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RESEARCH ARTICLE

Polycentric Urbanization and Sustainable Development in China

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Abstract

This paper addresses urbanization in the context of China's efforts to meet its commitments regarding the United Nations' Sustainable Development Goals (SDGs). This paper focuses specifically on governmental policies to promote polycentricity, with multiple urban centers of a similar scale within metropolitan areas, rather than a traditional single, dominant central business district. Polycentric urban forms have the potential to reduce average commuting times, thereby impacting greenhouse gas emissions. Polycentricity may also enhance access to employment and other opportunities for marginalized households. To this end, we examine the nexus between emerging polycentric urbanization patterns in Chinese cities and modes of governance at the national and local levels. Changsha, in Hunan province, is selected as a case study to illuminate the issues. Our analysis shows that fiscal considerations and other national and local governance imperatives can play a crucial role in determining how urbanization evolves. While China is unique in many ways, there are also important commonalities with other countries in the global South that are experiencing rapid urbanization, so the insights generated here may be more broadly applicable.

1 | THE IMPORTANCE OF CHINESE POLYCENTRICITY TO SUSTAINABLE DEVELOPMENT

In 2015, the United Nations General Assembly set 17 Sustainable Development Goals (SDGs). Of those, SDG 11 addresses urbanization directly, which calls on UN member countries to 'Make cities and human settlements inclusive, safe, resilient and sustainable'. SDG 11 does not stand in isolation, however. Because human settlements are the locus of so much of contemporary life, urbanization outcomes are inextricably linked to many of the other SDGs. For example, the evolving urban economy influences SDG outcomes in terms of poverty (SDG 1), economic growth and employment (SDG 8), industrialization (SDG 9), and consumption and production patterns (SDG 12). Likewise, the ongoing spatial dispersal of urban activities will impact climate change (SDG 13), the availability of water and sanitation (SDG 6), energy supplies (SDG 7), and other infrastructure (SDG 9). Urban governance also influences efforts to reduce inequality (SDG 10), foster public health (SDG 3), provide quality education (SDG 4), promote gender equality (SDG 5), and build effective institutions (SDG 16, 17). In short, as urban populations grow, urbanization policies are critical factors in determining SDGs outcomes.

The polycentric urban development is considered as a key tool to promote social cohesion, economic competitiveness, and environmental sustainability (Veneri & Burgalassi, 2012). According to the guiding principles of 'European Spatial Development Perspective'

(ESDP), polycentric development is a pre-requisite for sustainable and balanced development (CSD, 1999). More recently, the report entitled 'An agenda for a reformed cohesion policy' (better known as the 'Barca report'), which is a guiding document for EU new cohesion policies, highlighted the role of networked polycentric regions in order to promote balanced territorial development and to overcome the disadvantages arising from large urban agglomerations (Barca, 2009). The SDGs-related implications of polycentric urban development are multifaceted and complex, but many scholars view polycentric urban development in generally positive terms (Boarnet, 2010; Heikkila, 2020; Landis et al. 2019).

The critical importance of urban development for meeting the SDGs is magnified by the rapid pace of urbanization, especially in the global South. It is in the global South, where a flood of urbanization is now fully underway, with its urban population doubling from 1990 to 2020, with comparable increases continuing over coming decades (United Nations, 2018). Even within this frame, China's urbanization has been astonishing, with the urban share of its population leaping from 26.5 per cent in 1990 to 63.9 per cent by 2020, and an anticipated 80 per cent by 2050 (National Bureau of Statistics of China, 2021; United Nations, 2018). Following the astonishing urbanization process, the built-up area has greatly enlarged from 12,200 to 60,721 km^2, and more than 0.6 billion population flowed into cities (National Bureau of Statistics of China, 2021). Thus, because of its huge size and its rapid transformation, the Chinese urbanization pattern would play a critical role in achieving SDGs.

