

# Imperfect Property Rights, Bounded Rationality and Relation Exchange

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**Abstracts:**

In sympathy-consent dimension, the failure of Akerlof's lemon market is not the exception, but one example out of generic phenomena. The general market failure stems from the imperfectness of property rights. Nevertheless, value exchanges in the market take place because they are made up for by complementary role of relation exchange. Relation exchanges are fulfilled through sympathy-consent process, the idiosyncratic attribute of which is path dependence. In sympathy-consent dimension, human intelligence is assumed bounded rational and property rights remain imperfect. Their behavior seeks relation exchange. Sympathy-consent dimension contrasts with rationality dimension, where the latter lodges the economic system that is determined by optimization-equilibrium algorithm. Values-costs of economic actions are not consistently measurable across different paths of sympathy-consent process, which establishes the legitimacy of sympathy-consent dimension as analytic architecture. In sympathy-consent dimension, relation exchanges turn out to be more fundamental than value exchanges in the market.

**JEL Code: P14****Key Words:**

**relation exchange, sympathy-consent process, path dependence, value/cost-transcendental domain, open/indeterminate system**

## **1. Introduction**

Akerlof (1970) introduced stories of market failure when trust matters. His case examples of lemon market include seniors' insurance, used cars, etc. Problem is Akerlof's cases of market failure are not exceptions of overall flawlessness, but endemic problem of economics. Exchanges in the market are built on property rights. The perfectness of property right is far from reality in human life. It is directly related to the problem of human cognizance.

It is well known in the literature of institutional economics that there is a gap, which we cannot narrow, between property rights approach and transaction cost approach (Klein, Crawford and Alchian 1978, Coase 2006). Still, the question remains unresolved. In this regard, specificity problem (Williamson 1975, 1985) seems to offer important clue to the efforts attacking the question.

Considering the fundamentality of the question, it seems advisable to raise a root question of the relation between exchange and property rights. Can exchange take place even if property rights are imperfect? Yes, but with the complementary role of relation exchange, e.g. trust. Exchange may take place even without the use of price. Human beings have practiced relation exchange without use of price for million years since primitive age. It is sympathy-consent process which navigated the fulfillment of relation exchange. Sympathy-consent process includes trust, friendship, branding, clientele, leadership, followership, affiliation, loyalty, coercion, domination, affection, prejudice, emotion, superstition, etc.

It is noble contribution of this research to find sympathy-consent dimension as analytical dimension in economics. In this connection, value-cost transcendental domain will be excavated. In a same token, relation-specificity-building process will be found to be same as relation exchange. Austrian catallaxy will be synthesized with neoclassical orthodoxy.

Section 2 introduces relation exchange as fact of real life. Section 3 introduces sympathy-consent process. Sympathy-consent dimension contrasts with rationality dimension. Austrian catallaxy is synthesized with neoclassical orthodoxy. In section 4, the legitimate existence of sympathy-consent dimension is vindicated from untenable consistency of value-cost

measures across different paths of sympathy-consent process. Value/cost transcendental domain is excavated. Relation exchange is found to be same as relation-specificity-building process. Closed/determinate system contrasts with open/indeterminate system. In section 5, relation exchange turns out to be more fundamental to value exchange in the market. In section 6, confusions about transaction cost (Coase 1937, 2006) are to be cleared. Sympathy-consent dimension is directly linked to rationality dimension through the concept of sympathy-consent-free states. Section 7 concludes the paper.

## **2. Relation Exchange**

Relationship is the fundamental underpinning of human life. Relational contract (Williamson 1985) recognized the need to understand the meaning of relationship. However, their understanding of relationship failed to recognize the Catalectics, i.e. science of exchange, of relationship (Hayek 1968, 1982; Mises 1998). It has not been properly understood in economics despite the fact that the significance of its meaning cuts deeply into the core of analytics of economics.

Exchange of relationship, i.e. relation exchange hereafter, is a fundamental propensity of human life since the age of primitive life, maybe for million years. It was practiced before the establishment of property rights and before the operation of market. Even nowadays when market economy is in full blossom, relation exchange still stays put as underlying root ground. Human beings engage in relation exchange to seek security and benefits, i.e. to seek welfare.

Adam Smith (1776) may be the most eloquent writer who illustrated the power of division of labor from the tale of pin factory. According to him, market exchange creates the mechanism which gives rise to the division of labor. It is critically important to understand that every relationship creates division of labor when they are exchanged. From friendship through trust, relationships are exchanged, which give rise to division of labor. Familiar example is home. At home, family affection is exchanged among husband, wife, and children. The creation of welfare at home is the basis of national economy.

Marketing activities are all actions of relation exchange. Branding, clientele, leadership, followership, affiliation, loyalty, coercion, domination, affection, prejudice, emotion, superstition and so on are all actions of relation exchange. Human lives heavily rely on the actions of relation exchange.

**Assumption RX (relation exchange as fact):** Relation exchange is presumed to exist as fact of human life.

Assumption RX is the initial presumption of this research. Relation exchange is presumed to exist as fundamental underpinning of human life. However, in order to establish relation exchange as analytical apparatus in economics, an analytic dimension is required to be in order. A new analytical dimension is to be introduced as instrument to attain the action of relation exchange because relation exchange is different from value exchange in the market. Price is used as medium of exchange in the transaction of value exchange in the market. However, the attainment of relation exchange relies on the sharing of mutual agreement between concerned parties, say as through trust. Since trust indicates a concrete action, we prefer to mint a generic terminology, which is sympathy-consent process.<sup>1</sup> That is, relation exchange is attained through sympathy-consent process among concerned parties.

