From the market-clearing to sympathy-consent process: the micro foundation of macroeconomics

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Abstracts

The microeconomic foundation of New Keynesian theory, as the counterpoint of New Classical theory, has been supported by behavioral studies. It was David Hume who established the analytical architecture of empiricism. Hume(1739) recognized the separated domain of empiricism from the domain of rationalism. The borderline is denoted as so-called The Principle of the Uniformity of Nature(PUN in short). It may be called as Hume's divide in this paper.

Hume's divide is proved rigorously by Rhee(2018c). Akerlof(1983)'s gift-exchange is nothing but the relation exchange of Rhee(2012b). His 'the norms for gift exchange' corresponds to Rhee(2012b, 2018a, 2018d)'s sympathy-consent process. Rhee(2012b)'s contribution is the augmentation of sympathy-consent dimension as the analytical domain. Phillips curve's trade-off relation is nothing but the phenomena that take place in the empiricist domain where ICP(indeterminate, coincidental, path-dependent) is unfolded as the idiosyncratic attribute of the domain. Any attempt to give determinate interpretation dooms to fail due to Hume's divide.

Keywords:

Phillips curve, gift exchange, cognitive system, sympathy-consent process, Hume's divide

I   Introduction

Keynes's General Theory discoursed on the possibility of disequilibrium of the national economy and involuntary unemployment. It pounded on economic society because his thesis argued against the tenet of mainstream neoclassical economics. The statistical report of the Phillips curve provided a frantic battlefield and stirred up prolific debates among economists. Friedman-Phelps's natural rate theory was the powerful argument enough to refute the validity of the trade-off relations between unemployment and nominal wage change (or inflation).

Despite the fantastic logic of New Classical theory, plenty of statistical evidence posited the indication that the real economy does not match well with the tenet of New Classical theory. The problem becomes how we can explain the permanent trade-off relationship of Phillips curve or involuntary unemployment. In this regard, G. A. Akerlof's studies of behavioral approach are important steps forward to the pursuit of the micro foundation of macroeconomics. For instance, his conception of seeing employment contract as gift exchange acknowledges the distinction between the gift-exchange economy and the neoclassical economy(Akerlof 1982).

This paper purports to dig deeper into the analysis to locate the analytical dimension in the domain of which gift exchange takes place as a normal action. The work requires the investigation of the domain of empiricism as an analytical dimension which distinguished from the value-cost rationalism dimension of neoclassical economics. The elucidation of Hume's divide is instrumental for the location of the domain of empiricism. The finding of the sympathy-consent dimension opens the gateway to the study of the micro foundation of macroeconomics. The arguments are extended to reveal that gift exchange(Akerlof 1982) is nothing but relation exchange theory(Rhee 2012b).

Section II introduces the Phillips curve, New Classical interpretations, and unresponding statistical shreds of evidence. New Keynesian attempts to find the micro foundation of macroeconomics are illustrated with Akerlof's behavioral macro approach being focused in Section III. In section IV, the analytical dimension of behavioral macroeconomic approach is elucidated to be the same as the empiricist approach of sympathy-consent process. To compare the neoclassical theory with the sympathy-consent dimension of empiricist approach, demand and supply are disaggregated into individual entrepreneurship and business model as the independent elements with respective cognitive system braced for decision making in section V. The impossibility to aggregate the entrepreneurship of individuals into demand and supply schedule by the value-cost measure unit due to the fundamentality of sympathy-consent process is proved as proposition in VI. VII provides concluding remarks.

II   Phillips Curve and New Keynesian theory

A. W. Phillips reported a statistical relationship between rates of change in the money wage and unemployment rates which were revealed from the statistics 1861-1957 in the United Kingdom(Phillips 1958). The negative relationships have been called the Phillips curve. Phillips curve didn't take much time to become the focus of attention in economics because it works as a test plate when to verify the efficacy of a macroeconomic model. It is in the steps of elucidation that the endeavor to track down an analytic interpretation of the macroeconomic phenomena turned to the works to probe the microeconomic foundation of macroeconomics(Phelps 1967).

