



A comparative analysis of multi-scalar regional inequality in China



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ABSTRACT

This paper investigates regional inequality across regions, provinces, prefectures, and counties in China from 1997 to 2010 using a comparative and multiscalar framework. Regional inequality is sensitive to geographic scales and regional heterogeneity. The year 2004 was a turning point for trends in inequality, when a new spatial regime started to emerge at the county-level in China. County-level inequality demonstrates a consistent upward trend despite a slight dip in 2005, which is different from a broad inverted U-shape trend at other geographic scales. Furthermore, intensifying inequalities are demonstrated between prefectures than within prefectures, within provinces than between provinces, and between regions than within regions. The underdeveloped Western region of China contributes the most to regional inequalities across counties and prefectures. Based on the heterogeneous characteristics of regional inequality, it is suggested that effective regional policies should adopt a geographic focus to reduce inequalities. Finally, a Markov chain technique is applied to predict the long-run properties of regional development in China. The results show that it is difficult for counties, prefectures and provinces to leapfrog from being less developed to well developed. This paper concludes that regional inequality in China in the long-run does not follow the neoclassical convergence hypothesis.

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1. Introduction

Economic inequality across regions is a persistent problem for both developed and developing nations (Candelaria et al., 2009). This phenomenon conflicts with the neoclassical growth model, which ultimately predicts worldwide economic convergence (Yang, 2002). The empirical evidence for convergence has been demonstrated in some developed economies dominated by neoliberalism, such as the United States, and in Japanese prefectures and European regions (Barro and Sala-i-Martin, 1995). However, many developing nations, such as China, have only recently begun experiencing the transition from autarkic or semi-autarkic economies to market-driven ones within the context of globalization. Furthermore, even though East Asia's experience supports the theory that greater openness to international trade decreases economic inequality for a country, Latin America demonstrates the opposite (Wood, 1997). Although many studies have been devoted to the methods of resolving the conflicts between the theory and reality of regional inequality, no formal consensus has been reached to date (Wei, 2013, 2015).

The People's Republic of China serves as a unique and significant example to study multiscalar patterns of regional inequality and to test western theories on economic convergence in a non-western context. Unlike conventional or neoliberal capitalist systems, China's economy only recently moved towards a socialist market economy after the People's Republic adopted the opening and reform policy in 1978. With the deepening of reform, China has increasingly integrated itself into the global economy. China is now the second largest economy in the world, with a gross-domestic-product (GDP) of approximately \$10.87 trillion US dollars (67.67 trillion Renminbi - RMB) in 2015 and an average annual growth rate of per capita of GDP (PCGDP) of 9.73% from 1978 to 2015. However, according to World Bank estimates, China's income Gini coefficient is much higher than South Asian countries such as India, Pakistan, and Bangladesh (Candelaria et al., 2009). In 2009, China's Gini coefficient reached as high as 42.1, signifying moderately high income inequality. This dramatic increase in income inequality has been widely attributed to multiple mechanisms such as unequal regional treatment by the central government through preferential policies which favor coastal development (Bao et al., 2002; Démurger et al., 2002), and other mechanisms related to decentralization, globalization, and marketization (Liao and Wei, 2012; Wei, 2015).

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Regional inequality is a contested issue for macroeconomists and regional scientists. Representative theories supporting regional convergence include neoclassical growth theory and the Kuznets' curve, while regional divergence is supported by theories of cumulative causation and conditional convergence. Given its complexity, various scholars have proposed new analytical frameworks which are more adapted to the Chinese context (Fan, 1995; Wei, 2001, 2002b, 2015). Regional inequality is sensitive to geographical scale; as corroborated in many empirical analyses at regional, provincial, and county levels (Fan and Sun, 2008; Liao and Wei, 2012; Wei, 1999, 2002a, 2015; Wei and Kim, 2002). However, a comparative analysis of multiscale inequality in China as a whole, and especially at the county level, has rarely been conducted. Therefore, this paper is devoted to examining temporal trends in multiscale regional inequality at the county, prefectural and provincial levels in China from 1997 to 2010 using the decomposable Theil index and Markov chain technique. On the one hand, following the “enhancing county-level economy (*zhuangda xianyu jingji*)” policy in 2002, economic development of counties has attracted increasing attention from the central government and local counterparts, but it remains unknown how regional inequality performs at the micro scale and how regional inequality is connected at different scales. On the other hand, the People's Republic has subdivided China into four regions¹ as shown in Fig. 1, namely, the Eastern, Central, Western, and Northeastern regions, for planning and development purposes. However measurement of regional inequality reflects internal socio-economic differences embedded at different scales. Overall regional inequality is therefore heterogeneous and time-variant.

