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### **Reflections on Theories of Social Optimization and Their Relevance for Future City Management in Japan**

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**ABSTRACT.** The paradigm of laissez-faire economy presumes that economic agents know efficient loci for input-output combinations and rationally act in the market by following their subjective values. Economy is efficiently organized and given dynamic forces to grow at its own risk. As a result, the greatest happiness for a great number is attained. It is difficult to correctly answer the question, why should we consider city management? Of course, the paradigm will not work in a city due to congestion and agglomeration as well as specificity of location. However, it is not sufficient to consider only subsidiary taxes and subsidy systems like Pigouvian prescriptions that lead the market equilibrium to a Pareto Optimum.

In a mature economy such as the Japanese economy that faces a long depression under pressure of aging and decreasing population, there are few investable targets as long as it is taken for granted that the paradigm should be maintained. Moreover, in a globalized economy, cities must compete against their rivals. This means not only efficiency of activities in the Pareto sense in the city but a higher absolute level of activity must be realized.

In this study, we focused on external costs and benefits that accrue through the activities of economic agents in a city. We argue that activities should be managed and controlled so external benefits are generated to a maximum extent and the activity level of the city is also maximized.

## **KEYWORDS.** Theories of social benefits, socially optimum optimorum, city management, urban future Japan

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#### **1. INTRODUCTION**

Traditional and modern economics have treated technical externalities, even if they are positive, as nuisance that cause distortion to block the first fundamental theorem of welfare economics. Analysis of externalities has long focused on the correction of distortion and realization of Pareto Efficiency. In this paper we discuss control of positive externalities to a maximum extent and their meaning for future city management in Japan.

In section 2, we generally focus on externalities and theories of social costs and benefits. We argue activities that cause positive externality should be managed so external benefits are generated to a maximum extent. In section 3, we argue it is important to focus on technical external economies such as agglomeration effects when managing activities in a city. In section 4, we show that the Pareto Optimal (Efficient) equilibrium is just a prerequisite for attaining an optimal level of technical externality in Chipman's sense (1970) and improvement in social welfare does not necessarily require Pareto optimality to be maintained even though the optimization of externalities in the social welfare function can be shown as optimum optimorum of Pareto efficient resource allocation as we have shown in the past (Higano, 2000). In section 5, we discuss the meanings of theories on social benefits and social optimization of externality discussed in sections 2, 3 and 4 for future city management in Japan. In section 6, we argue that Japanese economy in the past and future focus on urban economy based on the discussions on externality and social benefits. In Section 7, we conclude this paper with a summary.

#### 2. ANALYSIS OF EXTERNALITY AND THEORIES OF SOCIAL BENEFIT

Analysis of social benefits was developed jointly with analysis of externality as a typical cause for which the first fundamental theorem of welfare economics does not hold. Externality is external economies and defined as the effects or impacts made by individual economic agents as a result of their decision making based on their own behavioral criteria (value judgments) (i) *directly*, (ii) *without markets* or (iii) *technically*. The meanings of (i), (ii) and (iii) are shown to be almost the same through analyses by Pigou (1920), Marshall (1920), Knight (1924), Meade (1952), Chipman (1970), etc. When externality adversely affects economic agents, it is negative externality or external diseconomies. When it is favorable, it is positive externality or external economies (in a narrow sense).

Theories of social benefits focus on characters, (ii), of external economies, especially on the status in which counter values equivalent to positive (negative) externality are not paid to (no compensation) agents that cause externality by (to) beneficiaries (victims). Public investment is a typical example that causes positive externality and its counter value is not fully paid. Using the

terminology "counter value" appears inconsistent to the above definition of externality, especially character (ii). Markets that determine counter value spontaneously exist neither actually nor virtually as the definition per se says. We can understand counter value by observing equilibrium prices in a quasi-market that is built in the actual market system to correct market distortion and solve market failure caused by externality. This was analyzed by Arrow (1977). Right of compensation for damages based on court findings can be tradable in markets and counter value is a result of equilibrium in markets. However, there are many other situations in which, if possible, counter value in the virtual settings needs to be known just like we need to know social benefits of public investment before we decide whether to implement it or not. In these situations, we can only estimate and evaluate counter value by simulation analysis of the market system.

