Austrian Economics in Transition

From Carl Menger to Friedrich Hayek

Edited by

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Contents

List of Figures and Table vii

Introduction viii

List of Contributors xii

Part I Carl Menger: Towards a New Image of the Founder

1 Carl Menger's Liberalism Revisited 3
Yukihiro Ikeda

2 Carl Menger after 1871: Quest for the Reality of 'Economic Man' 21
Kiichiro Yagi

Part II Liberal Aspects of the Historical School: Max Weber

3 Discoursing Freedom: Weber's Project 41
Jun Kobayashi

4 Max Weber and the 'New Economics' 62
Keith Tribe

5 The German Historical School, Schumpeter and Ichiro Nakayama: Economic Theory and Economic Sociology 89
Tamotsu Nishizawa

Part III Some Methodological Problems

6 Friedrich von Wieser on Institutions and Social Economics 109
Richard Arena

7 From Menger to Polanyi: The Institutional Way 138
Michele Cangiani

15

Hayek's Transformation of Market-Images in the 1930–40s

Makoto Nishibe

1. What is Hayek's transformation problem?

It is often admitted that great philosophers and economists tend to show very drastic turns in the evolution of their ideas or theories. For example, we may quote, on the one hand, Kant and Wittgenstein for such philosophers, and on the other, Keynes and Marx for such economists. Hayek will certainly be included in this list.

Since Hutchison (1981) divided Hayek between Misesian a priorist 'Hayek I' and Popperian falsificationist 'Hayek II' and Caldwell (1988) set out to discuss the nature of 'Hayek's Transformation' in view of the concept of equilibrium, many have joined on the argument of this theme and generally accepted that Hayek transformed his theoretical and methodological positions in the 1930s, and that his seminal essay 'Economics and knowledge' in 1937 is the breakpoint. It is also acknowledged that this view is endorsed by Hayek's own remark:

> Though at one time a very pure and narrow economic theorist, I was led from technical economics into all kinds of questions usually regarded as philosophical. When I look back, it seems to have all begun, nearly thirty years ago, with an essay on 'Economics and Knowledge' in which I examined what seemed to me some of the central difficulties of pure economic theory.
>
> (Hayek, 1967: 91)

But there is still much disagreement on the nature and extent of Hayek's transformation. First, is it a 'once and for all' clean break that was seemingly implied at least in the initial question raised by Caldwell, or, is it 'continuous' until he became an interdisciplinary socio-economist of

a spontaneous order with transcendental realist ontology in later years (Lawson, 1994), or 'gradual' since he was a technical economist on monetary business cycle (Foss, 1995)? Second, is it mainly caused or strongly influenced by such exogenous factors as Hayek's involvement in the Socialist Calculation Debate (SCD) as Caldwell (1988, 1994, 2004) suggested, or by such endogenous effects as a methodological turn seen in his essays 'Scientism and the study of society' in 1942–44 (Lawson, 1994; Fleetwood, 1995), or, as an inner development within technical economics in his subsequent responses to criticisms by Myrdal, Hicks, Sraffa and Morgenstern to Hayek's early work on inter-temporal equilibrium under perfect foresight (Foss, 1995)? Third, is it once or more? Fleetwood (1995), for instance, insists Hayek has experienced transformations 'twice' and divides Hayek into three periods: Hayek I (–1937), Hayek II (1937–1960) and Hayek III (1960–) in view of his philosophy of ontology, not epistemology.

In this chapter, I contend that Hayek transformed in terms of not only the concepts of equilibrium but also his vision of the market in the 1930s and 1940s as he had become involved in SCD, and that a more crucial breakpoint lies in 1946, rather than in 1937 as is commonly assumed.[1] The reason why I suppose so is as follows.

Hayek, in his 1937 essay, was still haunted by the idea that use of the notion of equilibrium is necessary for a positivist scientific explanation and tried to introduce subjective/objective knowledge based on the concepts of equilibrium. However, Hayek, in his 1940 article, drastically changed his attitude towards general equilibrium theory (GET) and counterattacked market socialism (MS). GET depicts the vision of the market centrally operated by an auctioneer and provides theoretical backing for 'a trail and error method' executed by a central planner in order to determine the shadow prices of production goods. Accordingly, MS can be thus given endorsement by GET on the ground that the former is no less feasible and desirable than the latter. Hayek was then urged to rethink the validity and reality of variant concepts of static equilibrium that he held as a technical economist on his recognition that Walrasian *tâtonnement*, groping method to find equilibrium prices that match supply and demand for all goods, can be utilized for MS. Eventually, he realized that it is necessary, in order to run through a logical defensive line of MS, to criticize the 'hardcore' concepts of equilibrium and competition underpinning GET.

