



# Spatiality of regional inequality

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## ABSTRACT

Spatial inequality has drawn renewed scholarly interests and societal concerns. This paper reviews the literature on regional inequality, with a focus on spatiality of regional economic/income inequality, to make a timely contribution for a better understanding of the complexity and dynamics of spatial inequality. We find that existing theories disagree over temporal trends and underlying forces of regional inequality, and spatio-temporal models have been favored by economic geographers. It also shows that the research on regional inequality covers all continents of the world, including both developed and developing countries. The scope of research has also been broadened, expanding to household and environmental inequalities. The paper proposes components of spatiality of regional inequality, including scale, location, physical geography, place, space, spatial network, and spatial-temporal models. The paper also proposes areas for future research.

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## Introduction

Inequality is a fundamental issue for human society, a core subject of academic inquiry, and a major concern of governments. There has been a long-lasting debate about the extent, dimensions, trajectory, mechanisms and consequences of geographical inequality, as well as policies that address poverty and inequality. This debate has been dominated by convergence (e.g., neoclassical economics) and divergence (e.g., dependency, neo-Marxism) schools. Concerns for the negative effects of globalization and liberalization and the unequal benefits of the transition in socialist countries have generated renewed debates since the late 1980s. Thanks largely to the uneven consequences of the recent global financial crisis and recovery, income inequality in many countries is at historic levels with protesters raising the voices of unfair capitalist system (Stiglitz, 2012). Spatial inequality as a key component of inequality has also drawn renewed scholarly interests and societal concerns. This special issue is a timely effort to examine the complexity and dynamics of spatial inequality, with a focus on spatiality of regional economic/income inequality.

Theoretical pluralism and debates characterize the research on regional inequality. We borrow Kuhn's ideas of paradigms and paradigm shift to review theories and empirics of regional inequality. For convenience and based on changes in society and

social sciences, this article divides academic inquiry of regional inequality into five periods with roughly 20 years each: 1930s–1940s, 1950s–1960s, 1970s–1980s, 1990s–2000s, and 2010s–present. Societal change and paradigm shifts over the last 80 years reflect the reality of the regional inequality literature: the disagreement of scholars over theories of regional inequality and controversial empirical findings indicates the complexity and dynamics of inequality. While economics has been ruled by neoclassical economics, economic geographers tend to be more plural and spatially oriented.

Prior to the Great depression of the 1930s, the mainstream economic thought was dominated by the general equilibrium theory. This was challenged by Keynesian economics, which provided demand-side thinking and paving the way for government intervention. The 1930s were also the time when Hartshorne clarified the nature of geography as the study of a real differentiation of the earth's surface, which placed the geography of inequality as the core subject of geography. Major theoretical advance only started in the 1950s after the World War II, with the development of the neoclassical convergence schools. However, despite the initial optimism for the modernization paradigm, poverty and inequality persisted, which, together with the Civil Rights Movement and the oil crisis, led to the popularity of structuralism in the 1970s and 1980s.

Globalization and reforms in socialist countries have renewed the debate on regional inequality since the 1990s. The neoclassical revival has also taken place in the research on regional inequality, represented by Barro and Sala-i-Martin (1991; 1992) new

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convergence theory. The recent global financial crisis and technological revolution have generated uneven recovery and distribution, which has stimulated a new round of thinking on inequality in the 2010s, making [Stiglitz \(2012\)](#) and [Piketty \(2014\)](#) authors of best-selling books. Inequality has once again become a hotly debated topic among top world leaders, including those of the United Nations, World Bank and the United States.

### Neoclassical convergence theories: the 1950s–1960s

Theories of regional inequality have been heavily influenced by neoclassical economics and the notion of long-term convergence, although economics has become more plural over time. Neoclassical economics and growth pole models maintain that factor mobility and diffusion tend to equalize regional differentials in the long run. Such views of neoclassical economics and modernization theory were dominant in the 1950s and 1960s.

#### *Neoclassical convergence theories*

The neoclassical growth theory emphasizes equilibrium conditions and the importance of the market in allocating resources and considers regional inequality as a transitory phenomenon. It stresses the influence of the supply-side factors such as labor, capital stock, and technological change, and views regional growth as a process of resource reallocation, i.e. the mobility of capital and labor. According to [Borts and Stein \(1964\)](#), while labor tends to move to more developed regions with higher wages, capital tends to move to labor-intensive and more profitable sectors in less developed regions. This condition eventually equalizes wages and the price of capital and reduces regional income differentials. The neoclassical convergence theory therefore holds that regional inequality rises from temporary disequilibrium between supply and demand; efficient markets and factor mobility tend to equalize regional differentials in long run. The regional export base model also projects long-term regional convergence and stresses the role of the export base and the trade of goods in regional development.

