

***Location and Space-Economy* at half a century: Revisiting Professor Isard's dream on the general theory**

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Abstract. Nearly half a century has passed since the publication of the seminal work of Professor Isard, *Location and Space-Economy*, which became the basis of a new field called regional science. As indicated by its subtitle (i.e., *A General Theory Relating to Industrial Location, Market Areas, Land Use, Trade, and Urban Structure*), the book was written with the aim of nothing less than initiating the development of a general theory of location and space-economy, embracing the total spatial array of economic activities. Such a theory was supposed to include both the traditional general equilibrium theory and the international trade theory as special cases.

In this paper, first I shall discuss what were his possible ideas on the general theory, given the state of economic science at that time, and what were the main contributions of *Location and Space-Economy* in initiating the development of such a theory. Second, I review the major contributions of subsequent works by Professor Isard and other scholars from the viewpoint of the development of the general theory. Finally, I discuss possible future directions in developing such a theory.

1. Introduction

I am deeply honored and very grateful for this opportunity to speak on Professor Isard's work at the 21st Meeting of the Northeast Section of Regional Science Association on the occasion of his 80th birthday.

My discussion today is centered around Walter Isard's first major work, *Location and Space-Economy*. As we know, this book provided the theoretical basis of a new field called regional science. Hence, speaking about this book is somewhat synonymous with discussing the theoretical foundations of regional science.

The book was published in 1956, that is, 43 years ago. Thus, you may complain that the title of my speech, namely, "*Location and Space Economy at Half a Century*", is based on too rough calculation. But, if you recall that Chapter 2 of the book, entitled *Some General Theories of Location and Space-Economy*, was largely completed by 1947, and given that in my opinion, this

chapter contains Isard's basic ideas on the general theory of location and space-economy, my claim of *Location and Space-Economy at Half a Century* is not entirely misleading.

Before starting, may I remind you one extraordinary aspect of the book? That is, the text of the book is of 287-page length, which is not extraordinary. But, the 287-page text is followed by the index of 62 pages. Although I cannot prove it, I bet the index-text ratio of 0.21 is the highest in the history of mankind. This point alone would be sufficient to indicate that this book is not an ordinary one. Of course, everyone here knows well that no work by Walter Isard has ever been ordinary.

Joking aside, let me move to a more serious discussion of the book. Before doing so, however, I would like to apologize that my following discussion is very personal. Each Christian, for example, would have a personal history with the Bible. In a similar way, my relationship with *Location and Space-Economy* spans the entire period of my academic life.

My first encounter with the book happened 33 years ago when I just started my academic career as a 22-year-old research assistant, just after graduating from the Department of Civil Engineering at Kyoto University, Japan. One day, my boss, Professor Kozo Amano, a former engineer at the Japan National Railway, told me that he had a big job for me. He said, "As you know, a superexpress railway, Shinkansen, has just been completed between Tokyo and Osaka. The Ministry of Transportation wants to extend it all over Japan. However, the Ministry of Construction is strongly against it because they want to develop instead a turnpike system all over Japan. So, you should develop an econometric model of Japanese regional economy, and compare the economic impact of the nationwide development of Shinkansen network with that of a turnpike network."

At that time, my knowledge of economics and econometric models was absolutely zero. So, I asked Professor Amano, how I should go about it? He said, "I do not know, but you should start working now because we must report the results at a joint meeting of the Ministry of Transportation and Ministry of Construction in Tokyo scheduled in 18 months."

I was totally shocked by this assignment. But, an order is an order. So I conceded but asked, "OK, but please give me something to start with." Then, my boss brought two books from his bookshelf, saying that, they might be of some help. The two books were *Location and Space Economy* and *Methods of Regional Analysis*.

I first skimmed over *Location and Space Economy*, and noticed many strange terms such as the Anglo-Saxon bias, monopolistic competition, general equilibrium in space and time, in addition to many curious diagrams using triangles, circles and hexagons. I felt something quite interesting with the book, but I decided that it is of no use for my immediate job. So, I browsed the other thick book, *Methods of Regional Analysis*, and immediately found that this was exactly what I needed.

