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: A Concise Research Review

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1. Introduction

This paper examines the trends and background of research on the agglomeration economies, which has been increasingly discussed in urban and regional economics and economic geography since the 2000s¹⁾. Urbanization has been a constant process since the beginning of the modern era. From the late 19th century onwards, the industrialization of Europe and the United States led to the formation of new industrial areas, and the influx of people from rural areas led to an increase in the urban population.

This trend continued into the 20th century, with the urban population rising from 13% of the total world population in 1900 to 29% in 1950 and then to over 50% in 2010. In Japan, the urban population was 18% of the total population in 1920, when the first census was conducted. However, after the war, this ratio rapidly increased due to the mergers of municipalities under the Town and Village Merger Act of 1953 (the Great Merger of the Showa Era) and the period of rapid economic growth from the late 1950s. In 2010, the urban population exceeded 80% in Japan²⁾.

1) This paper is a revised version of Kondo (2015).

2) See *UN World Population Prospects (each year edition)*.

This continued migration of people to urban areas has affected the economies of cities and regions, creating a dynamism in which companies and industries are concentrated in certain places, causing some cities and regions to grow and others to decline. This dynamism has created disparities between regions, giving rise to urban and regional problems. For example, the urban problem is overcrowding due to rapid urbanization. Typical examples of external diseconomies, which become more pronounced as the size of cities increase, are the deterioration of living environments due to shortages of land for housing, overdevelopment, the rise in land prices due to the concentration of economic activity, congestion and traffic jams during commuting, noise, and environmental pollution due to exhaust fumes and emissions (Brueckner, 2011; O'Sullivan, 2018). In contrast, regional economies face medium- to long-term social declines in population (excess of transfers) and many regions are forced to rely on exogenous developments due to resource constraints, even though they were originally oriented toward endogenous developments that utilize local resources. Exogenous developments include public investments to build social infrastructure and a series of regional policies to create industrial parks to attract companies and factories. The regional economy generally has a weak macroeconomic structure, and the small size of the regional labor market means that employment and tax revenues are vulnerable to economic trends. Thus, problems caused by the disparities between regions have been highlighted, especially those in cities.

In recent years, attention has been paid on agglomeration economies studies to explain the underlying dynamism of economic trends in cities and regions. Aspects of urban and regional economies are evaluated in a positive light, such as the positive effects of urbanization on economic growth. In economics, the term agglomeration is used to describe a state in

which a geographical concentration of economic activity is observed. The economic agents located there enjoy the benefits of agglomeration to some extent. In other words, cities, with agglomeration, benefit economically from the geographical concentration of firms and people. Firms are located in cities or in specific industrial zones because the positive benefits of being located in a cluster gives them an advantage in contrast to the disadvantages of external diseconomies. The general population is drawn towards cities because their utility as consumers and workers outweigh the negative factors. Therefore, there is economic rationality in the geographical concentration of economic activity. The disparity between cities and regions, due to agglomeration, causes the urban and regional problems and the mechanisms of agglomeration, to be inextricably linked. The theory of agglomeration has become an indispensable part of the thinking about modern urban and regional economies.

This study extends the perspective of agglomeration studies to provide insights into new trends in urban and regional economies, primarily from the perspective of industrial location and policy. Geographically, the paper focuses on the background of Japan since the 2000s. Growth in East Asia has been discussed in terms of the catch-up industrialization theory (Suehiro, 2008) and the flying geese pattern of development theory (Akamatsu, 1962; Kasahara, 2004), in which Japanese industrialization precedes and follows that of Korea and China. In recent years, however, the focus has been on strategies for the development of urban and regional economies as growth centers. In particular, the expansion of free trade areas, as seen in the development of Free Trade Agreements (FTAs) and Economic Partnership Agreements (EPAs,) has increased trade dependency within East Asia, creating closer inter-city and inter-regional economic networks. In this paper, we summarize the research trends in agglomeration

theory and its surrounding fields and clarify the issues behind contemporary urban and regional economies. Also, we examines the impact of agglomeration economies on urban economies.