#### *Core-periphery dynamics and the inverted-U model*

The inverted-U model, influenced by the Kuznets inverted U-shape theory of income inequality and Rostow's stage theory of economic growth, argues that regional inequality tends to rise during the early stage of development and fall as the economy matures ([Williamson, 1965](#)). [Kuznets \(1966\)](#) was concerned with high birth rates in developing countries but insists that regional income inequality would eventually decline. This school is attractive as it accommodates both the convergence and divergence models as well as provides a basis for policy intervention. The Kuznets curve concept has also been applied in environmental pollution, which is known as environmental Kuznets curve. Scholars find that many countries, including China, do go through such a Kuznets' process ([Zhang & Bao, 2015](#)).

[Perroux's \(1950\)](#) growth poles serve as the engines of regional growth. While agglomeration economics and Myrdalian backwash effect cause early polarization, diffusion and redistribution would eventually occur. [Friedmann's \(1966\)](#) core-periphery model holds that though development originates in a few core regions and tends to self-reinforce, it would trickle down to the periphery and eventually functionally interdependent spatial systems would emerge. The notion of long term convergence and prosperity could be found in dominant urban and regional development theories, including the central place theory and urban system theories. [Alonso \(1980\)](#) summarizes five bell shapes in development: development stages, social inequality, regional inequality,

geographic concentration and demographic transition. This paradigm of regional development is also known as top-down development, or development from above ([Hansen, 1981](#)). Despite development and change over years, scholars can still identify the core-periphery structure in regional development ([Liao & Wei, 2015](#); [Poon, Tan, & Yin, 2015](#)).

#### *The cumulative causation thesis*

While neoclassical growth models have been influential in regional development, disagreements have persisted over time. [Myrdal's \(1957\)](#) cumulative causation mode argues that the negative backwash effect tends to reinforce regional inequality, though in the long run, the spread effect can induce the development of backward regions; the process of regional development is self-reinforcing and growth rate differentials tend to persist and even widen over time. Capital and labor tend to flow at the same direction, i.e., from the periphery to the core where more opportunities and better returns are available. Thus, while factor mobility stimulates regional divergence, rather than convergence, the divergence models allow for increasing returns to scale. Moreover, human capital and technology also favor the core and facilitate regional divergence. Policy intervention is necessary to counter the imperative of the free market and to reduce regional inequality.

### The critique, empowerment and structural models: 1970s–1980s

Since the late 1960s, a great deal of theoretical debates and empirical tests have been generated across countries in the world. Scholars who support convergence and inverted-U models find that in countries such as the United States and Japan, regional inequality has experienced a long-term decline, although they disagree over sources of income convergence (e.g., [Barro & Sala-i-Martin, 1992](#); [Crown & Wheat, 1995](#); [Mera, 1977](#); [Tabuchi, 1988](#)). Findings in developing and socialist countries tend to be mixed (e.g., [Fuchs & Demko, 1979](#); [Kanbur & Venables, 2005](#); [Royuela & García, 2015](#); [Schiffer, 1985](#); [Wei, 1999](#); [Zhang & Bao, 2015](#)). The persistence of poverty and inequality also triggered the civil rights movements in the United States and inspired new thinking on inequality, especially by critical geographers and development sociologists. In this context, a variety of structural models appeared as alternatives and debates on regional inequality intensified.

#### *The critique of neoclassical theories*

The debates on development and inequality have touched many issues. The term development itself is a controversial concept and neoclassical economics has been criticized for equalizing development with growth measured by GDP and/or income. The critique of neoclassical economics can be shortly summarized as the following: (1) Assumptions of the neoclassical economics (e.g., perfect competition, perfect information, and free factor mobility) are difficult to fulfill. Production factors are “sticky” and mobility is impeded in many countries ([Richardson, 1978](#)). Post-Keynesian economists argue that the allocation of the capital stock depends on its initial distribution and structural parameters such as saving and capital-output ratios. (2) Neoclassical economics overlooks the potential contribution of factors on the demand side of the market, and is weak in accounting for short-term changes, the open economy, and regional divergence ([Armstrong & Taylor, 1985](#)). (3) Cultural, institutional, and geographical factors may play significant roles in influencing trade, factor mobility, innovation and regional development ([Krugman, 1991](#); [Porter, 1990](#)). Alternatively,

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