CRR DISCUSSION PAPER SERIES A

Discussion Paper No. A-22

Frank H. Knight on Market Thinking: Reflections on the Logic and Ethics of the Capitalist Economy

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December 2016

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Reflections on the Logic and Ethics of the Capitalist Economy

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Abstract The purpose of this paper is to shed a new light on the working and performance of the market economy from a pluralistic viewpoint. To this end, we first pay attention to the general equilibrium theory a la L.W. McKenzie, K. J. Arrow and G. Debreu. Whereas this theory seems to be established on the foundation of solid logic and advanced mathematics, the existence of special ethics and ideology behind the scenes should not be forgotten. We next reexamine the thought of Frank H. Knight, who has raised an strong objection against glorification of the market economy.

In the late 1960s, I was a graduate student at the University of Rochester. I still recall the touching moment when Professor McKenzie, finally succeeding after a long struggle to prove the existence of a competitive economy by help of a mathematical theorem of fixed point, posed a bit in a class and said quietly, "It' so beautiful! ". The world was then in the midst of Cold War and divided into the two powerful blocs, the socialist bloc dominated by the Soviet Union and the capitalist block led by the United States of America. McKenzie's complacent whispering sounded like the victory declaration of capitalism over socialism.

Around 40 years have passed since then. It seems that the "academic Cold War" between Marxian economics and modern economics is now over. At the same time, the ethics and ideology of general equilibrium looks surely fading away although it is not completely vanished. It is our regret, however, the new, synthetic social science which can replace the existing dogmatic doctrines are not in sight yet. A completely new approach like a second Knight or a second Keynes would urgently be needed.

Key words: Knight, market thinking, general equilibrium, ethics, ideology

1 What Money Can and Cannot Buy: An Introduction

1-1 Sandel on the Moral Limits of Markets

For everyman in the street, it is so important to distinguish between what money can buy and what money cannot buy. These two things are clearly different and should not be confused. It seems very strange to see, however, that there are many modern economists who tend to forget the differences, thus simply applying the logic of buying and selling to the whole aspects of life.

Michel Sandel is a famous professor of political philosophy at Harvard University. His famous 'Justice' course has been the first Harvard course made freely available online and on television. [1)] In a very popular book, Sandel (2012) once remarked:

> "As the cold war ended, markets and market thinking enjoyed unrivaled prestige, understandably so. No other mechanism for organizing the production and distribution of goods had proved as successful as generating affluence and prosperity. And yet, even as growing number of countries around the world embraced market mechanisms in the operation of their economies, something else was happening. Market values were coming to play a greater and greater role in social life. Economics was becoming an imperial domain. Today, the logic of buying and selling no longer applies to material goods alone but increasingly governs the whole of life. It is time to ask whether we want to live this way."
>
> (Sandel (2012), pp.5-6)

Presumably, almost everyman who has common sense and conscience would have to agree with Sandel. Market values were likely to play a grater and greater role in every aspect of human life. Although economics was once regarded as a dismal science, it experienced a great transformation through mathematical rigor and big data analysis: some people dared to call economics "the queen of social sciences."

Let us recall the 1950s and the 1960s when the general equilibrium theory was firmly established by the three eminent economists, Lionel W. McKenzie (1919-2010), Kenneth J. Arrow (1921-) and Gerard Debreu (1921-2004). Interestingly enough, if we collect the initials of these economists, we would form the catch word MAD. Therefore, some cynical persons might say that we then lived in the MAD Age, or perhaps another name of the Golden Age. We would like to investigate how mad or

how powerful the general equilibrium way of thinking once was, and also discuss how and to what degree it continues to be so even today.

1-2 Gary Becker on an Economic Approach to Marriage

Gary S. Becker (1930-2014) was a Nobel-winning scholar of economics and sociology. He was working for the University of Chicago, and greatly contributed to raising the good (and possibly bad) reputations of the Chicago School in modern times. He was a famed scholar of remarkable impact beyond the academic world.

His way of thinking was extremely money-oriented. According to him, any rational person must make his/her decision making on the basis of monetary benefits and losses. Any standard micro-economic text taught us that any consumer maximized his/her utility subject to the budget constraint, and any producer, the net profits as revenues minus costs. In a sense, so far so good. Consumers and producers could be regarded as typical subjects of economics in conventional economics.

Becker proceeded to go beyond the traditional domain of economics. For instance, he extended his analysis to what people usually thought of as non-economic problems such as marriage and crime. Although such an extension might look rather brave and challenging, it could possibly be over-extension or even a long way off the mark.

In a very interesting book, Becker (1976) once remarked:

> "According to the economic approach, a person decides to marry when the utility expected from marriage exceeds that expected from remaining or additional search for a more suitable mate. Similarly, a married person terminates his (or her) marriage when the utility anticipated from becoming single or marring someone exceeds the loss in utility from separation, including losses due to physical separation from one's children, division of joint assets, legal fees, and so forth. Since many persons are looking for mates, a *market* in marriages can be said to exist."
>
> (Becker (1976), p.10)

When I myself was about to leave the U.S. after my stay there for 8 years, I happened to encounter Becker's article mentioned above. In fact, Bill, one of my American friends in Pittsburgh strongly recommended to read it, and sincerely wished to hear my personal reply. To tell the truth, the article sounded to me a thunderbolt from a clear sky. Although I got married with a lovely girl a year before, any kind of pecuniary calculations over benefits and losses never crossed to my mind. In short, my

marriage had noting to do with the Becker way of market thinking. Besides, the change of my place of employment from an American university to a Japanese university resulted in a reduction of my yearly income by half. I was then in a mood to accept it: I did this because of my family obligation to old parents living in the land of the Rising Sun. It may be fair to say that Becker's market-oriented solution to the marriage problem constituted merely one of possible many solutions conceivable. I do think, however, that the young Sakai's non-economic solution was another possible solution in a cultural/historical perspective.