When externality exists, the first fundamental theorem of welfare economics does not hold. This may be explained by a difference between optimal level of economic activity from the view point of an economic agent that causes externality and an optimal level of economic activity from the view point of the economy (society) as a whole. The former view point is called private view point and the latter is called social view point. The former optimality is called private optimality and the latter is called social optimality. Of course, optimality in the first fundamental welfare economic agents irrespective of whether the counter value is actually paid by beneficiaries. On the other hand, private view point focuses on the level of counter value actually paid as the definition per se says. When counter value is actually paid, externality is (partially or fully) internalized. We can safely say that a larger counter value, leads to a positive externality in the economy.

Different concepts are closely related to private vs. social optimality. The concepts are private vs. social value balances. The private value balance of economic activity of a certain economic agent is positive, the same or negative depending on the sum of revenues accrued as a result of economic activity greater than, equal to or less than the sum of costs caused by activity and born by the agent. The social value balance of economic activity of a certain economic agent is positive, the same or negative depending on the sum of revenues (not necessarily in money so "benefits" are usually better and normally used) accrued by all economic agents as a result of economic activity greater than, equal to, or less than the sum of costs caused by the economic activity and born by economic agents. When economic activity has positive externality, private and social value balances can differ. For example, installation of an expensive waste water purification facility by a firm may create a negative profit (namely, the private value balance is negative) unless improvement in water environment is priced and counter value is paid. However, improvement in the water environment may result in a large benefit far greater than the cost of installing the facility that may improve the economy as a whole. Namely, the social value balance

of installing a water purification facility may be positive. This implies the private and social value balances of the economic agent that installs the water purification facility may be different. Analogically, social value balance may be negative and private value balance positive when economic activity has a negative externality.

An important point here is that private value balance is optimally derived from the private view point irrespective of whether it is positive, zero or negative. Of course, if it is negative, the state never lasts a long time. The firm exits the market unless the balance is improved in a limited time. On the other hand, there is no guarantee that social value balance is optimized even if it is positive because the optimality is controlled and managed dependent on value judgment. When we adopt a value judgment that implies the net social benefit is the larger, the welfare of the economy is the better, there is no guarantee the net social benefit is optimized (maximized) through the equilibrium of corrected markets even if social value balance is positive.

The analysis of social benefits was developed jointly with the analysis of externality. The main stream analysis was devoted to correcting distortion in markets that cause market failure. Tax and subsidy policies including Pigouvian types correct distortion in markets and give economic agents an incentive (compensation) to take economic action, which will result in positive net social benefit that accrues to the economy as a whole. Unless the correction is made, the distortion may cause a negative private balance and the action never be spontaneously taken. However, the optimal level of net social benefit attained through corrected markets appears to have been thrown out and kept outside the scope of the analysis. Chipman's (1970) motivation appears to pursue this optimality.

Related to theories of social benefit generated by public investments such as construction of highways, a typical example having technical externality, issues in question should be mentioned here: whether the summation of private value balances of all direct users of the highway are equal to the social value balance after construction of highway:

$$\Sigma \Delta$$
(private value balances) $|_{direct} = \Delta$ (social value balance)?

in which:

 $\Sigma\Delta$ (private value balances)|<sub>direct</sub> is summation of increases in private value balances of direct users of the highway. In other words, it is called direct benefit at *generation* and at *incidence basis* on the spot Kohno, 1982; Kohno and Higano, 1982; and

 $\Delta$ (social value balance) is an increase in social value balance; called social benefit