2. Agglomeration Economies in Modern Economics

Agglomeration economies studies is both an old and new field of economics. It is old because the concept and theory of agglomeration were first proposed in the early 20th century. It is new because it has been in the spotlight again in modern economics since the mid-1980s, when developed countries entered an era of low growth and globalization. Originally, agglomeration studies was based on the idea of industrial agglomeration which is the concentration of a particular industry within a certain geographical area, where firms and factories are located in interrelated locations.

Two economists, with the same first name, Alfred Weber and Alfred Marshall, developed a framework for agglomeration theory. The German economist, Weber, systematized the theory of industrial location in Weber (1909), and discussed the agglomeration orientation of industrial locations in "Chapter 5 Agglomeration." Originally, the subtitle of the book Weber (1909) was "Pure theory of location," and he was keenly interested in the development theories of where agglomerations were formed. Marshall, who was a professor of economics at University of Cambridge, wrote "Chapter 10: Industrial organization, continued" in "Part 4: Factors of production" in "The Concentration of Specialised Industries in Particular Areas" of Marshall (1890), which was the standard textbook at the time. He discusses the regionalization of industries in this textbook and focuses on the factors that contribute to the regionalization of industries. However, he is primarily concerned with the functioning of agglomerations, citing the

introduction and spillover of new technology, the growth of ancillary industries, regional pools of skilled labor, and the benefits of diversity. Marshall's theory of agglomeration has a greater impact on later generations than Weber's theory because the mechanisms of agglomeration have been studied in more detail.

Marshall's theory of agglomeration was originally conceived in the context of the organization of production, therefore, modern economists study the economic benefits of agglomeration, focusing on the benefits of increased scale, or economies of scale. Figure 1 shows the classification of economies of scale (Kameyama, 2006; Hosoya, 2009). There are two types of economies of scale: those that are internal, and those that are external to a firm. The latter, external economies, are almost synonymous with the benefits of agglomeration (economies of scale). An example of an internal economy is when a factory requires a certain number of buildings and machines, which incur fixed costs, but as the size of the factory increases, the fixed costs per unit of output decreases.

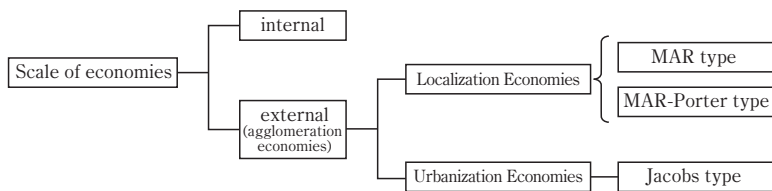


Figure 1. Classification of economies of scale

In comparison, external economies can be classified according to several factors. First, external economies can be divided into two broad categories: economies of localization, which result from the concentration of industries

in the same sector, and economies of urbanization, which result from the concentration of various industries. Of these, the former is the dynamic Marshall-Arrow-Romer (MAR) type of agglomeration formulated by Glaeser et al. (1992), who expands the work of Marshall (1890), Arrow (1962), and Romer (1986). Glaeser et al. (1992) examine the benefits of agglomeration (in this case, technology spillovers) to urban and regional economies in terms of regional specialization, urban diversity, external effects of regional monopoly or competition, and the impact of a regionally specialized MAR-type economies. In addition, with regard to the economies of urbanization, much attention has recently been paid to rethinking the urban economy. In particular, in a series of studies by Jacobs (1961, 1969, 1984), the merits of the concentration of different industries in cities are discussed, and Jacobs takes a positive view of the effects of agglomeration, which can be called the merits of diversity, against the merits of specialization. Glaeser et al. (1992), taking into account the diversity of cities discussed by Jacobs, propose three types of externalities that promote the growth of cities: the MAR type, an externality based on the concentration of the same industries; the Porter type, which is based on competition in the same industry; and the Jacobs type, which is based on diversity in different industries.