 "Is money neutral?" Milton Friedman made use of the Phillips curve to give an affirmative answer to the question(Friedman 1968). Until people didn't realize the increase in money supply, they will respond with increases in the economic activity, which reduces the unemployment rate

but raises the market interest rate at the same time. Once people realize the harboring of inflation, inflationary expectation begins to hold effect. Monetary policy no more reveals potency. Unemployment rate returns to the natural rate. Phillips Curve becomes vertical at the natural rate of unemployment in the long run, denying its long-run validity.

   Edmund Phelps(1967, 1968) incorporated the inflation expectation in the neoclassical modeling to draw out the result on the long-run invalidity of Phillips curve. It is the tenet of rational expectation theory that declared a death sentence to the validity of the Phillips curve(Lucas 1972; Sargent 1971, 1973). New Classical Economics denies the possibility of economic equilibrium at other than NAIRU(the non-accelerating inflation rate of unemployment).[1] Economics returned to the neoclassical tenet of Patinkin's neutrality of money(1965).

   Despite the popularity of the Friedman-Phelps natural rate theory among economists, the evidence seemed not to support the tenet. "Unemployment in the U.S. for the whole of the 1930s was indisputably in excess - surely *greatly* in excess – of any plausible natural rate. According to the natural rate hypothesis, price deflation should have accelerated for the whole decade. That did not happen. Prices fell for a time, but deflation stopped after 1932; there was no significant deflation for the next ten years, despite extremely high unemployment. This evidence suggests that, at least after some time, at high levels of unemployment and low inflation rates, the natural rate hypothesis breaks down."[2] Pierre Fortin estimates of the Canadian economy from 1992 to 2000 confirms the invalidity of natural rate theory(Fortin 1996). Late 20 century, there were plenty of cases of stagflation, i.e. inflation and unemployment in the U.S. and Western Europe. But unlike the theory of natural rate hypothesis, such stagflation didn't lead to accelerating deflation and decreasing unemployment.

   In response to the natural rate arguments of New Classical Economics approach, George A. Akerlof raised a new question of "whether Patinkin's results generalize to a world which has 'stickiness' and 'market imperfections.'"(Akerlof 1969) The condition of competition in the labor market is affected by the collective bargaining of labor union. The workers' behavior at the wage bargaining is better explained by behavioral theory(Akerlof 2002). "Downward wage rigidity is a natural implication of prospect theory(Kahneman and Tversky 1979) if the current money wage is taken as a reference point by workers in measuring gains and losses. In support of this view, Shafir et al(1997) found in a questionnaire study that individuals' mental frames are defined not just in the real terms hypothesized by classical economists but also exhibit some money illusion."[3]

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[1] The Royal Swedish Academy of Sciences, "Edmund Phelps's Contributions to Macroeconomics," Information Department, Box 50005, SE-104 05 Stockholm, Sweden, 9 October 2006.

[2] J. A. Akerlof(2002), op. cit. p.420.

[3] J. A. Akerlof(2002), op. sit. p. 420.

From a behavioral approach, the New Keynesian economists proposed two behavioral hypotheses. Firstly, as a purely Keynesian hypothesis, "workers resist, and firms rarely impose, cuts in nominal pay." Secondly, "workers do not consider inflation sufficiently salient to be factored in to their decisions. As inflation increases, the losses from ignoring it also rise, therefore firms and workers take it into account in bargaining." The downward stickiness of money wage is supported by the studies of Card and Hyslop(1997) and Kahn(1997), which "found that distribution of nominal wage changes is asymmetric around zero. .. Using Swiss data, Fehr and Goette(2000) found that even a seven-year period of low inflation and low productivity growth did not increase the frequency of money wage cuts."[4]