The first argues they are always equal to each other; the second argues the latter is far greater than the former. The former argument is called theory of transfer and the latter is called *theory of existence* (Kohno, 1982; Kohno and Higano, 1982). We can safely say Mohring and Harwitz [1962] argue theory of transfer, although their ambiguous measuring benefit concepts were

clearly specified by Kohno and Higano (1982) and Kohno (1982). Tinbergen (1957) argues theory of existence in numerical calculation schemes and is supported by Kohno and Higano (1982) and Kohno (1982) and Funahashi and Higano (1994) Implication of a difference between the two theories is whether we need to know the amount of benefit generated by construction of a highway on an incidence basis to make a decision on investments to the highway. Existence theorists argue we must know and measure benefits on an incidence basis for decision making. Transfer theorists argue it is enough to measure direct benefits on a generation basis. Logical basis of transfer theory is reached once a new market equilibrium is attained, summation of demand price of highway transportation service reflects social benefits on an incidence basis through market equilibrium. Apart from which theory is correct, we practically need to know the social benefits to make a decision on public investments for a highway before investments are actually made without the right investment criterion. Practically, theory of transfer, irrespective of whether it is theoretically correct or not, has a defect and inconsistency that must wait until a shifted demand price function of highway transportation service after a new market equilibrium has been attained to absorb shocks of the highway construction. Or, we must evaluate and estimate post demand price function of highway transportation service. This requires time and money equivalent to that necessary for the benefit calculations based on existence theory.

#### 3. NECESSITY OF CITY MANAGEMENT FROM THE VIEW POINT OF MAXIMIZATION OF EXTERNALITY

The paradigm of laissez-faire economy presumes that economic agents know efficient loci for input-output combinations and rationally act in the market by following their subjective values. Economy is efficiently organized and given dynamic forces to grow at its own risk. As a result, the greatest happiness for a great number is attained. Of course, the paradigm will not work in a city due to externality of congestion (negative) and agglomeration (positive) as well as specificity of location. As already argued, it is not sufficient to consider only subsidiary taxes and subsidy systems like Pigouvian prescriptions that only lead the market equilibrium to a Pareto Optimum (efficiency).

In a mature economy like the Japanese economy that faces a long depression under pressure of aging and a decreasing population, there are few investable targets as long as it is taken for granted that the paradigm should only be maintained. The Japanese economy like economies of other developed countries is still dependent on the city while its relative importance will decrease due to global environmental issues and climate change. The analysis in the previous section suggests that not only efficiency of activities in the Pareto sense but a higher absolute level of activities should be realized in the city. We argue that activities should be managed and controlled

directly or indirectly so external benefits are generated to a maximum and the activity level of the city is also maximized.

As already discussed, analysis of social benefits was developed jointly with analysis of externality. A.C. Pigou [16] defined social vs. private costs and prescribed a Pigouvian type of tax and subsidy that leads to a laissez-faire market equilibrium as a Pareto Optimum. Marshall (1920) focused on "technical effect" due to production of firms in a dynamic context. The technical effect has two characteristics that appear inconsistent with each other, and are difficult to be analytically specified. Namely, Marshall considered technical effects external to individual firms that generate the effect (individual firm cannot appropriate technical effect through direct control) and *internal* to the industry to which the firms belong (each firm in the industry can indirectly enjoy benefits of technical effects as a member of the industry). Technical externality in production is generally specified as a shift in the isoquant curve of a firm due to production of other firm(s). Meade (1952) analyzed subsidies that lead to a Pareto Optimum by analyzing differences between social and private marginal productivity. Differences in social and private marginal productivities and between social and private costs are two sides of a coin. This was first analyzed by Knight (1924), and shown by Chipman (1970) in a more general framework but with specific utility and production functions. He analytically specified Marshall's technical effect by defining special parameters that are not controllable by individual firms, but can technically affect their production when the aggregate production of the industry is once determined. He showed taxes and subsidies lead the laissez-faire market equilibrium to a Pareto optimum by deriving social and private demand and supply functions. However, the optimum level of technical externality, which appears as a motivation to Chipman's analysis, was not resolved. Of course, to solve this, a social welfare function in any sense must be defined in his framework and the analysis will be more complicated. The key point of this paper is to use the concept of optimization of externality in Chipman's sense when we consider city management.