Using various methods explained in the book, I developed an interregional econometric model of Japan. Fortunately, I happened to know that the first Japanese interregional input-output table (9 regions \times 43 sectors) was to be completed by the Ministry of Trade and Industry in half a year. So, my model was centered around the interregional input-output model in which interregional trade-pattern coefficients were endogenously determined by using a gravity-type model. It was a rather primitive but huge interregional econo-

metric model, estimating recursively the nationwide impact of developing the Shinkansen network over a 25-year period, compared to that of building a turnpike network. Together with three professional computer programmers in a computer service company in Osaka, we worked so hard to complete the model that one of computer programmers eventually suffered from stomach cramps and was hospitalized. Believe it or not, we successfully finished the computer calculations at four o'clock in the morning of that day on which we had been scheduled to report the results at the joint meeting of Ministry of Transportation and Ministry of Construction in Tokyo. So, with the first Shinkansen from Osaka to Tokyo that morning, I brought a box-full of computer prints to the meeting just in time, and managed to report the results successfully. (A part of the work was subsequently published in the *Journal of Regional Science* in 1970.)

As such, my first serious association with Professor Isard's work was through *Methods of Regional Analysis*, which saved me in the beginning of my academic career. After finishing my first job, however, I felt that my brain had dried up. Our econometric model was largely based on common sense without using any deep theory. Hence, I became very hungry for theories, which made me remind the other book, *Location and Space-Economy*.

So, this time, I read the book more carefully. Somehow, I was quite fascinated with the book. But, to tell the truth, I was able to understand very little of it. I wanted to study more seriously the foundations of spatial economics, and confessed this desire to my boss, Professor Amano. He told me that "if you are interested in learning such things, you should go to Professor Isard's place."

"Where was he?" I asked. "At the University of Pennsylvania", he answered. I had never heard of such a university, but it did not matter, and I asked, "how can I go there?" "Well," Professor Amano replied, "as you know, tuition fees at an Ivy-league university is so high that no way you can afford it. So, if you want to go to the University of Pennsylvania, you should get a scholarship." I asked, "How can I get a scholarship?" He brought me a copy of the *Journal of Regional Science* from his bookshelf, and showed me its backcover, saying, "Look!, the Department of Regional Science is offering a scholarship grant. Why don't you apply for it?" Although I had little hope, I applied for the grant. One month later, to my great surprise, I got a letter from Professor Isard informing me that I got the grant, and that I must go to the University of Pennsylvania. That marked the beginning of my 25-year association with Penn.

In 1968, I headed for Penn brimming with renewed enthusiasm and expectation on learning more about *Location and Space-Economy* directly from Professor Isard. But, life was not that simple. When I arrived at Penn, Isard's interest was far beyond *Location and Space-Economy*. He was in the midst of completing his third major work, *General Theory*, another extraordinary book with more than a thousand pages. As its subtitle (*Social, Political, Economic and Regional*) indicates, *General Theory* aimed at establishing a comprehensive theory of the world beyond mere economic aspects. Thus, what I first learned from Professor Isard at Penn was a general *social theory* with full of unconventional terms such as *c-solidarity*, *c-power*, *c-respect*, *c-affection*, *c-enlightenment*, and *c-love* tendered, and so on. Although recently I became to appreciate the depth of *General Theory* more and more, back in 1968, it was a little too advanced for a 24-year novice eager to learn the foundations of spatial economics.

Thus, despite my strong desire to learn more about *Location and Space-Economy* directly from Professor Isard, actually I never had such a chance then. Nevertheless, having spent much of my 30-year academic career focused on a single subject of spatial economics, I have recurrently gone back to *Location and Space-Economy* whenever I am at a loss, looking for new ideas and new directions.

You may agree with my opinion that *Location and Space-Economy* is a book that fascinates everybody with the author's noble mission of redeeming space at the core of economic science. But it is never easy to comprehend the real meaning of what is written in each condensed page and in each long footnote. What one can learn from the book depends on what kind of questions how deeply one poses in reading it.

