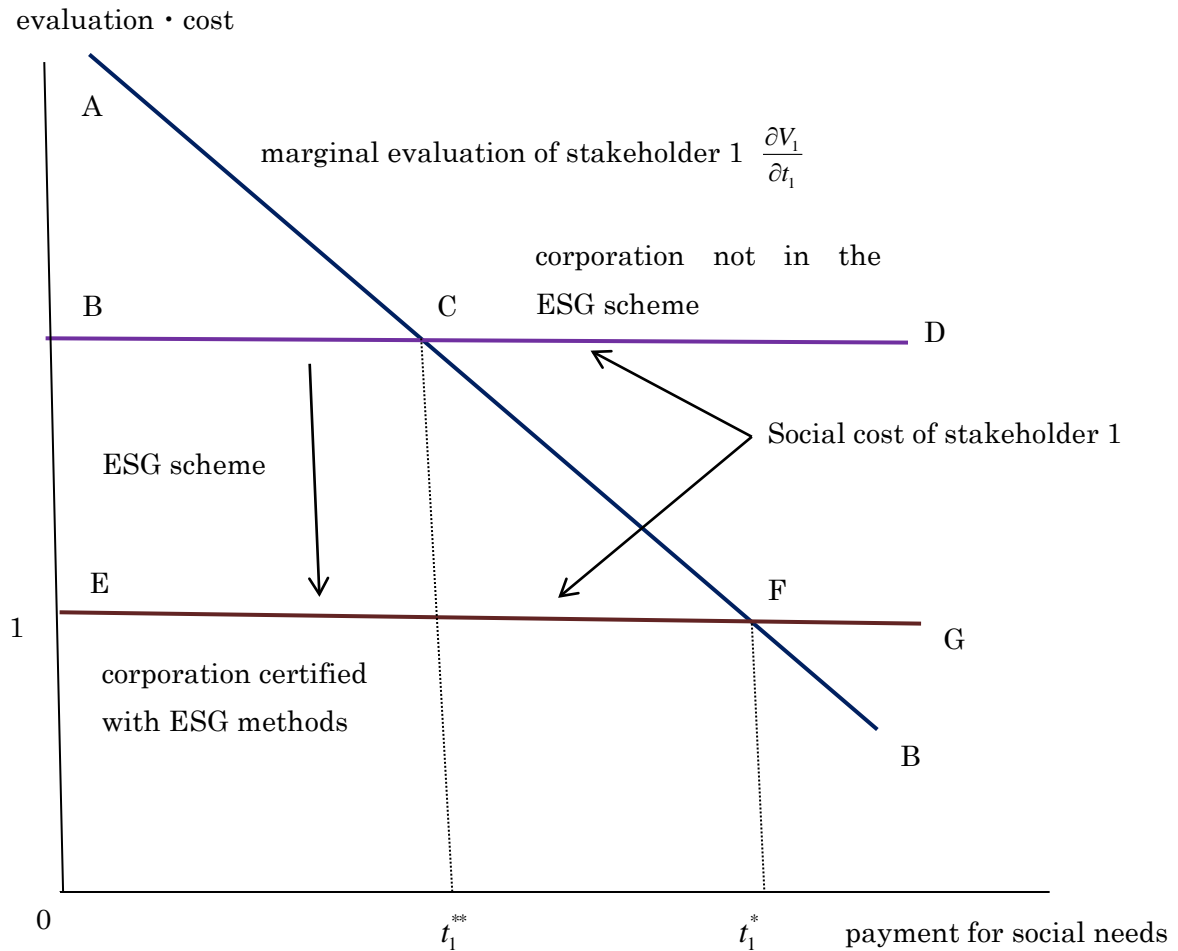
Figure4. Comparative analyses of corporation certified ESG and private corporation.

From the condition (11), it is certain that the following inequality (14) holds.

$$(9) = 1 < \frac{1}{\delta + \frac{d\Phi_1}{d(\alpha_1 - V_1)}} = (3) . \quad (14)$$

Reminding that the marginal evaluation curves are assumed to be decreasing, we are assured that the corporation provides more public goods for the targeted social needs by the partner stakeholder 1 than the private corporation alone. The result is depicted in the figure 5. The transformation of the private corporation into the corporation certified with ESG methods or the ESG corporation moves the curve BD downwardly to the curve EG. The equilibrium point C is replaced by the point F. Changing the form of organization helps to achieve social needs by indicated the amount indicated by $t_1^{**} t_1^*$. We describe the result in Proposition 2.