Such distinction of value exchange with price from relation exchange with sympathy-consent process bears significant meaning because the two indicates different analytical dimension. The former indicates rationality dimension while the latter indicates sympathy-consent dimension which is distinguished from rationality dimension. The distinction of these two analytical dimensions is the essential step to the understanding of analysis of relation exchange. Why and how rationality and sympathy-consent dimensions are distinguished is the question to address in this paper. Table RD-SCD unfolds the details of distinction between two analytical dimensions.

Table RD-SCD: Rationality Dimension vs. Sympathy-Consent Dimension

	Rationality Dimension	Sympathy-Consent Dimension
Human intelligence/Behavior	Rationality/Optimization	Bounded rationality/Satisficing
Exchange	Value exchange	Relation exchange
Medium of exchange	Price	Sympathy-consent process
Path dependence	Equilibrium	Path dependence
System	Closed/determinate	Open/indeterminate

### 3. Sympathy-Consent Dimension vs. Rationality Dimension

Fundamental difference between two analytical dimensions stems from the hypothetical difference on human intelligence. In rationality dimension, human intelligence is assumed smart enough to seek rationality. Hence, optimization behavior is able to be fulfilled. However, in the approach of sympathy-consent dimension, the confidence on human intelligence is not so much fulfilling. Human beings aim at rationality as for their target-setting, though their intelligence falls short of the achievement of target. Their attempt to seek rationality is bounded by the shortfall of intelligence. Hence, their behavior is unable to fulfill optimization. Instead, human beings conduct satisficing behavior (Simon 1956).

The use of jargon ‘satisficing’ here is different from the use in Simon (1956), although the compound word is adopted from him. In contrast with Simon (1956), satisficing behavior does not indicate the actions in rationality dimension, e.g. constrained optimization, but indicates the actions in sympathy-consent dimension, i.e. relation exchange.

**Assumption ISL (individualistic self-love):** Individuals seek self-love, i.e. self-interest.

**Assumption BR (bounded rationality):** Human cognizance capacity is restrained by physical limit. Hence, bounded is their rationality of decision making.

**Definition SF (satisficing):** Satisficing is defined to be the actions of sympathy-consent process which seek self-love under the condition of bounded-rationality.

A typical action, which is given rise by satisficing behavior, is the exchange of relationship. The relationship includes trust, distrust, friendship, animosity, marketing, branding, clientele, leadership, followership, affiliation, loyalty, betrayal, coercion, domination, affection, prejudice, emotion, patriotism, superstition, etc. Relation exchange is considered as the action of sympathy-consent process. Since human intelligence is subject to the bound of physical limit, we rely on sympathy-consent process, i.e. relation exchange to seek self-love.

**Definition SCP (sympathy-consent process):** Sympathy-consent process is defined to be the analytic process to perform mediatory role in order to fulfill relation exchange.

The validity of sympathy-consent process, i.e. Definition SCP is upheld by the real-life evidence of relation exchange (Assumption RX). In other words, we begin with real-life evidence of relationship, from which sympathy-consent process is drawn out as a step to build analytical architecture. Since relation exchange is presumed to exist as the fact of real life, we are also assured of the validity of sympathy-consent process. If relationship is a fact of life, sympathy-consent process is the image of such fact.<sup>2</sup>

### *Path Dependence of Relation Exchange*

Path dependence indicates the phenomena that coincidental history affects the subsequent outgrowth of decision path. Relation exchange is path dependent. For instance, we don't

reshuffle or reorganize the cohort of friends at every time of decision making. The collection of friends is not the matter of optimal choice. Friends are given as legacy of historical coincidence.

The analytical perception of relation exchange is sympathy-consent process. Hence, path dependent is the sympathy-consent process. Relation exchange is attained by the completion of sympathy-consent process.

**Definition PD (path dependence):** The phenomena that historical coincidence affects the subsequent outgrowth of decision path are defined as path dependent.

**Assumption PDSCP (path dependence of sympathy-consent process):** Sympathy-consent process among individuals is assumed to unfold the attribute of path dependence.

**Definition RX (relation exchange):** Relation exchange is defined to be the exchange of relationship through sympathy-consent process as mediatory step.

What is distinctive to relation exchange is that the action of relation exchange sets out historical legacy and stokes the next round of sympathy-consent process. It will be called relation-specificity-building process. Relation specificity is introduced as analogy from Williamson's asset specificity (Williamson 1975, 1985). Path dependence of relation exchange follows from Assumption PDSCP (path dependence of sympathy-consent process) and Definition RX (relation exchange). The examples of relation-specificity-building actions are such actions as the building of trust-relation, making of friendship, action of betrayal, marketing action, affiliation-building, action of coercion, action of domination, etc. Such actions of relation exchange give rise to relation-specificity, which lodges path dependence.

Relation-specificity-building process is the process which is set out by satisficing behavior. Is such relation-specificity-building process a legitimate process in analytic sense? In other words, is such relation-specificity-building process viable in the analytic architecture of economics? It is the main theme to address in this paper.

**Proposition PDRX (path dependence of relation exchange):** Relation exchange unfolds path dependence.

**Proof:**

The path dependence of relation exchange follows from Assumption PDSCP (path dependence of sympathy-consent process) and Definition RX (relation exchange)  $\square$ .