Krugman (1991) develops a model, based on monopolistic competition, in which increasing returns, transport costs, and demand interacted with each other, thereby enabling the discussion of agglomeration within the framework of general equilibrium theory. This research field, which encompasses international economics, urban economics, and regional science, is called spatial economics or new economic geography (NEG) and is theorized as a new frontier of economics by Fujita et al (1997). Fujita (2010) explains the need for a new frontier of economics. However, as

Fujita (2010) points out, spatial economics explains the agglomeration power of economic activities mainly through the monetary externalities between consumers and producers in a market, and does not sufficiently discuss the interaction formed by the creation, use, learning, and propagation of knowledge, which are part of the sources of the agglomeration power of human activities. In other words, we live in an age in which information is a source of power. However, although we live in an information society and a knowledge economy, the impact of knowledge spillovers and externalities on new innovations in cities and regions remain to be seen.

3. Area Studies and Agglomeration Economies

Area studies, as represented by geography, mainly focus on the qualitative aspects of agglomerations, such as traditional production areas with thriving local industries, or business towns with manufacturing companies. In modern times, three main studies have triggered a revival of agglomeration studies. First, Piore and Sabel (1984) propose the socioeconomic model of the secondary industrial division, which is based on the idea that the industrial divide is the juncture that determines the course of technological development, and their focus is on news industrialization in the 1970s. Their concerns are the transition away from mass production during the world's low growth period in the 1970s. They identify Keynesian internationalization and flexible specialization as conditions for future prosperity and point to micro adjustment mechanisms in macroeconomic fluctuations, notably the Japanese system of subcontractors and the network of small and medium-sized enterprises (SMEs) in the Italian region of Emilia-Romagna. In particular, their positive evaluation of these systems has influenced subsequent studies of industrial clusters. For example, Scott

(1988) identifies clusters with flexible specializations as new industrial spaces and show that spatial interdependence among firms added a certain robustness to market fluctuations. In Japan, Kiyonari and Hashimoto (1997), Itami et al. (1998), Japan Small Business Research Institute (2003), and the Kikkawa and JTUC Research Institute (2005) discuss the positive evaluations of industrial clusters in Japan and their impacts on regional policies. They focus on new functions and the development potential of industrial regions in different parts of Japan.

Second, there is a focus on Silicon Valley. In particular, Saxenian (1994) compares Route 128 near Boston in the USA with Silicon Valley near San Francisco, focusing on the development and the regional innovation system of the latter. The author not only compares the economic systems, but also focuses on the unique climate that fosters entrepreneurship and the importance of local culture and society in agglomeration studies. Silicon Valley has once again attracted worldwide attention as a symbol of America's resurgence in industrial competitiveness. As a hub for information, communication and high-tech industries, it has become a source of global innovation, with a high concentration of money, talent, and knowledge, and the birth of numerous venture companies. Saxenian (2006), who studies human resources in Silicon Valley, shows that the decentralized industrial system of Silicon Valley had spread globally through the brain drain of high-level research and development personnel and technicians to various regions. Markusen (1996), in studying knowledge spillovers, classifies core agglomerations such as Silicon Valley as a hub and discussed agglomerations by contrasting them with Marshallian industrial agglomerations and satellite platform agglomerations to show their superiority (Figure 2). The development of Silicon Valley has had a major impact on regional policies for high-tech as well as information

and communication technology (ICT) industries around the world, and efforts are underway in developed countries such as East Asia and Japan to create a second Silicon Valley with knowledge clusters and clusters of knowledge-intensive industries (Rosenberg 2002).

