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**DOI**

[10.3390/su12125179](https://doi.org/10.3390/su12125179)

**Publication date**

2020

**Document Version**

Final published version

**Published in**

Sustainability

**Citation (APA)**

Song, Y., Stead, D., & de Jong, M. (2020). New Town Development and Sustainable Transition under Urban Entrepreneurialism in China. *Sustainability*, 12(12), Article 5179. <https://doi.org/10.3390/su12125179>

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Article

# New Town Development and Sustainable Transition under Urban Entrepreneurialism in China

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Received: 8 June 2020; Accepted: 23 June 2020; Published: 25 June 2020



**Abstract:** New towns are a major form of urban growth in China. In recent years, increasing numbers of large new town projects have been planned and built in and around existing cities. These new town projects have frequently been employed by city governments as central elements of pro-growth strategies, based on ideas of urban entrepreneurialism, which seek to promote economic growth, project a dynamic city image, and increase urban competitiveness. This article studies how the pro-growth, urban entrepreneurial approach affects the planning and development of Chinese megacities. A conceptual framework focusing on land-leasing revenue and new town development strategies is employed to explore the linkages between urban growth mechanisms and urban outcomes. Empirical material from four cities in the Pearl River Delta—Guangzhou, Shenzhen, Foshan, and Zhuhai—is presented. The analysis indicates that new town developments in these cities have different levels of dependency on spatial expansion and land revenue, and emphasize different issues of sustainable development in their plans. Cities with a lower dependency on physical and economic growth are more likely to emphasize the quality of the built environment and address issues of sustainable urban development more closely when planning and implementing new town projects.

**Keywords:** new town development; urban entrepreneurialism; land-driven economy; Pearl River Delta

## 1. Introduction

China has undergone high levels of urbanization and economic growth for several decades since major economic reform in 1978, during which its urban population grew from 172 million to 831 million by the end of 2018 [1]. In the early part of the 21st century, the Chinese government announced its plan to build 20 new towns every year before 2020 [2,3] and new town development has gradually become a key form of urban growth [4]. Various types of new towns have been planned and developed in recent decades including university towns, administrative new towns, high-speed new towns, financial city, smart city, eco-city, and low-carbon city [5]. New town development with progressive and sustainable urban concepts not only creates new economic development poles in the city, but is also used by city authorities to symbolise local urban and economic achievement, better quality of life, and innovative urban transitions.

The increasing popularity of sustainable urban concepts in China is due to intensive competition among cities [6]. Capitalist cities tend to compete with each other to increase their attractiveness to capital, talent, and visitors [7,8]. Local governments have adopted pro-growth approaches through ‘place making or promotion’ [9] ‘civic boosterism’ [10], prestige projects [11] to stimulate local economic growth and increase their competitiveness. Similar entrepreneurial strategies have also been adopted in Chinese cities [12–14]. Recently, various theories used to explain pro-growth urban governance in capitalist cities, such as entrepreneurialism [7], growth machine [15], and urban regime [16], have been applied to the Chinese context [4,17,18].

In general, entrepreneurial governance in China is often led by local government and strongly influenced by the legacy of state socialism [12]. There are several defining characteristics of China’s ‘entrepreneurial local state’, such as the 1994 tax-sharing system reform [19], land property and market reform [4], and cadre appointment system [20]. Each of these characteristics encourage local governments to adopt pro-growth urban development strategies to increase extra budgetary revenue, and enhance local economic and political performance. Furthermore, local governments are also protected by ‘soft budget constraints’ [21], which means that they are cushioned from financial losses if urban investments do not provide a return. This has generated a tendency for local governments to overspend and overdevelop [22]. For instance, Long (2019) identifies 180 cities in China with shrinking populations, which are nevertheless making pro-growth urban master plans based on ambitions for population and urban growth in the near future [23]. In extreme cases, some new town projects have resulted in ‘ghost towns’ where urban expansion has far outpaced population growth [24].

New town or ‘new city’ [4] development is China’s main strategy of ‘city making’ [25], as new towns not only house residents and businesses, but also provide new centres of regional spatial reconfiguration [26], contributing to ‘a globalizing central area that formed a unified global city region’ [27]. The increasing popularity of sustainable and innovative urban concepts like eco-city, low-carbon city, sponge city, smart city, and knowledge city in Chinese new town development illustrate the attempts of local governments to create global cities and boost their attractiveness through city branding and marketing [6,28]. Using sustainability as a ‘city branding’ tactic highlights that local government is not only a market regulator or a unique player, but it can use market instruments to achieve its hidden political agendas. De Jong (2019) argues that this ‘eco-civilisation’ and ‘new-type urbanisation’ agenda is not likely to be genuinely implemented under its structural institutional mechanism encouraging the accumulation of land and power of local elites [5,29]. Through the transition from rural industrialism to new urbanism, new town development generally embraces a regime of accumulation and legitimation from land value [4], turning suburbs into spaces of capital accumulation [30]. These observations suggest that new town developments are often a feature of local governments’ pro-growth strategies, which can lead to overspending and unnecessary investments, and potentially hamper the implementation of its sustainable and innovative urban objectives in the long run.