The polycentric urban development having arisen in many Chinese cities in the last decade, such as Beijing (Huang et al. 2017; Qin & Han, 2013; Zou et al. 2015), Shanghai (Murakami & Chang, 2018), Hangzhou (Wen & Tao, 2015; Yue et al. 2010), and Guangzhou (Wu, 1998). According to the calculation by Liu and Wang (2016), approximately 60 per cent of all 318 cities are intra-city polycentric in structure. Most of these polycentric cities are medium- or small-sized, and are less developed than the leading cities liking Beijing and Shanghai, which have encountered severe agglomeration diseconomies in their historical city centers, therefore necessitating polycentric development. The driving forces of polycentric urban spatial configuration formation in medium- and small-sized Chinese cities remain to be determined. This is at least in part attributable to state-dominated practices. Nevertheless, the existing state power-based theories of causation for polycentric urban development, such as urban planning, infrastructure investment, and new town development, cannot fully explain the phenomenon of prevailing polycentricity in Chinese cities (Murakami & Chang, 2018). That is, there is a lack of empirical research on the manner in which polycentric urban development has been configured by state-led endeavors. The role of governance has not been adequately researched.

Policy implications

- Fiscal considerations and other national and local governance imperatives play a crucial role in determining how urbanization evolves.
- The fundamental economic drivers of urbanization manifest themselves in China much the same as anywhere else, which can result in the dissipation of economic rents accruing from the scarcity value of urban land.
- China's unique governance system does provide significant capacity for staunching the economic rent dissipation with equalitarianism principle, which is embodied as: (i) tight regulation of intra-urban competition by higher-level governments; (ii) regular auditing of preferential treatments to prevent monopolization; and (iii) diversified resource endowment for location decisions.

In view of the great significance of polycentricity to sustainable development and achievement of SDGs, this paper aims to examine the role of governance in the formation of polycentric urbanization patterns in China, therefore, contributing to the understanding of the causation of polycentric urban development. The extant literature has provided a horizontal overview of polycentric urban development, but this must be enriched by in-depth case studies to examine how the formation processes unfold in specific localities (Liu et al. 2018; Liu & Wang, 2016). Changsha is selected as the studying case in this research.

2 | OVERVIEW OF THE POLYCENTRIC URBANIZATION AND SUSTAINABLE DEVELOPMENT

Polycentric cities are generally characterized as having one or more urban centers/sub-centers beyond the traditional central business district (CBD) (Liu & Wang, 2016; Veneri & Burgalassi, 2012). The polycentricity, although remaining a rather ambiguous concept, has been extensively highlighted in academic research and policy agendas (Liu & Wang, 2016; Veneri & Burgalassi, 2012). It can be conceptualized at multiple geographical scales, ranging from intra-city to inter-city, or even trans-regional scales (Davoudi, 2003; Hall & Pain, 2006; Liu et al. 2018; Parr, 2004; Taylor et al. 2009). This concept can also be interpreted from either morphological or functional perspectives (Green, 2007; Hoyler et al. 2008; Yue et al. 2019; Zhao et al.

2017). The research literature has demonstrated that polycentric urban development occurs in major cities and urban regions, liking greater Cleveland, Beijing, Mexico City, Lima, Greater South East of UK, etc. (e.g. Arribas-Bel & Sanz-Gracia, 2014; Bogart & Ferry, 1999; Burger, 2010; Feng et al. 2009; Fernandez-Maldonado et al. 2014; Liu et al. 2018).

Urban forms and spatial structures are thought to reduce the environmental pressure of regions. In transportation, Bertolini (2010) believes that polycentricity can reduce private vehicle flows and hence emissions between centers. Lee and Lee (2014) hold the similar view, because polycentric urban form can decrease commuting distance by enhancing land use mixtures. Also, Veneri and Burgalassi (2012) found polycentric urban form is characterized by the highest use of public transport which is carbon emission friendly. Specific to industry development, the polycentric urban form will decentralize firms in CBDs, and scholars have confirmed that industrial gatherings exacerbate environmental pollution and emissions (Verhoef & Nijkamp, 2002; Zeng & Zhao, 2009). Polycentric urban form is considered that can protect open spaces and reduce the emission efficiency of the urban heat island effect (Debbage & Shepherd, 2015; Ewing & Rong, 2008).