Hayek, in his 1946 paper, first acknowledged the true meaning of 'competition' utterly different from 'perfect competition' in GET, or 'rivalry' in Lavoie's (1985) term, as a main driving force to make the

market process dynamic and non-equilibrium. This signifies a clean break with GET, but it is not a birth of a new theory. Here neither his economic theory nor his explicit methodology, but the vision of the market, which is tacitly and subjectively held 'pre-analytical framework' (Schumpeter, 1954) for substantive economics,[2] has changed and developed. So the dividing line between Hayek I and Hayek II should be drawn in 1946, not in 1937. There is certainly a huge gap between his view of the market as 'the telecommunications system' before 1946 and that as 'rivalry and discovery process for knowledge' after 1946. Putting both together in Hayek II would lead us to overlook such important issues as I have just explained.

2. From a critique of socialist economic planning to a critique of general equilibrium theory

Now I shall demonstrate, from a detailed study on Hayek's articles in SCD and thereafter, that a key concept for Hayek to be able to break through the concept of equilibrium particularly embodied in GET is rival-like competition as discovery process that first emerged in 1946, not subjective and dispersive knowledge in 1937.

Hayek participated in SCD by editing the English translation of Mises's 1920 German paper and others as *Collectivist Economic Planning* in 1935.[3] In order to consider the nature and cause of Hayek's transformation concerning his vision of the market, I shall focus on his transition from a critique of socialist planning to a critique of GET.

The decisive change from his 1935 book to his 1940 paper 'Socialist calculation III: the competitive "solution"' lies in the fact that, while Hayek criticized the competitive solution of MS, he has come to view GET more critically, although he has then constructed an inter-temporal equilibrium model for monetary business cycles using GE. He criticizes Lange and Dickinson (Lange, 1936–37; Dickinson, 1939) as:

> [...] it is difficult to suppress the suspicion that this particular proposal has been born out of an excessive preoccupation with problems of the pure theory of stationary equilibrium
>
> (Hayek, [1940] 1948: 188)

Hayek investigates the problems that Lange and Dickinson applied GET to a socialist economy in the static sense. Obviously, he is aware of defects of static equilibrium, but he has not reached a point where he can represent any alternative theory to it. So he cannot help but point out the gap between the dynamic nature of a real market and the static nature of a market theory: 'With given and constant data such a state of equilibrium could indeed be approached by the method of trial and error. But this is far from being the situation in the real world, where constant change is the rule' (Hayek, [1940] 1948: 188). Hayek also exposed his criticism to MS.

> Or, to change the metaphor, the difference between such a system of regimented prices and a system of prices determined by the market seems to be about the same as that between an attacking army in which every unit and every man could move only by special command and by the exact distance ordered by headquarters and an army in which every unit and every man can take advantage of every opportunity offered to them.
>
> (Ibid.: 187)

This metaphor well grasps the difference between a concentrated market-image contained in MS model and a dispersive market-image that he feels for a real market. It is not difficult to see that Hayek's critique of MS in this paper is convertible to that of GET. However, Hayek had not yet firmly formed the criticism of such 'hard core' assumptions of GET as 'the parametric function of prices', (Lange, [1936–37] 1938: 70) equivalent to the 'price-taker' or 'perfect competition' assumption. This is why Hayek must depend on his image of a real market on his criticism against Lange and Dickinson.

Hayek's criticism towards GE originated from his unique market-image that was not articulated yet as a market theory, but was only realized as 'tacit knowledge' (Polanyi, 1967). It depends on his actual experiences and observations, but is not directly induced from them. The central planner who executes a trial and error method utilizing 'the parametric function of prices' was just imitating a price-adjusting auctioneer in Walrasian *tâtonnement* process for finding a GE solution. So if Hayek condemned Lange for being wrong, he would give Walras the same judgment. Hayek's metaphor suggests that the market depicted in GET is actually centralized and well-organized and the real market is decentralized and autonomous.

3. Compromise to general equilibrium: division of knowledge is insufficient to overturn it

In order to see how his critical position towards GET moves, we must turn to Hayek's arguments developed away from such controversial

scenes. Hayek's criticism of GE first appeared in the famous paper in 1937, 'Economics and knowledge', in which Hayek focused on the problem of knowledge in economics and critically examined the presuppositions of GET.

Although he attempted to describe his own market-image by the 'division of knowledge' (Hayek, 1937 [1948]: 50) with subjective and dispersive character of individual knowledge, he gave some concessions to GET. For example, he said that tautologies in a formal equilibrium analysis could survive as the logic to explain a social process if they were reinforced by some empirical hypotheses. This makes his position towards GET blurred. He takes the problem regarding the boundaries of equilibrium analysis as the tautological 'Pure Logic of Choice' (ibid.: 35).