Proposition 2. The corporation credited with ESG provides more public goods pursued than the private corporation outside of the ESG mechanism.



Source: Tanaka (2012)

Figure 5 Provision of public service by ESG corporation and private corporation.

Some authors argue that the ESG corporation should promote social innovation. We consider the second type of the ESG corporation that performs the core of innovation in provision of public goods. The social innovation is expected to improve social welfare largely by reforming general public service relating to the large part of public interests. The effects of the reform are expected to influence the large part of the community. In assumption 2 the second type of the ESG corporation is described formally by the inequalities (15), (16).

Assumption 2. The social influential conditions of the corporation credited with ESG methods are stated by (15) and (16).

$$-\sum_{i=2}^n \left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) \frac{\partial V_i(x^*, t_i^*)}{\partial x} < -\sum_{i=2}^n \left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) \frac{\partial V_i(x^{**}, t_i^{**})}{\partial x}. \quad (12)$$

$$-\sum_{i=2}^n \left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) \frac{\partial V_i(x^*, t_i^*)}{\partial x} > -\sum_{i=2}^n \left(\delta + \frac{d\Phi_i}{d(\alpha_i - V_i)} \right) \frac{\partial V_i(x^{**}, t_i^{**})}{\partial x}. \quad (13)$$

(15) means that the for-profit corporation is supported by the majority of positive stakeholders. (16) implies that the private corporation suffers from the pressure of dominate numbers of negative stakeholders. For example, the corporation indicated by (15) brings about great benefits such as employments and welfares for the local community. The corporation expressed by (16) is suspected to perform insufficient compliance. The conditions indicated by (15) and (16) are named as the positive stakeholders dominant community and the negative stakeholders dominant community. Whenever the social innovation happens, we could suppose that the social impacts of social enterprise obtain multiplier effects in the following cases. The positive stakeholder 1 initiates a social enterprise in positive stakeholders dominate community and the negative stakeholder 1 arranges another corporation with negative stakeholders dominant community. We could conclude the discussion by presenting proposition 3.

Proposition 3. The social enterprise or the corporation credited with ESG methods is expected to obtain great impacts on social innovation under the following condition. The positive stakeholder cooperates with for-profit organizations in the positive stakeholders dominant community. The negative stakeholder constructs the corporation with for-profit organizations in the negative stakeholders dominant community.

Proposition 3 makes clear that the significant condition that social enterprise or the

corporation credited with ESG initiates social innovation is stated by (11) and (15) or (13) and (16). That is, the proposition indicates formally the condition that the corporation credited with ESG brings about social innovation. Although the conditions stated by assumption 1 and 2 are not satisfied easily, the pervasive usage of ESG methods will become to enlarge the scope covered Proposition 1~3. That is, enlarging credits of ESG mechanism could make large scopes of opportunities to gain a clue to social issues.

6. The Movements toward ESG in the Empirical Case Study of Japanese Corporations

In the above sections, we argue that the ESG methods aim to clear up the swelling risks in economic, social and environment systems and to guide the integrated system to sustainability. Maita, A. (2016) supposes that movements of the corporations to have an access to the ESG mechanism are surveyed from the information published by the Japanese corporations. This empirical research in this section make a survey of the development in ESG and could complement the theoretical analysis in this paper.

(1) The corporations with large scale of sale and in manufacturing industry present positive reporting policies distinctively.

The Japanese Ministry of the Environment (2016) presents some implications of the survey on 551 corporations (about 40 percent of total) out of the 1400 corporations of the respondents²¹, regarding the 2014 fiscal year. The 551 corporations have published "environmental report (even name is different, such as CSR report, but reports show environmental information) ". They are consisted by 278 listed corporations (65 percent of total), and 273 non-listed corporations (28 percent of total) in the stock markets.

The above survey (2016) also refers the investigation of publication regarding environmental reports by classifying the corporations into 7 types according to the scale of annual sales. Answers to "have created and published" of 100 billion yen sales or more (5 classes from the top), are 97% (292 corporation) in the listed corporations and 87% (238 of non-listed corporations). In the manufacturing industry, 64% (179 corporation) in listed corporations and 42% (114 of non-listed corporations)

²¹ The listed corporations in the first and second sections of each Stock Exchange of Tokyo, Osaka, and Nagoya are 1,664 and corporations to obtain 500 employees or more in the non-listed are 4,574. The total 6,238 corporations are targeted for the surveying research. Among them the 3,000 corporations (425 listed corporations and 975 non-listed corporations) are extracted. Effective respondents are 1,400.

have published this type of reports. This figure distinguishes the feature of manufacturing industry.