There is a large amount of literature on China’s new town development and its urban entrepreneurial mechanism. At the same time, there is a lack of empirical evidence on how local pro-growth strategies affect the planning and development of city-level new towns and the implementation of sustainable and innovative objectives. This article aims to fill the gap by examining local government rationales and strategies of new town planning, development, and the potential urban outcomes, and to contribute to a deeper understanding of China’s local politics and urban growth of new town development in both theoretical and empirical terms. The article is organized in six parts. Section 2 reviews urban theories that help to explain the cause and effects of land-driven economy and pro-growth mechanism in China’s urbanisation and new town development. A conceptual framework is proposed to explore the linkages between urban growth mechanisms and urban outcomes. Section 3 outlines the methods used to select cases and gather data. Sections 4 and 5 examine and analyse the selected cases with the conceptual framework. Section 6 discusses the results and analysis from the examination of the case studies and Section 7 concludes on the main findings from the study.

## 2. Urban Entrepreneurialism in New Town Development

### 2.1. Urban Entrepreneurialism in China

Understanding China's urban governance and its urban transformation, including new town development, requires an understanding of its post-socialist state-market relation in facilitating urban growth [31]. As already illustrated above, two main paradigms of urban growth machine and urban entrepreneurialism are often used to explain China's growth mechanism [7,15]. For example, drivers of urban development in Shanghai have been explained in terms of post-socialist pro-growth coalitions [18,32]. From the perspective of neo-liberalism and entrepreneurialism, post-socialist reforms have led to the creation of new local governments in China that are more 'entrepreneurial' in nature [17,33,34], but lacking in financial discipline and public accountability, which promote urban growth for political and economic objectives [21]. To understand how China's entrepreneurialism differs from that in other parts of the world, and the relations of its growth mechanism with new town development, it is first necessary to provide some more detail about the institutional context.

China's 1994 tax-sharing system reform is a key foundation of the land-driven economy and its concomitant governance. The goal of the reform was to increase tax revenue of the central government from lower tier governments. After the reform, local municipal governments had to transfer a larger share of their tax revenue to the central government, but in return they had more decision-making power in local urban development and were allowed to keep all revenue by leasing land to developers [19]. However, there is a gap between local tax income and public expenditure. In 2018, for instance, local governments collected 53% of the 'general public budget revenue' (tax revenue), but were responsible for 85% of total tax expenditure. Although the 'transfer payment' system has enabled provincial and central government to allocate tax revenue to facilitate those local governments in severe deficit, local governments in general have to seek extra budgetary revenue to support local development, and the revenue by leasing land has become a major source (which is also known as 'government-managed funds revenue'). The tax-sharing reform resulted in a decentralization of decision-making power in land politics, which made the behaviour of local government more firm-like [35]. The fiscal decentralisation not only laid the foundation for its formation of pro-growth urban development mechanisms, but also provided a new motivation for local governments to lead and promote local urban development projects.

Another significant institutional change is the shift in China's cadre appointment and evaluation system, which generates local leaders. Under China's cadre appointment system, local leaders are appointed by upper-tier governments. Since 1978, the economic performance of cities became a key criterion for evaluating the suitability of local leaders for positions in upper-tier governments [20]. Urban growth, especially new town development, became a preferred way for local governments to demonstrate local economic growth and modernization achievements after an extensive wave of industrialization (*kaifagu*) in 1990s [4]. Thus, local leaders are often zealous in promoting conspicuous local economic growth in order to secure career promotion in China's administrative hierarchy [36]. For key local officials, like those in megacities, urban achievement is often more about prestige and less about functionality or sustainability [37].

Land and housing reform is another key factor in shaping local government's pro-growth approach. The establishment of a land leasehold market and the enacting of the Land Administration Law and Planning Act in 1998 made the previously strictly state-owned land and properties tradeable [38]. Local governments therefore have the legitimate right in land requisition, leasing out to developers, and retaining most income. Soon thereafter, local governments, as *de facto* owners of land within their jurisdictions, were not solely land suppliers but also major market players [21]. Local governments became more willing to initiate and lead urban projects to inflate local economic and political performance through local state corporatism [39], local state entrepreneurialism [40], and private-public partnership with developers [41].

After the above institutional reforms, local governments acquired significant autonomy in the disposal of land and finance, two vital resources in urban development [21]. From an urban governance perspective, local governments rely on non-public investors and form coalitions as it is not financially feasible to undertake large projects alone [42]. A pro-growth approach is therefore adopted, which has heavy reliance on the property sector to promote economic and urban growth [36,43]. According to such pro-growth approaches, infrastructure projects and property-led development have become an essential mechanism to restructure urban areas, build a good city image, and attract investment. However, it has also been criticised for resulting in a diversion of public resources from social needs [21], lacking public accountability and social goals [44], and causing overheated property booms. The approach also creates a reliance on land-driven revenue (*tudi caizheng*) of local governments, especially of the relatively developed cities. Due to the increasingly strict regulation and macroeconomic control in first-tier cities like Beijing, Shanghai, and Guangzhou, pro-growth strategies based around maximising land revenue have become more prevalent in second-, third-, and even fourth-tier cities in recent years [45]. In other words, pro-growth approaches have become a default mechanism for many local governments in China when planning urban development. The nature of this pro-growth mechanism is the focus of analysis in this paper.