It is very difficult to give a direct answer to the question, why do cities exist? However, it is safe to say agglomeration economies enhance city development once they exist. Agglomeration economies are typical positive externalities associated with space. Moreover, in a real setting, space is generally heterogeneous and location has various advantages with agglomeration economies. In this sense, the city is a system for generating external economic benefits and the city must be well managed and organized so that the net social benefit is optimized and maximized.

For example, development of many specific locations by the construction of a large shopping mall, which is sometimes possible by only securitization, can contribute to improving the decline of surrounding districts as the mall attracts a number of visitors, who may also visit other shops located in the surrounding districts. As we argued, if the shopping mall can attract enough customers the private value balance of the development becomes positive, the externality of the development may result in a positive social value balance and surrounding districts may thrive. The result is usually obtained by proper city management of the districts including the shopping mall. Of course, other shops must also have business models to be consistent with city management.

As we have argued above, few investable targets exist in a mature economy like the Japanese economy. This is true for urban-development without city management. Taking the above example of developing a large shopping mall, there is no guarantee the development will be spontaneous, especially when the economy faces depression. Even if development progresses, there is no guarantee the number of customers at the shopping mall will be enough to result in a positive net social benefit for the surrounding districts. Even if the social benefit were positive, there would be no guarantee the net social benefit is optimal or maximized. This means that not only efficiency of activities in the Pareto's (and Pigouvian's) sense of the city, but an optimal level of activities must be attained to maximize the net social benefit. More practically speaking, a *higher* absolute level of activities must be pursued and realized that result in a greater net social benefit, because it is almost impossible to identify the socially best state of an economy in real settings of spatial and dynamic context even if we can presume a social welfare function that is powerful in real settings and acceptable for the majority of the constituents of the economy.

#### 4. SOCIAL OPTIMALITY OF MARKET EQUILIBRIUM IN SENSE OF OPTIMUM OPTIMORUM

Higano [8] demonstrated that a socially optimal state of the economy based on a given value judgment can be sustained by implementation of the Pigouvian tax and subsidy policy and *income redistribution* after a series of studies (Higano and Orishimo (1990), Higano (1991a; 1991b), Shibusawa and Higano (1997), etc.). The economy of a city in the analysis was assumed as follows: a given number of households exist in the city; utility function of household is a Becker (1965) type and utility level is dependent on the consumption of composite goods and leisure; households are identical but they obtain different incomes depending on allocation of time between leisure and work due to commuting (called as office work) to the city center (production activities occur only at point of the city center) or telecommuting at home (called as office work). Therefore, income of households may also be different depending on housing location; traffic of commuting causes traffic congestion in Vickrey's (1965) sense; and traffic of commuting requires input of space and commuting time is dependent on the level of traffic congestion.

The economy assumed in the analysis may be unsuitable for explaining and strengthening the

argument in section 3, because neither idea of a shopping mall nor declining district exist in the economy. However, location in space is different, but a simple character in terms of distance to the city center. In other words, except for this space is homogeneous. This simple character brings externality into the analysis and the meaning of optimization of externality is clearly shown. Namely, generation of commuting traffic caused by development of a certain lot at a certain location in a housing district with various household densities and caused by an increase in office work time for households living in the housing district, causes negative externality in the sense that it induces not only additional increases in commuting time of households who live not only in the district but also in further districts. By contrast, as a result of duality, development of a certain location into a transportation facility for commuting causes positive externality in the sense that it induces a decrease in the commuting time of households living not only at the location but also at any location further away. In addition, an increase in work at home of households living in a certain location induces positive externality because it decreases commuting traffic that is generated at the location.