Scholars believe that there is a positive relationship between polycentric urban form and economic performance. A polycentric structure has been regarded as an effective approach to mitigate the impacts of agglomeration diseconomies (Fujita & Thisse, 2002; Meijers & Burger, 2010). Cities with larger subcenters and a more balanced distribution among these subcenters are often conceived to be more productive (Li & Liu, 2018; Liang & Lu, 2019).

Research has also shed light on the causes of polycentric urban development. The driving force for the formation of new sub-centers has principally been interpreted as agglomeration diseconomies, arising from traffic congestion, increased land rent, and rising commuting costs (Ahlfeldt & Wendland, 2013; Anas & Kim, 1996; Lucas & Rossi-Hansberg, 2002; McMillen & Smith, 2003). Meanwhile, improvements in private transportation and telecommunications reduce the importance of agglomeration, further encouraging firms to disperse geographically (Arribas-Bel & Sanz-Gracia, 2014; Pfister et al. 2000).

The effects of state-led practices have also been extensively researched. Multiple-center urban planning or development strategies are regarded as playing a critical role in forming polycentric urban structures (Liu & Wang, 2016; Xie et al. 2018). City governments' participation in land and housing development of new towns has greatly promoted the formation of polycentric cities, as demonstrated in Korean and Chinese cases (Lee & Shin, 2012; Liu & Wang, 2016). Murakami and Chang (2018) argued that the transfer of land-use rights from local governments to property developers greatly predetermines the long-term trajectory of polycentric development. Additionally, municipal infrastructure investment in suburban areas facilitates the development of polycentric urban structure. For example, Garcia-López et al. (2017) verified the positive effect of railroads on the formation of urban sub-centers.

3 | RESEARCH STRATEGY

3.1 | The case study of Changsha

Changsha is the capital of Hunan province in south-central China. The total area of the city is 11,816 km^2, with 2150.9 km^2 constituting the urban region (Changsha Statistics Bureau, 2019). This urban region comprises inner five districts: Yuelu, Kaifu, Furong, Tianxin, Yuhua. In 2020, Changsha had a household-registered population of 10.06 million, ranking 17th among China's most populated cities, and its GDP had reached 12.14 trillion RMB, ranking it 13th nationally (National Bureau of Statistics of China, 2021).

Changsha is selected as the studying case for two reasons. First, its polycentric urban configuration is evident, and its polycentric urban development process is complete and intensive enough to provide a persuasive case. Second, Changsha is neither a leading city in China nor one that is lagging behind in terms of economic growth or urban population. Third, Changsha did not receive any unique privilege or policy support from the central government for urban development. The polycentric urban development process in Changsha is aligned with other Chinese cities. Thus, the research findings with the case of Changsha therefore may be applicable to many other cities in China.

3.2 | Interview and data collection

The primary research method in this study is a field survey, comprising semi-structured interviews and direct observations. Snowball sampling was employed to ask respondents in the preliminary interview to recommend suitable government departments and participants for a further semi-structured interview. Seventeen in-depth interviews and a focus group meeting were conducted from November 2015 to October 2019 in Changsha. There are four categories of respondents in the interviews, which include: (i) government officials who are responsible for investment attraction affairs (Commerce Bureaus of Kaifu, Yuhua, and Yuelu districts); (ii) office leasing and sales managers of office building developers (BOFO International Plaza, North Star Time Square, and Jinmao ICC); (iii) department heads of newly incoming firms that are in charge of site selection (Hengfeng Bank, PwC Accounting, and DHC Software); and (iv)

office-broking manager from a real estate consultancy company (Cushman & Wakefield). The participants of the focus group meeting are all staff members from commerce bureaus of Kaifu.

They were asked to respond to the questions relevant to 'intra-urban competition situations for mobile investment', 'competitive endeavors taken by governments', 'the impact of incentive schemes on decision-making', 'the factors affecting site selection', 'the interaction between incoming firms and governments', etc. Archive studies, retrieval of census, and secondary data collection from government sectors and professional websites were conducted to supplement the research.