In this respect, *Location and Space-Economy* reminds me of a famous Zen garden in Kyoto. This so-called Rock Garden, at the Ryoanji Temple is a rather small one, and it looks simple, with just a dozen or so of rocks arranged over the carefully combed sand. The visitor is supposed to choose a quiet spot on the terrace surrounding the garden, then sits down, and meditates while viewing the garden. However, each rock is so ingeniously positioned that from any angle of your choice, you can see only the several of rocks, while the rest of rocks is hidden behind them. Just when you think you've seen all the rocks, you'll realize that upon changing your position, you will discover some rocks that were previously hidden from view. People say that depending on your point of view or your frame of mind, you will have a different understanding of the entire composition of the garden. So, when you visit the temple next time, several years later perhaps, and choose a different spot in the terrace, you will see another set of rocks, and have another understanding of the garden. My association with *Location and Space-Economy* has been somewhat similar to my experiences in this famous Zen garden in Kyoto.

Now, let me move to the discussion of what I understand about the book at this stage of my limited academic life. In the following discussion of Isard's seminal work today, my point of view is limited to a particular angle of my choice. That is, as is indicated by its subtitle (*A General Theory Relating to Industrial Location, Market Areas, Land Use, Trade, and Urban Structure*), the book was written aiming at nothing less than the development (in the future) of the *general theory of location and space-economy*. Given that my own academic life also has been focused on the single objective of developing the general theory of location and space-economy, I would like to discuss what were Isard's possible ideas on the general theory, and what were the main contributions of *Location and Space-Economy* in initiating the development of such a theory.

2. Isard's ideas on the general theory of location and space-economy

According to Isard, "the general theory of location and space-economy is conceived as embracing the total spatial array of economic activities, with attention paid to the geographic distribution of inputs and outputs and the geographical variations in prices and costs. Modern general equilibrium theory is a special case of this theory, in which transport costs are taken as zero and all inputs and outputs are viewed as perfectly mobile; international trade

theory, as narrowly conceived by Ohlin, is also a special case of this theory” (p. 53).

Professor Isard’s basic ideas on such a theory are presented in Chapter 2. Hence, in the following discussion, let me focus on Chapter 2, entitled *Some General Theories of Location and Space-Economy*. This is the chapter starting with the famous section entitled *The Anglo-Saxon Bias*. In this chapter, Professor Isard critically reviews those works which he considers the precursors of a general theory of spatial economy, and reveals his own ideas in the process. As explained in a footnote, this chapter was basically completed in 1947, when he was just 27 years old.

What a remarkable chapter it is! It reflects Walter Isard’s extraordinary depth of the understanding of spatial economies at such a young age. In my opinion, this chapter alone would be sufficient to place Isard in the Pantheon of spatial economics.

His basic ideas on the general theory of location and space-economy are summarized in the concluding section of Chapter 2, emphasizing the following three points:

1. First, the prevailing paradigm of general equilibrium analysis in the tradition of Walras, Pareto, and Hicks fails to consider spatial dimensions explicitly. More importantly, the framework of such a general equilibrium analysis based on perfect competition is not comprehensive enough to incorporate the *particular effects* of transport and spatial costs on the distribution of economic activities in space.
2. Second, “because of the monopoly elements which are almost invariably present in spatial relations, a broadly defined *general theory of monopolistic competition* can be conceived as identical with the general theory of location and space-economy” (p. 54). (The emphasis is by the author. The same note applies in the following.)
3. Third, “The *evolutionary approach* of Weber and others, and especially the writings of Weigman, who conceives the space-economy as a rhythmic-moving Gestalt whole with a basic structural core of land and labor markets, should be helpful in suggesting lines along which this general theory may be nurtured to embody dynamic relations.” (p. 54)

In short, what Walter Isard was saying about half a century ago was: first, the general theory of location and space-economy must be more than the traditional general equilibrium analysis based on perfect competition; second, such a general theory should be identical with the general theory of monopolistic competition; and third, the evolutionary approach should be helpful to embody dynamic relations in the general theory.

