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**Frank H. Knight on Uncertainty and Profit
Manager versus Entrepreneur**

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Abstract

This chapter aims to carefully discuss how Frank H. Knight, the "Grand Old Man" of Chicago, dealt with uncertainty and profit, with special reference to manager versus entrepreneur. Frankly speaking, Knight was a sort of man in paradox, having a dualistic view and adopting an eclectic approach. In order to shed a new light on his life and work, we first argue that there possibly exist some traces of the great Knight in the words and deeds of Martin Bronfenbrenner, once one of Knight's students at Chicago. Then we focus on the distinction between risk and uncertainty. According to Knight, non-measurable uncertainty must radically be different from measurable risk: only uncertainty, but not risk, enables the entrepreneur to acquire true profit as its reward. In contrast to the manager who are doing just routine jobs every day, the entrepreneur dares to engage in new ventures activities, thus playing the central figure of the capitalist system. We live in the new age of uncertainty. The second Knight is urgently needed.

Keywords: Frank H. Knight, Martin Bronfenbrenner, risk, uncertainty, manager, entrepreneur, profit, capitalist system

I M. Bronfenbrenner as "Prof. Sharp Tongue": Some Traces of F.H. Knight

Speaking of myself, I have known Prof. Martin Bronfenbrenner (1914-1997) for more than fifty years, first as a student, later as a colleague, and always as an intimate friend. Whenever I met with him on university campuses, on city streets or in private houses, he was fond of teaching me and even himself, and of course always criticizing the academic and world affairs. Long time ago, when I was a graduate student at Kobe University, Japan, my fellow classmates were fond of calling him "Prof. Sharp Tongue" because he was so famous of being an eloquent speaker with sharp tongue. Listening to his ironic expressions and even cynical remarks, I myself wondered if I could probably see some traces of his own teachers at Chicago. Needless to say, Frank H. Knight was among those great teachers.

Any kind of tradition, whether it is good or bad, is likely to be handed down from generation to generation. Although I myself have never had an opportunity to personally speak to Knight, I would like to say that I possibly observed some traces of his unique way of thinking in the words and deeds of Bronfenbrenner, one of his bright students at Chicago. So when I happened to check the term "Frank H. Knight, 1885-1971" at Google, Wikipedia, it was really a happy surprise to find the following interesting sentence: ¹⁾

Knight failed to acquire any followers and failed to build up a distinct "school of thought" around himself. We can see *some* traces of his perspective in the work of Kenneth E. Boulding, Martin Bronfenbrenner, James Buchanan and George J. Stigler, but they can hardly be called "Knightian" in any meaningful sense."

It should be noticed that the delicate expression "*some* traces of Knight's perspective" with the word "*some*" emphasized in italics is carefully employed here. Presumably, it would be almost "a mission impossible" to find *all* the traces of his perspective in the work of other scholars. It is my bold mission, however, to trace *some, but not all*, traces of the perspective of Knight in the work of Bronfenbrenner.

In historical perspective, Frank H. Knight was Martin Bronfenbrenner's great teacher, and Bronfenbrenner my great teacher. So it would be no wonder that the dualistic view and critical eyes in the work of Knight had more or less handed down to Bronfenbrenner, and eventually even to me. I still recall that Bronfenbrenner's personal letter to the late Dr. Shigeo Minabe, my very close friend in the United States and Japan, contained the following honorable ending with his own personal signature:

"Bronf Von Brenner", followed by the Japanese red stamp "Baka", meaning "Fool" in English. Interestingly enough, this had dispelled all my doubts on the question of why he used to say that not a few Japanese professors were not "full professors" but only "fool professors". According to his twisted usage of expressions, "a fool professor" never meant "a fool" in its literary sense, but rather "a cool professor" or "a respected professor". It is because Bronfenbrenner as a gentleman with such pride was so self-effacing that he was preferred to be called himself "a fool", alias "a highly respected gentleman". In the same letter afore-mentioned, he kindly gave the following advice to Minabe, "You should do as I say, but not as I do." As the saying goes, saying is one thing, but doing is another. ²⁾

I remember how Bronfenbrenner managed to take care of his class at Kobe University in 1965. The graduate course he taught us was named "Income Distribution Theory." The course was conducted in English, which was a rather extraordinary practice in Japan in the 1960s. In order to make his teaching more accessible to Japanese students, he used to come to the classroom one hour earlier than the regular schedule. Taking advantage of such extra hour, he usually draw six or seven fancy-looking figures filling in a big blackboard. We graduate students were astonished by his skill of making use of so many colored chinks including red, yellow, blue, green, brown and white. This was the reason why Bronfenbrenner acquired another honorable nickname "Professor Rainbow" from attentive Japanese students.