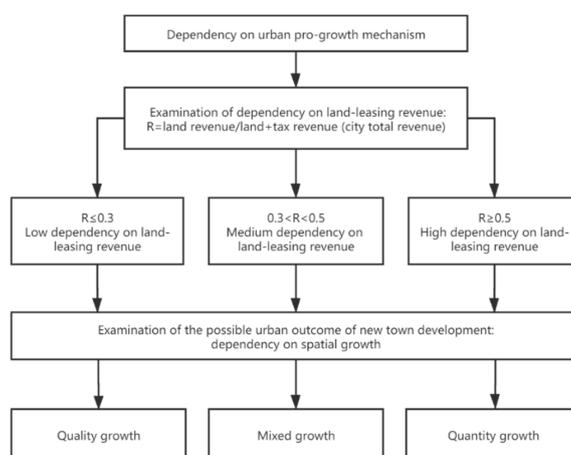
## 2.2. New Town Development

New town development in China is the main strategy of ‘city making’, and is the main form of urban development, which is closely connected to the formation of China’s pro-growth mechanism. According to Wakeman (2016) “new towns are not a novelty, but have an established history and well-known experiences” [46], and this is also the case in China. New towns or ‘new cities’ (*xin cheng*) began to gain importance and popularity in the late 1990s, marking the major transition from industrialism to urbanism [4]. The history of new town development in China reflects the evolution of national land politics. The new towns of early 2000s reflected the efforts of local governments to consolidate their territorial authority over urban fringe and rural hinterland where rural governments used to enjoy a high degree of decentralised land control of *kaifaqu* (development zone, usually refers to industrial parks) during the 1980s and early 1990s [4]. Around this time, new towns tended to act as multifunctional satellite or commuter towns constructed to accommodate the rapid growth of the urban population (or university towns for the expansion of universities from late 1990s). However, as intercity competition intensified, the nature of new towns gradually shifted and increasingly became sites for spatial reconfiguration of the city and its wider region. Innovative and sustainable urban concepts such as financial city, eco-city, low-carbon city, smart-city, and knowledge city were used to justify (or simply to label) new town projects. These justifications or labels were designed to tap into the international urban discourses to increase global urban competitiveness and attractiveness.

In China, the term new town covers a wide range of urban development. It can be used to describe new communities, new towns, new districts, and new cities [47], from urban centres, urban fringes, to rural hinterlands. The ambiguity of new towns is not merely a linguistic problem; new towns in China are difficult to explain in terms of a single discourse, urban tradition, or historical era [25]. In practice, various actors, from municipalities to private developers, use the term ‘new town’ on their projects, from city-level urban projects up to tens of square kilometres, to neighbourhood-level gated communities. In this article, we only look at new town projects initiated by municipalities to see how local governments shape urban outcomes from a political economy perspective.

The study employs a conceptual framework with a two-step approach to explore the linkages between urban growth mechanisms and urban outcomes (Figure 1). In the first step, the dependency on land-leasing revenue in city’s fiscal structure is examined, since this is the key indicator of urban growth process as capital accumulation. Chinese local governments have two major sources of revenue: Tax revenue and land-leasing revenues. To measure the dependency of land-leasing revenue, the ratio of land-leasing revenue to total revenue is measured ( $R$ ). Where a city’s land-leasing revenue is equivalent or even surpasses its tax revenue ( $R \geq 0.5$ ), then this city relies on land-leasing revenue

and can be regarded as high dependency. As a reference, in 2018, the total tax revenue of all local governments in China is 7595 billion yuan, and the total land-leasing revenue is 6291 billion yuan [48]. The  $R$  of all local governments is therefore 0.45. Using this as an average figure and considering the fact that most Chinese cities adopt pro-growth strategies, it is assumed that cities with  $R$  from 0.3 to 0.5 have medium dependency on land-leasing revenue and cities with  $R$  less than 0.3 have low dependency on land-leasing revenue. The assumption of distinguishing low, medium, and high dependency on land-leasing revenue is not generated through strict quantitative analysis (which is not the goal of the paper). Where a city has far more revenue from tax than from land-leasing, then this city no longer bound by the mechanism of urban growth to boost local fiscal revenue. Thus, it is likely that the main purpose of urban development of the city gradually changes from quantity to quality. This is then examined in more detail by referring to the overall strategies and urban outcomes of the new town projects of these cities. Cities with a high dependency on land-leasing revenue are likely to develop new towns for quantity growth both fiscally and physically. Cities with land revenue as priority have higher risk of overdevelopment and urban sprawl, and those new towns branded with sustainable and innovative concepts, if any, are unlikely to be implemented as they are subject to city branding for capital accumulation. Cities with medium dependency on land-leasing revenue may evolve a mixed growth pattern. For these cities, land-leasing revenue still matters, but they may not rely on massive spatial growth to sustain its land-leasing revenue growth. They may try to focus more on the quality of urban environment as it enhances city's attractiveness in the long run, but the implementation process is likely to be constantly challenged by the need to boost land revenue, especially in new town projects. Finally, cities with low dependency on land-leasing revenue should also have low dependency on spatial growth. New town projects in these cities are likely to aim for urban quality growth such as sustainable urban transition.



**Figure 1.** Conceptual framework with a two-step examination of dependency on pro-growth mechanism to possible urban outcomes.

### 3. Research Methods and Data Collection

The paper draws on empirical evidence from four cities in the Pearl River Delta (PRD) of Guangdong province: Guangzhou, Shenzhen, Foshan, and Zhuhai. They represent the four wealthiest cities in the PRD in terms of GDP per capita, but are very different in terms of city size and population (Table 1). Guangzhou and Shenzhen are first-tier cities and have similar levels of population and GDP, but Guangzhou's land area is much bigger than Shenzhen (i.e., Shenzhen has much higher population density). Zhuhai and Shenzhen have similar levels of GDP per capita but Zhuhai is a much smaller city than Shenzhen with a much lower population density. Foshan has the lowest GDP per capita of the four cities, and around the same level of population density as Guangzhou. They are also different in terms of administrative arrangements: Guangzhou is the provincial capital city of Guangdong

province; Shenzhen and Zhuhai are special economic zones (SEZ) while Shenzhen is directly under the central government; Foshan is an ordinary city.