"Behavioral theory suggests the idea that inflation is not salient when it is low, anticipated future changes in the price level are ignored in wage bargaining. .. Econometric estimates of the Phillips curve which allow for the possibility that past inflation has a different impact on current inflation when inflation is high than when it is low are consistent with this hypothesis: at high inflation, the sum of coefficients on past inflation is close to one. At low inflation, this sum of coefficients is much closed to zero"(Akerlof, Dickens and Perry 2000).[5]

At low inflation and high unemployment, monetary policy holds its potency. "Thus, a benefit of a little inflation is that it 'greases the wheels of the labor market"(Card and Hyslop 1997). However, the reality was the opposite. "Central bankers kept inflation too low and unemployment too high. During the 1990s, Canada had very low inflation and an unprecedented unemployment gap – close to four percentage points – with the United States."[6] [7] Central bankers were tamed by the textbook version of the natural rate hypothesis(Akerlof 2002).

III   Micro foundation of macro-economics

Workers consider the money wage rise without minding little about low inflation. But at high inflation, they take expected inflation seriously as well as money wage changes. To explain such asymmetric behavior of workers, Akerlof adopted the theories of behavioral approach(Akerlof, Dickens and Perry 2000). Workers are more sensitive to losses than to gains(prospect theory: Kahneman and Tversky 1979). "From a questionnaire study, Shafir, Diamond, and Tversky(1997) found that individuals' mental frames are defined not just in the real terms, but also exhibit some money illusion."[8] The rise in money wage tends to bring about labor supply at

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[4] J. A. Akerlof(2002), op. sit. pp. 420-21.

[5] J. A. Akerlof(2002), op. sit. pp. 421-22.

[6] 3.8 percent from 1990 to 1999, according to *Economic Report of the President*, 2000, Table B-107.

[7] J. A. Akerlof(2002), op. sit. pp. 422.

[8] J. A. Akerlof(2002), op. sit. pp. 420.

low inflation. But at high inflation, such labor supply does not follow due to inflation expectation. This permanent asymmetric relation of labor supply refuted the Friedman-Phelps natural rate hypothesis, according to New Keynesian economists.

The micro foundation of New Keynesian economics is more deeply rooted than so-looking in the illustration intended to refute the neutrality of money. The case of Akerlof's lemon market(1970) explained that opportunistic behavior may lead to failure in exchange if there is information asymmetry between buyers and sellers. Rhee(2018f) elucidated that it is the failure of the neoclassical tenet of the price mechanism, not the failure of exchange.

In 2002 AER paper, Akerlof raised six fundamental questions to the tenet of the New Classical model(Akerlof 2002 p. 412). If just one of those is taken to bring on in here, it is the existence of involuntary unemployment. "In the New Classical model, an unemployed worker can easily obtain a job by offering to work for just a smidgeon less than the market-clearing salary or wage; so involuntary unemployment cannot exist."[9] Akerlof's recognition of labor contracts as partial gift exchange is the attempt to address the question(Akerlof 1982).

His idea is that "labor contracts are partial gift exchanges. According to this idea, at least in part, wages are determined by, and in turn also influence, the norms of workers' effort; similarly, workers' effort is determined, at least in part, by these norms. A relation between the terms of exchange and norms is in our view what differentiates gift exchange from pure market exchange. (change of line) Indeed, while the norms may be greatly influenced by the same thing as market prices, there is still a major difference between pure market exchange and gift exchange. In pure market exchange, the maximum price at which a buyer is willing to purchase a commodity or factor service is the minimum at which the respective commodity or factor service is obtainable. Obversely, the minimum price at which a seller is willing to sell a commodity or factor service is the maximum at which the respective commodity of factor service can be sold. In gift exchange buyers may be willing to pay more than the minimum at which they can purchase a commodity or factor service because of the effect of the norms for a gift exchange. Similarly, sellers may be willing to accept less than the maximum at which they can sell a commodity or factor service because of the effects of the norms for gift exchanges. .. due to this behavior with gift exchange markets need not clear. Thus, the gift-exchange economy and the neoclassical economy differ in at least one fundamental respect."[10]

The *raison d'etre* of gift exchange confirms the plain contrast of the micro foundation of New Keynesian theory with that of New Classical theory. The counterpoints in the directional implications of monetary policy or macroeconomic policy between two different tenets emanate from the difference in their microeconomic foundations. Academic endeavors among economists to find the micro-foundations of macroeconomics launched plenty of prolific researches.