His income distribution lecture at Kobe turned out to be so successful that its whole contents together were put in a single academic book entitled *Income Distribution Theory* in 1971, namely the year when I myself was an ambitious assistant professor at Pittsburgh, exactly the birth place of Bronfenbrenner. According to Harry G. Johnson who kindly wrote *Forward* to this book, Bronfenbrenner (1971) was a very brilliant book in the sense that this was then the only book available that ranged — and ranged authoritatively — over the whole field of distribution theory. Bronfenbrenner himself, however, seemed to have his own unique opinion that clearly showed his distinguishing features. In fact, at the very opening page, he strongly declared that "this book was dedicated to [his] brilliant failures." Of course, this book was not "the product of complete failures" at all, but rather more objectively "the product of *brilliant successes*." But, alas, he was not a straightforward person in any sense, but strangely a bit self-effacing person. In fact, in writing *Preface*, he appeared very modest as usual, and even apologetic to the prospective reader:

This is an old-fashioned income distribution book.... What makes the book old-fashioned is,

primarily, the content of "reformation and restatement," which also makes long. (page xiii)

In the light of economics history, any book which is often called "a great book" must contain to a certain extent the old-fashioned part of reformation and restatement. As Johnson (1971) noted, "knowledge is painful to acquire and too easy to forget: and in a busy and bustling profession, it is too easy to be fascinated by each new wave as it rolls in and to overlook the fact that the tide is ebbing out (or flowing in as the case may be) " (page ix) I am in general agreement with Johnson's opinion that in the distribution book written by Bronfenbrenner there must exist some new waves that appear to be rather small but is likely to grow larger as time goes by. At this point, it is recalled that the great classic *Risk, Uncertainty and Profit* (1921) written by Knight, one of Bronfenbrenner's teachers at Chicago, characteristically begins with the following very modest *Preface* :

There is little that is fundamentally new in this book. It represents an attempt to state the essential principles of the conventional economic doctrine more accurately, and to show their implications more clearly, than has previously been done. That is, its object is refinement, not reconstruction. (Knight, 1921, Preface, page ix)

Frank H. Knight seems to be a man in paradox. Paul A. Samuelson has once said that "there is certainly a classic. Time has not made it obsolete." And George J. Stigler has convinced that "the volume is clearly one of the half-dozen classics in economic theory to appear in the U.S. in the first half-century." In the light of those fine appraisals made by Samuelson and Stigler, it should be almost impossible to agree with the modest man Knight's own assessment that "there is little that is fundamentally new in this book." This must sound to us like "a bad joke."

We would like to point out here that Martin Bronfenbrenner was no doubt a rhetorical successor of his master, Frank H. Knight. According to my teacher's teacher Knight, his uncertainty book (1921) represented the mere restatement of the conventional economic doctrine in a more accurate and more clear fashion than ever before. Strangely echoing such modest statement, my own teacher Bronfenbrenner argued that his distribution book (1971) was nothing more than the refinement and restatement of the old-fashioned economic theory. Therefore, it would be safe to say that we clearly see some traces of the perspective of the great Knight in the words and deeds of Bronfenbrenner. ³⁾

So far, as introductory remarks, we have shed a new light to the relation between Bronfenbrenner and Knight. The contents of the remainder of this chapter are as follows. The next session aims to argue that contrary to Knight's apparent modesty, there have been so many new ideas in his uncertainty book. The point of discussion is how he has succeeded in separating the two concepts, measurable risk and non-measurable uncertainty. Then the third section will deal with his unique idea for the role of an entrepreneur distinct from a manager. He passionately will discuss that only an entrepreneur, but not a manager, is entitled to acquire net profit as the reward for "uncertainty seeking." The last session will be kept for final remarks.