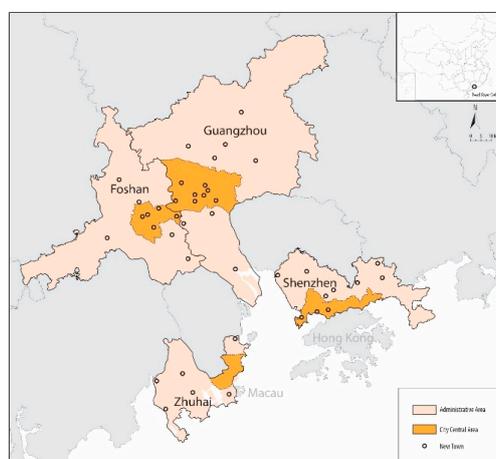
A major reason for comparing these four cities is they are all located within one highly competitive regional urban system: The Pearl River Delta. It is widely recognised that these cities are often in competition with each other [49–51]. According to Porter’s competitive city concept [52], cities compete with each other and their competition does not fundamentally differ from national level competition. Thus, the competitiveness of a city is determined rather by indigenous factors than external ones, among which its local socio-economic environment works as an indispensable source of growth dynamics [21]. Guangzhou and Shenzhen are in competition for the leading role in the PRD region in terms of urban economic development, while Zhuhai as a much smaller city is competing with other megacities for urban environment, liveability, and sustainability. Foshan, on the other hand, as the neighbouring city of Guangzhou, is competing with its lower level of living costs and looser controls on industry. If intercity competition motivates cities to pursue more innovative and sustainable urban development to attract investment, residents, and visitors, then examining cities that interrelate within a highly competitive urban network can provide a richer understanding of the rationale of new town development strategies, how their growth mechanism works, and what this implies for urban sustainability.

**Table 1.** Basic information of Guangzhou, Shenzhen, Foshan, and Zhuhai and their rankings in the Guangdong province.

	Guangzhou	Shenzhen	Foshan	Zhuhai
Administrative Land Area (sq.km)	7434	1997	3798	1736
Population (2018)	15,305,900 (1st)	13,026,600 (2nd)	7,905,700 (4th)	1,891,100 (21st)
Density of Population (Person/sq.km)	2059	6522	2082	1089
GDP (billion yuan; 2019)	2363 (2nd)	2693 (1st)	877 (3rd)	344 (6th)
GDP/capita (yuan; 2019)	156,427 (3rd)	203,489 (1st)	117,985 (4th)	177,550 (2nd)

Source: Statistic Year Books of Guangzhou [53], Shenzhen [54], Foshan [55] and Zhuhai [56].

New-town projects in each of these cities were mapped (see Figure 2). The following rules for selecting new town projects were applied: (1) All new town projects mentioned in the urban master plans; (2) new town projects planned by district governments, but not included in urban master plan; (3) national districts emphasized in the urban master plans. Although some gated communities are also labelled as ‘new towns’, they are not included in this study. In very rare cases, some other public actors like state-owned enterprises also develop new towns. For example, the Guangzhou Iron and Steel Group developed Guanggang, a new town on its abandoned industrial site, but as it is closer to a gated community project, it is not included either.



**Figure 2.** Guangzhou, Shenzhen, Foshan, and Zhuhai in Pearl River Delta (PRD) region and their new town projects.

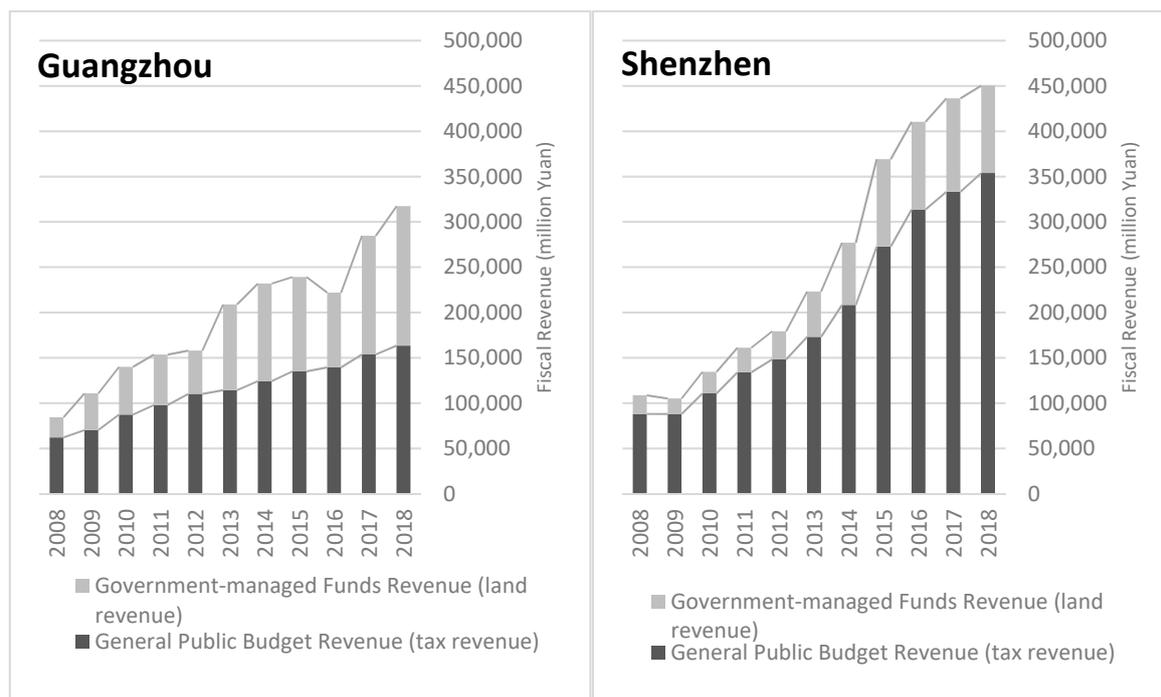
Based on these selected cities and new towns, the following data to support the case studies were collected: (1) City-level fiscal data including tax revenue and land-leasing revenue from city-level statistic year book and budget performance reports; (2) the latest version of urban master plans; (3) basic information of each new town project including their size, concepts, locations, and initiating actors. In addition, interviews were conducted with local university researchers and urban planners to gather supplementary background information regarding new town development in these four cities. Lastly, field work was conducted on some new town projects to examine how they were implemented in practice.