1-3 Knight versus Friedman: Uzawa's Remark

Hirofumi Uzawa (1928–2015) was one of the most famous economists in postwar Japan: he was once working for the University of Chicago before he came back to the University of Tokyo, Japan. In a very popular book, Uzawa (2013) once made a very important remark in Japanese. Although it was a bit long sentence, let us attempt to write its English translation down below:

> "In the 1950s and the 1960s, the central figure of the so-called Chicago School was Friedman, with a supportive role being played by Hayek. In contrast, Knight thoroughly condemned the atomic bombing by the U.S. over Hiroshima and Nagasaki in 1945 for the worst crime ever committed by mankind. Knight gave serious thought to the problem of competition and ethics: he was really an outstanding economist. In my opinion, Knight was entirely different from what people loosely called the Chicago School.
> What I particular want to mention is the fact that Knight kindly adopted as his daughter the young girl who had lost her parents by the Hiroshima atomic bombing. He was so nice to her that he used to take her to Uzawa's house. Besides, one of his sons became a professor at the Institute of Low Temperature Science, Hokkaido University, Japan. Knight was really such a man of warm heart as well as a man of high morals. .....
> Friedman and his circle continued to devote themselves to moneymaking. As Knight seemed to think that this was not the right thing to do, he once said to many colleagues around him, 'It is true that Milton Friedman and George Stigler finished their doctoral dissertations under my direction. I would like to say, however, that their recent behaviors were too much for me. So I would rather like to declare that they are no longer my students'. This was presumably a sort of the declaration of

expulsion. I can recall that he was then an old man over 80 years, yet such a good and wonderful person." (Uzawa (2013), pp.35-36.)

Uzawa's remark aforementioned clearly indicates a striking difference between Knight and Friedman from an ethical point of view. Concerning the relationship between the logic and ethics of the market economy, Knight was very cautions against falling into the trap of the market logic first and nothing else: in fact, he emphasized that ethics and social philosophy should play a critical role in protecting from possibly devastating consequences of excessive competition. Contrary to such teachings of his mentor, Friedman became a strong believer in "market fundamentalism without ethics." It would not be fair to say that Knight and Friedman belonged to the same school of economic thought, namely the Chicago School. Alternatively, we could say that Knight early led the original Chicago School, and Friedman later modified the morals of the school in a different direction. .

To sum up, this paper aims to shed a new light on the working and performance of the market economy from a pluralistic viewpoint a la Knight. The problem of much interest is whether and to what extent we can persuasively discuss the efficiency and limitations of the economy without reference to equity and justice. The contents of this paper is as follows. In Section 2, we will outline the solid framework of general equilibrium theory which was strongly promoted by McKenzie, Arrow and Debreu, and point out the unique ethics and ideology lying its background. In Section 3, we will turn to the reassessment of Knight's strong objections against the market fundamentalism. In order to escape from mathematical jungles, we will make use of graphical illustrations as much as possible. We sincerely hope that our visual and intuitive way of presentation will work out beautifully.

2 The Ethics and Ideology of General Equilibrium Theory

2-1 The Life and Work of "Professor Fixed Point"

In the 1960s, the campuses of many Japanese universities and colleges were so noisy: there were so many political gatherings and strike activities. Many students dared to go out of the university campuses, thus shouting political slogans and engaging in street demonstrations. In short, Japanese universities were no longer good places for study and research. So some of the active youth wanted to go abroad, and could continue to do their graduate studies. I myself was one of those ambitious students,

thus applying for admission of graduate schools at American universities. Very fortunately, in 1968, I was admitted to the Graduate School of Economics, the University of Rochester.

There was a very prominent professor at the Rochester Economics Faculty, who was mainly responsible for the establishment of the outstanding graduate program in economics. The name of that famous professor was Lionel W. McKenzie. He was one of those pioneers who together with Kenneth Arrow and Gerard Debreu succeeded in introducing advanced mathematics such as differential topology into economics. One of his favorable mathematical tools was the Fixed Point Theorem which was established by great mathematicians including L.E.J. Brouwer (1881-1996) and Shizuo Kakutani (1911-2004). So it would be quite natural to see that McKenzie was nicknamed "Professor Fixed Point." [2)]

The way in which McKenzie taught general equilibrium theory at Rochester was legendary. Every time, he distributed to a selected group of graduate students his hand-written manuscripts, which contained a lot of mathematical symbols and complicated equations. As could easily be guessed, the symbols and equations were rather loosely written and sometimes almost incomprehensible. There was something dignified in his teaching; Using large blackboards in a class room, he usually wrote so many definitions and axioms before proceeding to prove a series of mathematical propositions. All the students seemed to be quiet, taking great pains in making their lecture notes faithfully.

Professor McKenzie was very fond of mathematics, thus being a passionate researcher in the application of advanced mathematics to economic science. It is true that he almost always he controlled his class authoritatively. No person was perfect, however. There was an occasion when he was a bit stuck in mathematical derivations, and pondered for some time while grasping a piece of white chalk in his right hand. Whenever his right hand got up and approached to his face, the color of his lips gradually changed from reddish to whitish: he forgot the inescapable reality that the white chalk happened to touched his lips. Occasionally, he spoke the names of some Japanese economists in heavy (or rather correct) English accents, Morry-she-ma (exactly, Michio Morishima), Woo-zawer (Hirofumi Uzawa), Inner-da (Ken-ichi Inada), Knee-kwaido (Hukukane Nikaido), and Nay-gee-she (Takashi Negishi) . Yes, they should be Japanese names, but sounded to me like American names.

I still remember the occasion when McKenzie did not feel well and unfortunately got struck in a mathematical jungle. This incident happened exactly when he was about to finish the proof of general market equilibrium solution. He

knows that the mathematical tool needed was no less than the effective use of the Fixed Point Theorem. Then he stopped walking and began to fold his arms, holding a piece of white chalk with his right hand. After five minutes or so, his cheek suddenly got more brighter than before, and nodded his head to himself, "I've got it!" And after completing the existence proof successfully, he convincingly yet rather quietly muttered with sigh, "Oh, it's so beautiful!" This was only faintly heard to me: I was lucky enough to sit on the front row.