(2) By inquiring the targets to disclosure information, the requirements of disclosure in the reports are more suitable to the stakeholders than to the investor including business partners.

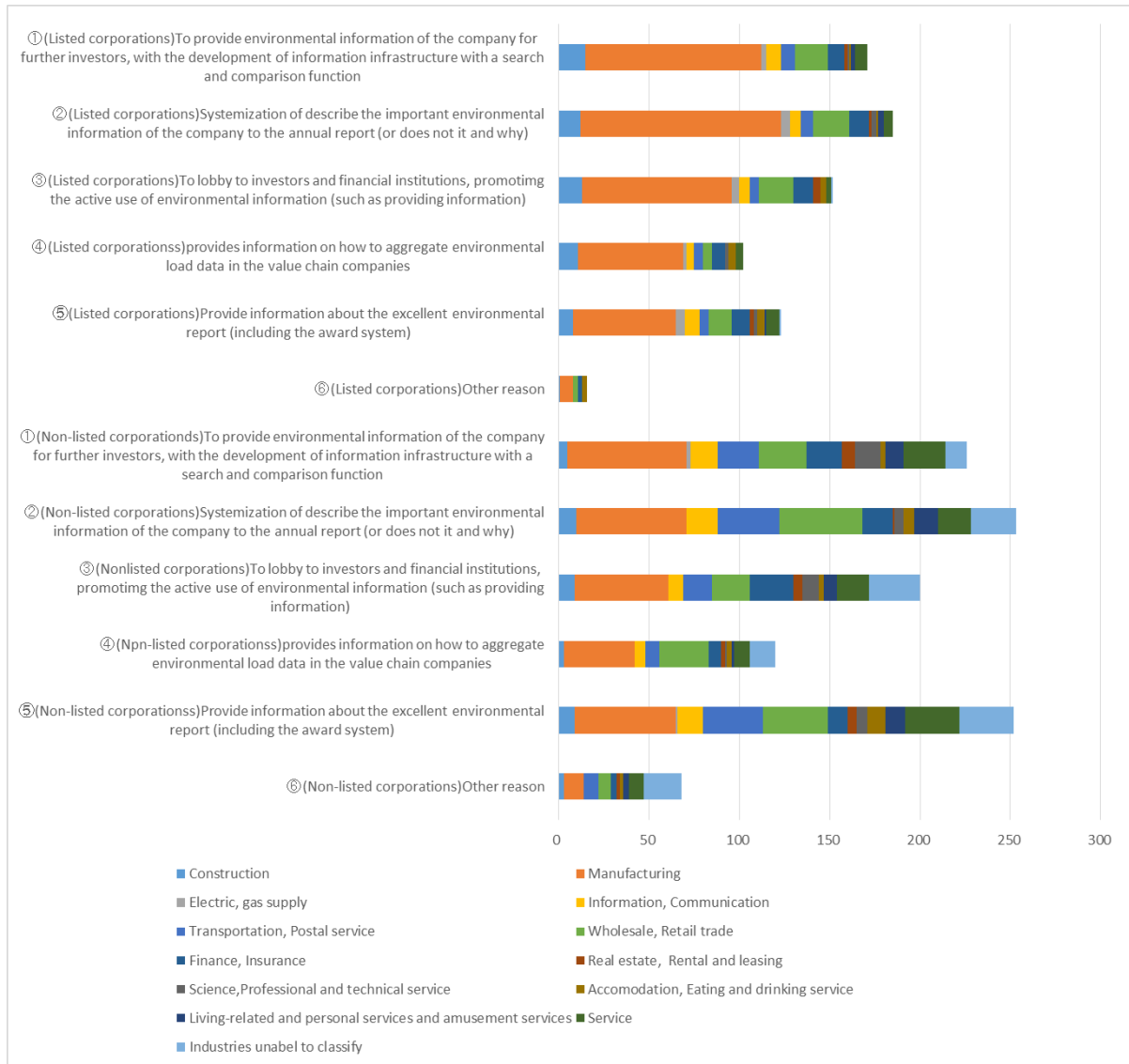
The above research surveys the policy on how their environment information is 'generally open to the public', by using the choices of answers. Also, the choices to be opening information to 'public in part' such as a specific person, business partners, financial institutions, and not to disclose information are available to the respondents. The answer that being 'open to the public' comes from the 452 corporations (186 listed corporations and 137 non-listed corporations) in manufacturing industry. They are the majority members of the respondents 1,400 corporations. Then, the corporations in wholesale and retail trade, transportation and postal industry, service industry, and others follow. The research²² is based also on the 7 classes by the size of annual sales. Answers to "have created and published" the reports in 100 billion yen sales or more (5 classes from the top) are 97% (293 corporation) in the listed corporations and 94% (378 of the non-listed corporations). The survey has not revealed information on individual corporations, also has not disclosed information of the respondents in sales size by industry. However, we can conclude that the requirements of disclosure in the reports are more suitable to the stakeholders than to the investor including business partners. It should be noticed that the number of responses in the choices regarding disclosure of environmental information is not different significantly between in the listed corporation and the non-listed corporations.