Clearly, this contribution (and its approach) is not without its limitations, which are briefly outlined below. First is the limitation of the underlying conceptual framework. The assumed healthy fiscal revenue structure with a low dependency on land-leasing revenue only applies to relatively developed and prosperous cities. Underdeveloped cities (not represented in the selection) may experience very low shares of land-leasing revenue simply because they are in a recession or debt crisis. This situation is growing more common since in recent years the central government has begun to control the scale of local debts and curbed the growth mechanism by limiting the application of certain policy instruments. These cities relied heavily on land revenue before, and their sudden fall in land revenue certainly does not stimulate high-quality growth. Second, this study focuses more on the overall strategies of cities in new town development. In-depth empirical study on urban outcomes of these strategies is needed to further illustrate the physical impact of pro-growth mechanism.

#### **4. Examination of Dependency on Land-Leasing Revenue**

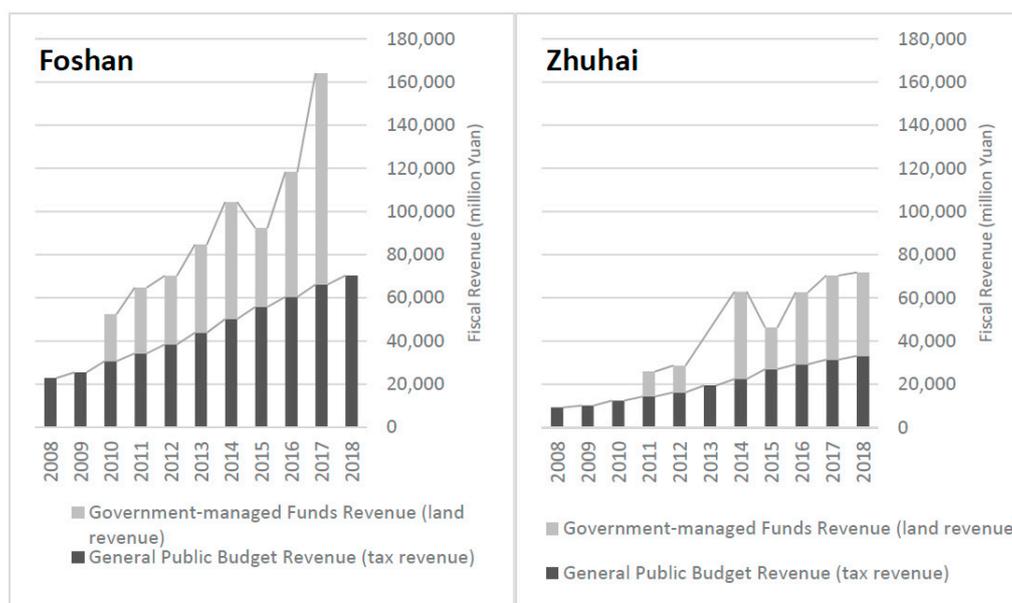
In this section, the dependency on land-leasing revenue of four selected cities is examined. According to data from 2008 to 2018, land revenue has clearly played an increasingly important role in each city's fiscal revenue structure (Figures 3 and 4). For instance, the ratio of land revenue to total revenue in Guangzhou rose from 0.26 in 2008 to 0.49 in 2018, meaning that the growth rate of Guangzhou's land-leasing revenue significantly surpassed the growth rate of tax revenue. Thus, Guangzhou has become increasingly dependent on land-leasing revenue. With almost half of its fiscal revenue from land leasing, Guangzhou has become a city with medium to high dependency on land-leasing revenues. Urban development in Guangzhou is not only a means to enhance its competitiveness but also a way of accumulating capital because of the economic revenues generated during the development process.

Shenzhen's fiscal revenue structure is quite different than that of Guangzhou. As illustrated in Figure 3, the ratio of Shenzhen's land-leasing revenue to its total fiscal revenue never exceeded 0.3 between 2008 and 2018, which represents a low level of dependency on land-leasing revenue of Shenzhen's local government. In general, Shenzhen has far less reliance on the economic contribution of land development. This can be partially explained in terms of land scarcity, which is an important concern in Shenzhen: Its population density is three times higher than Guangzhou. Because Guangzhou has medium dependency on land-leasing revenue, its overall approach to urban development might be assumed to be a combination of both quality and quantity growth criteria (according to the analytical framework presented above). Meanwhile, Shenzhen's relatively low dependency on land-leasing revenue is likely to result in an emphasis on the quality of growth (more than quantity) in its urban development strategies.