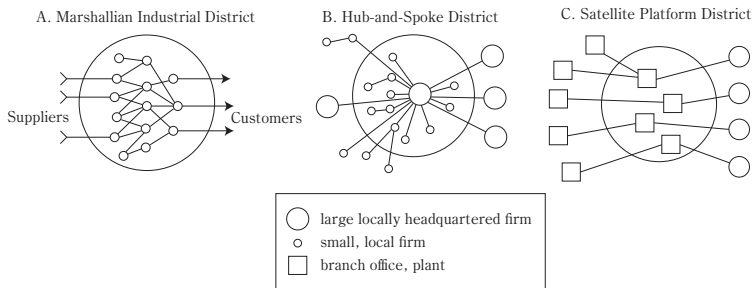


Figure 2. Three types of industrial agglomeration

Source: Markusen (1996)

Third, the concept of industrial clusters is introduced. Professor Michael Porter of Harvard Business School proposes the concept of clusters from the perspective of competitive strategy (Porter 1990, 1998). The contemporary significance of Porter's cluster concept can be summarized in four main points (Ishikura et al., 2003). First, the importance of new knowledge-based factors of production, in contrast to existing studies that emphasize the comparative advantage of traditional factors of production. Second, whereas traditional agglomeration studies focuses on the concentration of firms (particularly factories), the cluster concept is characterized by the inclusion of a diverse range of participants, including firms, universities, research institutions, financial institutions, and local governments. Third, while previous discussions of agglomeration effects tend to emphasize the minimization of costs, cluster theory points to the

importance of innovation. Fourth, a distinctive feature of cluster theory is that it clearly indicates the significance of competition within clusters. Thus, the concept of clusters has had a significant impact on innovation-oriented regional policies in various industrial regions by linking agglomeration and innovation theories (Ishikura et al. 2003; Bresnahan and Gambardella 2004; Breschi and Malerba 2005; Braunerhjelm and Feldman 2006; Matsubara, 2013).

Thus, agglomeration studies provides an important perspective for the discussion of regional economies in the humanities and social sciences, including area studies. Matsubara (2013) points out that the enrichment of agglomeration studies, especially in economic geography, is based not only on costs but also on benefits such as innovation, productivity, contact, and diversity. In particular, it focuses on the proximity and interaction between participants and the economic factors that generate the benefits of agglomeration, and extends to knowledge creation theory, social network theory, institutional studies, and cultural studies. In this way, the frontiers of agglomeration studies are expanding into areas that have not been adequately discussed in contemporary modern economics.

4. Urban Economies and Innovation in Japan

Urban development is accompanied by vertical and horizontal expansions. The geographical concentration of various economic functions leads to an increase in the price of land in urban centers and a corresponding increase in land use. There is a shift from low-rise buildings to high-rise buildings, especially large office buildings, which increases productivity per unit of land area. These centers are usually referred to as city centers and have distinctive urban landscapes. However, the development of cities leads not

only to the concentration of economic functions, but also to the geographical concentration of the population. As the population grows, residential development spreads outside the city and the urban area expands along with social infrastructure, such as railways, roads, and public service facilities. This expansion means that the sphere of influence of the city center expands as it develops into a metropolitan area.

For example, the Tokyo metropolitan area is the most populous metropolitan area in Japan and has developed as the central region of Japan. The population of the three metropolitan prefectures and their surrounding large cities consisted of approximately 35 million people, according to the 2010 census, accounting for just over a quarter (about 27%) of the total population. In 1955, at the start of Japan's period of rapid economic growth, Tokyo's population was 15.42 million people out of a total population of 90.1 million (about 17% of the national total), which means that in the following 50 years, the population of Tokyo had become approximately 10% more concentrated. In addition to the population, the economic centrality of the prefecture has become more pronounced. According to the Japanese Cabinet's prefectural accounts, the gross domestic product (nominal value) of the three prefectures of Tokyo in 2007 was approximately 165 trillion yen, accounting for nearly a third (approximately 32%) of the national total. Similarly, in 1955, the Tokyo metropolitan area accounted for approximately 24% of the national total, indicating an increased concentration not only in terms of the population, but also in terms of the economy. As Scott (2001) points out, these global city-regions are not just city-regions, but global city-regions with vast hinterlands around them, symbolizing the modern city.