We defined resource allocation that is equivalent to the state of the economy. In the definition, resource means space (land) and time. Set of feasible resource allocation (FRA) is defined as set of states of the economy in which demand and supply for resources are equated so the utility level of identical households is invariant with location of housing. Set of market resource allocation (MRA) is defined as set of states of the economy in which a household maximizes utility, firms maximize profit, profit is distributed to households as dividends, maximized utility level is invariant with housing location, and derivative demand and supply for resources and commodities are equated with each other in all markets. As the definition states, MRA is a subset of FRA. Differences between the two are such that there is no idea of market price and income with FRA. Of course, Pareto Optimum Market Resource Allocation (POMRA) is a subset of MRA and difference set of MRA and POMRA is not a null set and is a market resource allocation distorted by externality. Socially sub-optimum resource allocation (SSORA) is defined as set of states of economy in which marginal conditions are adjusted based on calculated counter values of externality so that Pareto optimality (efficiency) is realized. The state of the economy in SSORA can be realized as the state of economy in POMRA by introducing the Pigouvian tax and subsidy policy into the market.

Following the Coase Theorem, there are a variety of tax and subsidy that corrects distortion in the market. Also, there are a variety of making positive (negative) lump-sum transfer that redistributes to households positive (negative) net revenue of authority, which corrects the distortion in the market via taxation and subsidization. Therefore, there could be an infinity number of SSORAs depending on a variety of tax and subsidy as well as positive (negative) lump-sum transfer. In the economy, households are identical and it is natural to adopt the egalitarian social welfare function, namely equilibrium utility level of households invariant with housing location are the social welfare function. The socially optimum resource allocation (SORA), state of an economy with the social welfare function, namely equilibrium utility level of household maximized, is a subset of SSORA. The maximization is substantially dependent on the optimal positive (negative) lump-sum transfer that is variable with location of households. The maximization is not dependent on *only* Pigouvian taxes and policies, although they can be variant following the Coase Theorem, because optimal positive (negative) lump-sum transfer is associated with Pigouvian tax and subsidy policies to maximize the equilibrium utility level of identical households to optimize the level of externalities and spatial distribution. In this sense, correction of distortion is prerequisite for maximization of social welfare, but not sufficient.

When a certain state does not satisfy (socially) Pareto Optimum conditions, we may not necessarily expect that we can increase welfare level by adjusting the state to (socially) the Pareto optimum (change from point b on higher contour exists in distorted MRA to point a on lower contour exists in POMRA in Figure 1). Nor does improvement in social welfare necessarily mean social improvement in Pareto optimum efficiency (change from point a to point b in Figure 1). In other words, we cannot expect that simple Pigouvian taxes and policies, which only correct distortion in the market due to externality and reveal no idea for optimization of externality, dynamically improves social welfare.



Figure 1. Improvement in socially Pareto efficiency vs. social welfare

The work by Higano (2000) highlighted issues proposed by researchers of externality and social benefits. Namely, attaining (socially) Pareto optimum and improving social welfare in the social welfare function do not coincide except for attaining a Pareto optimum that is socially optimum in the social welfare function. This study also highlighted the introduction of Pigouvian taxes and subsidies that correct distortion due to externalities in the markets is not sufficient for realization of a maximized social welfare. This implies that in reality activities in the city should always be managed so as to improve social welfare of citizens in the city, even though it is very difficult to know whether the current situation is optimum. We can safely say that maximization of (positive) externality generated by activities in the city is prerequisite to realization of improvement. Namely, city management in a mature economy like the Japanese economy with optimization of externality is important and essential, and should be pursued so that development of prosperous investment targets can be expected and social welfare can be maximized.