In the proof, the path dependence of relation exchange is derived from the same attribute of sympathy-consent process. In reality, the phenomena of path dependence are being experienced in relation exchange. The attribute of path dependence should be interpreted as coming off simultaneously at the actions of relation exchange and sympathy-consent process as well.

***Rationality Dimension***

What is the relation between relation exchange and value exchange in the market? <sup>3</sup> The exchange in the market is to be studied to illuminate on its connection with relation exchange.

**Definition VX (value exchange):** Value exchange is defined to be the exchange in the market with price used as medium of exchange.

What is the connection between value exchange and relation exchange? In order to understand the connection, the sympathy-consent dimension as analytical dimension should be introduced.

**Definition SCD (sympathy-consent dimension):** Sympathy-consent dimension is defined to be the analytical dimension which is built on the actions that are fulfilled through sympathy-consent process.

Sympathy-consent dimension is the analytical dimension which unfolds satisficing behavior of human beings whose intelligence is subject to bounded rationality. Sympathy-consent dimension is built on the actions that are fulfilled through sympathy-consent process. From Definition SCP and Definition SF, sympathy-consent process is defined to be the mediatory process as instrument to fulfill the action of satisficing behavior. Hence, the action of satisficing behavior operates in the sympathy-consent dimension. The legitimacy of such analytical dimension will be challenged by the actions of value exchange if its analytical viability is not vindicated. It is the main theme of this paper to address the question, which will be presented in section 4.

In contrast, rationality dimension is the world of human intelligence, the sagacity of which is sustained enough to uphold rational behavior. Optimization rather than satisficing is the human behavior that holds in rationality dimension. In rationality dimension, equilibrium solution is sorted out to locate every economic state.

**Definition RD (rationality dimension):** Rationality dimension is defined to be the analytical dimension which is unfolded by optimization behavior of rational human beings.

Sympathy-consent dimension stems from the lacuna of human intelligence or shortfall from rationality. Hence, if the size of lacuna dwindles, the shortfall from rationality reduces. At extreme, satisficing behavior becomes optimization behavior, if rationality dimension is put in place.

**Proposition RD (the existence of rationality dimension):** Rationality dimension constitutes the analytical dimension which is built on the actions of optimization behavior.

**Proof:**

Rationality dimension is the analytical dimension upheld by optimal decision-making behavior of rational human beings. Human intelligence is assumed smart enough to support the rationality of human beings. It indicates that the consistent measurement of value-cost is sustained by the rationality. The legitimacy of system operation has been vindicated by the establishment of orthodox neoclassical economics. □

In this research, no attempt is undertaken to illustrate the system and its operation of orthodox economics because it is already a well-established analytical architecture (Arrow and Debreu 1954). Equilibrium analysis built on optimization behavior of human beings is the main pillar of neoclassical economics.

*Synthesis of Austrian Catallaxy with Neoclassical Orthodoxy*

How is the sympathy-consent dimension related with rationality dimension? In other words, how is the relation exchange interwoven with value exchange? The concept of sympathy-consent-free states is the essential key which opens the gateway that connects two different analytical dimensions.

**Definition SCF (sympathy-consent-free states):** Sympathy-consent-free states are defined to indicate the states of life where sympathy-consent process is attained without any friction or delay.

Of course, SCF (sympathy-consent-free) states are unrealistic and hypothetical states. In reality, the attainment of sympathy-consent process is difficult, painful, and time-consuming. However, the significance of its conceptual meaning is in its enabling power to allow the illumination on the overarching connection between rationality dimension and sympathy-consent dimension. By this connection, the analysis and conceptual meaning in rationality dimension may be interpreted into the analytical context in the sympathy-consent dimension. It bears particular significance because it indicates the synthesis between Austrian catallaxy with neoclassical orthodoxy. The concept of sympathy-consent-free states offers analytical angle which highlights on how Austrian process approach connects to neoclassical rationality dimension.

In sympathy-consent-free states, imperfect property rights do not make any problem that may arise in sympathy-consent process. The conflict of interests among individuals, if any, will be resolved immediately with no cost incurred. Sympathy-consent process will be fulfilled immediately with no cost. It is precisely same as Coasean world with constant transaction cost.<sup>4</sup>

The definition of property right closely connects to the analytical architecture of institutional economics. In rationality dimension where sympathy-consent-free states hold, human intelligence is smart enough to pursue optimization behavior. Any disputes on property rights are bound to be resolved without any friction or cost incurrence. Possible inconsistency in value-cost calculation across different paths of sympathy-consent process will be settled with consistently fixed transaction costs. Although there are consistent and fixed transaction costs, the situation is not different from the condition of perfect property right because the resolution on any disputes on property rights is assured by the sympathy-consent-free states.

**Definition PPR (perfect property right):** In sympathy-consent dimension, perfect property right is defined to indicate the state that the values-costs of property rights are able to be calculated consistently to the change of paths of sympathy-consent process.

In reality, sympathy-consent-free states are different from sympathy-consent dimension because the former builds rationality dimension. The process of sympathy-consent is tough to attain, time-demanding, painful and costly. It is cost-inconsistent across different paths of sympathy-consent process, as will be vindicated in next section.

#### 4. Existence of Sympathy-Consent Dimension

##### ***Untenable Consistency in the Measure of Values-Costs***

Now, imperfect property right is able to be derived from Definition PPR. Property rights are defined to be imperfect if their values-costs are unable to be calculated consistently across different paths of sympathy-consent process.