> I have long felt that the concept of equilibrium itself and the methods which we employ in pure analysis have a clear meaning only when confined to the analysis of the action of a single person and that we are really passing into a different sphere and silently introducing a new element of altogether different character when we apply it to the explanation of the interactions of a number of different individuals.
> (Ibid.: 34–5)

This question can easily be understood if we remember the distinction between 'economic problems' and 'technological problems' in his lead paper of his edited book (Hayek, [1935b] 1948: 121–2).[4] Then we can interpret that Hayek proposed that GET should be applied only to technological problems. Nonetheless, Hayek never went on abandoning the whole concepts of equilibrium. According to Hayek, the problem of 'Pure Logic of Choice' does not lie in too much formalization of a theory, but insufficiency of it. If it were formalized sufficiently so that this particular field of theory of logic could completely be isolated from the substance of economics, it would become possible to use formal economic theory as a tool in the same way as mathematics (Hayek, [1937] 1948: 35). Hayek seemed to think here that the application of GET could be limited strictly to technological problems by its complete formalization, or, in other words, that GET is valid and applicable as an abstract theory only if it is as a purely tautological formal system as mathematics even though it does not have its corresponding real objects in society.[5]

It is apparent from this that Hayek criticizes Lange for his applying GET to economic problems in a socialist planned economy. But, if the application of GET to a planned economy is an error, its application to a market economy must be also an error because both economies

must face economic problems. If so, Hayek's claim that only a market economy is feasible cannot be maintained regardless of his endorsement of GET.

It thus follows that Hayek needs to show what kind of market economy was presumed, in order to present the ground for his criticism against economic planning, and that he must start to criticize GET as a market theory. It remained as Hayek's task to examine why GET cannot be applied to economic problems, show the limits of GET as a market theory and, finally, represent his original market-image in contrast with that of GET.

Hayek's criticism of Lange should have been accomplished by showing clearly that a 'real market' is virtually the opposite of the perfectly competitive and concentrated market depicted by GET. Hayek's market-image is 'rivalrous and dispersive' that is completely different from GET.

The term 'rivalrous' refers to the state of affairs in which, under a circumstance where the ends and purposes of multiple economic agents conflict with each other, all economic agents struggle to attain their own plans. 'Economic rivalry is', as Lavoie put it, 'the clash of human purposes' (Lavoie, 1985: 22), that is, 'some plans are necessarily disappointed by the carrying out of rival plans by others' (ibid.: 23). This concept of competition is meaningful in a dynamic market process and completely different from that of the neo-classical 'perfect competition' that is presupposed as defining the end state attained through competition. On the other hand, the term 'dispersive' indicates the nature of a reticulated network where each agent, being mediated by neither an auctioneer nor a central planner, is in direct connection with his or her neighbours.[6]

According to this terminology, the 'concentrated' market indicates the 'well-organized market' assumed in GET where an auctioneer exists and money functions solely as *numeraire* or means of exchange; and the 'dispersive' market indicates the market where money can be hoarded so that buying and selling can take place independently without coordination. 'Say's law' does not hold well, and 'the parametric function of prices' does not work properly in the 'dispersive' market.

Let us get back to the original topic. Hayek, furthermore, tried to show the theoretical importance of the concept of equilibrium, making the distinction between 'subjective equilibrium' and 'objective equilibrium'. If the conditions for subjective equilibrium hold, and if the individual sets of subjective data exactly correspond to the objective data, the development of the objective data is completely foreseen and

causes no exogenous disturbance. The situation is now called 'objective equilibrium'. While subjective equilibrium means the compatibility of expectations and plans of different individuals, objective equilibrium means the correspondence of the expectations and plans to external events, or, the correspondence of subjective data to objective data. Since the correspondence of subjective data to objective data is simply assumed in 'Pure Logic of Choice', it does not pay attention to how its correspondence would be reached. In other words, both subjective and objective equilibriums are presupposed in the beginning. This shows why a pure analysis of equilibrium is called the tautological system.

From such viewpoint, Hayek criticizes GET as 'Pure Logic of Choice' for its assumption of 'perfect information' or, in Hayek's term, 'perfect knowledge' (ibid.: 49). Hayek claims that we cannot presuppose perfect knowledge as long as knowledge of each economic agent is limited and there exists the 'division of knowledge'(ibid.: 50), and that the aim of equilibrium theory should be to explain how individuals obtain knowledge, and how subjective data thus correspond to objective data. But even if we remove the assumption of perfect information and take into consideration the formation of expectations under imperfect information, GET can still survive as we can now see it as 'the economics of information'.[7] Then it has become clear that the assumption of perfect information is not necessarily the 'hardcore' assumption for the concentrated market-image of GE. It is, rather, more important to note that subjective disequilibria are ordinary states in a 'real' market, and that the rivalry in which 'any development of the external facts might bear out somebody's expectations and disappoint those of others' is universal.