Again, what a remarkable thinking by such a young scholar 50 years ago! Incidentally, if you may wonder whether you have heard recently similar assertions from someone else, you might be probably correct. But, before answering from whom you may have heard similar ideas recently, let me elaborate on Isard’s ideas following the book.

First, when Isard critically discussed the modern general equilibrium analysis half a century ago, he was mainly concerned with Hicks’s *Value and Capital* published in 1939. After examining Hicks’s work, Isard concluded that Hicks “confines himself to a wonderland of no spatial dimension.” (p. 25–26). In order to elaborate his point, in a footnote in the same page (p. 26), Isard recorded his interesting conversation with Schumpeter in which Schum-

peter defended the Hicksian analysis, maintaining that “transport cost is *implicitly* contained in production cost, and thus Hicksian analysis is sufficiently comprehensive.” Isard, then, replied that “production theory . . . cannot justifiably treat certain production costs explicitly and other important ones implicitly in order to avoid the obstacles to analysis which the latter present. For a balanced treatment, the *particular effects* of transport and spatial costs in separating producers from each other must be considered. They are too vital to be sidestepped through implicit treatment, as Hicks and others may be interpreted as having done.”

(It is not clear what Isard meant here by “the *particular effects* of transport and spatial costs in separating producers from each other.” But, given that Isard complained in the same footnote about Hicks’s rejection of monopolistic competition model in favor of perfect competition, I guess that “the particular effects” include the monopolistic elements that spatial costs necessarily introduce into production theory.)

The debate about whether or not the neoclassical general equilibrium model based on perfect competition is comprehensive enough to fully reflect spatial dimensions has a long interesting history even after the writing of *Location and Space-Economy*.

On one side, the traditional general equilibrium school maintained that the problem of space can be handled simply by defining each commodity by its location as well as by its physical characteristics, and hence once we have made a clever indexing of commodities, we can essentially forget space in economic theory. This is the way Debreu (1959) treated space in his seminal work, *Theory of Value*.

The other school supporting Isard’s view says: No, No, No!, the problem of space is not that simple. In order to capture the essential impact of space on location of economic activities, we need new models fundamentally different from those of the traditional general equilibrium theory based on perfect competition. In particular, Koopmans maintains in 1957 in his influential book, *Three Essays on The State of Economic Science*, that the vital effects of space become evident when our concern is the location of all economic activities and hence the distribution itself is a variable. When the distribution of economic activities in space is in question, Koopmans maintains, “without recognizing indivisibilities – in human person, in residences, plants, equipment, and in transportation – urban location problems, down to those of the smallest village, cannot be understood.” (p. 154) A corollary is, since the traditional general equilibrium analysis abstains from the consideration of indivisibilities or increasing returns, it fails to capture the essential impact of transport and spatial costs on the distribution of economic activities. Of course, in the general theory of location and space economy envisaged in Isard’s book, the distribution of economic activity is a main variable.

In the long debate concerning this fundamental issue of spatial economics, in my opinion, the definitive answer was given by Starrett in 1978, which essentially validated Isard’s view. In a paper entitled “Market Allocation of Location Choice in a Model with Free Mobility,” Starrett showed what I call the *Spatial Impossibility Theorem*. The essential question here is whether the competitive price mechanism is able to explain the endogenous formation of economic agglomerations. To test whether a model can explain the endogenous formation of agglomerations, it is best to consider the simplest case of a perfectly homogenous geographical space (and free choice of location by

all agents), for if any concentration of economic activities occurs in such a homogenous space, it must be due to endogenous forces of agglomeration. Starrett shows in a very ingenious and simple way in a perfectly general setting that *if the space is homogeneous and transportation of goods is costly, then any possible competitive equilibrium (if it exists) is such that no transportation of any good can occur in the entire economy.*

Of course, no transportation occurs only when all types of economic activities are uniformly distributed in space, and hence every location in the economy is self-sufficient.