It was no doubt that McKenzie's lecture on general equilibrium theory was mathematically so beautiful that it greatly impressed all the students in his class. His inclination toward mathematical beauty seemed too much to us, however. In academic activities, if we seek "beauty" in addition to "logic" and "ethics", we should be demanding too much. Then we could possibly be caught in escapable pitfalls in the sense that we vainly searched for a sort of "utopian capitalism" or rather "elegant nihilism". A will-o'-the wisp would be burning and sneer at us forever ! [3)]

2-2 The Brouwer Fixed Point Theorem

L.E.J. Brouwer (1881-1966) is a famous Dutch mathematician, who worked in topology, measure theory and complex analysis. He proved a number of mathematical theorems including what mathematicians later called the Brouwer fixed point theorem. Probably to his surprise, the powerful theorem failed to be fixed at the field of pure mathematics, influencing beyond the mathematical border to a variety of applied areas such as general equilibrium analysis in economic science.

In what follows, let us briefly explain the Brouwer fixed point theorem. Let us consider a set X and a function f from X to X, namely a transformation of X into itself. We find it very interesting to find the existence of an element x^* such that $x^* = f(x^*)$, namely, an element which does not move in the transformation. Such an element is particularly named a fixed point of the function f. [4)]

Let us assume that X is a non-empty, compact, convex set of R^n, then n-th dimensional real space. It is well-known that in the real space, a compact set is equivalent to a bounded and closed set. If we consider a unit closed interval [0, 1], it is indeed non-empty, compact, and convex. For an illustrative purpose, let us consider the following continuous function from [0, 1] into itself.

$$f(x) = x^2 - x + 3/4 \qquad (1)$$

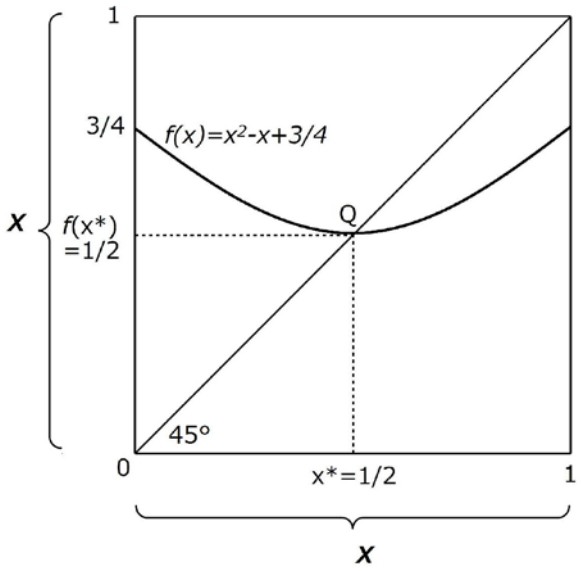


Fig. 1　The Brouwer fixed point theorem

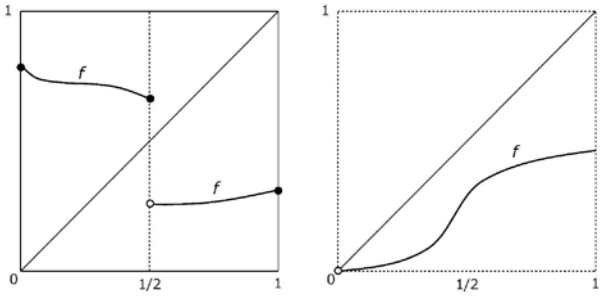
Then as is seen in Fig. 1, the curve f must cross the 45 degree line at least once. Such a crossing point Q^* constitutes a fixed point, namely, $f(x^*) = x^* (= 1/2)$.

More formally speaking, we can establish the following simple yet powerful theorem which was first proved by Brouwer (1910) more than 100 years ago:

Theorem 1　(the Brouwer fixed point theorem)

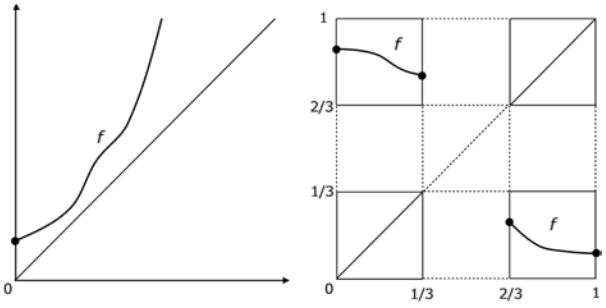
Let X be a non-empty, compact, convex set of R^n, and f be a continuous function from X to itself. Then f has a fixed point: namely, there is an element x^* of X such that $x^* = f(x^*)$.

Although the Brouwer fixed point theorem seems very powerful, it should never be almighty: namely, it does not hold unconditionally. A clear yet rigorous proof is provided by Nikaido (1970). We are only content here to confirm that the following four conditions must be satisfied for applicability of the theorem.



(A) f is not continuous at $x = 1/2$

(B) X is not a closed set: $X = (0,1)$



(C) X is not bounded: $X = [0,\infty)$

(D) X is not convex: $X = [0, 1/3] \cup [2/3, 1]$

Fig. 2 The four cases where the fixed point theorem are not applicable

① The function f must be continuous on the set X.

② X must be a closed set.

③ X must be a bounded set; namely, X must have upper and lower bounds.

④ X must be a convex set.

Fig. 2 shows that if one of those four conditions is not met, the fixed point theorem is no longer applicable. In Panel (A), the curve f is not continuous at $x = 1/2$, whence f does not cross the 45 degree line. Panel (B) stands for the case in which the set X is an

open unit interval (0,1), which demonstrates non-intersection of f and the 45 degree line. In Panel (C), since X is an infinite interval $[0,\infty)$, it is no longer bounded above. If the curve f under question is always increasing above the 45 degree line, then there should be no crossing point between these the curve and the line. Finally, Panel (D) indicates the situation under which X is not a convex case. Suppose that X is the union of the two closed sub-intervals such that $X = [0,1/3] \cup [2/3,1]$. Then if the curve f jumps at $x = 1/3$ and $x = 2/3$ as is seen the panel, there should be no crossing point.

To sum up, we should be very careful of the effectiveness and limitations of the Brouwer fixed point theorem.