Notably, Hayek's claim that 'Pure Logic of Choice' is a tautological system of equilibrium leads to criticism against the mathematical method in which equilibrium prices are obtained by solving simultaneous equations with respect to demand and supply of capital goods. Hayek's criticism against the applicability of GE prices to a socialist economy is therefore valid for Barone-type mathematical method for solutions even though Barone himself was already sceptical about the calculation of equilibrium prices on the desk (Barone, 1908).

But the same criticism does not hold good to Walras's *tâtonnement* and Lange's trial and error method, where each economic agent (consumer or productive manager) does not necessarily need to possess complete objective data nor knowledge concerning other agents' states and plans, but has only to make decisions in accordance with its maximizing (or minimizing) rule given a set of prices under its own subjective data: preferences as to consumer goods and leisure; and conditions for productive

techniques. The initial errors of the central planner can be corrected as a result of the trial and error process. What was stated here similarly holds to Walras's *tâtonnement* process.[8] Noteworthy is that such analysis of subjective equilibrium is not self-evident tautology because, differently from a mathematical solution, it analyzes a 'dynamic' process that starts from subjective equilibrium and finally reaches objective equilibrium even though it confined itself to the analysis of static state.

What rather seems to be problematic in Lange's trial and error method is that the parametric function of prices is a requisite for it. This also holds for GET. The postulate or rule that each economic agent takes maximizing behaviour with given prices under its own constraints shows the condition under which each economic agent can independently make its own decision without using the knowledge of the economy as a whole and of other agents' plans and behaviours. If the influence of each agent's behaviour is negligibly small, prices can be conceived as public information commonly known to each agent, in other words, parameters that each agent may take as given. In such a situation each economic agent need to neither expect other agents' behaviours nor put their influence into its own data so that it may never cause economic agents' plans to contradict each other nor to be incompatible. For the parametric function of prices logically excludes the possibility of this kind of contradiction and every economic agent is supposedly ensured in subjective equilibrium.[9]

It is hence apparent that the assumption of perfect information is not a 'hardcore' postulate for GET, and that a perfectly competitive market eventually corresponds to a concentrated market-image consisted of the well-organized market and its auctioneer (or a price-adjusting central planner). Hayek's dispersive market-image that gradually becomes clearer is in contrast to such a concentrated market-image. Although Hayek intended to call into question the situation of subjective disequilibrium where plans of different individuals are incompatible with each other, there was no such situation with the parametric function of prices working. Since Hayek criticized GET without questioning the point, regardless of presenting a new view on division of knowledge, he finally returned to a concentrated market-image.

Hayek, taking it for granted from empirical observations that there exists 'a tendency toward equilibrium', only questioned the mechanism how objective equilibrium is arrived through spontaneous interplay of individuals. Though Hayek in the former part of this paper indicated the difficulty of application of GET to a social process, the problem that he

proposes at this stage shows his regression to only an extended version of GET dealing with subjectively held and dispersive knowledge.

Why does Hayek's ambivalence to the concept of equilibrium arise? In 1936 when Hayek delivered his presidential address before the London Club, he remained sceptical of GET as capable to become an empirically useful science in spite of his position in favour of Popperian falsificationism. Hayek seems to unknowingly accept the parametric function of prices and, as a result of it, a concentrated market-image because he *a priori* believes in Adam Smith's harmonious view of the market where pursuits of personal interests based on individual self-love would be finally coordinated through a market process regardless of conflicts and competitions.

4. Breakthrough from general equilibrium: rivalrous competition as a discovery procedure is crucial to take it off

Two papers in the mid-1940s showed a sharp contrast in terms of the subtle but crucial theoretical difference between Hayek's division of knowledge and GET.

In 'The use of knowledge in society' in 1945, Hayek proposes to 'look at the price system mechanism as such a mechanism for communication information' (Hayek, [1945] 1948: 86):

> [F]undamentally, in a system in which the knowledge of the relevant facts is dispersed among many people, prices can act to co-ordinate the separate actions of different people in the same way as subjective values help the individual to co-ordinate the parts of his plan.
>
> (Ibid.: 85)

At first, Hayek insisted that the problems which 'economic calculus' (or the Pure Logic of Choice) 'are solving are *not* the economic problems which society faces' (ibid.: 77). This is because we have to consider that the knowledge which we can use 'never exists in concentrated or integrated form but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess' (ibid.). Nevertheless, when Hayek thereafter explains 'economic problems' as follows it is no doubt that economic problems are reduced to technological ones as to efficient utilization of dispersive knowledge.