**Figure 3.** Land revenue versus tax revenue in Guangzhou (left) and Shenzhen (right) from 2008 to 2018. Sources: Statistic Year Books and Budgetary Reports of Guangzhou [53] and Shenzhen [54].

Foshan and Zhuhai, as lower-tier cities than Guangzhou and Shenzhen, have a higher dependency on land-leasing revenue in general. Foshan's land-leasing revenue was 42–52% of its total revenue between 2010 to 2016. In 2017, 60% of Foshan's fiscal revenue was from land-leasing (Figure 4). As such, Foshan is very dependent on the revenue through land development. The city's reliance on urban growth can be further observed in its strategies to develop new town projects. Zhuhai also witnessed significant increases of land-leasing revenue despite its smaller size. Apart from some missing data (the annual budgetary report of Zhuhai in 2013 is missing on its government website; Zhuhai began to release its budgetary report from 2011 so that land revenue data before that are missing), it can be seen that Zhuhai's land-leasing revenue surpassed its tax revenue in recent years. In 2014, 64% of total fiscal revenue was derived from land-leasing (Figure 4). The latest data for Foshan and Zhuhai show that both cities have more than 60% of their fiscal revenue was from land-leasing, which can be described as high dependency on land revenue according to the conceptual framework (Figure 1). According to the analytical framework presented above, both cities are likely to emphasise the quantity (rather than the quality) of growth in their urban development plans and practices. In the following section, the new town development plans and practices in each of the cities are examined to see whether their urban development strategies match the above propositions.



**Figure 4.** Land revenue versus tax revenue in Foshan (left) and Zhuhai (right) from 2008 to 2018. Sources: Statistic Year Books and Budgetary Reports of Foshan [55] and Zhuhai [56]. Note: The government-managed funds data of Foshan in 2008, 2009, and 2018 are missing, and the Foshan government change statistical calibre in 2016; the government-managed funds data of Zhuhai in 2008, 2009, 2010, and 2013 are missing.

## 5. Examination of New Town Development Strategies

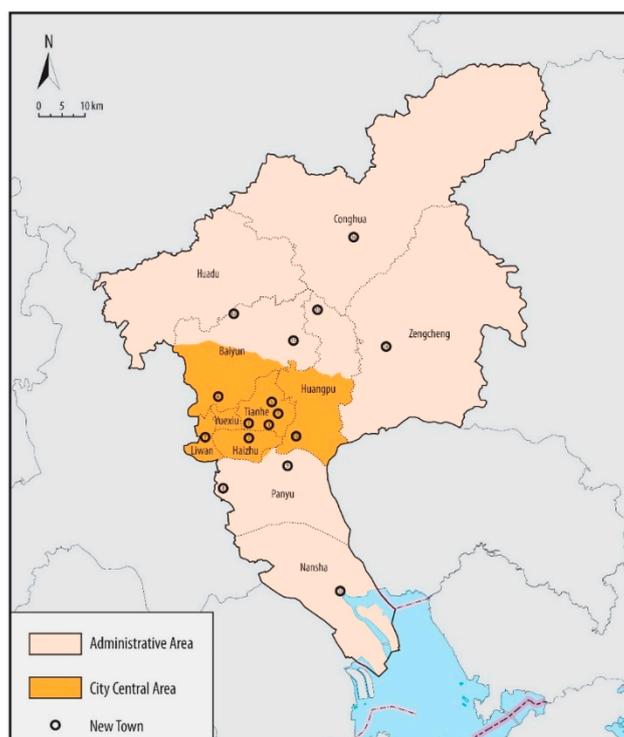
In this section, new town development in each city is compared. The history of the urban development process is analysed to understand the role and significance of new town in the urban development process. The town projects are placed in the context of the urban development narrative to illustrate how local entrepreneurial governance affects new town development in practice.

### 5.1. Guangzhou

Guangzhou, the capital city of Guangdong province, is the political and economic centre of the PRD region. It played a key role in China's development as its historical southern gateway [57] but now faces similar challenges as many other hub cities, and is becoming overshadowed by the rapid growth of nearby Shenzhen. Nevertheless, Guangzhou has strong decision-making powers and economic resources for urban development, and the idea of developing large urban projects and deploying pro-growth strategies for enhancing its competitiveness can be easily justified.

In the process of urban development, new towns have played an increasingly important role in Guangzhou. The concept of new town appeared in the early 2000s when the city government initiated its university town and Zhujiang new town project (Figure 5 and Table 2). At that time, the concept of university town had just become popular, and the university town in Guangzhou was essentially an experimental project on the urban fringe [58]. Zhujiang new town was regarded as the core of the new city central axis of Guangzhou. The municipal government was quite cautious about this new town project and had several rounds of plans and revisions for almost a decade. The 2010 Asian Olympic Games was the event that pushed the development process of Zhujiang new town and finally implemented the project. Zhujiang new town soon became the most prestigious and successful urban project in Guangzhou. With several landmarks constructed, including the Guangzhou Opera House designed by the famous architect Zaha Hadid, Zhujiang new town demonstrates Guangzhou's latest urban achievement as the so-called 'city living room'. On the other hand, hosting the Asian Games also brought huge amount of debt to the local government due to lavish spending on landmark

developments (e.g., Guangzhou Tower and Haixinsha Island where the Asian Games opening ceremony took place), sport stadiums, public transport facilities, and urban beautification projects [59].