4 | THE RISE OF INTRA-URBAN COMPETITION AMONG URBAN DISTRICTS

In 1994, China reformed the tax-sharing system with respect to taxes levied by the central and local governments, reserving the largest and most stable parts of tax revenue for the central government (Wong & Zhao, 1999). As a result, local governments throughout China encountered severe fiscal deficits. The prosperity of real estate development provided an alternative channel of revenue for local governments through leasing of state-owned land (Li et al. 2011). The resulting land leasing income has become an indispensable supplement to local fiscal revenue. For instance, the nationwide land leasing income in 2018 was 6.51 trillion RMB, which accounted for 35.5 per cent of the revenue in China's general public budgets (Ministry of Finance of the People's Republic of China, 2019).

Nevertheless, there is limited and decreasing available land for leasing in inner cities. As presented in Table 1, the land leased for real estate development in Changsha has been low and decreasing following the peaks in 2005 and 2007. Thus, local governments, especially at the district level in inner cities, have been obliged to seek other sources of income to offset budgetary deficits.

In view of this, attracting advanced producer service firms has become the optimum choice for district-level governments, owing to these companies' minimal land occupation, non-polluting nature, and high tax revenue. For example, the five urban districts in Changsha have all prioritized the development of finance, commerce and trade, cultural creativity industries, etc., as shown in Table 2.

Consistent with the emphasis on the development of advanced producer service industries, each urban district has proposed to build an urban center or sub-center (i.e., known as 'financial centers', 'quasi-CBDs', and 'international new towns' in regional strategic planning) to accommodate prospective advanced producer service firms (Table 3). These planned urban centers are portrayed by local states as promising harbingers of the future and advertised extensively with iconic slogans such as 'The Bund', 'Wall Street' and the like. The five urban districts of Changsha have invested heavily in the infrastructure and public facilities of these designated places, as well as attracting private investment in high-rise office buildings, large shopping malls, and five-star hotels by means of land write-downs, cash rewards, and other methods. Thus, these proposed urban centers/sub-centers in the five urban districts of Changsha are taking shape physically in the short term under public-private joint efforts.

The homogeneity in prioritized industries and urban center/sub-center development among the five urban districts has inevitably led to intensive intra-urban competition for economic growth in Changsha. Thus, these districts compete with each other to attract not only incoming firms but also extant firms in other districts. This is somewhat surprising, as this dissipation of economic rents might not be expected in a more centralized governance system. Consequently, the global top 500 companies and financial enterprises have become the focus of competition among the urban districts.

5 | THE STATE-LED INVESTMENT ATTRACTION SYSTEM IN INTRA-URBAN COMPETITION

5.1 | The involved government sectors and incentive schemes

The five urban districts have all made extensive endeavors to attract mobile investment to succeed in the intra-urban economic competition. As argued by Baybeck et al. (2011), learning and economic competition lead to the diffusion of policy across local authorities. Thus, the district-level governments imitate the effective competitive policies of neighboring governments.

TABLE 1 The area of land leasing for real estate development in Changsha

Year	2003	2005	2007	2009	2011	2013	2015	2017
leasing land (10,000 m^2)	789.72	1007.59	973.23	392.92	331.17	458.99	106.68	205.85

Source: Changsha Statistics Bureau (2019).

TABLE 2 The competitive policies of the five urban districts in Changsha

Urban district	Competitive incentive policies
Furong District	The incentive measures to promote economic development in Furong District (2013)
Tianxin District	The measures to promote financial industry development in Tianxin District (2014) The incentive measures to promote regional economic development (2014)
Kaifu District	The provisional incentive measures of economic development in Kaifu District (2014) The incentive measures to promote financial industry development in Kaifu District (2016)
Yuhua District	The incentive measures to promote regional industry development in Yuhua District (2014) The incentive measures to promote financial industry development in Yuhua District (for trial implementation) (2015) The incentive measures to promote cultural industry development in Yuhua District (for trial implementation) (2015) The incentive measures to promote professional service industry development in Yuhua District (for trial implementation) (2015)
Yuelu District	The schemes of promoting headquarter economy development in Yuelu District (2012) The schemes of promoting cultural industry development in Yuelu District (2013) The incentive measures to promote regional economic development in Yuelu District (2014) The policy suggestions of developing service industry development in core area of Xiangjiang New District (2014) The policies of promoting service industry development in Yuelu District (2015)

Source: collected from the official websites of five urban districts respectively.