> The economic problem of society is thus not merely a problem of how to allocate 'given' resources [...] It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge which is not given to anyone in its totality.
>
> (Ibid.: 77–8)

The main subject for Hayek to explain here is how fragmentary knowledge is as efficiently utilized in a market as in the conscious planning by the single authority. Hayek, in order to criticize constructivist economic planning, emphasizes that a market mechanism is not the product of human design, and that its efficiency is accomplished as an unintended result. This line of discussion, however, can be interpreted to mean that he gave particular importance to the merit of a 'result' from coordination of different motives and ends of multiple economic agents by an 'invisible hand' in a market.

The view that dispersive knowledge is socially best utilized in the market does not go beyond the framework of GET. It is a mere analogous definition of equilibrium as the state in which dispersive knowledge is most efficiently utilized in a market, while equilibrium in the conventional sense is the state where scarce resources are most efficiently allocated. In other words, the market-image of 'a system of telecommunications' is still not essentially different from that of GET.

> It is more than a metaphor to describe the price system as a kind of machinery for registering change, or a system of telecommunications which enables individual producers to watch merely the movement of a few pointers, as an engineer might watch the hands of a few dials, in order to adjust their activities to changes of which they may never know more than is reflected in the price movement.
>
> (Ibid.: 87)

Hayek's market-image seen here is in fact similar to Lange's in which a market is regarded as a servomechanism given by nature for calculating equilibrium prices.

In contrast with this, the essay 'The meaning of competition' in 1946 is indeed crucial as Hayek started to struggle against 'perfect competition' to take off from the paradigm of GET. He, in the light of the economic problem, elaborates the meaning of competition in the dynamic market process.

> If the state of affairs assumed by the theory of perfect competition ever existed, it would not only deprive of their scope all the activities which the verb 'to compete' describes but would make them virtually impossible [...] Advertising, undercutting, and improving ('differentiating') the goods or services produced are all excluded by definition – 'perfect' competition means indeed the absence of all competitive activities.
>
> (Hayek, [1946] 1948: 92, 96)

The concept of perfect competition implies a stationary state where all economic activities are completely adjusted and nothing takes place without exogenous disturbances. But in a state where multiple economic agents are trying to realize independent plans, their subjective data are mutually incompatible and changes constantly occur in their subjective data. This is caused by various causal factors 'in the form of the acquisition of new knowledge by the different individuals or of changes in their data brought about by the contacts between them' (ibid.: 94). Since 'competition is by its nature a dynamic process whose essential characteristics are assumed away by the assumptions underlying static analysis' (ibid.), it is certain that Hayek's concept of competition is meaningful only in the analysis of dynamic process.

> The solution of the economic problem of society is in this respect always a voyage of exploration into the unknown, an attempt to discover new ways of doing things better than they have been done before. This must always remain so as long as there are any economic problems to be solved at all, because all economic problems are created by unforeseen changes which require adaptation.
>
> (Ibid.: 101)

It was not until this stage that Hayek had illuminated the idea of a discovery process of knowledge: in the 'competitive' market where ends and purposes of different individuals conflict and contradict each other and, moreover, data are constantly changing, competition encourages incessant discovery of new knowledge. Such a process is 'a voyage of exploration into the unknown, an attempt to discover new ways of doing things better than they have been done before'. Both Eatwell and Milgate (1994) and Lavoie (1995) emphasize, Hayek's concept of dynamic competition or rivalry, which, both of them suggest, in turn resembles Marx's concept of competition rather than neo-classical perfect competition, plays a crucial role in such a theory of market.

The substantial difference from the previous standpoint is what Hayek's main concern had shifted from an *end state* with efficient use of subjective and dispersive knowledge to a competitive or rivalrous *process* through which discovery of the unknown is encouraged. Hayek had *ipso facto* taken a step out of GET by examining the subjective and objective disequilibrium process. He here set up as the object of a theoretical investigation a basically different entity from a concentrated market: the *dispersive and rivalrous* market where the parametric function of prices is not in operation. The difference between these two articles in terms of both the problematic domains and the investigative objects is so subtle that it has been frequently overlooked. But this change was decisive for Hayek who hereafter deepened his criticism of GET and began to regard the market as a social institution.

The criticism of GET was further extended in the essay 'Competition as a discovery procedure' based on some lectures held in 1968. Hayek has now come to recognize this subject in a clearer form than before. Thus, his criticism of GET appeared to become unambiguous and irreversible.