**Figure 5.** New town projects in Guangzhou.

**Table 2.** Information of new towns in Guangzhou.

	Name	Initiative	Branding	Overall/Starting Area	First Planned
1	Zhujiang New Town	Municipal	CBD	6.44 km <sup>2</sup>	1993
2	Haizhu Ecological City	Municipal	Eco-city	92 km <sup>2</sup> /8.9 km <sup>2</sup>	2013
3	Guangzhou International Financial City	Municipal	Financial city	17.2 km <sup>2</sup> /1.32 km <sup>2</sup>	2011
4	Tianhe Smart Vally (Olympic New Town)	Municipal	Smart city	15.2 km <sup>2</sup>	2018
5	Tianhe Smart City	Municipal	Smart city	63 km <sup>2</sup> /20.69 km <sup>2</sup>	2012
6	Baiyun New Town	Municipal	Second-CBD	9.3 km <sup>2</sup>	2004
7	Huadi Ecological City	Municipal	Eco-city	3 km <sup>2</sup>	2013
8	Southern High-speed Railway Station Business District	Municipal	High-speed rail new town	36 km <sup>2</sup> /4 km <sup>2</sup>	2013
9	Guangzhou International Innovative City (University Town)	Municipal	Knowledge city	5.67 km <sup>2</sup>	2013
10	Huangpu Harbour Business District	Municipal	Second-CBD	25.04 km <sup>2</sup>	2013
11	Guangzhou International Healthcare City	Municipal	Healthcare	33.1 km <sup>2</sup>	2013
12	Huadu Airport Economic District	Municipal	Airport city	-	2011
13	Nansha New District	Central government	-	-	2011
14	Guangzhou Education City	District government	Knowledge city	10.79 km <sup>2</sup>	2014
15	Sino-Singapore Knowledge City	Municipal	Knowledge city	5.86 km <sup>2</sup>	2011
16	Conghua New City	District government	-	39 km <sup>2</sup>	2013

However, the increased debts did not slow down the development of new towns, instead accelerating the process. Guangzhou's local government initiated and announced nine new town projects in 2013 alone (No. 2, 3, 5, 7, 8, 9, 10, 11, 12 in Table 2). Every new town in this set of projects had a 'world-class' vision and multifarious urban progressive concepts such as eco-city, financial-city, smart-city, knowledge city, healthcare city, and airport city. All these new towns carried the ambition of transforming Guangzhou's urban and industrial environment over the long

term. However, the fiscal data in the same year (Figure 3) indicate a drastic increase of land-leasing revenue, more than double compared to one year before. It is highly likely that the sudden increase of land-leasing revenue was due to the release of nine new town projects and their subsequent land transaction from land market. Taking the example of Guangzhou international financial city (No. 3), after its detailed plan completed by the end of 2012, Guangzhou local government leased out four parcels of land of the ‘boosting area’ of the financial city in February 2013, gaining 13 billion CNY revenue, which was equivalent to one-third of the total land-leasing revenue of the year before [60]. In Chinese media, these land transactions were called the ‘king of land deals’ (*diwang*). Soon after, criticisms emerged accusing the Guangzhou local government for using new town projects as a means to ‘sell land’ (i.e., adopting a ‘land-driven economy’). These new town projects continued to act as local government financing vehicles (LGFVs), attracting property investments and generating capital through the land market [32].

Many new town projects were hastily planned under entrepreneurial principles, resulting in problematic implementation. First, there were duplications of urban concepts. Tianhe smart valley (No. 4) and Tianhe smart city (No. 5) not only followed very similar development concepts, they were also in close proximity to each other. There are three other knowledge cities (No. 9, 14, 15), two second-CBD projects (No. 6, 10), and two eco-cities (No. 2, 7). Some of them adapted these concepts based on local conditions, like the former university town turning into international innovative city (No. 9), but some of them had nothing to do with their labels, such as Huadi ecological city (No. 7). This also relates to a second problem: Their planning lacked empirical justification. For example, Tianhe smart valley used to be branded as Olympic new town for a city-level sport stadium located there. But this place turned into ‘Guangzhou eastern ecological and liveable district’ later, and then it transformed again into a ‘smart valley’ for technological and innovative industries. It is hard not to question the scientific basis underlying these several plan versions. This reflects the negative effects of seeing entrepreneurial considerations outweigh urban transition targets in new town projects.

Two main observations can be made in light of the above analysis of new town practices in Guangzhou. First, the size of new town projects varies greatly depending on the function and location of the new town. Most new towns are located within or near the urban central area (Figure 5), and their starting areas are planned in details. Suburban expansion is not the major objective of new town projects in Guangzhou; they are more focused on small-area urban renovation and upgrading. However, Guangzhou is still highly dependent on land-leasing revenue, which is closely linked with new town projects. The sudden release of many new town projects and the subsequent increase of land-leasing revenue immediately follow each other. However, because of high property and land prices, Guangzhou can generate a large amount of land revenue by small-area development in the urban centre, rather than large area suburban growth. Second, the urban pro-growth approach in Guangzhou is driven more by land-driven income than spatial growth. Pro-growth approaches have resulted in several planning problems in new town practices, including redundant functions, duplication of activities, and weak linkage to urban master plans.