2-3 The Equivalence between the Walras Existence Theorem and the Brouwer Fixed Point Theorem

Mathematics is often called "the queen of sciences"; it has produced so many beautiful theorems since Archimedes (284?-212B.C.), an ancient Greek mathematician. It seems that the Brouwer fixed theorem is one of the most beautiful theorems in modern times. Although the theorem per se is a pure brain product, it has many applications to other fields such as economics and game theory. [5)]

In the 1950s and the 1960s, there reemerged a bulk of mathematical economists who found much interest in giving a rigorous proof for the existence of multi-market equilibrium a la Leon Walras (1874), a lonely French pioneer. Among those economists were Arrow (1951), Arrow & Debreu (1954), Debreu (1959), McKenzie (1954, 1955,1959), Gale (1955), and Nikaido (1956). Unquestionably, the Brouwer fixed point theorem and its generalizations such as the Kakutani fixed point theorem have been the most powerful mathematical tools employed by those economists. [6)]

The purpose of this sub-section is to show the equivalence between the Walras existence theorem and the Brouwer fixed point theorem. Uzawa (1962) was the first person to point out such equivalence in a very exact form. In what follows, let us attempt to give an elementary proof by help of simple figures.

In what follows, we would like to pick up a very simple, one-good market equilibrium model a la Walras (1874) in order to establish following theorem:

Theorem 2 (Equivalence between the fixed point and the market equilibrium)

The fixed point implies the market equilibrium, and vice versa.

Let the demand function and the supply functions of good x respectively be

denoted by $x = d(p)$ and $x = s(p)$, where p stands for the unit price of x. For simplicity, assume that the functions d and s are both continuous and smooth. Then we can write down the excess demand function e of good x as follows:

$$e(p) = d(p) - s(p). \tag{2}$$

.

Common sense tell us that when the price of a good x rises, the demand for the good decreases and the supply increases. Consequently, on the one hand, if the price p is low enough (namely, $p = p^L$), the excess demand for x occurs , so that $e^L = d^L - s^L > 0$. On the other, in case the price p is high enough (i.e., $p = p^H$), minus the excess demand (namely, the excess supply) for x takes place, whence $e^L = d^L - s^L < 0$. Let put $P = [p^L, p^H]$. Then evidently, P is a closed interval; whence it is a non-empty, compact, closed set.

Now, let us consider the following mapping from P into itself:

$$\Phi(p) = p + \alpha \cdot e(p) \tag{3}$$

It is noted here that α stands for a fraction, namely, a constant between 0 and 1. the mapping $\Phi(p)$ indicates a sort of Walrasian price adjustment process. For example, Let us put $\alpha = 1/2$. Then if the excess demand for x occurs (i.e. $\alpha > 0$), we find $\Phi(p) = p + (1/2)\, e(p)$, meaning that the price p must go up by 50%. By the same token, if the excess supply takes place, then p must go down by 50 %.

Clearly, the mapping $\Phi: P \to P$ is continuous. So if we apply the Brower fixed point theorem here, we may find the fixed point, namely, p^* such that $\Phi(p^*) = p^*$ In the light of Eq. (3), we can immediately obtain the following equivalent relation:

$$\Phi(p^*) = p^* \quad \Leftrightarrow \quad e(p^*) = 0 \quad . \tag{4}$$

Needless to say, Eq. (4) above is a mathematical restatement of Theorem 2. Therefore, the Brouwer fixed point implies the Walras market equilibrium, and vice versa. Take a look at Fig. 3. The point Q^* and the point R^* respectively indicate the fixed point and the market equilibrium. It is very obvious from this figure that the existence of Q^* in the upper figure implies the existence of R^* in the lower figure, and vice versa. The proposition "the fixed point equals the market equilibrium" constitutes one of the very fundamental ideas underlining the core of general equilibrium theory.

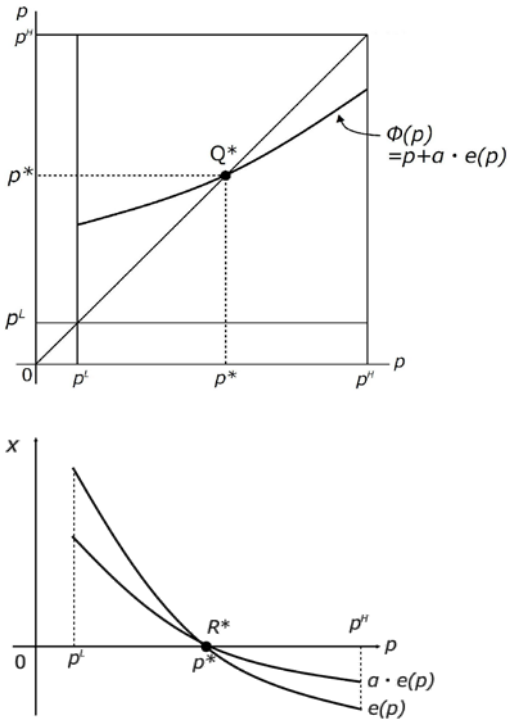


Fig. 3 Equivalence of the fixed point Q^*
and the market equilibrium point R^*:
$\Phi(p^*) = p^* \quad \Leftrightarrow \quad e(p^*) = 0$

3 Welfare Implications of General Equilibrium

3-1 The Impact of the Cold War on the Economics Profession

Just after the Second World War, we were engaged in another world war named the Cold War. There emerged many political, military, and ideological tensions between the Western Capitalist Bloc (the United States, its NATO allies, Japan, and others) and the Eastern Socialist Bloc (the Soviet Union, its Warsaw Treaty allies,

China, and others). The term "Cold War" was intentionally employed since there was no longer large-scale "hot fighting" directly between those two blocs. The importance of the "ideological struggles" , however, should not be underestimated.

In the field of economics profession, a sort of "Economics Cold War" took place between what we called modern economics and what we named Marxian economics. It should be recalled that Marxian economics was not only the official economics taught in the Eastern Bloc, but also a more or less popular subject in the Western Bloc except the United States. In Japan, most of the major universities were then dominated by Marxian socialists, with modern economists taking a back seat.