Hayek, in this essay, elucidated the idea of 'competition as a discovery procedure':

> [...] *wherever* the use of competition can be rationally justified, it is on the ground that we do *not* know in advance the facts that determine the actions of competitors [...] I propose to consider competition as a procedure for the discovery of such facts as, without resort to it, would not be known to anyone, or at least would not be utilized.
>
> (Hayek, 1978: 179)

> Economic theory sometimes appears at the outset to bar its way to a true appreciation of the character of the process of competition, because it starts from the assumption of a 'given' supply of scarce goods. But which goods are scarce goods, or which things are goods, and how scarce or valuable they are – these are precisely the things which competition has to discover. Provisional results from the market process at each stage alone tell individuals what to look for. Utilization of knowledge widely dispersed in a society with extensive division of labour cannot rest on individuals knowing all the particular uses to which well-known things in their individual environment might be put. Prices direct their attention to what is worth finding out about market offers for various things and services. This means that the, in some respects always unique, combinations of individual

> knowledge and skills, which the market enables them to use, will not merely, or even in the first instance, be such knowledge of facts as they could list and communicate if some authority asked them to do so. The knowledge of which I speak consists rather of a capacity to find out particular circumstances, which becomes effective only if possessors of this knowledge are informed by the market which kinds of things or services are wanted, and how urgently they are wanted.
>
> (Ibid.: 181–2)

As far as the knowledge to be discovered through competition in the market depends on individual's 'capacity to find out particular circumstances', it cannot be regarded as 'given data', for it is obvious that the unused knowledge without being discovered by competition continuously exists. Hayek here no longer takes the view that a market economy accomplishes efficiency as the result of competition.

> The results of a discovery procedure are in their nature unpredictable; and all we can expect from the adoption of an effective discovery procedure is to improve the chances for unknown people. The only common aim which we can pursue by the choice of this technique of ordering social affairs is the general kind of pattern, or the abstract character, of the order that will form itself.
>
> (Ibid.: 184)

Hayek maintains here that what we expect from competition as a discovery procedure is neither the attainment of optimal allocation of resources nor efficient utilization of knowledge in a state of equilibrium, after all, but merely 'the general kind of pattern, or the abstract character, of the order that will form itself'. In short, competition does not bring about 'equilibrium', but merely certain 'pattern of order' that corresponds to Hayek's spontaneous order that is the concept more relevant in economics and economic policy.

Hence I may conclude that Hayek could finally renounce the market-image of GET at this stage owing to an alternative concept of competition. This does not mean that he has presented any alternative 'market theory' to GET. But, notably, he has introduced the concept of 'order' instead of 'equilibrium' as describing the main character of a new market-image.

5. Hayek's transformation of market-images in 1930–40s: vision, theory and methodology

Regarding the initial questions on the nature and extent of Hayek's transformation, I would like to draw my conclusion. Hayek's transformation is not once and for all, but twice with discontinuous breaking points in 1946 and 1960. The transformation involves not only methodology or theory but also vision, in particular the vision of the market, which can work as a catalyst to help create a new theory and methodology. The key concept for Hayek to break with GE and reach a new market-image is rivalrous and discovery competition since 1946, not subjective and dispersive knowledge since 1937, and that this break is mainly caused by his SCD battle with Lange's trial and error method in 1936–37 that makes GE endorse MS to be feasible.

Finally, I will explain the implications of such theses for the relation between vision and theory or methodology, making my comments on the previous interpretations of Hayek's transformation. Caldwell, while withholding direct attribution of the cause of Hayek's transformation to his participation in SCD, emphasized a strong influence of the debate on it.[10] He thereafter toned down his insistence regarding this issue.[11] Then he has reached his updated interpretation on the matter, '[i]n my opinion, the calculation debate did not *cause* Hayek to come up with a specific idea; rather, it was what helped him *put together* the ideas mentioned above in the specific way that he did' (Caldwell, 2004: 214).

I tried to reconstruct the argument to contend that the main *cause* for Hayek's transformation is, regardless of Caldwell's withholding, 'his battle with the market socialists'. I basically agree with Caldwell's last interpretation but would like to clarify what the distinction between 'to come up with a specific idea' and to '*put together* the ideas' implies in the present context. In my account, 'to come up with a specific idea' is such analytic act in science as to define, deduce or induce, and to '*put together* the ideas' is preanalytic integrative act in science to grasp the reality, that might be regarded as 'abduction' in Peirce's term[12] or 'vision' in Schumpeter's term. In this article, I claim, using the concept 'vision' or 'image' as preanalytic cognitive framework prior to any analytic activity that functions as a catalyst to create a new concept or theory of science, that Hayek's vision of the 'market' that 'Hayek I' had been engaged in was turned over by his encounter to the market socialists's defensive argument of socialism by using GET. Subsequently, the uneasiness that occurred in his mind must have made

Hayek notice that subjectively held and dispersive knowledge as well as a discovery of tacit and new knowledge that he had so far neglected play important roles in a rivalrous and dispersive market process of a real world. This triggered Hayek's transformation in which static and fictitious images of the market were gradually replaced by dynamic and real ones.