**Definition IPR (imperfect property right):** In sympathy-consent dimension, imperfect property right is defined to indicate the state that the values-costs of property rights are unable to be calculated consistently to the change of paths of sympathy-consent process.

Most idiosyncratic attribute of sympathy-consent dimension is the inconsistent value-cost measure across different paths of sympathy-consent process. Such inconsistency of value-cost measure arises from coincidental determination of paths of sympathy-consent process. The paths of sympathy-consent process are given to individuals as legacy of historical coincidence, which are not the objects of choice. The shadow prices of actions in different paths of sympathy-consent process are not consistently comparable due to the difference in paths of sympathy-consent process.

If such coincidental nature of sympathy-consent process disappears so that value-cost measures of different paths are known and are comparable, then path dependence will not persist because optimization/equilibrium solution algorithm will drive out all inefficient paths.

It is precisely sympathy-consent-free states. It is also rationality dimension where the condition for perfect property right holds.

**Proposition UCMSCC (Untenable Consistency in the Measure of Values-Costs of Actions across Different Paths of Sympathy-Consent Process):** In sympathy-consent dimension, it is impossible to consistently measure the values-costs of actions SCC [i] across different paths of sympathy-consent process, where symbol [i] denotes the historical coincidence of sympathy-consent process.

**Proof:**

The values-costs of actions at different paths of sympathy-consent process Set SCC [i] are the mapping of actions at different paths of sympathy-consent process Set [i]. By Assumption PDSCP, sympathy-consent process (or actions at different paths of sympathy-consent process) Set [i] reveals path dependence. Hence, Set SCC [i], which is the mapping of Set [i], should be path dependent. Path dependence means that historical coincidence makes change to the forthcoming process. In the transaction of relation exchange, it is historical coincidence that will determine specific SCC [ $i_\alpha$ ] or specific SCC [ $i_\beta$ ]. The measures of values-costs are not consistently comparable across different paths of sympathy-consent process because the calculation of shadow prices is not comparable across different paths of sympathy-consent process. That is, shadow price systems are not consistently comparable between SCC [ $i_\alpha$ ] and SCC [ $i_\beta$ ].  $\square$

Let's think about the case example of beer purchase by a customer. When stopping by at beer corner of supermarket, customers are bewildered by the tens of different brands which are displayed. Making a choice among such large variety of different brands cannot be attained by price only. Together with price information, brand appeal helps determine purchase decision. Or you may have to rely on supermarket manager's advice. It is the sympathy-

consent process. If such sympathy-consent process is not trustable, the customer may refuse to purchase any. It is the market failure case of Akerlof's lemon model.

Suppose that two options of decision paths or relation exchanges are available to the customer. They are, say, either reliance on supermarket manager's advice ( $\alpha$  path) or trust on maker's brand advertisement ( $\beta$  path). If relation exchange relies on the former path (reliance on supermarket manager's advice), the cost of relation exchange is denoted as SCC [ $i_\alpha$ ]. If relation exchange relies on the latter path (trust on maker's brand advertisement), the cost of relation exchange is denoted as SCC [ $i_\beta$ ]. These two events are mutually exclusive because historical coincidence chooses path. Path determination is not the matter of choice, but of the legacy of historical coincidence.

At each different path of sympathy-consent process or relation exchange, different path of experiences or relationship develops. For instance, along  $\alpha$  path, the customer's trust on supermarket manager's advice will be checked and assured by experiences, which will influence on forthcoming brand-choice decisions of the customer. Along  $\beta$  path, the customer's trust on makers' advertisement will be checked and assured by experiences, which will again influence on forthcoming brand-choice decisions of the customer. Each different path encompasses different experiences and relationships. In other words, each different path holds different streams of specificities, i.e. experiences and relationship specificities (Williamson 1975).

### ***Existence of Sympathy-Consent Dimension***

Now, we are ready to establish the existence of sympathy-consent dimension. Definition SCD defines the concept of analytical dimension which is built on the actions that are fulfilled through sympathy-consent process. Now, the legitimacy of value/cost transcendental domain is confirmed by Proposition UCMSCC. Since value-cost measures are not consistently measured across the paths of sympathy-consent process, there should exist some value/cost-transcendental steps that guideline sympathy-consent process. It is relation-specificity-building process, i.e. actions of relation exchange. That is, the existence of sympathy-consent

dimension is upheld by Proposition UCMSCC. Proposition UCMSCC confirms the legitimacy of value/cost transcendental domain, which is pertinent to sympathy-consent dimension.

**Corollary VCTD (the legitimacy of value/cost transcendental domain which is pertinent to sympathy-consent dimension):** Sympathy-consent dimension belongs to value/cost transcendental domain.

**Proof:**

Proposition UCMSCC states that the actions in any path of sympathy-consent process are not consistently represented by value-cost measures across different paths of sympathy-consent process. In other words, such actions of sympathy-consent process, which are in fact the actions of relation exchange, belong to value/cost transcendental domain.  $\square$

The legitimacy of value/cost transcendental domain appertains to sympathy-consent dimension. The validity of sympathy-consent process, which belongs to value/cost transcendental domain, vindicates the legitimate existence of sympathy-consent dimension as analytical architecture of economics analysis.