II Risk, Uncertainty and Profit: Knight's Theory of Trinity

2.1 How Uncertainty is Radically Distinct from Risk

Knight's life work *Risk, Uncertainty and Profit* (1921) per se seemed to be a book in paradox. Although he modestly said that there was little that was fundamentally new in this book, he nevertheless did not forget to add the following prideful sentence:

The particular technical contribution to the theory of free enterprise which this essay purports to make is a fuller and more careful examination of the role of the entrepreneur or enterpriser, the recognized "central figure" of the system, and of the forces which fix the remuneration of his special function. (Knight, 1921, page xi)

Knight certainly had the conviction that this book contributed a great deal to understanding the working and performance of the free enterprise system and the critical role played by the entrepreneur as an adventurer. He has repeatedly stressed that uncertainty must be taken radically distinct from the more familiar notion of risk. The essential point is that "risk" usually means a quantity susceptible of measurement while "uncertainly" is not so. In other words, whereas risk is measurable in the sense that it can be described by a certain distribution function such as the normal distribution, Pareto distribution and the like, uncertainty is neither measurable nor quantifiable. ⁴⁾

He has written the following memorable remark:

It is this "true" uncertainty, and not risk, which forms the basis of a valid theory of profit and accounts for the divergence between actual and theoretical competition. (page 20)

We are not quite sure of how and to what extent "actual competition" differs from "theoretical competition." According to my slightly bold guessing, actual competition or the competition as is seen in the real world is definitely much more aggressive and even destructive than theoretical competition or the competition imagined by the traditional theorists in their brains. In fact, Knight wisely observed the following fact:

The writer [namely, Knight himself] is strongly of the opinion that business as a whole suffers a loss. The main facts in the psychology of the case are familiar.... The behavior of men in lotteries and gambling games is the most striking fact. Adam Smith pointed out the tendency of human nature to exaggerate the value of a small chance winning. (page 365)

From the viewpoint of "theoretical competition." it would be utterly unthinkable to find that the whole business may suffer a loss: the amount of aggregate profit would gradually decrease as competition becomes harder and harder, and eventually reaches the terminal point of zero profit, namely the theoretically ideal state of perfect competition. The critical Knight is in no mood to stop thinking at this stage. He rather proceeds to go beyond, thereby carefully observing the reality of cut-throat

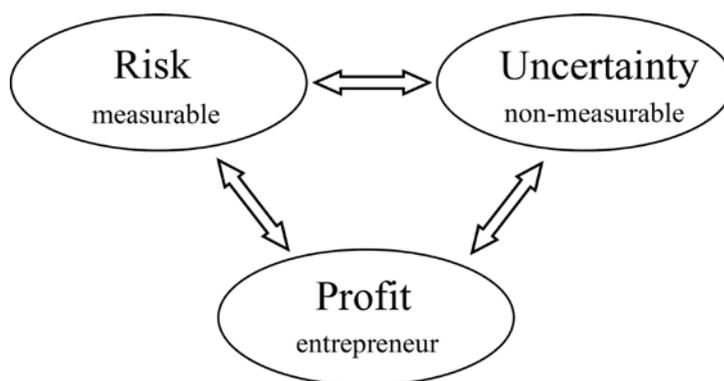


Fig. 1 Risk, uncertainty and profit: Knight's trinity

competition or the probability of the cruel form of "actual competition," in which the aggregate profit would possibly go under zero profit. As the great Adam Smith has observed, human being has a tendency to overestimate the small chance of winnings, thus unintentionally resulting in a loss as a whole. As human history tells us, human being could foolishly engage in such a large scale of war that there would eventually no winners whatever, with the tragic result of total destruction.

Summing up, the trinity of "risk, uncertainty and profit" constitutes the keystone of the grand system of Frank H. Knight. Such structure may clearly be depicted in Fig. 1.

2.2 Three Types of Probability Situations

Knight argues that it is quite convenient to separate the following three types of probability situations. They are as follows: (1) *a priori* probability, (2) statistical probability, and (3) estimates or judgments. Let us attempt to discuss what they are all about, and how they differ in characteristics.

2.2.1 *A priori probability*

This is really mathematical or purely theoretical probability. The most simple example for this case is given by the probability of rolling one dice for the number six, namely the fraction $1/6$. Another good example is provided by the probability of rolling two dices for the sum of seven. Its answer must be $6/36$ or $1/6$ since there are mathematically six possible combinations (namely, $1+6, 2+5, 3+4, 4+3, 5+2, 6+1$) out of thirty-six conceivable combinations (namely, $6 \times 6 = 36$). The whole picture of combinations and probabilities may be depicted in Table 1.