Kirzner, on the other, seems to support my thesis that Hayek transformed his vision of the market though SCD when he emphatically states in his article on SCD:

> Not only was the debate an important episode, of course, for its own sake. It was, in addition, I shall claim, important as a catalyst in the development and articulation of the modern Austrian view of the market as a competitive-entrepreneurial process of discovery.
>
> (Kirzner, 1988: 1)

He appreciated SCD as essential lessons for Austrians, contrary to Lavoie's interpretation of the debate inclined towards self-justification of Austrian (Lavoie, 1985), because it is a self-discovery or self-awareness process in which what Mises and Hayek tacitly understood but could not explicitly demonstrate in terms of their unique vision of the market has become more articulated through exchanges of opinions with different positions in SCD. 'My contention is that what Austrians learnt was more than a technique of exposition; they learnt to appreciate more sensitively how their own tradition understood the market process' (Kirzner, 1988: 3). I agree with Kirzner in this respect and would like to further add regarding social 'welfare' that any scientific debate as well as the market is a discovery process in which scientists of different parties can at least gain the benefit of articulating their own positions and differences between opinions, apart from a problem of winning or losing.

Both Lawson (1994) and Fleetwood (1995) regard Hayek's transformation as the one in methodology, in which Hayek, via positivism and subjectivism, reached in his late career a final ontological position, quasi- transcendental or critical realism. Fleetwood's elaborate study is successful in describing Hayek as becoming an interdisciplinary social theorist who based on the general theory of socio-economics by redirecting seemingly subjective knowledge and rules as scientific objects allocated in a deep domain. Obviously, his main focus is on Hayek III's quasi-transcendental realism, and he has not therefore fully investigated the aspects of his economic research in Hayek I and II. I rather try to show an implication for the relationships of vision, theory and methodology in economics by examining how Hayek's transformation has taken place.

I contend that Hayek's socio-economics results not only from his philosophical and methodological turns particularly observed in his Scientism essays in 1942–44, as Lawson and Fleetwood indicate, but also from the change of his vision of the market that is a complex of some basic concepts in theory. Hayek had experienced his philosophical turns through I–III as Fleetwood showed, however, the transformation in methodology had not taken place by itself. Once Hayek forms a particular market-image that works not only for utilization of dispersive knowledge but also for discovery and creation of new knowledge through rivalry, he was then first able to criticize GE by it, not a theory. Such particular 'hardcore' concepts (in Lakatos's term) as equilibrium, competition and knowledge have changed and, finally, at some threshold point, the vision of the market changed. The vision of the market is a complex constituted by those concepts to support a total structure of a theory, so its change or replacement is potentially able to overturn the economic theory as a whole. Methodological shifts followed these changes in order to build the foundations.

Now I presume, by abductive inference, that Hayek's transformation, or, generally speaking, anyone's transformation occurs in a sequence of (1) vision, (2) theory, (3) methodology, not in the reverse order. Vision gradually turns into theory. Once theory is established, methodology is abstracted from theory as meta-theory and it fundamentally determines the basic nature and structure of theory. But methodology does not create or transform a theory. It is often observed that a shift in methodology is not the cause, but the result of change of theoretical endeavour as substantive scientific activities grappling with reality.

Vision in substantive economics is no less important than methodology, particularly in order to discover a new finding, create a new framework and improve scientific knowledge of reality. Vision offers a metaphor, an analogy or an image to activate *abduction* different from deduction and induction, which consists in a cognitive movement from surface phenomena to some deeper mechanisms, structures, rules, power or relations. So it is recognized that vision is necessary for scientific hypothetical reasoning which enables creation of new theories or concepts. Once vision transforms, it requires a change of methodology in order to present an integrative and consistent basis of a new theory so that it can formally systemize itself. The vision of a theory as the frame of reference to key concepts in economics, even though they cannot

be expressed in explicit manner in the first place, are not less important than methodology in order for economics to explore the unknown reality of our socio-economic world.

So I believe that the rivalrous and dispersive market-image for discovery of knowledge should be a vision for establishing a new theory of the market as a self-organizing complex system or a 'spontaneous order' that is the basic idea of Hayek III, whilst Hayek himself had not accomplished it.