TABLE 3 Prioritized industries and proposed urban centers in the urban districts of Changsha

Urban district	Priority industries	Proposed urban center
Furong District	Finance, Commerce & Trade, Tourism	Furong CBD (traditional central business district of Changsha)
Tianxin District	Finance, Trade & Logistics, Cultural Creativity, Hotel & Catering, Tourism, IT, Agency	Nanhu New Town (financial bund of Xiang river)
Kaifu District	Finance, Cultural Creativity, Trade & Logistics,	Changsha Financial & Commercial Zone (regional financial center and 'Wall Street of Central China')
Yuhua District	Commerce & Trade, Finance, Cultural Creativity, Tourism	High-Speed Rail New Town (Regional CBD of Changsha)
Yuelu District	Finance, Cultural Creativity, Tourism, Trade & Logistics, IT, Health, Agency	Riverside New Town (financial center of Hunan province)

Source: collected from official documents and government websites of the five urban districts

Consequently, all five urban districts deploy essentially the same competitive strategies.

For the involved government departments, the main functions of investment attraction have been partially devolved from the Commerce Bureau to produce a model known as 'one bureau and two centers' (i.e. the Commerce Bureau, the Modern Service Industry Development Center, and the Financial Affairs Center). The Commerce Bureau was originally the only authority responsible for investment attraction affairs, the Modern Service Industry Development Center is a newly established agency to specifically facilitate the settlement and subsequent service of incoming firms, and the major duty of the Financial Affairs Center has shifted from supervision to attraction of financial business. Additionally, other government departments are required to undertake part of the function of investment attraction. For example, the Bureau of Industry and Information Technology has been endowed with the new responsibility of attracting high-technology enterprises. The financial and taxation sectors are also required to estimate the future fiscal income of new investment, while the judicial department takes charge of investment contract reviews.

In terms of the inputted manpower resources, the deputy principal or above in each urban district is appointed to specifically take charge of promoting investment attraction, and, aside from the staff originally allocated to investment attraction, a portion of staff from other government sectors has been requested to temporarily shift their obligations to this aspect of government. For instance, a respondent from the Yuhua district-level government stated that 'my colleagues, originally working in the Statistical Bureau, were dispatched to other cities to contact and lobby potential investors for several months, aiming to enhance the staff resource of investment attraction''. Comments such as

this would not be out of place in the context of traditional economic development functions in the United States.

Additionally, local authorities have announced competitive policies with various incentive schemes to attract incoming firms, with several having formulated additional competitive policies specifically to financial and cultural industries. Table 2 lists the competitive incentive policies of the five urban districts in Changsha.

The incentive schemes of such competitive policies are generally categorized into: (i) *monetary subsidies* in the form of cash rewards for new investment and relevant intermediaries, monetary subsidies for buying or renting office space, and development fund support; (ii) *tax relief* via tax credits or individual income tax abatement for senior executives; (iii) *administrative assistance* in terms of regulatory flexibility, one-on-one service from major government officials; (iv) *business-operation assistance* via low-interest loans, labor recruitment, and training support; and (v) other incentives such as priority provision of public housing and quotas of top schools. Furthermore, renowned companies, especially those from Fortune Global 500 and China's top 100 companies, are eligible to negotiate directly with district- or city-level governments on a case-by-case basis for particular preferential treatments that go beyond the normal privileges.

In summary, to succeed in intra-urban economic competition, every district-level government has designated several sections with large numbers of civil servants to engage in works related to investment attraction. Meanwhile, they also provide a variety of incentive schemes to attract mobile business. Correspondingly, the extant and incoming firms actively communicate and negotiate with different urban districts to seek the most beneficial incentive packages. As one interviewee said, 'once [our company] decided to enter into Changsha, we began to negotiate with different urban districts for possible investment, and make them bid against each other to offer the best incentive package''.

5.2 | The supplemental role of private partnership

During the intra-urban competition process, private enterprises are also intimately involved in the state-led investment attraction system. To secure more sales/rents to incoming firms, office building developers have to cooperate with relevant government sectors in various investment attraction affairs, such as data collection, investment promotion activities, brand advertisement of districts, and others. For example, developers are requested to provide space and other assistance in their office buildings for district-level governments to set up service hubs, which perform on-site administrative service provision, information collection from office buildings and settled firms, and related tasks. Property management companies of office buildings that may influence the location choice of firms are also brought into the state-led investment attraction system through staff training, model selection, industry association, and monetary reward.