#### 5. NECESSITY AND EFFECTIVENESS OF COMPREHENSIVE EVALUATION IN CITY MANAGEMENT

As we argued in section 4, there is almost no way to identify the social optimal state of the economy in real settings of spatial and dynamic context even if we presume a social welfare function. However, change or reform in politician terminology, which targets economic development, must generate externality that causes a larger difference between private and social optimality. With a larger difference, higher economic development can be expected to result in a higher welfare (the larger the difference, the stronger the reason for reform or change to be led by the government). In this sense, the direction of change must be oriented to a better state of the economy. Whether change or reform is oriented to a better direction must be comprehensively identified. It should never be identified by a simple pair-wise comparison because externality caused by change or reform usually has multi-dimensions and the opportunity cost of action (policy, investment, etc.) that generates externality must be high in a mature economy. We argue that numerical simulation of socio-economic models is more suitable for identification whether change is oriented to a better state or not. The simulation model should incorporate not only private and social value balances as discussed in Section 2, but also material balance and energy flow balance (Higano, et al., 2009; Sheng, et al., 2012) because the necessity for construction of a low carbon society provides good opportunities for prosperous business models in the city and the simulation models should be rightly specified to comprehensively evaluate externality of the business model.

Of course, simulations by the model cannot identify the best state to which change must be directed, just as any other method cannot identify it. In the context of city management, our argument is dependent on estimation and evaluation of externalities. This does not necessarily mean that we must know externalities exactly. Even if we do not know the exact net social benefit of externalities, it is sufficient to make sure that city management implementations generate externalities that result in a higher net social benefit. In this sense, method of evaluation of externality must include optimization of externality, which will orient change to a better state.

#### 6. URBAN JAPAN OF THE NEW URBAN WORLD IN THE FUTURE

There are three viewpoints needed to consider a parable about the future urban world in Japan:

- (1) Aging and decreasing population;
- (2) High-tech and innovation oriented economy; and
- (3) Environmental issues.

Particularly, the first view point is important for the Japanese economy and can be summarized as follows:

**[P1]** After the era of high economic growth ended and the bubble economy collapsed in Japan, we entered an era in which utilizing existing stock efficiently and effectively rather than increase the amount of stock, namely *efficient and effective utilization rather than construction of stock*.

In Japan we now face serious aging and population decreases in the society: two families (two parents) will be succeeded by one family (one parent). This means we will definitely have a surplus supply in the housing market. In a matured society where every person is satisfied with physical commodities and goods, the demand for durable goods cannot grow as long as the population is decreasing.

Firms cannot grow by only increasing production and export unless the firm creates or adds something more valuable to the commodity, because the Japanese economy is locked into fierce competition with emerging countries. Investment creates an increase in stock and is an important component of the final demand that drives the economy during an era with a high economic growth rate. However, economic growth in Japan is now unable to depend on conventional investments alone because social and private infrastructures constructed by such investments are almost saturated, and are mostly dependent on effective utilization of the existing stock, which induces high quality demand for high demand price, so high quality investments differ from conventional investments.

The Japanese economy has an excess of highly educated laborers, which causes social problems never experienced before. Accepting more immigration, increasing retirement age, and improving work environment for women should all be seriously argued and implemented in another sense, but cannot solve issues caused by the aging society and a decreasing population.

Rather, the situation will become worse. The point here is to change quality of demand, which induces structural change in the industry such as establishment of a low carbon economy to add higher value, because we cannot expect further increases in demand for *commonly-used* commodities produced in the Japanese economy due to the maturity of the Japanese economy and fierce competition in the global market.

In Japan, the price of real estate (stock) remains low especially in the city after the bubble economy collapsed. Also, the Japanese economy, which was institutionally and heavily dependent on "land," cannot grow unless the price of real estate, especially land price increase. This means bad loans that are a barrier for the Japanese economy to recover are unable to be fixed unless the price of real estate recovers to the level before the bubble economy started. On the other hand, this has another important meaning:

**[P2]** The Japanese economy will be unable to grow unless socio-economic activities in the city are organized so the price of real estate increases.

One background factor is mentioned above [P1], "efficient and effective utilization of stock rather than mass construction of stock."