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[9] J. A. Akerlof(2002), op. sit. pp. 412.

[10] Akerlof(1982), pp. 567-68. Parenthesis is authors.

Efficiency wage(Akerlof and Yellen 1985), procrastination and obedience(Akerlof 1991) and studies on specificity and sclerosis(Caballero and Hammour 1998) are among them.

IV   Analytical dimension of behavioral approach

An idiosyncratic attribute of microeconomic analyses in New Keynesian theories is the illumination of phenomena which do not fit to the analytical architecture of neoclassical theory. Examples are insignificantly suboptimal behavior(Akerlof and Yellen 1985), information asymmetry and market failure(Akerlof 1970), gift exchange(Akerlof 1982), procrastination and obedience(1991) and so on. Akerlof(2002) gave behavioral interpretation to the coherent core of concepts which integrate through these studies. Specificity and sclerosis((Caballero and Hammour 1998) share the problem.

   The problem is the lacuna in the neoclassical theory due to which the theory fails to catch the reality of economic life. For instance, Akerlof(1982) says "In gift exchange buyers may be willing to pay more than the minimum at which they can purchase a commodity or factor service because of the effect of the norms for gift exchanges."[11] *The norms* for gift exchange doesn't pertain to the analytical territory of neoclassical theory. With the human cognitive system as being unveiled by behavioral studies, individuals' judgment concerning the norms for gift exchange becomes reference-dependent (Kahneman and Tversky 1979), influenced by framing effects (Tversky and Kahneman 1981, 1986) and guided by judgment heuristics (Kahneman and Frederick 2002).

  This concept of the gift exchange is precisely the same as relation exchange in Rhee(2012b, 2018a, 2018c). Every concept mentioned as above pertains to the analytical territory of sympathy-consent dimension.[12] These studies of Akerlof's tracked down the concepts of sympathy-consent process, but fail to recognize the sympathy-consent dimension as an analytical domain.

  Akerlof(1982) distinguished the gift-exchange economy from the neoclassical economy.[13] At the same time, he said, "due to this behavior of gift exchange, markets need not clear", which confirms the efficacy of the norms as a vehicle to deliver a gift exchange. However, the analytical trace of the conduit between market-clearing and the norm remains unclear in Akerlof(1982).

  This paper attempts to interpret the norm as phenomena in the analytical dimension, i.e., the dimension of sympathy-consent, where price is determined not by the market clearing system

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[11] Akerlof(1982), op. cit. pp. 568.

[12] Rhee, ibid.

[13] Rhee, ibid. p. 568.

D(p)=S(p), but by the selected format of exchange like haggling, ask/bid, auction, markup, administered pricing(Rhee 2012b, 2013b, 2018a). The determination of price according to an exchange format pertains to the dimension of sympathy-consent(Rhee 2018a).

The delivery of the sympathy-consent process as an analytical outgrowth from the interface between individuals with respective cognitive systems sets out the behavioral domain where the phenomena remain at large as indeterminate, coincidental, and path-dependent(ICP in short)(Rhee 2018f). The ICP attributes of the sympathy-consent dimension grow out of the process of human decisions(reference-dependent: Kahneman and Tversky 1979; framing effects: Tversky and Kahneman 1981, 1986; judgment heuristics: Kahneman and Frederick 2002).

Akerlof(1982) attempted modeling which can incorporate the gift exchange into an analytical structure in the value-cost rationality dimension. It seems untenable as will be disclosed by Hume's divide. *The critical question at this juncture is whether human cognition can be translated into the analytical structure of modeling the expression of which is written in the value-cost measurement indices.* If the answer to the question is not affirmative,[14] Akerlof's attempts at modeling are misleading(Rhee 2018f).