Under the circumstances mentioned above, especially in the United States, general equilibrium theory has played a very special role in establishing the proposition that the capitalist economy really works al least as efficiently as its rival, socialist economy. A great number of research projects on mathematical economics were very generously supported by the National Science Foundation, Naval Research Logistics Project, and the like. [7)]

The thinking of Immanuel Kant (1785), a famous German philosopher, has influenced moral philosophy a great deal. According to his philosophy, there are three important value judgments in human behavior. They are truth, good and beauty. General equilibrium theory has taught us that the market economy works, and indeed works very beautifully. Contemporary mathematically-trained economists have succeeded in truly and beautifully providing the existence proof of a multi-market, competitive equilibrium on the basis of the powerful fixed point theorem. There is something missing in general equilibrium theory, however. In order to make our value judgment a la Kant more complete, we have to demonstrate that the market economy is a very good system, or a even optimal system, from a moral point of view.

It is really remarkable to see the following important theorem has been established by Arrow (1951), Hurwicz (1960), and others.

Theorem 3 （the fundamental theorem of welfare economics)

Let us suppose that an exchange economy be "normal." Then it possesses the following properties:

(1) Every market equilibrium achieves Pareto-optimality.

(2) Every Pareto-optimal state can be achieved as a market equilibrium position.

The rigorous proof of this theorem is omitted here. We note that in a "normal economy", an increase in the quantity of any good increases the total utility of every

person but decreases his/her marginal utility. Besides, in a Pareto-optimal economy, it is not possible to make any one person better off without making the other worse off. Whether and to what extent Pareto optimality really represents the "ideal state" of the economy remains to be debatable. [8)]

3-2 The Market Equilibrium and Pareto Optimality

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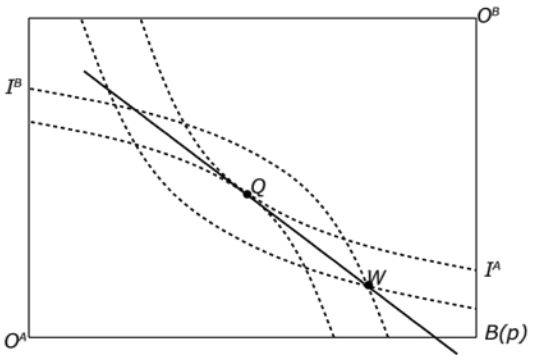
The relation between the market equilibrium and Pareto optimality may easily understood by the box diagram a la Edgeworth (1881). Let us take a close look at two panels in Fig. 4. Panel (A) shows Property (1) of Theorem 3 afore-mentioned: every market equilibrium achieves Pareto optimality. In order to understand this, let us arbitrarily pick up the initial endowment point W and the budget set $B(p)$ passing through W. Then the point Q lying on $B(p)$ achieves the equality of demand and supply for the two goods, good 1 and good 2, since it is really a point in the box diagram. Moreover, it is apparently a point at which the two persons, Ms. A and Ms. B, can achieve her utility maximization subject to the budget constraint since at the point Q. Now let us simply look at such a situation and forget the presence of the budget set for a while. Then we immediately see that the two indifference curves I^A and I^B just touch at Q. This shows that Pareto optimality is now achieved at Q.

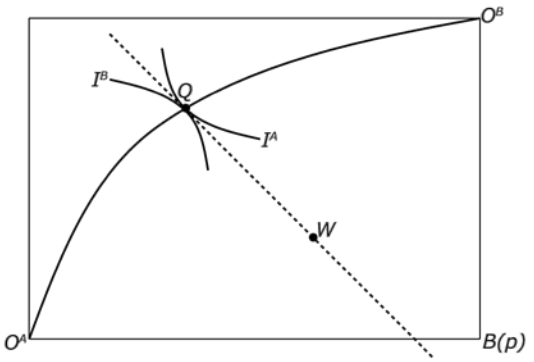
In contrast, Panel B indicates Property 2 of Theorem 3; Every Pareto optimal state can be achieved by a market mechanism. Let us pick up a point Q on the contract curve O^AO^B. Since point Q is a Pareto-optimal point, it must be the point in which the two convex indifference curves I^A and I^B just touch each other. We can then find a separating line $B(p)$ and an initial endowment W. It is now clear that the Pareto optimal point P becomes a market equilibrium point with the initial endowment W and the common budget line $B(p)$.

I still remember how some graduate students instantaneously reacted when I energetically taught the nice relation between the market equilibrium and Pareto optimality at the University of Pittsburgh in the early 1970s. A clever female student from Turkey had the courage to ask a question to me:

"Dr. Sakai, I was really impressed by your lecture to inform me that the market Economy is a sort of the Earthy Paradise. The three virtues of true, good and beauty seem to be perfectly achieved there. I would like to tell you, however, that I am from a less developed country located between Asia and Europe. I wonder whether and to what extent your today's talk is relevant to the present state of my country."



(A)　The equilibrium point Q achieves Pareto optimality



(B)　The optimal point Q achieves a market equilibrium

Fig. 4　The market equilibrium and Pareto Optimality

I was then really shocked by this question:　it seemed to be a bolt out of the blue. I took a short pose, and eventually managed to answer it.

" This is really a very good question.　As you know, I am also from the country of tradition and culture like you.　Although Japan now might be a bit more

advanced than your country, I am sure that it is not, and will never be, the Earthy Paradise. Now, all my fellow students, let us together think of the validity and limitations of general equilibrium theory. Man is a thinking reeds!"

This was part, though by no means the whole, of the reason for the change in my research area from general equilibrium to risk and uncertainty.

4 Frank Knight's Strong Objections against the Capitalist Economy

4-1 Knight's Pluralist Insight

Frank H. Knight was perhaps one of the deepest thinkers and the most critical economists in the 20th century. When I joined the economics faculty at Pittsburgh in the 1970s, I was surrounded by many people who had mixed feelings for general equilibrium theory and fondly talked about Frank Knight's philosophical pluralism. [9)]

Knight was often called the "Grand Old Man" of Chicago, playing a central role in setting the character of "the early Chicago School." Interestingly enough, Patinkin (1973) vividly recalled the days when Knight was a teacher at the University of Chicago (1941-47):

"A the Chicago of my student days it was, ironically enough, the socialist Oskar Lange who extolled the beauties of the Paretian optimum achieved by a perfectly competitive market—and Frank Knight who in effect taught us that the deeper welfare implications of this optimum were indeed quite limited."