In the story of beer purchase, the imperfectness of property rights regarding the purchase of beer (a customer's bewilderment at the sight of tens of different brands which are displayed) is made up for by sympathy-consent process (trust on selected brand). Once you stay put in a path, you cannot make a decision of next step in rationality dimension because costs of relation exchanges SCC [ $i_a$ ] or SCC [ $i_\beta$ ] are not consistently comparable. You have to make a decision of next step in sympathy-consent dimension. That is, your decision is affected by the experiences of previous sympathy-consent process (either case of reliance on supermarket manager's advice or on brand advertisement). Since your trust on selected brand

was confirmed by your experience, you place trust on the same brand at current decision of purchase. One sympathy-consent process connects to the next round of sympathy-consent process. We follow satisficing behavior. It is the attribute of value/cost transcendental domain or of sympathy-consent dimension.

In another case example of the story on friendship exchange, a coincidental making of friendship at a time cannot turn to the exchange of friendship values in next round of relationship. That is, you cannot calculate and compare the values of friendship across different friendship paths in order to make a selection choice among them. A coincidental making of friendship connects to next round of relation exchange, i.e. value/cost-transcendental action of friendship exchange. Value/cost transcendental domain appertains to sympathy-consent dimension.

**Proposition SCD (the existence of sympathy-consent dimension):** Sympathy-consent dimension constitutes the analytical dimension which is built on the actions that are fulfilled through sympathy-consent process.

**Proof:**

Proposition UCMSCC confirms that the legitimacy of value/cost transcendental domain appertains to sympathy-consent dimension. From Assumption RX, relation exchange is presumed to exist as fact of human life. The validity of sympathy-consent process, which belongs to value/cost transcendental domain, vindicates the legitimacy of the existence of sympathy-consent dimension as analytical architecture of economics analysis.  $\square$

***Attributes of Sympathy-Consent Process***

What does sympathy-consent dimension look like? Two attributes of sympathy-consent process stand out to represent the sympathy-consent dimension. One is to value/cost-

transcendental domain. The other is relation-specificity-building process.

**Attribute VCTD (value/cost-transcendental domain):** The actions of sympathy-consent process belong to value/cost-transcendental domain of economic analysis.

**Proof:**

Corollary VCTD already presented the proof of Attribute VCTD.  $\square$

Since the actions of sympathy-consent process belong to value/cost-transcendental domain, the actions of sympathy-consent process do not belong to rationality dimension. Williamson (1975) recognized that specificity issue is involved in this problem. However, sympathy-consent process was not known. Coase (2006), Grossman and Hart (1986), Hart and Moore (1990, 1999) ignored the existence of sympathy-consent process and discussed specificity issue in rationality dimension.

In sympathy-consent dimension, specificity issue should be investigated in value/cost transcendental domain. Relation-specificity-building process is nothing but relation exchange in value/cost transcendental domain, which is the action of sympathy-consent process. They are the actions of satisficing behavior.

**Definition RSBP (relation-specificity-building process):** Relation-specificity-building process is nothing but the action of relation exchange in value/cost transcendental domain.

**Attribute RSBP (relation-specificity-building process):** Relation-specificity-building process, which is precisely same as actions of relation exchange in value/cost transcendental domain, is the action of sympathy-consent process.

**Proof:**

From Corollary VCTD, we understand that the actions of sympathy-consent process belong to value/cost-transcendental domain. In sympathy-consent dimension, specificity issue (Williamson 1975) should be investigated in value/cost transcendental domain. In this condition, relation-specificity-building process is nothing but relation exchange in value/cost transcendental domain, which is the action of sympathy-consent process.  $\square$

***Closed/Determinate System vs. Open/Indeterminate System***

The assumption of perfect property right, though unrealistic it is in real life, is the base ground to establish rationality dimension. Sympathy-consent process is unnecessary in the condition of perfect property right. Institutional difference is measured in units of transaction cost, which will unfold the consistency across the paths of sympathy-consent process. Path dependence of sympathy-consent process does not hold. Hence, value-cost measures become effective index to be used as instrument to seek optimization. The result is the instating of rationality dimension as analytical architecture in economics. Individuals seek optimization behavior. The operation of economics system gives rise to equilibrium solution. Since the operation of economics system is completely braced by optimization behavior and equilibrium solution, it is called closed/determinate system.

**Definition CD System (closed/determinate system):** Closed/determinate system is the economic system which consists of determinate states.

The economic states, which are determined by optimization behavior of human beings and its equilibrium solutions, are determinate states. Nothing is left undetermined because unique solutions are sorted out by optimization-equilibrium algorithm.

**Proposition CD System of RD (closed/determinate system of rationality dimension):** On the assumption of perfect property right, the economic system, which is built on individual behavior of self-love, becomes closed/determinate system.

**Proof:**

With the assumption of perfect property right, there is no need for the operation of sympathy-consent process. There is no such problem as inconsistency in the value-cost measurement across the paths of sympathy-consent process. Hence, value-cost measures become effective index to be used as instrument to seek optimization. Individuals seek optimization behavior. Cost-value becomes measurement unit in the actions of optimization. The operation of economics system leads to equilibrium solution. Every state of the economy is identified (located) by equilibrium solution.  $\square$

If perfect property right is assumed, the need for sympathy-consent process disappears. It is precisely the situation of sympathy-consent-free states. Hence, the action of rationality dimension is ready to set out. So-called Arrow-Debreu economics precisely fits to the category of CD System (closed/determinate system) (Arrow and Debreu 1954). In closed/determinate system, the transaction of value exchange takes place by itself without the assistance of sympathy-consent process because perfect property right is assumed.