Prices of commodities are changeable and dependent on the financial and socio-economic conditions. However, commodities with a higher substantial value should be priced higher in the markets than commodities with lower substantial value. If the markets are perfect, we can expect good results. The substantial value of stock is neither absolute nor constant but changeable dependent on how effectively we utilize it. The substantial values can only be properly realized as relative prices in the perfect markets.

According to our experience through the high economic growth and bubble era in Japan, we have made a mistake:

**[M1]** Real estate with a higher supply price has a higher substantial value (in the supply-oriented markets due to shortage of supply).

For example, in the era of high economic growth more than 7% substantially, any housing, e.g., even though a little bit shabby, could be sold in the market at the same price as a similar type of housing, and could be sold once it was constructed or even before the construction had started. Through the era of high economic growth in the 1960's and 1970's, more or less housing and other real estate were traded at a higher supply price than the price that reflected its substantial value. This means that facing an era in which we should utilize existing stock effectively and efficiently, we now have to correct the difficulties to increase the substantial value of stock since the existing stock, especially most residential housings is too inferior to increase the substantial value in the market.

Entering into the bubble era, we made another mistake that was more serious and caused longer stagnation of the Japanese economy after the bubble economy collapsed:

**[M2]** Real estate with a higher demand price has a higher substantial value (in the demandoriented market due to excessive demand).

It is well-known that the mistake was caused by excessive credit in the bubble era after excessive liquidity. Mortgages were given to a certain tract of land with priorities. Total value of loan given by mortgages were far beyond substantial mortgage value of land. Institutionally banks in Japan could not loan without a mortgage that was easily exchanged for cash and land were the most secure mortgages for the bank while land price was increasing. Due to excessive liquidity after Plaza Accord, the bank had to make a lot of loan and money loaned was spent for buying land for speculation based on the trend of land price observed in 1960's to 1970's. Starting a chain action, land prices increased far higher than the rent that should have reflected the net value of activity land sales. This is one reason the Japanese economy was suddenly filled with bad loans. If the banks in Japan had been allowed to loan without mortgage, and had made loans, for example, based on assessment of prosperous business operated, land prices would have reflected the substantial value of the land, namely substantial rent value of land, and never experienced the bubble economy or been faced with numerous bad loans. In this sense, as argued in Section 3, business models and innovative activities that sustain and are sustained by a good business model are important for city management in Japan. Therefore, we should change [P1] to:

**[P2]** The Japanese economy is unable to grow unless socio-economic activities in the city are organized so that the substantial value of real estate increases and the price of real estate reflects the substantial value.

Two questions must be answered related to [P2]:

- (1) How to increase the substantial value of real estate (direct question); and
- (2) How can we organize a perfect real estate market?

These two questions are closely related to each other.

When the markets are perfect, increases in the number of real estate trade is to increase the substantial value of real estate if other conditions remain the same. In the real estate market, trade of land for more efficient utilization is substantially made as transfer of ownership. Traditionally all trades were of this type. Recently, trade of land for efficient utilization can be made virtually as a trade of securitized paper (securitized real estate) such as J-REIT (Japan – Real Estate Investment Trust) through SPC (Special Purpose Company). Securitization of real estate, which

must be associated with a business model, provides an incentive to SPC to utilize real estate with a best business model so the flow of profits (benefits) earned by the utilization is made better. Therefore, a business model that specifies how to effectively and efficiently utilize the real estate (stock) will determine the substantial value, which reflects price of securities if the market of J-REIT is organized perfect. Therefore, we present the following proposition:

**[P3]** Considering the new urban world on which the Japanese economy will be dependent, a business model is very important and it is critical how effectively we utilize the existing stock of real estate and increase its substantial value.

A business model means a set of innovative devices and ideas that will generate more substantial value of stock than before the business model was adopted even though outer conditions remain unchanged. Concrete accomplishment of a business model is sometimes realized by being granted intellectual property directly to the model. On the contrary, substantial value and price of intellectual property can be realized in a (perfect) market like J-REIT through a combination of innovative and conventional business models that generate more profits/benefits by using it. This provides an incentive for people to make R&D activities and investments in the urban economy.