(3) Several incentives to disclosure information appear.

The above survey (2016) shows the motivations on disclosure of non-financial information in Figure 6. The plurality of answer is permitted. It seems that the answers of each corporation imply 1 ~ 3 motivations. From considering the features of answers, we should remark for the following analysis that the number of answer in the manufacturing industry is larger than other industries, and that the number of answer in the non-listed corporations is greater than that of the listed corporations. The features of the answers from the non-listed corporations are stated as follows: the answers to '⑤provide information about the excellent environmental report (including the award system)' are the largest (256 answers) and '②systemizing the descriptions

²² Please inquire the details in the research of posepose3@gmail.com.

on the important environmental information of the corporation to the annual report (or does not it and why)' follow (255 answers). And the answers '① to provide environmental information of the corporation for further investors, in particular regarding the development of information infrastructure and a search and comparison



Source: Produced by Maita,A. by basing on Ministry of the Environment (2016)

Figure 6 Motivations on disclosure environmental information by industry

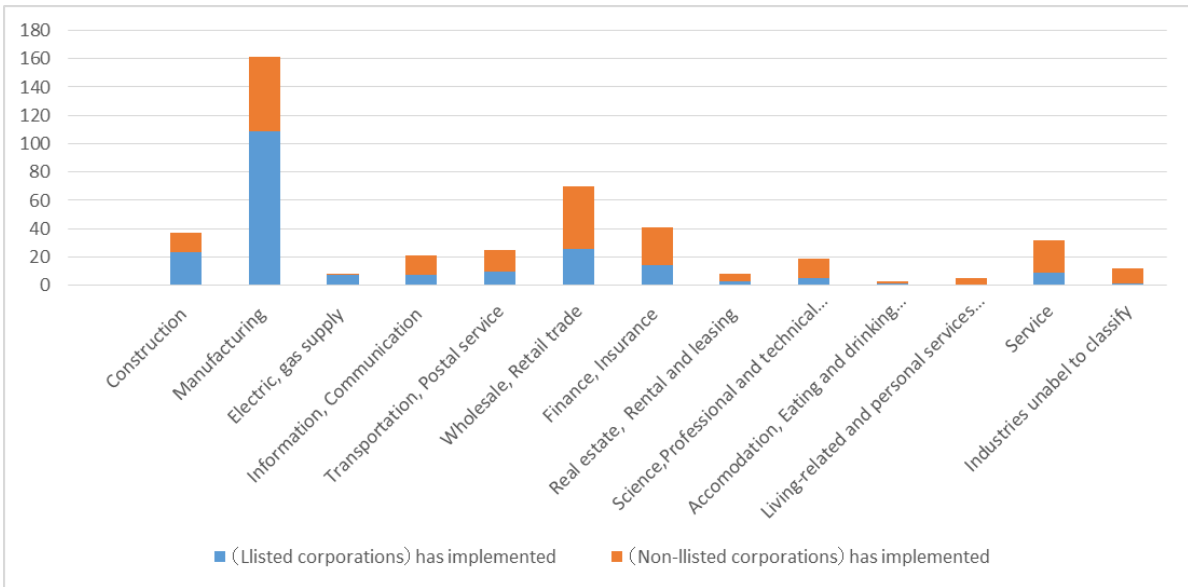
function' follow, the answers '③to appeal on investors and financial institutions, promoting the active use of environmental information (such as providing information)' are the fourth largest answers in number. The answers '⑤'to be evaluated as the information to have expressed the view of report publishing department rather than management. However, the above survey (2016) also states that the department to

promote environmental considering management is attempting to strengthen concerns with management in the non-listed corporations recently. Among the findings from the listed corporations, we should notice that the answer ② is followed by ①, then ③, and that ⑤ seems to express their needs to communicate with investors. The answer '④to provide information on how aggregate environmental loads data in the value chain corporations', is ranked on the fifth in the listed and the non-listed corporations, and shows that the situation of procurement management on the value chain is getting the common idea in management, especially in the manufacturing and wholesale trade, and others.