We may arbitrarily increase the number of rolling dices. For instance, if we roll three dices, then we easily obtain the following sequence of fractions:

$1/216, 3/216, 6/216, 10/216, 15/216, 21/216, 25/216, 27/216,$
 $27/216, 25/216, 21/216, 15/216, 10/216, 6/216, 3/216, 1/216.$

As is clearly seen, those theoretical probabilities together are expected to produce a symmetric distribution diagram. There may exist, however, a variety of non-symmetrical distribution diagrams, which are more commonly seen in daily life than symmetrical ones.

Table 1 Rolling two dices: a statistical probability

The sum of two numbers	Possible combinations of two numbers	Number of combinations	Probability
2	1+1	1	1/36
3	2+1, 1+2	2	2/36
4	3+1, 2+2, 1+3	3	3/36
5	4+1, 3+2, 2+3, 1+4	4	4/36
6	5+1, 4+2, 3+3, 2+4, 1+5	5	5/36
7	6+1, 5+2, 4+3, 3+4, 2+5, 1+6	6	6/36
8	6+2, 5+3, 4+4, 3+5, 2+6	5	5/36
9	6+3, 5+4, 4+5, 3+6	4	4/36
10	6+4, 5+5, 4+6	3	3/36
11	6+5, 5+6	2	2/36
12	6+6	1	1/36

2.2.2 Statistical probability

This is neither mathematically nor theoretically determined, but merely empirically evaluated. Its evaluation is also done on the solid basis.

One of the best examples is given by what we may call life expectancy. Strictly speaking, life expectancy is defined as the average number of years a person born in a certain country is expected to live if mortality rates at each age are assumed to remain steady in the future. Table2 indicates the life expectancy at birth for both sexes, females and males in selected countries in the world. As is seen in the table, it varies a great deal from country to country. As of 2015, Japan as a developed country has the highest expectancy: on average, the Japanese female is expected to live for 86.8 years, and the Japanese male 80.5 years. Sierra Leone is a developing country in which the life expectancy is considerably low: only 50.1 years for both sexes, 50.8 years for male, and 49.3 years for male.

Another example of statistical probability is provided by road traffic-related death

Table 2 Life expectancy at birth: world selected list (2015)

Country	Both sexes	Female	Male
Japan	83.7	86.8	80.5
United Kingdom	81.2	83.0	79.4
United States	79.3	81.6	76.9
China	76.1	77.6	74.6
India	68.3	69.9	66.9
Nigeria	54.5	55.6	53.4
Sierra Leone	50.1	50.8	49.3

Source: The World Health Organization (WHO, 2015)

Table 3 Traffic-related death rate: Comparison of selected countries (2013)

Country	Road fatalities per 100 thousand	Road fatalities per 100 thousand
Japan	4.7	6.5
United Kingdom	2.9	5.1
United States	10.6	12.9
China	18.8	104.5
India	16.6	130.1
Nigeria	20.5	615.4
Sierra Leone	not available	not available

Source: World Health Organization (WHO, 2013)

rate. As is seen in Table 3, there are large disparities in this rate from country to country. As you can see, the United Kingdom and Japan are among the most safe countries. To take an example, in Japan in 2015, the road fatalities per 100 thousand persons is 4.7, implying that 47 persons out of 1 million are destined to be killed by various traffic accidents.

Both *a priori* probability and statistical probability have one important thing in common because they both are related to measurable risk in the sense that they can be described by specific distribution functions. There is another sort of probability, however, which is not measurable at all. It is this third kind of probability that should be our next topic to pick up.

