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Regional income inequality in China revisited: A perspective from club convergence☆

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ABSTRACT

Growing income inequality in China has elicited considerable concern, and consensus has not been reached regarding whether regional income converges into one common steady state. The controversy may be attributed to the various definitions and methodologies for testing convergence. This study analyzes regional income inequality and convergence in China from the perspective of club convergence proposed by Phillips and Sul (2007). Instead of one convergence at the national level, we determine that provincial incomes are converging into two clubs: seven east-coastal provinces (Shanghai, Tianjin, Jiangsu, Zhejiang, Guangdong, Shandong, and Fujian) and Inner Mongolia are converging into a high income club, and the remaining provinces are converging into a low income club. In addition, we obtain strong evidence that income inequality within a club decreases, while that between clubs deteriorates over time. Between-club inequality is associated with investment in physical and human capital, as well as population growth rates.

1. Introduction

China has experienced remarkable economic growth following reform and the open trade policy enacted in 1978 (Tian and Yu, 2012). China's real GDP rocketed from 0.36 trillion RMB in 1978 to 9.8 trillion RMB in 2013 in terms of prices in 1978; representing a greater than 27-fold increase in 36 years. In addition, the real per capita GDP, which takes population growth into consideration, increased by more than 19-fold during the same period. However, certain regions, particularly the coastal provinces, benefit disproportionately from this policy, due to preferential policies, superior geographic location and improved infrastructure (Lu and Wang, 2002). Consequently, regional inequality only narrowed in the late 1970s and 1980s; while after 1991, regional disparity increased steadily (e.g., Chen, 2010; Li and Haynes, 2011; Villaverde et al., 2010). Moreover, most studies report that regional economic inequality has become more severe compared to that in 1978 (Chen and Groenewold, 2010; Hao and Wei, 2009; Pedroni and Yao, 2006; Westerlund, 2013; Zhang and Zou, 2012). For instance, the change in ratios of real GDP per capita in the richest region (Shanghai) compared to the poorest region (Guizhou) follows an inverse U trend, which peaked at 16 in 2002 (see solid line in Fig. 1). In addition, the real GDP per capita in Tibet, Yunnan, Gansu, and Guizhou continued to be lower than 24,248 RMB (3975 USD)[1] in 2013, which is categorized as a lower-middle income group according to the World Bank classification. On the contrary, Tianjin, Beijing, and Shanghai were classified as a high income group with real GDP per capita greater than 74,884 RMB (12,276 USD). Pervasive regional economic disparity presents great challenges to social and economic stability (Islam, 2014; Zhang and Zou, 2012) and is widely considered to be an inefficient and unsustainable development strategy (Lee, 2001; Wang and Hu, 1999). To reduce the income gap between different regions, the central government has implemented several new regional development strategies, such as the "Great Western Development", "Rejuvenating Northeast Old Industrial Bases", and "The Rise of Central China".

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[1] The exchange rate between USD and RMB is 6.1 in 31.12.2013.

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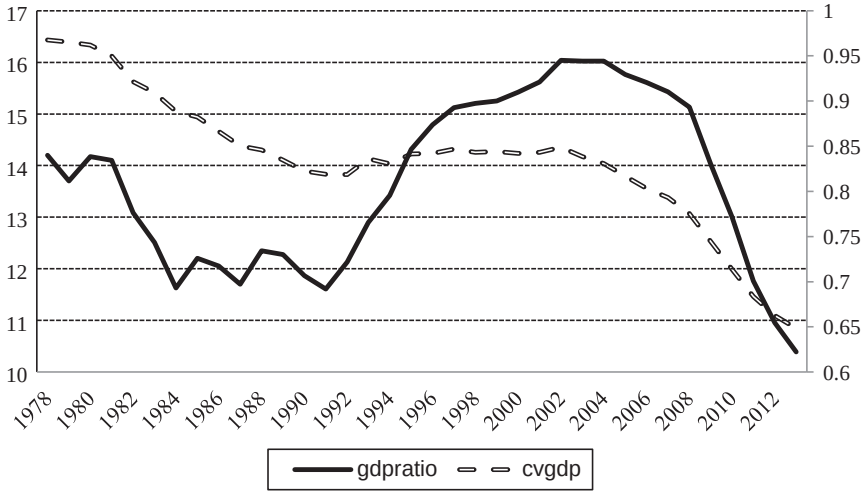

Fig. 1. The ratio of real GDP per capita (gdpratio) and the coefficient of variance (cvgdp).