In other words, the perfectly competitive price mechanism alone cannot endogenously generate economic agglomerations. Therefore, if we want a general theory of location and space economy that can explain the endogenous formation of economic agglomeration, then such a theory must depart from the traditional general equilibrium analysis based on perfect competition. This proves that in this historical debate on the essence of spatial economies, Isard was right.

Now, given that the competitive equilibrium paradigm cannot offer the foundations of spatial economics, what alternative theory could be conceivable? Here comes Isard's second major insight that *the general theory of location and space-economy would be identical to a broadly defined general theory of monopolistic competition.*

It is important to notice that when Isard refers to monopolistic competition, he had in mind not only the spatial oligopolistic competition theory in line of Hotelling (1929), Kaldor (1935), and Lösch (1940), but also Chamberlin's seminal work, *The Theory of Monopolistic Competition*, published in 1933. Isard was very much in favor of Chamberlin's approach. However, Isard complains that "Chamberlin . . . does treat spatial position explicitly, but only as one of the leading manifestations of the broader category of 'product differentiation'." Isard suggests that "From his analysis emerges explicitly the need for applying the techniques of monopolistic competition in handling the space-economy of reality" (p. 27).

Again, what a remarkable insight this is! It is as if Isard could foresee the outbreak of spatial economic models based on Chamberlinian monopolistic competition approach since late 1980s.

Finally, let us turn to Isard's third assertion that the evolutionary approach should be helpful to embody dynamic relations in the general theory of location and space-economy. If we read Chapter 2 alone, it is not obvious what is meant by the evolutionary approach. But if we read the further elaboration of the idea in Chapter 1 and Chapter 11, among others, then Isard's idea becomes clearer. In particular, allow me to quote the following interesting sentence from Chapter 1, concerning the historical development process of a hypothetical region.

"The nucleus typically grows in size from an initial small compact mass reflecting the *centripetal drive of increasing returns* to a larger and larger but less and less compressed body, at times even sprawling seemingly chaotic and without coherence. The *centrifugal effects of diminishing returns* from increasing intensity in the use of land and the mounting diseconomies and congestion from multiplying numbers become manifest in the growing extent of the spatial spread. At the peripheries of each of the zones of cultivation, the process entails transition from one type of land use to another. But does the transition take place smoothly and orderly or abruptly and haphazardly?"

Again, you may feel that you have heard from someone else recently a similar explanation of the development process of spatial economy using the two opposing forces of the *centripetal drive of increasing returns* and the *centrifugal effects of diminishing returns*.

Anyway, the crucial point is that if we once admit that increasing returns are an essential feature of actual spatial economy, then from the methodological viewpoint, it would be fundamentally wrong to try to explain the complex spatial configuration of economy observed today by a naive one-shot general equilibrium approach.

For an illustration, let's look at Figure 52 of *Location and Space-Economy*. In my opinion, this is the most intricate, most realistic drawing of urban system ever composed by a regional scientist. My point is as follows: Suppose that you have developed a general equilibrium model which can yield this complex pattern of spatial configuration as an (one-shot) equilibrium solution. Then, I claim that the same model would yield a continuum of other equilibrium solutions having different spatial configurations, thus failing to explain why a particular configuration depicted in this figure has been realized. Multiple solutions necessarily arise because any general equilibrium model that can yield such a complex pattern of economic agglomerations on a continuous location space must contain some kind of endogenous agglomeration forces based on increasing returns. Then, by the very nature of endogenous agglomeration forces, each city or agglomeration will generate its own 'lock-in effect' in the location space; hence, its exact location cannot be uniquely specified by the equilibrium model. Furthermore, when such lock-in effects of many cities or local agglomerations interact together, more indeterminacy to the equilibrium spatial structure will occur.