Modeling belongs to the value-cost rationality dimension, whereas the norms for gift exchange belongs to the sympathy-consent dimension. The former is the domain of rationalism, whereas the latter is the domain of empiricism. The two are completely separate analytical spaces where the analytical mapping of one side cannot serve to map the phenomena of the other side(Rhee 2018c). This may be called 'Hume's divide' because it was David Hume(1739) who recognized it at first. Rhee(2012b) attempted to prove it analytically and reaffirmed its validity(Rhee 2018c). The problem is that Akerlof's modeling approach(1982) begins with a behavioral cognitive system, but ends with neoclassical modeling, which is not compatible with sympathy-consent process.

The sympathy-consent dimension, which is the domain of empiricism contrasted with the value-cost rationality dimension, is the analytical domain where economic phenomena remain indeterminate, coincidental and path-dependent(Rhee 2012b, 2013b, 2018a, 2018c, 2018f). However, the domain of value-cost rationalism is the analytical dimension where economic phenomena are determinate, hence not coincidental nor path-dependent. Having these in the backdrop, let's look deeper into the analytical aspect of Akerlof's attempts to launch modeling of behavioral approach into the neoclassical analysis.

V   Individual entrepreneurship as the constituents of demand and supply

Neoclassical theory can be considered as the price mechanism, which may be represented by the market-clearing system i.e., the equilibrium condition between demand and supply D(p)=S(p).

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[14] The turnouts of behavioral experiments seem to confirm the negative answer(Kahneman 2003).

We are accustomed to setting up the analysis from demand and supply schedules. However, looking at into the components of demand and supply, there are individuals' entrepreneurship and respective business models as the constituents of each. Every individual has its respective cognitive system. *Now, the question becomes if we can aggregate the entrepreneurship of individuals by the units of value and cost to make up to the demand or supply schedule.*

As a preparatory step to address the question, the definition of the sympathy-consent process should be put in order. We should note that individual entrepreneurship and business model with the respective cognitive system is conceivable due to the fundamentality of the sympathy-consent dimension, the legitimacy of which is proved in Rhee(2012b) and Rhee(2018c). The sympathy-consent dimension pertains to the domain of empiricism as afore-mentioned.

Individual's behavior is determined by one's respective cognitive system(cognitive system 1 and system 2: Kahneman 2003). Exploitations may be sorted out from innovative ideas braced to combine business networks, related institutions, knowhow, and technology to develop agile business models. Utilitarian behavior with a business model derived as such is entrepreneurship. Individual entrepreneurship is the expression of one's behavior according to a cognitive system. The individual behavior which is dictated according to one's cognitive system pertains to the sympathy-consent dimension where every phenomenon unfolds the attribute of ICP(indeterminate, coincidental, path-dependent)(Rhee 2018a, 2018c, 2018f).

The interaction between the entrepreneurship of individuals is different from the value exchange of neoclassical (market clearing) model because the former pertains to the sympathy-consent dimension whereas the latter pertains to the value-cost rationality dimension(Rhee 2018b). As afore-mentioned, the mapping, e.g. optimization-equilibrium algorithm, of the latter space cannot be applied to map the (ICP) phenomena of the former space(Rhee 2018c).

The interaction between workers' and firm's entrepreneurship is the gift exchange. Hence, it is relation exchange(Rhee 2012b). Professor Akerlof's presentation of gift-exchange as the outcome in the aligning process by means of the norm is precisely the process of sympathy and consent in Rhee(2012b, 2018c, 2018f), the augmentation of which to the economic analyses opens the gateway to the study of empiricist domain.