The pros and cons of this concentration in Tokyo have been debated from the perspective of national land structures. However, in recent years,

positive evaluations have been made from the perspective of optimal city sizes and the benefits of concentration (Hatta 1994, Hatta and Yashiro 1995, Hatta 2006) due to the growing recognition of the power of cities in economic growth. Traditionally, urban economics have been concerned with external diseconomies caused by overcrowding and focused on approaches that prevent market failures through appropriate regulations and institutional designs. The relationship between cities and innovation has been discussed mainly in the field of economics (Glaeser 2008, 2011; Moretti 2012; Shearmur 2012). It is believed that the concentration of different companies and populations, in a metropolitan area, increases the diversity of industries and occupations. The density of the population increases the opportunities for interaction, and the concentration of technology and information, based on well-developed social infrastructures, increase the probability of innovation. For example, the famous product life-cycle theory by Vernon argues that innovative new products are developed in large cities, in developed countries, which then spread geographically to surrounding areas (Vernon, 1966). In other words, it can be said that metropolitan areas play the role of incubators where, due to their high population density and active innovation activities, technology, and information accumulate and new industries and products are continuously created.

5. The Challenges of the Modern Urban Economies

Thus, since the 1990s, with the advent of the global economy, the economic potential and incubator function of big cities, as opposed to the fairness of the disparity between big cities and regions, has come under renewed scrutiny. First, since the 1980s, there has been a renewed focus

on the studies of agglomeration, and expectations have been raised about the advantages of large cities, where people, goods, money, and information are concentrated. Unlike industrial agglomerations, where specific industries are geographically concentrated, the benefits of diversification are greater in metropolitan areas with a wide variety of industries and efficient social infrastructures. As mentioned above, Marshall's theory of agglomeration discusses agglomerations consisting of identical industries. However, Jacobs argues that urban agglomerations are geographically concentrated clusters of various firms in different industries, and that their incubation of economic innovation functions are a benefit of diversification (Jacobs 1969). In recent years, Jacobs's ideas of the city have come to prominence because of her theorization that the presence of diverse industries and firms leads to innovation. The joining of urban and innovation theories, as represented by Jacobs, has become a major trend (Hosoya 2008).

Second, there is debate on the importance of human capital in innovation. In particular, developed countries, including Japan, are shifting from manufacturing to knowledge-intensive economies, such as information technology (IT) services, financial services, and other knowledge-based industries. The weight of intangible assets such as IT, technology, and know-how is increasing, and competition among countries and companies for the protection of patents and other intellectual property rights is intensifying. Against this background, the creation and use of knowledge is becoming increasingly important for innovation, and the importance of knowledge-based human capital is being debated. In this sense, metropolitan areas, with their high population concentrations, are attracting attention as places for innovation. In a knowledge-based economy, where novel ideas are the source of a wide range of economic activities, the key is knowing

how to be creative and different. For this reason, creativity has become a key word in the debate on innovation in urban areas, and the studies of the creative class and city has attracted attention as the ideal city for the 21st century (Florida 2002, 2005). According to Sasaki (1997, 2012), a creative city is “a place of creativity based on the free exercise of creative activity by its citizens, rich in creativity in culture and industry, with an innovative and flexible urban economic system free from mass production, and capable of creative problem solving for global environmental problems and local community issues.” A city rich in creative space is where creative solutions to global environmental and community problems can be found. With its high population density, and high concentration of highly skilled people with a wide range of knowledge, the Tokyo metropolitan area can be seen as a place for creative activity.

Given this relationship between cities and innovation, there is a growing interest in the function and role of cities in the global economy, with multinational companies moving into city centers and global money flowing into urban redevelopment. While Tokyo, New York, and London are considered leading world cities, in East Asia, Seoul and Busan in South Korea, and Beijing and Shanghai in China have become hubs of the global economy in recent years. In this context, changes not only in the internal economies of cities, but also in national and international urban agglomeration structures, across national borders, have become an important contemporary issue.

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*(J) is in Japanese.