Recently, it is well recognized that the value of a building should be appraised by considering it as one building in a district or town in which all buildings are functionally as well as geographically related to each other. To make a functional relationship more efficient and effective a prosperous business model related to utilization of a set of real estate is needed. It is very difficult to grant intellectual property rights to this kind of business model. However, the business model can have an exclusive value that should only accrue to the community of the district as a whole since such a business model is site-specific. Especially this is true as for most of the benefits generated by the business model that does not accrue as controllable returns or dividends to owners of real estate, namely when the benefits can be appropriated only as Marshallian type of external benefits.

An ultimate resolution of global warming issues is the construction of a low carbon society. As for the real estate market, construction of energy saving buildings and housing should be now taken as defaults. Till 2020, we should identify and establish prosperous business models in the markets: how to decrease the dependent ratio on the supply of electricity by electric companies (commercial power electricity) that are mostly dependent on fossil fuels in Japan, more than 80%; and how to increase the substantial value of real estate by competitively supplying nonfossil fuel oriented electricity against the commercial power supply. This type of business model will be more effective and prosperous if it utilizes exhaust heat elsewhere in the city. Of course, not only software with which multiple claims can be untangled but also hardware of buildings in

a district for which the exhaust heat can be effectively recovered and utilized should be carefully designed in the business model. When the business model is evaluated as linked with the market of emission permits, at least a part of the value of the business model, which otherwise is mostly appropriated by non-owners of stock and never spontaneously implemented even if the social benefits are large, will be reflected as an increase in the value of real estate in the district and accrue to individuals and firms of stock owners in the community.

The purpose of comprehensive evaluation of the business model and real estate is originally to make transparent trades in both the real estate market and derivative markets so that the markets work efficiently as designed. As we see in the above discussions, evaluation also contributes to realization of a business model in the sense that it can be realized in the markets only if the evaluation is adopted and structured into the market like the market of J-REIT. Possibilities of this kind of business model are unlimited because after issues of global warming, if we could overcome them, the scarcity of water resources and the depletion of mineral resources will next determine the value of stock in the city.

#### 7. CONCLUSIONS

The Japanese economy will still be dependent on the urban economy in the future. We cannot expect that the growth model, in which the economic growth is driven by only investment in the stock, is workable since there are few investable targets in a mature economy like the Japanese economy, which faces a long depression under pressures of aging and a decreasing population. However, we can expect that agglomeration economies can still give dynamic force to city to grow. In this sense we need city management that focuses on maximization of externalities by inducing efficient utilization of existing stock and derivative demand of high quality. Business models will play a critical role in the utilization of existing stock and induce investments of high quality.

Evaluation mechanisms must be designed and structured into the markets so that not only the trade in the market is made transparent but also the prosperous business model generates large social benefits, which otherwise cannot spontaneously accrue to individual players, will be realized in the markets similar to the market of J-REIT.

We argue that the activities should be managed and controlled directly or indirectly by city management so external benefits are generated to a maximum extent and the activity level of the city is also maximized.

Necessity of city management was argued based on theories of social benefits. City development is enhanced by externality of agglomeration economies. Importance and necessity of city management is a logical conclusion of theories of social benefit. Especially because social

optimality (in sense of maximization of social welfare function) of equilibrium state can't be necessarily realized by markets corrected with tax and subsidy policies including the Pigouvian type. This was shown based on our previous research results (Higano, 2000).

Practically, it is very difficult to identify an optimal state of the economy. However, change or reform, which target economic development in a mature economy, must have larger externalities and must be identified whether change or reform is directed to a better state of the economy in the sense that a larger net social benefit is realized in the economy. We argue that numerical simulation of socio-economic models is more suitable for the identification.

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