Notes

1. This article is based on part of chapter 4 of my Japanese book (Nishibe, 1996). The basic theses contained herein remain the same but for minor amendments, but arguments are made clearer and references are amplified.
2. 'Obviously, in order to be able to posit to ourselves any problems at all, we should first have to visualize a distinct set of coherent phenomena as a worth-while object of our analytic efforts. In other words, analytic effort is of necessity preceded by a preanalytic cognitive act that supplies the raw material for the analytic effort. In this book, this preanalytic cognitive act will be called Vision. It is interesting to note that vision of this kind not only must precede historically the emergence of analytic effort in any field but also may re-enter the history of every established science each time somebody teaches us to *see* things in a light of which the source is not to be found in the facts, methods, and results of the pre-existing state of science' (Schumpeter, 1954: 41).
3. Two years before, Hayek (1933) had first criticized socialist planning whose origin is regarded in Historical School, in 'The trend of economic thinking', but he hadn't begun his criticism to MS and the concept of equilibrium yet.
4. While 'economic problems' relate to a socio-economic situation where different ends and motives of multiple individuals conflict with one another, 'technological problems' relate to a situation where a single economic agent just like Robinson Crusoe has to make a proper decision on alternative opportunities subject to certain constraints.
5. I would like to point out that Hayek's idea of what is to be called 'formal economic theory as a tool' is nearly approaching Schumpeter's idea of 'economic analysis' (Schumpeter, 1954) assumed as formal techniques and tools in economics. Since Schumpeter believed in the reality of 'economic analysis' as a supra-historic standard or rule applicable to every kind of economy, he endorsed Lange's application of GET to a socialist economy at least in the scope of static problems. On the contrary, Hayek could never find any corresponding reality to formal economic theory other than Robinson Crusoe's economy with a single agent and therefore insisted that its application to a socialist economy is impossible. This is truly a big difference, but Hayek's 'formal economic theory as a tool' is almost identical to Schumpeter's 'economic analysis' in the sense that both of them neglect that such formalization of theory involves a particular method of abstraction from reality and of discrimination from other theories, and that both of their arguments are attempting, as a result, to defend GET. Hayek had foreseen the rapid upswing of the axiomatic formalization and mathematical generalization in GET since the 1950s, however, contrary to Hayek's proposal, GET has kept being applied not only to a single person's technological problem but also to a society's economic problem. This would mean, regardless of Hayek's criticism, that GET has been misconceived until now as the theory of a 'real' market, not as 'Pure Logic of Choice'.
6. This might be regarded as similar to the concept of 'decentralized' that is often used in the literature of economics. But I will here introduce the term 'dispersive' instead of 'decentralized' since the latter is in many cases misleading as, for instance, the following discussions illustrate. The pair of terms 'decentralized' and 'centralized' expresses the degree of concentration of decision-making power, whether it is either political or economic, say, in a society and a firm. However, the dichotomy between a centralized planned economy and a decentralized market economy frequently gives us a preconception that planned economy is always 'centralized' and a market economy is always 'decentralized,' and then tends to lead us to neglect a possibility of the existence of a 'centralized' market and 'decentralized' planning. Since there is, at the same time, a modern neo-classical usage of those terms for classification of market structures where an oligopolistic or a monopolistic market is 'centralized', and a competitive market is 'decentralized', we are likely to confuse their meanings in political and economic decision making in the former case and those in the market structure in the latter case. I therefore propose that we should reserve 'centralized' and 'decentralized' exclusively for *the economic and political decision-making* sense, and prepare another pair of terms 'concentrated' and 'dispersive' for *the market structure* sense.
7. Caldwell (1997) has examined such newly emerged problems as incentive compatibility and asymmetry of information that were embedded in MS of SCD and have recently become well noticed in the economics of information. Caldwell made his conclusion on the economics: 'he [Hayek] might warn against an excessive preoccupation with question of information' (Caldwell, 1997: 1886). Such a warning about the economics of information is shared by Nishibe (1996) and the present chapter. And this must affect what interpretation of Hayek's transformation is relevant.
8. It was theoretically believed so at the time, even though it was made clear that excess demand function of all goods must satisfy certain conditions for convergence towards equilibrium and such stability conditions are considerably restricted.
9. Such parametric function (or signalling function) of prices requires satisfaction of such conditions for perfect competition as: (1) one-price to one-good law holds because prices in a market are transmitted instantly and with no cost to each economic agent; (2) each economic agent behaves as a price taker because a large number of small sized agents are assumed; (3) there is freedom for firms of entry to and exit from industries and no institutional obstacles for that; and (4) all goods are homogeneous in quality.
10. He initially stated, 'I will argue that it was his participation in the socialist calculation debate which helped lead Hayek to realize the centrality of the question of coordination, and of its links with specific assumptions

concerning knowledge [...] Though I will not claim that his participation in the debate *caused* Hayek's transformation, a knowledge of his role will be helpful in understanding why events unfolded as they did' (Caldwell, 1988: 515–6).

11. He put, 'I stand by my intention of the nature of Hayek's transformation. I would like to qualify, however, my discussion of the causes of his change [...] I still think that it is correct to say that, if one looks at the episode in retrospect, the causal factor that eventually emerged as most important was his battle with the market socialists [...] But this is different from saying that his battle with the socialists was the main cause at the time that Hayek's transformation was actually taking place. No single cause stands out' (Caldwell, 1994: 121–2).
12. 'All the ideas of science come to it by the way of Abduction. Abduction consists in studying facts and devising a theory to explain them. Its only justification is that if we are ever to understand things at all, it must be in that way' ('Harvard Lectures on Pragmatism', Peirce, 1903; 1931–58: vol. 5, 145).

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