This paper is organized as follows. The next section presents a brief review of the literature. Then, the data and methodology of this study are introduced. This is followed by a detailed analysis of the provincial, prefectural and county-level inequality in China as well as their heterogeneity across the four regions. Multiscale regional inequality is further decomposed into inter and intra provincial and prefectural inequality. The Markov chain technique is then applied to predict the long-term distribution of economic development across provinces, prefectures, and counties in China. This paper concludes with major findings and policy implications.

2. Literature review

Many regional economists have taken neoclassical growth theory as their starting point. This model dominates microeconomics and has gained widespread acceptance by regional economists, albeit sometimes with modifications. This model assumes that regional inequality is only a transitional phenomenon, and that the difference between leading regions and lagging regions will be diminished by the influence of supply-side factors such as labor, capital stock, and technological progress. In the more complex open economy versions of the neoclassical school, labor tends to migrate from poor regions to high-wage regions, whereas capital is inclined to move away from the prosperous regions to the less-developed regions. This dynamic movement of labor and capital is meant to boost the economic growth of poor regions. With the trickling down of advanced technology into lagging regions, any region with a leading role in technology is predicted to find its lead diminished at some point in time. As argued by many economists, this theory is more accurate in small, open economies

which are more dependent on international flows and trends (Hulten and Schwab, 1984). However, expected convergence in neoclassical theory often lacks empirical evidence. It has frequently been noted that divergent economic development prevails in some countries and for some time periods (Broadberry and Gupta, 2006; Liao and Wei, 2012; O'Leary, 2002; Williamson, 1965). Recent evidence from China also demonstrates dramatic, divergent economic growth after China's economic reforms initiated in 1978 (Chen and Zhu, 2012; Fang and Yang, 2000; Ye and Wei, 2005). China's triple process of economic transition - marketization, decentralization and globalization - is likely to increase regional inequalities (Wei, 2001). This divergent trend persists through a process of circular and cumulative causation in the fashion of a “vicious circle”.² Kaldor (1970) used the so-called Verdoorn's Law to explain circular causation processes leading to regional disparities. He argued that government intervention is necessary to reduce regional inequality and his work stimulated a new round of heated debates about regional growth processes (Fan and Sun, 2008; Kanbur and Venables, 2005; Wei, 2013, 2015).

In addition to economic growth theories which support government intervention, growth pole and Kuznets' curve theories (Richardson, 2007; Krugman, 1997) can be considered to be relevant to the Chinese context. The central idea of growth pole theory is that economic growth is not uniform over an entire region but concentrates around growth poles as engines of innovation (Richardson, 2007; Lo and Salih, 2013). Growth pole strategies have been discarded or neglected in many countries because agglomeration economies near growth nuclei result in unbalanced economic growth. However, guided by principles of efficiency, this strategy was widely implemented during the reform policy period in China by emphasizing the development of urban areas and metropolises (Liu et al., 2007). It is expected that spread and backwash effects will help narrow the urban-rural divide and core-periphery inequality (Ke and Feser, 2010). The Kuznets' curve theory predicts that economic inequality first increases, driven by market forces, and then decreases when a certain development level is reached. Wei (1999, 2001, 2002a, 2013) and Wei and Kim (2002) argued that regional inequality is particularly relevant to the transitional stages of development in provincial China and its trajectory is more complicated than that which the Kuznets' curve would predict.

Since the 1990s, a new generation of regional growth theories has been developed, and many studies have rejected the somewhat simplistic and absolute convergent or divergent views. Based on empirical evidence in many countries and regions, Sala-i-Martin (1996a) introduced the conditional convergence and club convergence theories. Conditional convergence has been widely tested at international and regional levels (Soukiazis and Antunes, 2011; Tunali and Yilanci, 2010; Young et al., 2013) and extensive empirical evidence seems to support the theory that regions tend to converge conditionally on time-varying explanatory variables (such as the saving rate, the population growth rate and the level of productivity) to their own steady states at a relatively slow speed per year (Barro, 2015; Fung, 2009; Sala-i-Martin, 1996b; Wang, 2004). Club convergence refers to the convergence process in different geographical regions with similar economic conditions. Current studies applying club convergence define clubs *ex ante* to identify similarities and differences between economic units according to geographic adjacency (Lau, 2010; Zhang et al., 2001). Challenging the club convergence theory, Pedroni and Yao (2006) found that the common geographic economic club is nonexistent in China. Club convergence should thus take a wide range of possible time

¹ China's Eastern region consists of Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan; the Central region consists of Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan; the Western region consists of Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang; and the Northeastern region consists of Liaoning, Jilin, and Heilongjiang.

² In addition to scale and agglomeration economies, cumulative advantages exist, such as knowledge and skill development, opportunities for communicating ideas and experience, and economic specialization.

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