Even when incoming firms directly access office building developers or real estate brokerage companies for site selection, these private agencies still encourage incoming firms to contact district-level governments, as the preferential treatment offered by urban districts facilitates deals between them. Meanwhile, these private agencies can acquire intermediary rewards from district-level governments, according to the urban districts' competitive incentive policies.

6 | THE SPATIAL CONSEQUENCE OF STATE-LED INVESTMENT ATTRACTION

In the intra-urban competition for mobile investment, all urban districts fight for advanced producer service firms with the unique state-led investment attraction system. Following the Chinese institutional settings, this operates with a prominent characteristic of *equalitarianism*, which is a means of preventing the kind of economic rent dissipation alluded to earlier.

First, higher tiers of government (city-level) have formulated legislation to prevent fierce intra-urban competition among urban districts. According to the regulation set by the Changsha Leading Group Office of Investment Attraction,[1] the urban district that first contacts an incoming firm has the privilege of prior negotiation. The number of urban districts that can join in the negotiation with a given firm is no more than two. If district-level governments are found to contravene the regulation, they would be penalized by disqualification from yearly assessment, decreased funding support, circulation of criticism notices, or even by their principal governors being held personally accountable.

Second, the preferential treatments offered by each urban district are strictly inspected in year-end audits by high-level government. The relevant administrative governors are held accountable if the treatments are beyond a reasonable level of generosity, such as exorbitant monetary subsidies or excessive deregulation. This constraint on preferential treatment, especially the various kinds of monetary subsidies, can prevent the affluent urban districts from winner-take-all situation with a cycle of higher monetary inputs leading to more investment influx to themselves only.

Third, the resource endowments of urban districts for location decisions of incoming firms tend to be diversified, not limited by the traditional rule of geographical advantage. That is, every urban district has its own comparative advantages that are attractive to

incoming firms with various preferences. This is what one finds in the United States, as documented for example by Giuliano et al. (2019) for their case study of Los Angeles. In the case of Changsha's Furong district, where the traditional CBD is located, it has the advantage of a central location and comprehensive business facilities. Yuelu district is further away from the traditional city center, but endowed with the privileges of a state-level new area (Hunan Xiangjiang New Area) in the aspects of land supply, taxation, etc. Yuhua district offers a wider range of producer service businesses for incoming firms, as it has more advanced industrial development with numerous industrial enterprises. Therefore, despite the convergence of monetary subsidies, each urban district is able to provide its unique preferential treatments.

Consequently, the state-led investment attraction system with equalitarian features allows every urban district to gain an equitable portion of firms during the intra-urban competition process. That is to say, the extant and incoming firms are (re)located into different urban districts, rather than concentrating in traditional CBDs. The distribution of the advanced producer service firms in Changsha has unmistakably supported this argument.

Taking financial enterprises (including banks, insurance companies, and securities enterprises) in Changsha as an example, Table 4 presents the time-series changes of their provincial or national headquarter office locations from 2004 to 2019. In 2004, Changsha was a typical monocentric city, with half of its financial enterprises located in the traditional Furong CBD. This spatial configuration remained unaltered until 2009. Subsequently, as more financial enterprises set up regional headquarters in Changsha, these enterprises gradually dispersed into different localities, instead of congregating in the traditional city center. This trend was especially prominent during the period of 2014 to 2019. For instance, at the end of 2014, not a single financial enterprise had placed its headquarters in Yuelu district, but ten enterprises did so in the following five years, coinciding with the establishment of state-level Xiangjiang New Area. Changsha has thus evolved from a single-center city to a polycentric urban development with multiple centers.

Moreover, of all 96 financial enterprises in Changsha at the end of 2014, more than half (49 enterprises) moved their headquarters in the subsequent five years (2015–2019), while only three enterprises had done so before this period. Furthermore, 36 out of those 49 enterprises were relocated into other urban districts. This sharp increase in office relocation of financial enterprises is evidently in accordance with the rise of intra-urban competition for advanced producer service firms. This kind of transformation indicates the intensive restructuring of urban spatial distribution of advanced producer service firms towards polycentricity.