However, the assumption of perfect property right is unrealistic in human life. Human action relies on relation exchange such as trust, friendship, branding, marketing, clientele, leadership, followership, affiliation, loyalty, coercion, domination, affection, prejudice, emotion, fame and so on. They are the actions in sympathy-consent dimension. Such actions do not belong to closed/determinate system due to their path dependence. Optimization-equilibrium algorithm is irrelevant. To illustrate this story, we need to introduce open/indeterminate system.

**Definition OI System (open/indeterminate system):** Economic system, which is built on indeterminate states, is defined as open/indeterminate system.

Sympathy-consent process is path dependent (Assumption PDSCP). Path dependent process gives rise to indeterminate states because the outgrowth of states is determined by historical coincidence. Hence, the sympathy-consent dimension, which consists of sympathy-consent process, constitutes open/indeterminate system.

**Proposition OI System of SCD (open/indeterminate system of sympathy-consent dimension):** The economic system, which is built on the actions of sympathy-consent process, belongs to open/indeterminate system.

**Proof:**

Sympathy-consent process is path dependent (Assumption PDSCP). Path dependent process gives rise to indeterminate states. Hence, the sympathy-consent dimension constitutes open/indeterminate system.  $\square$

Rationality dimension is different from sympathy-consent dimension. However, the two different territories become connected because sympathy-consent-free states are the limit case of sympathy-consent process.

This finding of open/indeterminate system, i.e. OI System of SCD, bears significant meaning. In traditional approach of economics, market has been described to indicate closed/determinate system because optimization-equilibrium algorithm is adopted as methodological instrument. Relation exchange approach seems to open gateway to describe

market as open/indeterminate system. Now, every marketing action (or action of relation exchange) may be considered to add to the contents of market.

## 5. Fundamentality of Relation Exchange

The study of sympathy-consent dimension is just at the beginning stage. In this regard, the study on the process of price determination in sympathy-consent dimension may be intriguing point, which can compare with the study of price determination in rationality dimension. In rationality dimension, price is determined through the transaction of value exchange.

The case of market failure, which is introduced by Akerlof's lemon market (1970), actually presents an inkling for the case of value/cost transcendental domain. The difference of Akerlof (1970) with relation exchange approach is that the case of market failure is not the exception but becomes generic in sympathy-consent dimension due to the imperfectness of property rights.

Then, what is the relation between relation exchange and value exchange? The answer to the question is contingent upon the imperfectness of property rights. If the imperfectness of property rights is presumed, the sympathy-consent process becomes *sine qua non* for the attainment of exchange.

**Corollary PSCPX (precedence of sympathy-consent process [i] to exchange):** With the assumption of imperfect property rights, the attainment of exchange transaction requires sympathy-consent process [i] as prerequisite condition, where symbol [i] indicates the coincidental property of sympathy-consent process.

### Proof:

Relation exchange and value exchange are two different exchanges. In case of relation

exchange, the imperfectness of property rights is immutable condition. Sympathy-consent process [i] is prerequisite condition for the attainment of relation exchange transaction. In case of value exchange, the imperfectness of property rights is the matter of definitional setting. If the imperfectness of property rights is assumed, sympathy-consent process [i] becomes prerequisite condition to the attainment of exchange transaction.  $\square$

Value-cost measures are inconsistent across different paths of sympathy-consent process. It becomes the world of value/cost-transcendental domain. In this value/cost-transcendental domain, engine is satisficing behavior. Navigator is sympathy-consent process. Relation exchange becomes essential condition to attain the transaction of value exchange. The transaction of value exchange is attained with the complementary role of relation exchange. It is sympathy-consent dimension.

Corollary PSCPX amounts to indicate that in sympathy-consent dimension, all the exchange transactions, without exception, should be accompanied by actions of relation exchange as *sine qua non* for the completion of transaction. From the market of agricultural products to financial markets, no exchange transaction whatsoever is attained without associated actions of relation exchange in sympathy-consent dimension.

If sympathy-consent process is denoted by the symbol [i], price  $p$  can be defined as  $p[i]$  in sympathy-consent dimension. In contrast with  $p[i]$ ,  $p$  stands for price in rationality dimension.

**Definition Set  $p[i]$  (set of price in sympathy-consent dimension):** The set of price is defined to be Set  $p[i]$  in sympathy-consent dimension if imperfect property rights are assumed.

Three attributes of Set  $p[i]$  are put in place as in the following.

**Attribute 1 of Set p [i]:** The prices of Set p[i] of value exchanges is measured in value unit.

**Attribute 2 of Set p[i]:** Sympathy-consent process [i] precedes the determination of Set p[i] of value exchange in sequence order.

**Proof:**

Proof follows from Corollary PSCPX (precedence of sympathy-consent process [i] to exchange).  $\square$

**Attribute 3 of Set p[i]:** Set p[i] of value exchanges is path dependent.

**Proof:**

Since sympathy-consent process [i] precedes value exchange as *sine qua non* (Corollary PSCPX), Set p[i] of value exchanges unfolds path dependence, which follows from Proposition PDRX.  $\square$

The path dependence of value exchange follows as outcome of Assumption PDSCP (path dependence of sympathy-consent process) and Corollary PSCPX (precedence of sympathy-consent process [i] to exchange). At first, the path dependence of price sounds odd to us who are used to equilibrium analysis of economics or closed/determinate system of economics where optimization behavior establishes equilibrium and restitutes it at the time of digression due to any possible disturbance. However, in many of real-life observations, we cannot but admit that price is not likely to return to the original equilibrium level at the time of digression.