(Patinkin (1973), p.801)

At Chicago in the 1940s, there were the two economics giants: Oskar Lange and Frank Knight. While the market socialist Lange extolled the beautiful equivalence of a competitive equilibrium and Pareto optimality, the reluctant capitalist Knight raised serious objections against it. Lange simply believed that human behavior was rational in the sense that a consumer maximizes his/her utility subject to the budget constraint while a producer maximizes his/her profit subject to the technological constraint. In contrast, Knight's view of human nature was more complicated and more realistic than such a simple-minded view. As Boyd (1997) noted, the intellectual legacy of Frank Knight was a study in paradox. Although he could be regarded as an outstanding

scholar in neoclassical economics, he nevertheless stood high as it harsh critic as well.

Knight (1925) once remarked:

"It is time to admit that while the craving for a monistic view of the world is real, the project of resolving either minds or objects into the other type of existence is futile. ..... Both realism and idealism are, in the vernacular, "the bunk"; monism is moonshine! In the human and social sciences, most clearly, the only possible point of view is pluralistic."

(Knight (1925), p. 255; Knight (1999), p.121)

Generally speaking, there are two views of the worlds, a monistic view and a pluralistic view. According to Knight, monism is too simplistic, and tends to view the world either white or black. The situation, however, is not a matter of black and white. Between black and white, there should be many complicated colors. If monism is regarded as weak moonshine, pluralism is sunshine and sheds a stronger and more colorful light into the world.

It is in such a pluralistic view that Knight very critically discussed the ethical foundations of the market economy.

4-2 Knight's Strong Objections against the Market Economy

Throughout his career, Knight never regarded the capitalist system as ethically defensible. In fact, he fondly adopted his pluralistic view in order to critically investigate the ethical foundations of the market economy. According to Knight (1935), we can enumerate the following twelve reasons why the market economy cannot be defended from a moral point of view.

(i) The assumption that the economy is made up of freely contracting individuals is quite questionable. All minors, the aged, and some others must be taken care of by adult persons. The family, but not an individual, is still the unit in consumption and production.

(ii) An individual is in large measure a product of the cultural environment. Human beings are not accurate mechanisms of desire satisfaction: human activity is largely impulsive, a relatively unthinking and undetermined response to external stimulus and rumors. When the family is the social unit, the inheritance of wealth and educational advantages tend toward the progressive increase of inequality. Therefore,

the results which a competitive economy bring about are often far from being ethically ideal.

(iii) The traditional assumption that all goods and services are perfectly divisible and freely mobile is based on mere supposition, thus being far from the actual economy.

(iv) One of the most important prerequisites to perfect competition is complete knowledge on the part of every individual. A perfect market would involve perfect, instantaneous, and costless intercommunication among all the traders. This would be existent only in a fictitious world.

(v) Competition further assumes that every buyer of every good knows very accurately its properties to satisfy his/her want. The competitor must perfectly foresee things as they will be, a too unrealistic assumption.

(vi) We have to find the proper relation between efficiency and equity. The social order must be judged ethically rather by the wants which it generates than by its efficiency in satisfying wants.

(vii) The workings of competition educate men progressively for monopoly. This is being achieved not merely by producers, but by labor and in many branches of agriculture. In short, free competition will destroy itself!

(viii) In reality, what is desired is more largely a matter of human relations than goods as such; we want things because other people have them, or cannot have them. A typical illustration is the improvement or use of property in ways which may add or subtract value from neighboring property.

(ix) An exchange system cannot work at all according to theory without a control unit. With the use of credit highly developed, the control of banking and currency involves a large measure of control over all business, but really free banking would soon reduce all exchange relations to chaos.

(x) An economic organization must employ its available productive power in part to provide for present needs of society and in part to provide for future growth. In an individualistic system, provision for progress depends on the interest of present individuals in future individuals, which is being engendered to uncertain extent and with uncertain consequences by a change of the social and historical condition.

(xi) All human planning and execution involve uncertainty, and a rational social order can be realized through individual action only if all persons have rational attitude toward risk and uncertainty. As can be seen in gambling and speculative behavior, however, the general human attitude tends to non-rational, and much social limitation is required.

(xii) We have to closely examine the ethical foundations and consequences of

unbounded individualism and competition. In the capitalist economy, productive contribution can have little or no ethical significance from the standpoint of absolute ethics. For instance, no one contends that a bottle of old wine is ethically worth as much as a barrel of flour, or a fantastic evening wrap for a powerful person's mistress as much as a substantial dwelling house. Besides, Knight has noticed that the ownership of personal or material capacity is based on a complex mixture of inheritance, luck, and effort, probably in that order of relative importance.

Because of those reasons aforementioned, the competitive system, viewed simply as a want-satisfying mechanism, falls short of our highest ideals. Knight thereby conclude that unlimited individualism and free competition cannot bring about the ideal utilization of social resources. We have to find the right proportion between individualism and socialism, and consider their various varieties.

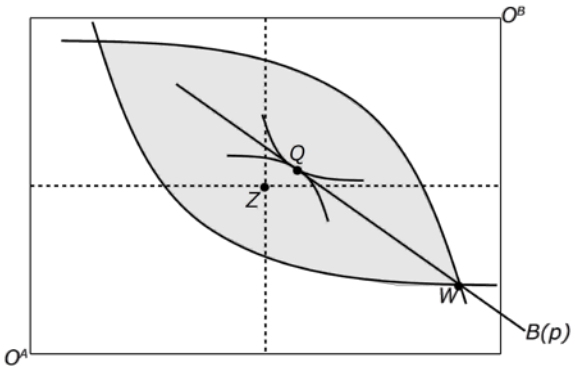
4-3 Inheritance, Luck and Effort: A Graphical Interpretation

Knight do not believe that individualism can automatically bring about an ideal utilization of economic resources. He contends that the welfare results of trading are based rather on initial endowment and chance, than on hard work.