Current literature (e.g., Bernstein, 2007; Lee and Selden, 2007; Pei, 2006) indicates that regional income inequality continues to increase. Given the large geographic area; however, China may have multiple equilibria regarding regional income growth. Therefore, re-investigating the regional income inequality from a perspective of club convergence may provide significant implications for development polices.

Many studies have analyzed regional income disparity in China (e.g., Pedroni and Yao, 2006; Yao and Zhang, 2001; Zhang and Zou, 2012; Zhang et al., 2001). The most pertinent question is whether regional real GDP per capita is converging, indicating that the poor regions are reaching the same income levels as rich regions (Zhang and Zou, 2012). Chen and Fleisher (1996); Gundlach (1997); Raiser (1998); Cai et al. (2002); Li and Xu (2008a, 2008b); Liu and Zhang (2009) and Lau (2010) report evidence of conditional convergence in real GDP per capita across regions during the reform period, after controlling such covariates as population growth rate, investment rate, initial human capital, openness, technology, inflation rate, transport, telecommunication infrastructure and market distortion. Other studies further investigate the convergence within certain geo-economic clubs. For instance, Cai and Du (2000) do not find convergence for the entire nation between 1978 and 1998; however, they provide strong evidence of convergence for East and Central China. Shen and Ma (2002) produce similar results and state that the East and Central regions converge at 2% per year. Yao and Zhang (2001) also report evidence of club convergence from 1952 to 1997. Zhang et al. (2001) employ the time series techniques to investigate income convergence during 1952 to 1997, and their results indicate that the East and the West are converging at their own specific steady states.

On the contrary, Liu et al. (2004) break down the Gini coefficient and find an increasing regional disparity for the whole nation. In addition, certain studies (e.g., Lin et al., 2005; Liu and Zhang, 2009; Su and Wang, 2007; Wu, 2006; Zhang and Feng, 2008; Zhu et al., 2014) highlight the role of geographic correlation in economic performance and suggest the use of the spatial econometric model to analyze income convergence. However, other studies find conflicting results. Zhu et al. (2014), for instance, show a geographic correlation across different provinces and find divergence for the whole nation, but they do find club convergence for the West and Central regions. On the contrary, Liu and Zhang (2009) find absolute β convergence in the long run. Table 1 presents a brief summary of the current literature.

The controversy in current literature may be attributable to three factors: the data used, the definition of convergence, and methodology used to test it. To elucidate this debate, this study analyzes regional income inequality by providing a brief review of currently used methods for testing income convergence. Moreover, we adopt a powerful econometric method developed by Phillips and Sul (2007) to investigate the convergence in real GDP per capita across 31 provinces in China. This method not only tests full panel convergence but also identifies club convergence if the entire sample is observed to be divergent. After identifying convergence clubs, the highest income in each club maybe taken as the potential income level for all individuals in that club. Thus, we can re-estimate the income inequality in the case that all club members reach the potential income level. In addition, we further investigate methods of alleviating the income disparity between clubs from the framework of neoclassical theory.

The remainder of this paper is organized as follows: Section 2 briefly reviews the conventional convergence tests and introduces the logt test; Section 3 describes the data; Section 4 presents the empirical results of the convergence test and the between-and within-income dispersion; Section 5 investigates methods of alleviating income disparity between clubs by investigating the determinants of club convergence; and the final section presents the study's conclusions and reviews the policy implications of the findings.

2. Methodology

2.1. Review of convergence

Convergence, particularly income convergence, has long been an important research topic in economic literature due to the policy significance of whether poorer regions can reach the same income levels as wealthier regions (Barro and Sala-i-Martin, 1992, 2004; Bernard and Jones, 1996). Generally speaking, there are two different types of convergence: β-convergence and σ-convergence. The former directly refers to the process in which poor economies grow faster than wealthy economies and ultimately converge (catch-up) with them (Islam, 1995; Mankiw et al., 1992; Sala-i-Martin, 1996). Conversely, the latter refers to a reduction in the dispersion of per capita income across economies (Phillips and Sul, 2007; Quah, 1993). β-convergence remains a primary focus in growth literature, possibly due to its straightforward policy implication for the converging process, even though Quah (1993) notes that σ-convergence should also be of interest as it directly measures changes of equality across economies over time. These two types of convergence are closely related: β-convergence is not a sufficient condition but a necessary condition for σ-convergence (Lichtenberg, 1994; Young et al., 2008).

To test β-convergence, Barro and Sala-I-Martin (1992) proposed a nonlinear regression to identify the relationship between the initial condition and growth rate, which is widely used in empirical analysis. Convergence is announced if poor economies grow faster than rich