VI   The fundamentality of sympathy-consent process

Human cognitive system(Kahneman 2003) is taken for granted. The perception-intuition(system 1) is more accessible than the reasoning(system 2) in the system of human cognizance. This system of cognizance determines human behavior. So, individuals' decision behavior may be affected by reference points according to prospect theory, may be constrained by the cognitive structure of framing, and may follow judgment heuristics. When individuals interact among themselves, it is the interaction between or among different human cognitive systems. It is not the interaction between or among value-cost measuring indices. In other words, individuals'

interactions are undertaken more readily by human cognitive system 1, perception and intuition, than by system 2, reasoning.

The process through which individuals' interaction takes place is the process of sympathy(Hume 1739; Smith 1759) and consent(Buchanan and Tullock 1962). In the sympathy-consent dimension, price becomes a part of the sympathy-consent process. The price is not the sole determiner of exchange transaction. The exchange becomes the gift exchange in Akerlof(1982) and relation exchange in Rhee(2012b). The norms for gift exchange is the corresponding concept of sympathy-consent process. In this case, market need not or does not clear as confirmed by Akerlof(1982 p. 568). It is the sympathy-consent process that determines the exchange or interaction(Rhee 2012b).

Definition SCP (sympathy-consent process): the sympathy-consent process is the process of interaction among the different cognitive systems of different individuals when undertaking the exchange of interaction.

The exchange of interaction among individuals with a respective cognitive system as the operating system gives rise to relation exchange(Rhee 2012b), which is a gift exchange in Akerlof(1982). Such exchanges are not confined only to the exchanges in the market. They include all sorts of interactions among individuals. We have to recollect that every relation exchange creates the division of labor and benefits every participant in it.

The sympathy-consent process among interacting individuals features as individuals' respective entrepreneurship in real life. Each entrepreneurship is equipped with business models. The decisions to venture entrepreneurship for the interaction among individuals are dictated by the cognitive system of the respective individual, not by the indication according to the value-cost measuring indices(Rhee 2012b, 2018a). Rhee(2012b, 2018a, 2018c) proved and reaffirmed the fundamentality of sympathy-consent process in comparison with the market clearing system. The price is determined as a part of the sympathy-consent process, which is amazingly confirmed by Akerlof(1982) as "the norms for gift exchange." "Due to this behavior with gift exchange markets need not clear."

As afore mentioned, in the sympathy-consent dimension, price is determined not by the market clearing system D(p)=S(p), but by a selected exchange format like haggling, ask/bid, auction, markup or administered pricing. In fact, the exchange formats are nothing but the processes of sympathy-consent, where the deals of transaction strike out between participating individuals, not between the aggregated demands as a whole and aggregated supplies as a whole.

Now, we are ready to address the question *if we can aggregate the entrepreneurship of transacting individuals by the units of value and cost to make up to the demand or supply schedule.*

Proposition The Inability of aggregation of the SCP into Demand and Supply Schedule (the inability to aggregate the sympathy-consent process into the demand and supply schedule): we cannot aggregate individual entrepreneurship into the demand and supply schedule by the value-cost measuring indices, when the decisions for the exchange of interactions among individuals are determined by respective cognitive systems of individuals.

Proof:

There are a couple of ways available to prove this proposition. Rhee(2012b) made use of the path-dependence property of the sympathy-consent process for the proof. Rhee(2018c) made use of set theory to prove Hume's divide, which becomes instrumental for the proof of the proposition. The SCP(sympathy-consent process) belongs to the set of empiricist domain. The market-clearing system D(p)=S(p) belongs to the set of the value-cost rationality domain. Two sets are completely separated by the implicit assumption of the neoclassical economics which is the CMVCI (consistent measuring of the value-cost indices). That is, two sets are disjoint. Due to this property of disjoint set, the phenomena of empiricist domain is unable to be represented by the mapping of the value-cost rationality domain like optimization-equilibrium algorithm. Since the entrepreneurship belongs to the domain of empiricism, it cannot be mapped by demand or supply schedule. □

Akerlof's attempt to represent the gift exchange behavior by neoclassical modeling is mistaken because it is not possible. In other words, Phillips curve relation pertains to the phenomena of empiricist domain. The sympathy-consent process turns out to be the micro foundation of the macroeconomics.