(4) The corporations to implement environment business tend to concentrate on some industries with middle sale sales.

The above survey (2016) describes that 445 corporations which correspond to the survey, about 30% in the 1,400 respondents are performing the environment business²³ (see Figure 7). The number of corporations announcing to "have implemented" reach almost the half, in the listed corporations, but remain about 20% in the non-listed corporations.

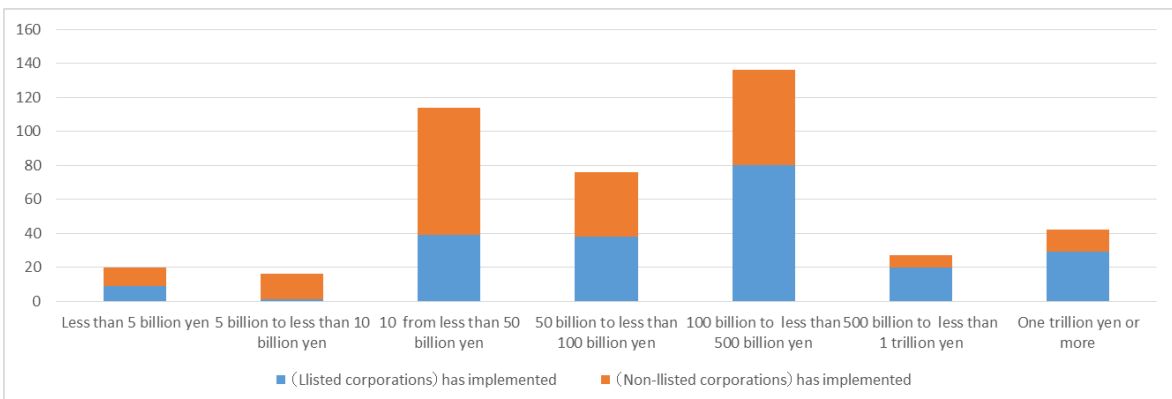
²³ In 1999, the Japanese Ministry of the Environment, according to the OECD standard, defines the "environmental goods and services industry" as follows. The environmental business covers to observe the water and air conditions, and the deteriorating effects "on the environment of the soil such as" waste, noise, eco-system as activities" and to provide products and services to improve those. The business mainly concerns the issues to prevent, reduce and minimize environmental damages. In particular, pollution prevention equipment, waste treatment and recycling plants and industries form large parts of the environmental industry. Viewing more closely, a wide variety of industries and business categories could be classified in this industry. Some prominent examples are the apparatus and equipment to reduce the environmental impact, such as the measurement and analysis equipment, manufacturing and sales of products with low per se environmental impact, such as low-emission vehicles, disposal thing processing industry, such as environmental protection-related services, such as infrastructure development of water treatment facilities.



Source: Produced by Maita, A. by basing on Ministry of the Environment (2016)

Figure 7. Corporations that implement environmental business by industry

According to the size of annual sales (see Figure 8), the corporations, sales of 50 billion yen or more of the corporations, exceeds the level of the average overall (more than 30%). In particular, the corporations in the class of one trillion yen or more have implemented about 60%. By industrial considerations, many industries to be greater than the whole of the ratio, the construction industry, electricity, gas, such as a supply industry, in the financial and insurance industries, and the respondents that "have implemented" become more than a majority. It suggests that energy-saving promotive products and energy-saving assistance loan occupy a large concerns in the related business.



Source: Produced by Maita, A. by basing on Ministry of the Environment (2016)

Figure 8. Corporations that implement environmental business by size of annual sales

The discussion in this section makes clear that corporations have been approaching sustainability and that the manufacturing corporations might be obliged to coping with a large scope of stakeholders. The corporations in other industries have a different weight among the scopes of stakeholders. The weight on the stakeholders is reflected on the communication methods in the ESG scheme. The corporations with middle scale of sales incline to attract investment for the environmental business. Since the situation surrounding Japanese industries is on the way toward the ESG mechanism certainly, the ESG methods could promote the social needs to be fostered successfully.