2.2.3 *Estimates or judgments*

In relation to estimates or judgments, Knight has attracted our special attention to the distinction between measurable risk and non-measurable uncertainty in the following way:

The distinction here is that there is *no solid basis of any kind* for classifying instances. This form of probability is involved in the greatest logical difficulties of all, and no satisfactory discussion of it can be given, but its distinction from the other types must be emphasized and some of its complicated relations indicated. (page 225)

Concerning the above sentence, the expression "no solid basis of any kind" is of the greatest importance since it tells us the clear distinction between theoretical and empirical probabilities on the one hand and estimates and judgments on the other hand. Undoubtedly, both theoretical and empirical probabilities have solid scientific basis, thus making no errors or no imperfections whatever. In contrast to those two cases, the third case of "estimates or judgments are 'liable' to err." (page 225) Human beings often make mistakes in every daily life. For example, every baseball player is liable to err: an infield or outfield player may fail to catch a ball, whereas a batter may fail to hit hard enough. Although the baseball game is played on some basis of pitching or hitting statistics, the statistics used is not so solid as the life expectancy or traffic-related death rate afore-mentioned.

Knight is eager to make estimates/judgments radically different from ordinary kinds of theoretical/empirical probabilities. At this point, he has also written the following remark:

The theoretical difference between the probability connected with an estimates and that involved in such phenomenon as are dealt with by insurance is of the greatest importance, and is clearly discernable in nearly any instance of the exercise of judgment. (page 226)

In reality, we observe a variety of insurance including life insurance, traffic accident insurance and fire insurance. Life expectancy and traffic accidents are subject to reliable information and solid calculation, so that they are almost always insurable. According to Knight, however, there are other kinds of probabilities connected with human estimates and imperfect judgments, which are in no way subject to insurance.

Joseph A. Schumpeter (1878-1950) is the great economist who was born in Austria and later immigrated to the U.S., working for Harvard University until his death. He highly appreciated Knight for making the solid distinction between measurable risk and non-measurable uncertainty. His massive book *History of Economic Analysis* (1954) was posthumously came out in the publishing world. It is really worthwhile to record his remark on the work of Knight:

To Professor Knight we owe, in the first place, a very useful emphasis upon the distinction between insurable risks and non-insurable uncertainty; and, in the second place, a profit theory that linked this non-insurable uncertainty on the one hand to rapid economic change — which, barring extra-economic disturbances, is the main source of this uncertainty—and on the other to differences in business ability which are much more obviously relevant to the explanation of profits and losses in condition of rapid change than would be otherwise. He thereby achieved a synthesis that is not open to the main objection against the ordinary type of risk theories.

(page 894)

I myself stand squarely behind Schumpeter. Knight's distinction between insurable risk and non-insurable uncertainty is so important that it has contributed a great deal to the history of economic analysis. I would like to point out, however, the historical fact that this distinction has not been supported by all the economists. For instance, Kenneth Joseph Arrow (1951) when he was young expressed his doubts in a straightforward way:

In brief, Knight's uncertainties seem to have surprisingly many of the properties of ordinary probabilities, and it is not clear how much is gained by the distinction. (page 18)

I do not quite know whether Arrow in the 1970s and hereafter is academically what he was in the 1950s. As the saying goes, time flies like an arrow. I do believe that he has somehow outgrown from his younger days: In fact, at the present time, he has been so admired all over the world as an outstanding pioneer in the economic theory of uncertainty.

2.3 Enterprise and Profit

2.3.1 *The Effects of Uncertainty on the Organization*

We are now in a position to carefully consider the effects of uncertainty on the form of organization of economic life. The best method seems to take up a society in which uncertainty is absent, then introduce uncertainty, and ascertain what changes will take place in its structure.

With uncertainty entirely absent, every person possessing perfect knowledge of the situation, there would be no occasion for responsible management and control of productive activity. The flow of raw materials and productive services through productive processes to the consumer would be entirely automatic. It is true that there might be managers, superintendents and the like for the purpose of coordinating the activities of individuals. Under conditions of perfect knowledge and full certainty, however, such functionaries could be regarded as mere workers, performing purely routine functions, without responsibility of any sort, on a level with men engaged in just mechanical operations.