VII   Concluding remarks

Phillips curve, a trade-off relationship between nominal wage change and unemployment rate, has been the kernel point of discussion in macroeconomics. New Keynesian interpretation focuses on the probing of the microeconomic foundation, the achievement of which leads to the refutation of Friedman-Phelps' money neutrality argument. The microeconomic foundation of New Keynesian theory has been supported by behavioral studies. It was David Hume who established the analytical architecture of empiricism, who recognized the separated domain of empiricism from the domain of rationalism. The borderline is denoted as so-called The Principle of the Uniformity of Nature(PUN in short), which is equivalent to CMVCI(consistent measuring of the value-cost indices). It may be called as Hume's divide.

Hume's divide is proved rigorously by Rhee(2018c). Akerlof(1983)'s gift-exchange is nothing but the relation exchange of Rhee(2012b). His 'the norms for gift exchange' corresponds to Rhee(2012b, 2018a, 2018d)'s sympathy-consent process. Rhee(2012b)'s contribution is the augmentation of sympathy-consent dimension as the analytical domain. Phillips curve relation is nothing but the phenomena that take place in the empiricist domain where ICP(indeterminate, coincidental, path-dependent) is unfolded as idiosyncratic attributes. Any attempt to give determinate interpretation dooms to fail due to Hume's divide.

References

Akerlof, George A.(1969), "Relative wages and the rate of inflation," *Quarterly journal of economics*, 83(3), 353-74.

_____ (1970), "The market for 'lemons': quality uncertainty and the market mechanism," *Quarterly journal of economics*, 84(3): 488-500.

_____ (1973), "The demand for money: a general-equilibrium inventory-theoretic approach," *Review of economic studies*, 40(1), 115-30.

_____ (1979), "Irving Fisher on his head: the consequences of constant threshold-target monitoring of money holdings," *Quarterly journal of economics*, 93(2), 169-87.

_____ (1982), "Labor contracts as partial gift exchange," *Quarterly journal of economics*, 97(4), 543-69.

_____ (1991), "Procrastination and obedience," *American economics review*, 81(2), 1-19.

_____ (2001), "The economics of 'tagging' as applied to the optimal income tax, welfare programs, and manpower planning," *American economic review*, 68(1), 8-19.

_____ (2002), "Behavioral macroeconomics and macroeconomic behavior," *American economic review*, 92(3), 411-433.

Akerlof, George A., William T. Dickens, George L. Perry(2000), "Near-rational wage and price setting and the long-run Phillips curve," *Brookings papers on economic activity*, 2000(1), 1-44.

Akerlof, George A. and Janet L. Yellen(1985), "A near-rational model of the business cycle, with wage and price inertia," *Quarterly journal of economics*, 1985 supplementary volume C. 823-838.

Ball, Laurence, N. G. Mankiw, David Romer(1988), "The new Keynesian economics and the output-inflation trade-off," *Brookings papers on economic activity*, 1-82.

James M. Buchanan and Gordon Tullock (1962), *The calculus of consent*, Ann Arbor: University of Michigan Press.

Caballero, Ricardo J. and Mohamad L. Hammour(1998), "The macroeconomics of specificity," *Journal of political economy*, 106(4), 724-767.

Card, David and Dean Hyslop(1997), "Does inflation 'grease the wheels' of the labor market?'" in Christina D. Romer and David H. Romer, eds., *Reducing inflation: motivation and strategy*, NBER Studies in Business Cycles, vol. 30, Chicago and London: University of Chicago Press, 1997, p. 195-242.

Fortin, Pierre(1996), "The great Canadian slump," *Canadian journal of economics*, 29(4), 761-787.

Friedman, Milton(1968), "The role of monetary policy," *American economic review*, 58(1), 1-17.

David Hume (1739), *A treatise of human nature*, produced in 1992 by Prometheus Books.