7. Concluding Remarks

Many governments proceed to sever curtails of public services corresponding with imperative social needs. Large amounts of social needs are necessary to be obtained without conventional governmental budgets. Insufficient infrastructure might cause deterioration of regions and be illustrated by the market or government failure. Those failures incur many losses in social and market systems and decrease the expected profits from investments. The number of profitable investments has declined and opportunities to raise economies have been lowering in the long perspective. To back the sustainability the ESG mechanism aims to decrease the number and the scale of the failures. Under the ESG mechanism some investments with negative profits are expected to turn into investments with positive profit of investment. If we promote innovative methods to achieve imperative social needs, the prolonged insufficiency to invest could disappear. Since the ESG scheme covers a large scope of economic and social systems, comprehensive system analysis has not developed successful yet. If the welfare analysis makes clear the social impact in the ESG methods, the approach in this paper could make a complete view on the reconstruction triggered by the ESG scheme.

It is confirmed in this paper that ESG methods should have positive effects for the sustainability in the three ways. If each effect proposed by the ESG methods is confirmed certainly, we could suppose that a synergistic effect appears and improves our market and social systems efficiently. In the binging, we should make assure each effect clearly. Firstly, ESG methods make efforts to deduce the welfare losses in numbers and values. The effect is expected to prevent the global communities from great crises. Secondly, ESG scheme activates the potential powers of the competition and cooperation in the local and global communities. That is, ESG scheme could guide the local and global communities toward the sustainability. Thirdly, ESG methods trigger the social innovation. The articulations to include the evaluation of some stakeholders could make the corporation more sensitive for risks and for innovations.

ESG efforts could make fundamental contributions for forthcoming the fourth industrial revolution and sharing economies. In the development process, the ESG scheme should incubate many types of investment for the social needs.

Globalized communities have been forced to pursue the reconstruction on the provision mechanism of public goods and services. The private provision of public goods is expected to supplement social needs. In order that every member of global communities may contribute to attain social needs effectively, markets perform properly and the cooperative framework should be constructed firmly. In the cooperative mechanism each member of community performs the own social responsibility and constructs trustful relations among them. The ESG methods could grow up to be the effective scheme to decline some part of complicate market failures and provide public services.

References

- Becchetti,L. and C.Borzaga (2010), *The Economics of Social Responsibility: The World of Social Enterprises*, New York, Routledge.
- Bühns,T (2009),*Environmental Integration : our common challenge*, State of University of New York Press, New York, Albany.
- Cunningham,I. and P. James ed. (2011),*Voluntary Organisations and Public Service Delivery*, New York, Routledge.
- GSIA(2014),*Global Sustainable Investment Review 2014*, GSIA; Global Sustainable Investment Alliance. <http://www.gsi-alliance.org/> (2016.11.11)
- Holland,P.T. and R.A.Ritvo (2008), *Nonprofit Organizations: Principles and Practices*, New York, Columbia University Press.
- Maita, A. (2016),’ Challenge of Deepening of Communication about the Environment for Japanese Corporations’, *The annual of the institute of economic research Chuo University*, the Institute of Economic Research Chuo University, written in Japanese, forthcoming in 2017.
- McLaren,D. and J. Agyeman,(2015), *Sharing Cities: A Case for Truly Smart and Sustainable Cities*, London, The MIT Press.
- Ministry of the Environment, Japan (2016),’-Survey on Eco-Friendly Corporate Activity of Japanese Corporations’,
<http://www.env.go.jp/policy/j-hiroba/kigyo/h26/03-2.pdf> (2016.11.7)
- Neff,D.J. and R.C.Moss (2011),*The Future of Nonprofits: Innovate and Thrive in the Digital Age*, New Jersey, John Wiley & Sons.
- Nyssens,M.(2006),*Social Enterprise: At the Crossroads of Market, Public Policies and*