**Corollary PDVX (Path Dependence of Value Exchange):** Value exchange unfolds path dependence.

**Proof:**

The path dependence of value exchange follows as outcome of Assumption PDSCP (path dependence of sympathy-consent process) and Corollary PSCPX (precedence of sympathy-consent process [i] to exchange).  $\square$

Now, we are ready to prove that relation exchange is more fundamental phenomena than value exchange.

**Corollary FRX (Fundamentality of Relation Exchange):** With Assumption IPR (imperfect property rights) and Assumption BR (bounded rationality), relation exchange is more fundamental behavior than value exchange.

**Proof:**

We may use either Attribute 2 of Set  $p[i]$  or Corollary PDVX without loss of effectiveness of the proof. In Attribute 2 of Set  $p[i]$ , sympathy-consent process [i] precedes the determination of Set  $p[i]$  in sequence order. Value exchange transactions take place by the essential role of sympathy-consent process [i] so that Set  $p[i]$  of value exchange is rendered path dependent (Attribute 3 of Set  $p$ ). However, Proposition UCMSCC unfolds that sympathy-consent process [i] cannot be consistently computed in value-cost measure. That is, between sympathy-consent process [i] and value-cost measure, causality goes only in one-way direction, i.e. from sympathy-consent process [i] to value-cost measure, not vice versa.  $\square$

Only in case of perfect property rights, value exchanges become independent from the influence of relation exchanges. It is the rationality dimension or sympathy-consent-free states where Arrow-Debreu economics is put in operation. When property rights remain imperfect, which is equivalent to assuming SCD (sympathy-consent dimension), value exchanges are unilaterally influenced by relation exchanges so as to set the direction of causality in one-way from sympathy-consent process or relation exchange to value exchange.

Corollary FRX seems to hold conclusive meaning of this research. Without the establishment of property rights, relation exchanges are the only reliable social order for the conduct of exchange transactions. Value exchanges take place only to the extent of property rights establishment. Even nowadays when property rights are highly upheld as fundamental human rights, relation exchange remains more fundamentally-grounded economic order in human society.<sup>5</sup>

## **6. Sympathy-Consent Dimension vs. Coasean Transaction Cost**

The establishment of sympathy-consent dimension helps clarify the concept of transaction cost. In Coase (1937, 2006), the concept of transaction cost is not set out clearly (Klein, Crawford, Alchian 1978). The source of confusion seems to arise from sympathy-consent process. In transaction cost, institutional component of rationality dimension as well as component from sympathy-consent process is combined. If the component from sympathy-consent process is separated out, transaction cost will represent institutional component of rationality dimension only. Sympathy-consent-free states enable us to separate out the component of sympathy-consent process from transaction cost.

Coase (2006) allocates pages to discuss trust problem between General Motors and Fisher Body once the location specificity of plant of Fisher Body is determined. It is precisely the problem of sympathy-consent process. If such trust problem is removed by the assumption of sympathy-consent-free states, the remaining component of transaction cost is location

specificity of plant construction, which may be assessed in rationality dimension. Hence, the measurement of transaction cost will become consistent across different paths of sympathy-consent process and will represent institutional component (location specificity in GM example above) consistently as cost measure in rationality dimension.

**Proposition Equivalence SCF-CTC (the equivalence of sympathy-consent-free states with Coasean states of constant transaction cost):** Sympathy-consent-free states are equivalent to Coasean states of constant transaction cost.

**Proof:**

In sympathy-consent-free states, any conflict of interests among individuals is resolved immediately with no cost. Hence, the transaction cost of institutional difference remains consistent across the different paths of sympathy-consent processes. It is Coasean states of constant transaction cost.

On the other hand, in Coasean states of constant transaction cost, constant transaction cost reflects institutional difference of rationality dimension, not including the cost of sympathy-consent process. That is, transaction cost remains consistent across the different paths of sympathy-consent processes among multiple individuals. It indicates the attainment of sympathy-consent-free states. □

Proposition Equivalence SCF-CTC is one of centerpieces in the architecture of relation exchange approach. It overarches sympathy-consent dimension and rationality dimension. The translation into rationality dimension is attained by the assumption of SCF (sympathy-consent-free states). Although the reality of property rights stays put in imperfect condition, the assumption of SCF states renders it as if it is perfect property right. It is precisely what is implied in *ceteris paribus* presumption. In this rationality dimension, everything is

measurable in value-cost units because value-cost measures remain consistent.

Perfect property right according to Definition PPR is precisely same as Coasean states of constant transaction cost in Proposition Equivalence SCF-CTC. Therefore, Proposition Equivalence SCF-CTC may be rewritten as the following Corollary Equivalence SCF-PPR.

**Corollary Equivalence SCF-PPR (the equivalence of sympathy-consent-free states with perfect property right):** Sympathy-consent-free states are equivalent to indicating the attainment of perfect property right.

**Proof:**

Proof is obvious from Proposition Equivalence SCF-CTC and Definition PPR.  $\square$

If the cost-value of property rights is measured consistently up to the change of paths of sympathy-consent process, any institutional differences that matter to the valuation of property right may be represented by transaction cost. It is precisely what perfect property right is defined to indicate in sympathy-consent dimension.

If sympathy-consent-free states are not assumed, property rights always remain imperfect. In other words, property rights remain imperfect in sympathy-consent dimension. Sympathy-consent process is built on bounded rationality (Assumption BR). Under the assumption of bounded rationality, property rights remain imperfect.