Generally, the state-led investment attraction strategy in Chinese institutional settings has the prominent characteristic of equalitarianism, which ensures that every urban district accommodates an almost equal share of advanced producer service firms, especially financial enterprises and Global 500 firms. In other words, the extant and incoming firms are distributed among the proposed urban centers of different districts via the state-led investment attraction in intra-urban competition. It follows that the state-led investment attraction system engenders the emergence of polycentric urban development among Chinese cities.

7 | CONCLUSION

Meeting the UN Sustainable Development Goals poses a daunting but essential challenge for all countries. As the world continues on its relentless path of urbanization, the resulting urban development patterns will be a crucial factor in determining whether each country's SDG commitments are met. Increasingly, metropolitan regions are polycentric in form, and this trend may be a positive one, balancing opposing forces of agglomeration economies and congestion effects. Ultimately, local governance will determine whether this process is well managed and fruitful.

TABLE 4 The number of financial enterprises' headquarters in urban districts of Changsha

Urban district and proposed urban center	2004	2009	2014	2019
Furong District (Furong CBD)	17 (50%)	29 (44.6%)	38 (39.6%)	33 (28.7%)
Tianxin District (Nanhu New Town)	7 (20.6%)	16 (24.6%)	23 (24.0%)	21 (18.2%)
Kaifu District (Changsha Financial & Commercial Zone)	6 (17.6%)	9 (13.8%)	14 (14.6%)	22 (19.1%)
Yuhua District (High-Speed Rail New Town)	4 (11.7%)	11 (16.9%)	21 (21.8%)	29 (25.2%)
Yuelu District (Riverside New Town)	0 (0%)	0 (0%)	0 (0%)	10 (8.7%)
Total	34	65	96	115

Source: collected from the website www.tianyancha.com

Using Changsha as a case study, this research uncovers two key findings. First, inner urban authorities all put emphasis on the advanced producer service industry development as the alternative fiscal revenue channel to replace land leasing. This homogeneity in priority industries gives rise to intensive intra-urban economic competition, in which urban districts within a city compete with each other for mobile investment. They adopt a distinctive state-led investment attraction strategy, by devoting several government sectors with large numbers of civil servants to investment attraction and offering a variety of incentive schemes to attract incoming firms. The fundamental economic drivers of urbanization manifest themselves in China much the same as anywhere else. We find this not only in the push and pull of agglomeration economies and congestion effects, but also in the tendency for potential firms to play off one local jurisdiction against another, as a means of extracting the most favorable terms. This can result in the dissipation of economic rents accruing from the scarcity value of urban land.

The second key finding is that China's governance system does provide significant capacity for staunching this economic rent dissipation. This is most evident in the so-called *equalitarianism* principle, which is embodied as: (i) tight regulation of intra-urban competition by higher-level governments; (ii) regular auditing of preferential treatments to prevent monopolization; and (iii) diversified resource endowment for location decisions. It should also be noted that those rent-dissipating behaviors are themselves a fairly direct result of fiscal imperatives imposed by the national level government, especially the 1994 tax-sharing reforms that left local governments to scurry for fiscal revenues through land-leasing arrangements of state-owned urban land.

The findings of this research have greatly enhanced our understanding of the causes of polycentric urban development. The findings are derived from a case study in transitional China, however, and thus are only partial evidence to be applied to cities in other countries. That is, the particularity of Chinese cities and their institutional setting may impose restrictions on the generalizability of the research findings. Nevertheless, this is an exploratory study that will lead to subsequent research examining the polycentric urban spatial configuration from the perspectives of intra-urban competition and investment attraction systems. This kind of research calls for more extensive empirical studies with examples from different developed and developing countries to seek more general conclusions. Attainment of the UN Sustainable Development Goals hangs in the balance.

ENDNOTE

1. Changsha Leading Group Office of Investment Attraction is a city-level governmental agency that is responsible for citywide investment attraction affairs, including complaint handling from incoming firms, coordination among urban districts, etc. The mayor normally takes the post of group leader.

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