- Civil Society*, New York, Routledge.
- Oster,S.M.(2010), “Product Diversification and Social Enterprise”, Seaman, B.S. and Young,D.R.(eds.),*Handbook of Research on Nonprofit Economics and Management*, Edward Elgar ,Chap 13. pp.195-207.
- Ridley-Duff,R and M.Bull (2011),*Understanding Social Enterprise: Theory & Practice*, Tousand Oaks California, SAGA Publications Ltd.
- Rifkin,J.(2014), *The Zero Marginal Cost Society: The internet of Things, The Collaborative Commons, and The Eclipse of Capitalism*, New York, St. Martin’s Press.
- Tanaka,H. (2004), “Theoretical Analysis for Corporate Social Responsibility,” *Global Environmental Policy in Japan*, ,No. 9, pp.1-9, written in Japanese.
- Tanaka, H. (2009),*The Sustainable Framework for Climate Change and the Financial Crisis*”, *Long Finance and London Accord (Web Papers)* , pp.1-18.
http://www.longfinance.net/component/yuidt/index.php?option=com_content&view=article&id=214&Itemid=157 (2016.11.10)
- Tanaka, H. (2010), “A Global Cost Sharing Scheme to Prompt Innovation in Environmental Technology, ” *long Finance and London Accord (Web Papers)* pp.1-12.
http://www.longfinance.net/component/yuidt/index.php?option=com_content&view=article&id=225&Itemid=157 (2016.11.10)
- Tanaka ,H.(2011a), “Global Public Supports for Innovation in Environmental Technology, ” *Long Finance and London Accord (Web Papers)* .
http://www.longfinance.net/component/yuidt/index.php?option=com_content&view=article&id=402&Itemid=157 (2016.11.10)
- Tanaka ,H.(2011b), “Sustainability and Network Effects in Global Cities, ” *Long Finance and London Accord (Web Papers)* .
<http://www.longfinance.net/programmes/london-accord/396-report-template.html> (2016.11.10)
- Tanaka,H.(2011c),*Comparative Researches on Global Cities between Tokyo and Tianjin*, Written by Japanese, Tokyo,Chuo University Kyouiku GP.
- Tanaka, H.(2012) “Social Responsibility, Social Enterprise and Social Innovation in the Stakeholder Communities,” *London Accord (Web Papers)* ,1-16.
http://www.longfinance.net/images/reports/pdf/chuo_socenterprise_2012.pdf (2016.11.10)
- Tanaka,H.(2013),“A Theoretical Model Analysis of Urban Transformation after Global Financial Crisis 2008,” *Long finance and London Accord(Web Papers)* ,pp.1-18.

- <http://www.longfinance.net/component/longfinance/?view=report&id=397>
(2016.11.10)
- Tanaka,H.(2014), “The Cooperative and Competitive Urban Municipality Policies in the Tokyo Area to Target Transforming Community Needs, ” *Long finance and London Accord (Web Papers)*, pp.1-19,
<http://www.longfinance.net/component/longfinance/?view=report&id=463>
(2016.11.10)
- Tanaka,H.(2016a), “The Finance System as Global Public Goods and the Regeneration of Global Communities,” *Long finance and London Accord (Web Papers)*, pp.1-12.
[http://www.longfinance.net/images/reports/pdf/Tanaka%20\(2016\)%20-%20The%20Finance%20System%20as%20Global%20Public%20Goods%20and%20the%20Regeneration%20of%20Global%20Communities.pdf](http://www.longfinance.net/images/reports/pdf/Tanaka%20(2016)%20-%20The%20Finance%20System%20as%20Global%20Public%20Goods%20and%20the%20Regeneration%20of%20Global%20Communities.pdf) (2016.11.10)
- Tanaka,H.(ed.)(2016b),*Global Community Governance*, Research Papers No5, The institute of Economic Research, Chuo University,
<http://www.chuo-u.ac.jp/research/institutes/economic/publication/research/> (2016.11.10)
- Tanaka,H. and C.Tanaka(2016c), “Urban Reform and Shrinking City Hypotheses on the Global City Tokyo,” *Long finance and London Accord (Web Papers)*, 2014,pp.1-18,
<http://www.longfinance.net/component/longfinance/?view=report&id=548>
(2016.11.10)
- Richardson,H.W. and C.W.Nam(eds)(2014),*Shrinking Cities: A Global Perspective*, London and New York, Routledge.
- Windrum,P. and Koch,P. (2008), *Innovation in Public Sector Services: Entrepreneurship, Creativity and Management*, Cheltenham, Edward Elgar.
- UNEP FI and UN Global Compact (2006) , *Responsible investment and hedge funds: A discussion paper*.
https://www.unpri.org/download_report/3972 (2016.11.11)