Now, let's distinguish sympathy-consent-free states from sympathy consent process. The former gives rise to rationality dimension, while the latter to sympathy consent dimension. From the transposition of Corollary Equivalence SCF-PPR, the existence of sympathy consent process indicates the accreditation of imperfect property rights. Likewise, from the transposition of Corollary Equivalence SCF-CTC, the existence of sympathy consent process indicates the inconsistency of transaction cost across the paths of sympathy consent process.

**Corollary Equivalence SCD-IPR (the equivalence of sympathy consent dimension with imperfect property right):** The assumption of sympathy consent dimension is equivalent to assuming the state of imperfect property right.

**Proof:**

Corollary Equivalence SCD-IPR is the transposition of Corollary Equivalence SCF-PPR. The former is vindicated by the latter.  $\square$

Corollary Equivalence SCD-IPR established that on the assumption of bounded rationality, imperfect property right and sympathy-consent process become inseparable twin as to the fulfillment of exchange transaction.

## 7. Concluding Remarks

Relation exchange is a fundamental propensity of human beings. Human beings have lived with relation exchange for million years since the primitive age. Unlike value exchange in the market, relation exchange is fulfilled through sympathy-consent process. Examples of sympathy-consent process include trust, friendship, branding, clientele, leadership, followership, affiliation, loyalty, coercion, domination, affection, prejudice, emotion, etc.

What distinguishes relation exchange from value exchange in the market? The difference comes from imperfect property right. If property right is established, exchange will take place by means of price in the market. Even if property rights are not established, exchange still takes place but with the complementary role of relation exchange. The imperfectness of property rights is made up for by the actions of sympathy-consent process. Essentially,

sympathy-consent process is the mode of life revealed by the satisficing behavior of human beings. Satisficing behavior stems from bounded rationality of limited human intelligence.

An idiosyncratic attribute of relation exchange is path dependence. Since relation exchange is fulfilled through sympathy-consent process, sympathy-consent process itself is presumed to be path dependent. The path dependence indicates that the paths of sympathy-consent process are determined by historical coincidence. They are not the matter of decision maker's choice. Therefore, values-costs of actions of sympathy-consent process are not consistently measured across the paths of sympathy-consent process because the shadow price systems of different paths are not consistently comparable. Such untenable consistency of value-cost measures of relation exchange across different paths of sympathy-consent process establishes the legitimacy of the existence of sympathy-consent dimension.

On the other hand, the untenable consistency of value-cost measurement across the paths of sympathy-consent process indicates the legitimacy of value/cost transcendental domain which becomes pertinent to the sympathy-consent dimension. In the value/cost transcendental domain, the navigation of decision making is guided by satisficing behavior. Power engine is being charged from individual setting of self-love as behavioral objective. Individual's modal pattern of sympathy-consent process is molded by relation-specificity-building process, which is nothing but action of relation exchange.

Now, the sympathy-consent dimension became established as new analytical dimension in economics, which contrasts with the traditional rationality dimension of neoclassical economics. The concept of sympathy-consent-free states is the linchpin which synthesizes Austrian catallaxy (sympathy-consent dimension) with neoclassical orthodoxy (rationality dimension). Economic system becomes open/indeterminate in sympathy-consent dimension, whereas it remains closed/determinate in rationality dimension.

In sympathy-consent dimension, Akerlof's lemon market is not the exceptional example, but one example of generic phenomena of market failure. Such market failure is made up for by actions of relation exchange. The transaction of value exchange is attained by the complementary role of relation exchange (such as trust). Due to the imperfectness of property rights, the determination of price is affected by sympathy-consent process and becomes path

dependent. Hence, the fundamentality of relation exchange over value exchange becomes established.

The important contribution of relation exchange approach is the finding of sympathy-consent dimension. Due to this finding, the separation of the components of sympathy-consent process from transaction cost is made possible. The assumption of sympathy-consent-free states is equivalent to locating Coasean states of constant transaction cost. It is the rationality dimension where the consistent value-cost measurement system is held tenable, which is same as the condition of perfect property right. In other words, the setting of sympathy-consent dimension is equivalent to assuming imperfect property rights.

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<sup>1</sup> Sympathy is taken from the sympathy of A. Smith (1759). Consent is taken from the public choice of Buchanan and Tullock (1962). Hume (1739; Prometheus Books: 1992, p.354) connected relation with sympathy by stating “.. an easy sympathy and correspondent emotions are alone common to relation, acquaintance, and resemblance.”

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<sup>2</sup> I was benefited from the talks with Professor Y. B. Choi of St. Johns university who introduced Cooter and Schäfer (2012) to me. Their ‘double trust dilemma’ seems to confirm the validity of sympathy-consent process.

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<sup>3</sup> Value exchange is the exchange in the market, which uses price as exchange medium. Market exchange is familiar terminology we are used to. In this paper, we use value exchange instead because market exchange includes not only value exchange but also relation exchange as well to complete transaction.

<sup>4</sup> Constant transaction cost is more appropriate than zero transaction cost. If sympathy-consent-free states are assumed, transaction cost becomes consistent measure. We will return to this topic in section 6.

<sup>5</sup> A. Smith (1759) presented epistemological approach which illuminates on the way leading to moral sentiments from the sympathy of the people. His thesis becomes more concrete when being interpreted into the tenets of relation exchange. Moral sentiment becomes the matter of institutional evolution which is drawn out from sympathy-consent process.