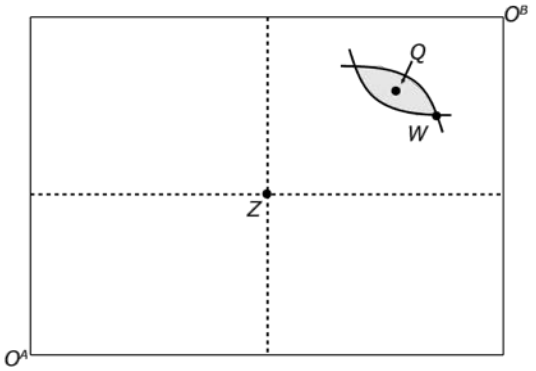
In what follows, let us attempt to graphically interpret some of his objections against the market economy. Let us compare the two boxes in Fig. 5. The upper panel (A) represents the trade of the two goods, good 1 (rice) and good 2 (fish), between Mr. Land and Mr. Sea. The initial endowment W is represented by point W, which is located in the south-east of the center Z. Mr. Land is a farmer who possesses a large amount of rice yet a small amount of fish, whereas Mr. Sea is a fisherman who has a large quantity of fish yet a small quantity of rice.

It would be nonsense to say that one of the two persons is absolutely richer or poorer than the other: In fact, each person is relatively rich in one good, but relatively poor in the other good. The trade between Mr. Land and Mr. Sea makes both much better off; the point Q, a Pareto optimal point, indicates the position after the trade. To sum up. gains in the exchange of rice and fish between a farmer and a fisherman are very large for the two persons. So far so good!

Such a sort of win-win situation would vanish if the initial endowment position is in the north-east position as is seen the lower Channel (B). This is the trade between Ms. Rich and Ms. Poor. Ms. Rich is absolutely more affluent than Ms. Poor: the former possesses more rice and more fish than the latter. Under such a lop-sided situation, a gain in trade, if it exist, would be minimal for both parties. In fact, the



(A) Mr. Land and Mr. Sea: the exchange between them is mutually beneficial.



(B) Ms. Rich and Ms. Poor : the gain in exchange is one-sided

Fig. 5 Is a starting point before the exchange fair enough?

movement of position from point W to point Q in Panel (B) would be too small to be identified. Our natural guessing is that after the trade with Ms. Rich, Ms. Poor would reconfirm her miserable position, thus psychologically more unhappy than ever. The have-not would go unrewarded. Certainly, this should not be a win-win situation.

4-4 Risk, Uncertainty and Moral Hazard: A Graphical Analysis

According to Knight, all human planning and execution can be realized through individual action only if all persons have a rational attitude toward risk and chance. The general human attitude, however, is not necessarily very rational, and individual knowledge is more or less limited. The traditional assumption that every buyer of any good perfectly knows its properties to meet his/her want would not be satisfied in reality.

One of many interesting problems is how we relate quality uncertainty to the market mechanism. As Akerlof (1972) noted, the existence of a single good with several grades may pose a very serious problem for the working of a market. In this case, there emerges the possibility that a seller has an incentive to tell a lie to a buyer: he/she may supply a poor-quality good rather than a good-quality good. As a result, dishonest dealings may tend to drive honest dealings out ; indeed, the market per se may shrink and will eventually vanish. This is what Akerlof has wisely called the lemons principle.

Fig. 6 enables us to understand how the market for travel accident insurance works. There are two persons in the market; Mr. Fair as an insurance provider, and Mr. Foul as an insurance purchaser. There are two contingent goods; X_1 as the amount of money when no accidents occur, and X_2 as the one contingent on a travel accident . With accidents or without them, Mr. Fair receives a certain amount of insurance fee from Mr. Foul. If and only if an accident such as theft or loss occurs, Mr. Fair must pay a promised amount of insurance money to Mr. Foul. Let point W be the initial endowment point. Then point Q is the market equilibrium point, with the exchange price ratio being associated with the budget set $B(p)$. The honest dealing between the two persons can be characterized by the bold arrow "$W \Rightarrow Q$" ; Mr. Fair is entitled to receive from Mr. Foul the insurance fee W_1Q_1 in exchange for the payment of the net insurance money W_2Q_2 that equals the gross insurance money minus the insurance fee.

Let us first consider the ideal situation under which both the insurer and the insured are fully informed of any travel accident. If the two contingent goods X_1 and X_2 are exchanged between the two persons, the market equilibrium is achieved at point Q that is also Pareto optimal. So far so good!

Unfortunately, the world where we live is not so idealistic; in fact, we are rather involved in the situation where non-symmetric information prevails. Mr. Fair as an insurance agent is not in a position to know whether and to what extent Mr. Foul, a

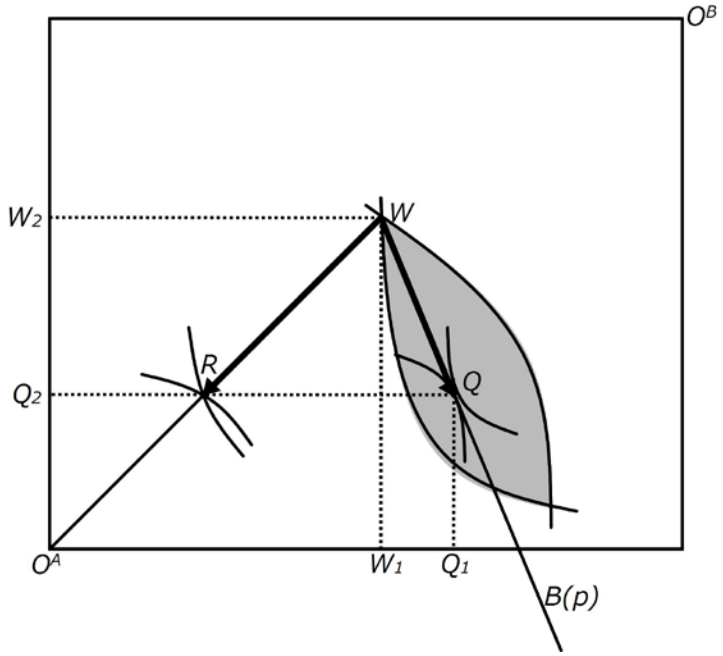


Fig. 6 The exchange of contingent goods between Mr. Fair and Mr. Foul: the bold arrow "W➡R" represents a dishonest dealing and the market may break down.

customer, is really engaged in a travel accident. The reliable tie between the two parties might be honesty. The reality may be severe and human trust may be rather weak, so that the insured is likely to have an incentive to tell a lie, taking advantage of the insurer's ignorance. Let us suppose that such betrayal really happens: Mr. Foul would claim that he has been involved in theft although the truth is not so. If Mr. Fair is a man of good character and accepts Mr. Foul's claim, the *actual* trade between the two persons would be indicated by the bold arrow "$W \Rightarrow R$" rather than the bold arrow "$W \Rightarrow Q$". Apparently, R is the point in which Mr. Fair becomes worse-off. Consequently, the market is doomed to shrink and possibly vanish.