How can we resolve this difficult problem of multiple equilibria which is inherent in any general equilibrium model of spatial economy containing the essential elements of increasing returns? This is where the usefulness of evolutionary approach suggested by Walter Isard half a century ago comes in. That is, if we want to explain the complex spatial configuration of an economy observed today, we must consider it as an historical outcome of the recurrent sequence of balance and overbalance of two opposing forces of centripetal drive based on increasing returns and centrifugal effects of diminishing returns.

3. The new economic geography as a general theory: Why did it take so long?

Summarizing my previous discussion, about half a century ago, Professor Isard offered three fundamental insights in establishing the general theory of location and space-economy. First, it must be fundamentally different from the traditional general equilibrium analysis based on perfect competition. Second, such a general theory should be identical with the general theory of monopolistic competition. And, third, the evolutionary approach should be helpful to embody dynamic relations in the general theory.

These fundamental insights initially presented in Chapter 2, are elaborated throughout the book, with each new chapter focusing on different aspects of the general theory of location and space economy. Hence, depending on one's topic of interest, or where one chooses to sit on the terrace surrounding the

great Zen garden, each reader can possibly obtain different inspirations and ideas from it.

For example, take a look at the Appendix to Chapter 8. In this 7-page Appendix, entitled *Some Theoretical Notes on Urban Land-Use*, Isard offers basic ideas in detail on how to develop the general theory of location and land-use in urban context.

It is well known that William Alonso who unfortunately could not join us today physically but, I am sure, is with us in spirit, obtained some initial inspirations from this appendix when he developed the pioneering work, *Location and Land-Use* (1964). Likewise, when I worked for the development of the so called non-monocentric land-use models later with my students at Penn, I also got initial inspirations from this appendix.

I am sure that every reader who has read whichever part of the book with great care got valuable inspirations and ideas. *Location and Space-Economy* is such a kind of book, somewhat resembling to the great Zen garden in Kyoto.

Not much time is left, so let me jump to the discussion of the most recent development in the general theory of location and space-economy, that is, the discussion of the so-called *New Economic Geography* being advocated by Paul Krugman and others. Now I come to the hard part of my job today. You might say that having heard my discussion about the basic ideas on the general theory of location and space-economy offered by Isard half a century ago, it sounds almost like listening to the sound-bites of the so called New Economic Geography.

Your observation is basically correct. The monopolistic competition model of spatial economy presented in the forthcoming book by Paul Krugman, Anthony Venables and myself fulfills more or less the three basic insights offered by Isard. Therefore, it can be qualified as a general theory of location and space-economy. (Incidentally, the book, entitled *The Spatial Economy: Cities, Regions and International Trade*, is finally coming out in June, 1999). In our book, we have tried, and succeeded to a certain extent, to explain both the formation of urban systems, the emergence of core-periphery regional structure, as well as the international specialization of industries by using basically a single model based on the modern version of Chambelinian monopolistic competition.

The flip side of the coin is: Is the New Economic Geography really new? Why did it take so long? I understand well that there are many people who are somewhat skeptical of the so-called New Economic Geography. Their complaints are well summarized in a recent paper by Andrew Isserman (1996), entitled "It's Obvious, It's Wrong, and Anyway They Said It Years Ago?"

I understand perfectly well many complaints about the New Economic Geography except one point that there is nothing new about it. Under the sun, of course, nothing is new. Likewise, given the rich insights offered by Isard in *Location and Space-Economy* half a century ago, the basic ideas of the New Economic Geography are not new. But, we must judge things in perspective or in relative terms.

To elaborate my point, let me take a metaphor. For example, since the birth of human being, almost every person had an eager dream of flying in the air, I guess. And, the basic mechanics of flying has been rather well-understood fairly long time ago. For example, if you see the drawings of "flying machines" by Leonardo da Vinci in the late 15th century, it is clear that he understood well the basic mechanics of flying in the air. But actually, it

was only in 1903 that the Wright brothers finally succeeded in passing the test of flying more than 200 meters above ground. Why did it take so long? Because, human power itself was not sufficient for flying in the air, and hence we must await the invention of powerful combustion engines. Thus, it was just a matter of technologies, not of science.