Now let us introduce uncertainty into the business organization, and ascertain what changes will take place in its working and performance. Knight (1921) becomes a very eloquent speaker at this stage:

With the introduction of uncertainty — the fact of ignorance and necessity of acting upon opinion rather than knowledge — into this Eden-like situation, its character is completely changed. With uncertainty absent, man's energies are devoted altogether to doing things; and it is doubtful whether intelligence itself would exist in such a situation; in a world so built that perfect knowledge was theoretically possible, it seems likely that all organic readjustments would become mechanical, all organisms automata. With uncertainty present, doing things, the actual execution of activity, becomes in a real sense a secondary part of life; the primary problem or function is deciding what to do and how to do it. (page 208)

Knight skillfully compares the society without uncertainty and the one in the presence of uncertainty. With uncertainty absent, people are supposed to live the Eden-like situation in which persons are just doing the same things as before and the organizations are mechanical like automata. Knight doubts that even human intelligence itself would cease to exist. ⁵⁾

With uncertainty present, those situations must change dramatically. While doing works routinely becomes a secondary part of people's life, deciding intentionally what to do and how to do it would be thought of as the primary problem. Then the internal organization is no longer a matter of indifference or a mechanical detail. Centralization of determination and controlling function is now imperative. A very important change in this direction resides in the tendency of the groups themselves to specialize, finding the greatest managerial capacity and placing them in charge of the group work. With the specialization of function goes also a differentiation of reward. The produce of society is now divided into two kinds of income. The first kind is contractual income or *rent*, the second one residual income or *profit*. The question which might occur to our mind is who is the person acquiring the first income, and who is the man being entitled to obtain the second one.

2.3.2 *Manager versus Entrepreneur*

When uncertainty is absent, the duties of managers at business organization would be of a routine character, thus being not significantly different from those of any other operatives; they would be just like other ordinary workers and their incomes are wages like other wages. When the managerial function comes to require the exercise of judgment, however, the business situation would change dramatically. Then the judgment by the management is liable to make a error, and the manager in charge ought to have responsibility for the correctness of the opinion. In a sense, "the nature of the function is revolutionized; the manager becomes an entrepreneur." (page 276)

We must keep in mind that the entrepreneur's income is not determined, but rather may be regarded as *residual* in the sense that it is what is left after the others are determined. In other words, "the entrepreneur's income is not fixed, but consist of whatever remains over after the fixed incomes are paid." (page 280) The presence of true profit, therefore, depends on an absolute uncertainty in estimating the value of judgment, or on the absence of the requisite organization for combining a sufficient number of instances to secure certainty through consolidation.

In conclusion, Knight (1921) has left us the following impressive sentence:

The only "risk" which leads to a profit is a unique uncertainty resulting from an exercise of ultimate responsibility which in its unique nature cannot be insured nor capitalized nor salaried. Profit arises out of the inherent, absolute unpredictability of things, out of the sheer brute fact that the results of human activity cannot be anticipated and then only in so far as even a probability calculation in regard to them is impossible and meaningless.

(pages 310-311)

By carefully reading the above sentence, we strongly feel Knight's passion for true uncertainty or absolute unpredictability of things that may serve as the source of true profit distinct from ordinary rent. Knight was a man with many faces. He was truly a man in paradox.

III Bronfenbrenner on "the Chicago School" : Final Remarks

It is generally agreed that Frank H. Knight is one of the superstars in the history of economic thought. His distinction between risk and uncertainty seems to be a common knowledge among all the economists in the world.

Although Knight has been called the "Grand Old Man" of Chicago, it is worth mentioning that he has managed to remain an outsider in his own kingdom. It is fair to say that he failed to build up an exclusive "school of thought" around himself. As we have repeatedly mentioned in the above, however, we are able to find some important traces in his thought in the work of Martin Bronfenbrenner. Of course, Knight is Knight, and Bronfenbrenner is Bronfenbrenner. Although there are some important interactions between them, the ideological foundations seem to be a bit apart. For example, while Knight has constantly opposed Keynesian macro policies of market intervention, Bronfenbrenner sometime called himself "Bastard Keynesian." We do see, however, that those two economists are not mathematically oriented, but find much interest in much wider areas such as philosophy, history, religion, policies, real world problems. In short, they are men of dualistic views, with sharp tongue and sarcastic remarks. ⁶⁾

There remains an important question of whether and to what extent the "Chicago School of Economics" has ever existed. As far as we can see, there are opposing views on this matter. On the one hand, Laurence Miller, Jr. (1962) claims that the Chicago School represents a subject of legitimate professional interest. In historical

perspective, in the 1930s, 1940s, and 1950s, so many eminent economists such as Frank Knight and Jacob Viner were doing outstanding research in theories and applications. And in the 1970s, 1980s, and hereafter, Chicago has produced so many leading theorists including Milton Friedman and George Stigler. Although Milnor has been brave to propose several elements as defining the "Chicago economists", alas, his proposal has not gained full endorsement from George Stigler himself (1962). We should not forget the presence of Paul Douglas, Oscar Lange, and Martin Bronfenbrenner, who have been rather independent, bastard Keynesian or liberal-oriented economists.