_____ (1748), *The enquiries concerning human understanding*, printed 2015 by Amazon.

Kahn, Shulamit(1997), "Evidence of nominal wage stickiness from microdata," *American economic review*, 87(5), 993-1008.

Kahneman, Daniel and Amos Tversky (1979), "Prospect theory: an analysis of decisions under risk," *Econometrica*, 47(2), 263-91.

Kahneman, Daniel and Shane Frederick (2002), "Representativeness revisited: attribute substitution in intuitive judgment," in Thomas Gilovich, Dale Griffin, and Daniel Kahneman, eds., *Heuristics and biases: the psychology of intuitive thought*, New York: Cambridge University Press, 49-81.

Keynes, J. M.(1936), *The general theory of employment, interest, and money*, First Harvest/Harcourt, Inc. edition 1964.

Lucas, Robert E., Jr.(1972), "Expectations and the neutrality of money," *Journal of economic theory*, 4(April), 103-24.

Patinkin, D.(1965), *Money, interest and prices*, 2nd edition: New York, Harper, and Row.

Phelps, Edmund(1967), "Phillips curves, expectations of inflation an optimal unemployment over time," *Economica* 34(August), 254-81.

_____(1968), "Money-wage dynamics and labor-market equilibrium," *Journal of political economy*, 76(4, part 2), 678-711.

Phillips, A. W.(1958), "The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861-1957," *Economica* 25(November), 283-99.

Rhee, Sung Sup (2012b), "KwankaeKyohwanKyongjaehak (Relation Exchange Economics)," *Jaedo wa Kyongjae (Review of Institution and Economics)*, 6(2), 123-151.

_____ (2013b), "YulrinKyongjaehak qua DatchinKyongjaehak (Open system of economics vs. closed system of economics)", *Jaedo wa Kyongjae (Review of Institution and Economics)*, 7(2), 13-43.

_____ (2018a), "The economics of empiricism and relation exchange," *Review of Institution and Economics*, 12(1),51-90.

_____ (2018b), "Empiricist approach to incomplete contract theory," *Jaedo wa Kyongjae (Review of Institution and Economics)*, 12(2),15-39.

_____ (2018c), "Sympathy-consent process mapping as the model of bounded rationality," presented at 2017 WINIR Conference at Utrecht, Netherland; revised at 2018 Korea Econometrics Society Conference at Choonchun, Korea.

_____ (2018d), "Institutional modality of the market with the application to financial assets," presented at 2018 Annual Conference of the Korea Law and Economics Association, Choonchun, February 1, 2018.

_____ (2018e), "The indeterminateness of the sympathy-consent dimension and the entrepreneurship (in Korean)," *Jaedo wa Kyongjae (Review of Institution and Economics)*, 12(3), 1-18.

_____ (2018f), "Opportunism fails the price mechanism, not the market," presented at 2018 WINIR Conference at Hong Kong, China, September 15, 2018.

Sargant, Thomas J.(1971), "A note on the 'accelerationist' controversy," *Journal of money, credit, and banking*, 3(3), 721-25.

_____ (1973), "rational expectations, the real rate of interest, and the natural rate of unemployment," *BPEA*, 2:1973, 429-72.

Shafir, Eldar, Peter Diamond, and Amos Tversky(1997), "Money illusion," *Quarterly journal of economics*, 112(2), 341-374.

Adam Smith (1759), *The theory of moral sentiments*, reprinted edition by D. D. Raphael and A. L. Macfie Classics (1976), Oxford: Oxford University Press.

Tversky, Amos and Daniel Kahneman (1981), "The framing of decisions and the psychology of choice," *Science*, 211(4481), 453-58.

_____ (1983), "Extensional versus intuitive reasoning: the conjunction fallacy in probability judgment," *Psychological review*, 90(4), 293-315.

_____ (1986), "Rational choice and the framing of decisions," *Journal of Business*, 59(4), S251-78.