Likewise, the basic mechanics of a general theory of location and space-economy were already conceived by Professor Isard half a century ago. But, the development of a really analytically operational model had to wait until the development of industrial organization theory, nonlinear dynamics, and personal computers in the 1970s and 1980s.

Of course, the New Economic Geography represents a very primitive model of general theory of location and space economy, barely passing the minimum test of 200-meter flight. It is still a far cry from jumbo 747 or supersonic Concorde. But, there is a saying that a thousand-mile journey starts with one step.

4. The future of the general theory of location and space economy

Now, the beer in the reception room is really warming up. So, let me move on to the final part of my discussion, namely, what are the possible directions for further development of a general theory of location and space-economy.

First, an obvious direction of immediate necessity is to develop a more general theory of monopolistic competition in space and time as envisioned by Isard a long time ago. This is, in fact, being vigorously pursued by several people, including Jacques Thisse, a most prominent location theorist today. Hence, I do not worry much about this line of development in the future.

What else needs to be necessary to be done? I imagine that the general theory of location and space economy would be identical with the general theory on the self-organization of human society in space and time. In this respect, it is my opinion that in the past, economists put too much emphasis on the economic side of human society (although that was their job!).

However, for the development of human society in the long-run, economic aspects represent merely a part of the phenomenon, perhaps not even the most important ones. In other words, economic development may represent merely a possible result of the more fundamental process of social and cultural development.

For example, why are all of us here today? I did not come here today to increase my consumption of, say, Kentucky Fried Chicken or Big Mac, or to drool at this year's Mustang model. Although I like them, I can live without them.

But without my encounter with *Location and Space-Economy* or the great Zen garden in Kyoto, my life would have been entirely different. More generally, a great mind such as that of Walter Isard has been a primary source of centripetal force in our dual space of knowledge, mind, and culture.

This means that for the development of a truly general theory of human society, we must explore the general theory on self-organization and co-evolution of the dual spaces consisting of the traditional economic space and the knowledge-mind-culture space.

Where is the starting point for such an ambitious endeavor? My plan is, of course, to start with Isard's third major work, *General Theory: Social, Politi-*

cal, Economic and Regional. But, in order to understand fully this great book, it will probably take me another twenty years.

Incidentally, twenty years from today is 2019 which coincides with the centennial of Walter, and exactly 50 years since the publication of *General Theory*. So, I would like to submit today to the organization committee of 41st Northeastern Regional Science Meeting a proposal for a paper entitled, *General Theory at Half a Century*.

For the time being, let me conclude my speech by simply saying, Happy Birthday Walter, on your 80th year.

References

- Chamberlin EH (1933) The theory of monopolistic competition. Harvard University Press, Cambridge, MA
- Debreu G (1959) Theory of value. John Wiley & Sons, Inc, New York
- Fujita M, Krugman P, Venables AJ (1999) The spatial economy: Cities, regions, and international trade. MIT Press, Cambridge, MA
- Hicks JR (1939) Value and capital. Oxford University Press, London
- Hotelling H (1929) Stability in Competition. *Economic Journal* 39:41–57
- Isard W (1956) Location and space-economy. MA: MIT Press, Cambridge
- Isard W (1960) Methods of Regional Analysis. MA: MIT Press, Cambridge
- Isard W (1969) General theory: Social, political, economic, and regional. MA: MIT Press, Cambridge
- Isserman AM (1996) It's obvious, it's wrong, and anyway they said it years ago? Paul Krugman on large cities. *International Regional Science Review* 19:37–48
- Kaldor N (1935) Market imperfection and excess capacity. *Economica* 2:35–50
- Koopmans TC (1957) Three essays on the state of economic science. MacGraw-Hill, New York
- Lösch A (1940) Die Räumliche Ordnung der Wirtschaft. Gustav Fischer, Jena English translation: The Economics of Location, Yale University Press, New Haven, Conn.
- Starrett D (1978) Market allocations of location choice in a model with free mobility. *Journal of Economic Theory* 17:21–37