Martin Bronfenbrenner (1962) has caught a golden opportunity to say his unique opinion on the "Chicago School." In his famous or infamous paper, he characteristically has declared his strong position against the existence of such school:

I [namely, Bronfenbrenner] never heard of any "Chicago School" until I left Chicago. I thought of my teachers and my older fellow students as good economists, not as members of a sect of cult or clique. Shortly after leaving the Midway, however, I encountered the term full force. It was usually used pejoratively, especially when I was included in the membership. On the banks of Lake Mendota, for example, "the Chicago School" meant Pangoless plus Crandgrind, with touches of Peachum, Torquemada, and the Marquis de Sade thrown in as "insulter's surplus."

(Bronfenbrenner, 1962, page 72)

Here Martin Bronfenbrenner's sharp tongue is so apparent, requiring no further explanation. Especially, the use of the word "Marquis de Sade" is amazingly provocative. I believe that he has been more or less influenced by the works and deeds of his mentor, Frank H. Knight. The relation between Knight and Bronfenbrenner should be brought to light, requiring still further investigation.

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Footnotes

- 1) Speaking of myself, for the period 1968-75, I was firstly a graduate student at the University of Rochester, and later an assistant professor at the University of Pittsburgh, where I taught economic theory and mathematical economics for both undergraduate and graduate students. Since Knight passed away in 1970, I could possibly have met with him sometime in the period 1968-1970, but alas, I could not. I had instead the golden opportunities at both universities in which I talked with so many Chicago graduates including the late Sherwin Rosen and the late Walter Oi. Dr. Robert Thaler, a Nobel laureate and now a distinguished professor at Chicago, was once one of my earnest classmates at Rochester.
- 2) Similar personal episodes of Bronfenbrenner were recorded by Goodwin (1998). Bronfenbrenner arrived at Chicago in 1934 and stayed there until 1938. According to Goodwin, Bronfenbrenner described Knight as a little man with a toothbrush mustache, a squeaky voice, and a quirk of wrinkling up the lower half of his face while propounding defiance of the universe. When I talked with Bronfenbrenner, I felt that he had strong defiance of the universe, especially harsh criticism of academism in the U.S. and Japan.
- 3) Bronfenbrenner(1971) used his own rhetoric to express gratitude to his wife Teruko Okuaki Bronfenbrenner for her consistent support: "every married man's wife improves his professional acumen, his scholarship, his mathematics, his statistics, his English, or at least his typing. Or it seems. Teruko Okuaki Bronfenbrenner, however, is not singularly competent in any of those respects. My main reason for thanking her is that she has been a better-than-average psychiatric nurse. Need I say more?" (Preface, page xiii) Shigeo Minabe constantly served as Bronfenbrenner's research assistant at Kobe and other places, thereby being called "a real gem" by Bronfenbrenner. It is recalled that Michiko Minabe, the wife of Shige Minabe, has been an excellent professional nurse in New Zealand, the United States and Japan.
- 4) Frank H. Knight's main work *Risk, Uncertainty and Profit* (1921) was a "Jugendarbeit" or a "masterpiece" in the old sense, by which an apprentice qualified for admission to the gild in old days. This first edition was reissued in 1933 during the Great Depression, reprinted in 1948 after the Second World War, and reprinted again in 1957 after the Korean War. Thus Knight's masterpiece seems to be immortal, and will survive well in the 21st century.
- 5) Arrow (1951, 1970) seemed to react rather harshly against such strong opinion of Knight. So Arrow once remarked: "[A]ccording to Professor Frank Knight, even human consciousness itself would disappear in the absence of uncertainty." (Arrow, 1970, page 1) In retrospect, the two giants, Knight and Arrow, seem to be considerably emotional at this stage, thus showing that both are just human beings, but not automata.
- 6) While the life and work of Frank H. Knight was systematically reviewed by Patinkin (1973) and later by Boyd (1997), the one of Bronfenbrenner was carefully evaluated by Goodwin (1998).