In the light of the history of economic thought, the economics of imperfect

information has been greatly developed since the 1970s. Akerlof (1972) was generally regarded as one of those outstanding promoters. We must bear in mind, however, that far back in the 1930s, Knight already did a significant contribution to this field, so that he could also be thought of as one of important founders.

5 The Disappointing Performance of the Economics Profession: Final Remarks

Shigeto Tsuru, a late Japanese economist, once attended with Paul A. Samuelson the graduate seminar conducted by Joseph Schumpeter at Harvard University. In the first page of a challenging book, Tsuru (1961) cited the following remark made by Dr. Seishi Kaya, chairman of the Japan Science Council:

> "On reflection it is really ridiculous that mankind cannot live on thus globe peacefully with each other when they possesses the knowledge and know-how even of making a round trip to the moon. The most important thing from now on seems to be to join our efforts in making the time nearer when we can all visit the moon as friendly tourists, instead of being involved in the clash between communism and capitalism." Tsuru (1961), page 1)

In the 1960s and the 1970s when I myself stayed first as a graduate student and later as an assistant professor at American universities, the clash between communism and capitalism was very severe in every aspect of human life; indeed, the Soviet Union and the United States competed neck-and-neck for the first landing on the moon. When the Berlin Wall collapsed in 1990 and the Soviet Union disintegrated into Russia and many other smaller countries in the following year, it appeared to many people that the Cold War was clearly over.

Later in 2008, however, the world banking system collapsed and we found ourselves involved in the biggest economic crisis after the Great Depression of the 1930s. The failure of socialism was never equivalent to the success of capitalism. A failure, if not the failure, of capitalism became a fashionable topic again. In a popular book, Richard A. Posner (2009) has recently remarked:

> "My focus is on the course, causes, and offered cures of the depression. But I also emphasize some points that have received relatively little coverage in other accounts: the depression's political dimensions, the disappointing performance of

the economics profession in regard to anticipating and providing guidance to responding to the depression, how ideology can distort economic policy, the inherent limitations of depression economics, how the self-interested decisions of rational businessmen and consumers can give rise to a depression....."

(Posner (2009), Preface, p. xiv)

Posner's remark aforementioned is both very serious and greatly challenging. We all have seen the disappointing performance of the economic profession in regard to the breakdown of the market economy. It is recalled here that Keynes (1936), a noted contemporary of Knight, once lamented the disappointing performance of the economics profession, and devoted his full energy to establish a new way of thinking.

In historical perspective, the two great economists, Knight (1921, 35, 99) and Keynes (1936), did outstanding contributions on the ethical foundations and consequences of a competitive economy. We believe that it is now high time to have serious reconsiderations of the logic and ethics of the capitalist economy. We need a Knight and/or a Keynes. Regrettably, neither a second Knight nor a second Keynes appear to be in sight yet. A completely new approach to the logic and ethics of the market economy would urgently be needed.

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.Endnotes

1) Sandel's Harvard course was also easily available on Japanese television. Its style was so appealing and influential that it was nicknamed "Sandel's excited lecture." It seems that his emphasis on justice and equity impressed very much those Japanese economics students who were tired of repeated talk on money and efficiency.

2) Interestingly enough, we can point out a sort of McKenzie-Hicks-Samuelson connection. McKenzie once dared to go to Oxford, and his supervisor was John Hicks. Although he wrote a draft of a thesis, it was unfortunately a rather unfinished product, so that he had to be satisfied with the less prestigious degree of B. Litt. When McKenzie was visiting the Coles Foundation, a professor from the University of Rochester came by to discuss the possibility that McKenzie might be interested in a position there to head an economics department with the aim of developing a Ph.D. program. McKenzie later learned that this job of chairmanship had been recommended by Samuelson at MIT. This was the reason why McKenzie spent his first year at Rochester in 1957 and later devoted his full energy to gradually make Rochester a world-famous institution of mathematical economics. For a detailed story on this point, see McKenzie (1999). My academic relation to McKenzie, a mentor at Rochester, carried over to Pittsburgh; I myself made Sakai (1972), my own lecture note on general equilibrium theory, by occasionally consulting McKenzie (1969) and also introducing some original materials. Besides, the life and work of Kakutani whose theorem of fixed point was fondly used by McKenzie, see Hirota (2004).

3) McKenzie (1969) was the handwritten lecture note he used in a graduate seminar in general equilibrium theory at Rochester. It was a loosely written manuscript full of corrections and imperfections. All the students had a very hard time to fully understand his unique writing style, mysterious notations and complicated equations. Fortunately, it was later typewritten by his efficient secretaries and eventually became a hard-covered book, namely, McKenzie (2002). The time span between the lecture note and the complete book is amazingly 33 years. We strongly feel that the esprit, wit
and human touch have been gone in those long years. As the saying goes, time and tide wait for no man!

4) Debreu (1959) and Takayama (1974) are very useful in understanding the Brouwer fixed point theorem and its related topics.

5) See Wald (1936) and Von Neumann & Morgenstern (1944) for instance.

6) From the 1970s onward, very useful advanced textbooks in general equilibrium theory have been appeared. So systematic presentations of the Fixed Point Theorems and their economic applications are now available to any eager graduate student.
For instance, see Nikaido (1970), Arrow & Hahn (1971), and Takayama (1974). Compared with those works, McKenzie (2002) was a belated product, yet presumably showed the culmination in thus field.

7) Newman (1968) was a nice collection of outstanding papers on mathematical economics. The reader could easily understand how effectively many scientific research funds were used in the 1950s and the 1960s.

8) The concept of Pareto optimality was first introduced by Pareto(1906). For a nice discussion for the relation between the market equilibrium and Pareto optimality, see Negishi (1960) and Quirk & Saposnik (1968).

9) The philosophical and economic thought of Knight was intensively discussed in Sakai (2010, 2015).