## 5.2. Shenzhen

Shenzhen is the youngest and the fastest growing megacity in the PRD. Before China’s economic reform in 1980s, Shenzhen was a small fishing village. Because of its proximity to Hong Kong, it was chosen as a special economic zone (SEZ) to learn from and experiment with Hong Kong’s capitalist market economy. Shenzhen has a unique urban structure defined by its borders with both Hong Kong and the mainland, known as the two-line borders (*erxianguan*). Shenzhen’s SEZ was strictly confined to protect the socialist system in mainland China, which deeply influenced Shenzhen’s urban structure. The central four districts Nanshan, Futian, Luohu, and Yantian, formed the original SEZ area (called ‘*guannei*’) and later became the city’s central area, while Baoan, Guangming, and Longgang were the buffer areas (called ‘*guanwai*’) and now form Shenzhen’s suburban area (Figure 6). The hard border between ‘*guannei*’ and ‘*guanwai*’ was removed in 2010 and Shenzhen’s administrative area increased

fivefold from 395 km<sup>2</sup> to 1948 km<sup>2</sup>. In 2012, the redevelopment of land surpassed the new construction land, which marked the end of expansion era, and urban redevelopment and renovation became the main theme in Shenzhen's urban planning.



**Figure 6.** New town projects in Shenzhen.

Shenzhen's low dependency on land revenue and urban growth mechanism is also reflected in its new town development strategies. Unlike Guangzhou, which launched a number of new town projects that were not contained in its urban master plan, new town projects in Shenzhen are generally in alignment with its master plan, as most of them were listed and mapped on the 'key development area and projects in the near future'. In the urban central area, there are only three main new town projects (No. 1–3 in Table 3). Xiangmihu new financial centre (No. 1) and super headquarter base (No. 2) are the latest urban upgrade projects in the dense and developed urban centre. They have a small amount of land to redevelop, and aim to use it efficiently using very high floor area ratios. Qianhai (No. 3) is a long-developing free trade zone and harbour city in Shenzhen.

**Table 3.** Information of new towns in Shenzhen.

	Name	Initiative	Branding	Overall/Starting Area	First Planned
1	Xiangmihu New Financial Centre	Municipal	Financial city	4.9 km <sup>2</sup> /1.9 km <sup>2</sup>	2018
2	Shenzhen Bay Super HQ Base	Municipal	CBD	1.2 km <sup>2</sup>	2013
3	Qianhai Central Zone	Municipal	Free Trade Zone	14.92 km <sup>2</sup>	2012
4	Shenzhen North Station Business District	Municipal	High-speed Railway city	6.1 km <sup>2</sup>	2014
5	Banxue Science and Technology City	Municipal	Smart city	21.9 km <sup>2</sup> + 10.88 km <sup>2</sup>	2016
6	Shenzhen Airport City	Municipal	Airport city	95 km <sup>2</sup>	2014
7	Guangming Phoenix City	District government	District centre	14.89 km <sup>2</sup>	2006
8	Dayun New Town	District government	District centre	15.93 km <sup>2</sup>	2006
9	Pingshan New Town	District government	District centre	-	2006
10	Shenzhen International Low Carbon City	Municipal	Eco-city	53 km <sup>2</sup> /1 km <sup>2</sup>	2012

In suburban areas, there are seven new town projects (No. 4–10). Three of them (No. 7–9) are new district centres initiated by district level governments. Normally, the main goal of these new towns is to accommodate the increasing population. Shenzhen north station business district (No. 4) is a typical high-speed rail station area development, which can also be found in Guangzhou and

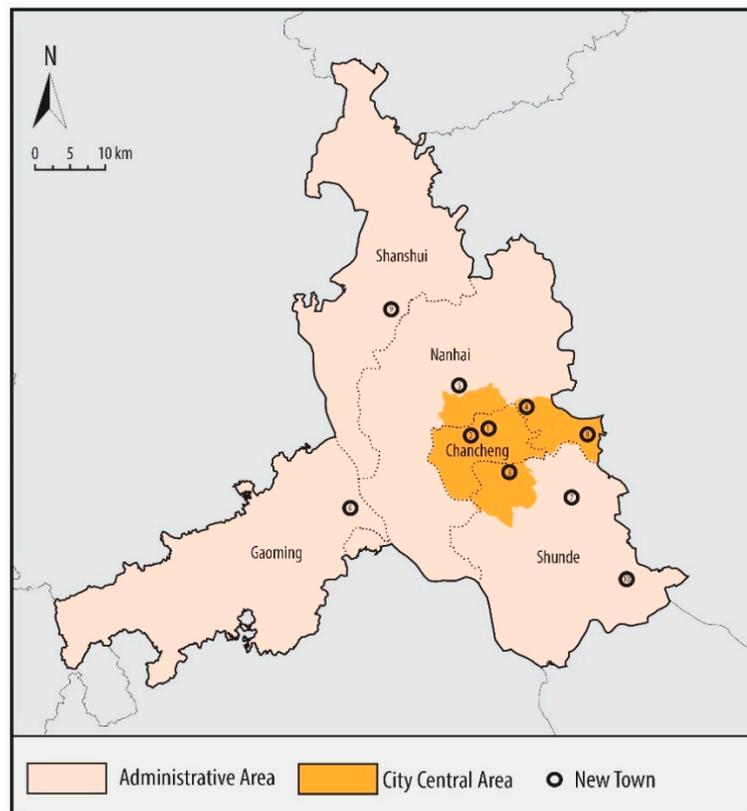
Foshan. The smart city of Shenzhen called Banxue science and technology city (No. 5) is also located near north station to fully make use of transport benefits, thus forming a transport and technology urban cluster. Lastly, the Shenzhen airport city (No. 6) and the international low carbon city (No. 10) are the two remaining special ones. They are located on the border area of Shenzhen where there is plenty of land to use and they are the biggest new town projects. Although sustainability is not the core value in Shenzhen's urban development, it remains as an important experimental base for ecological technologies.

Several characteristics of new town development in Shenzhen are apparent. First, most of the new town projects in Shenzhen are located in the suburban area (in Guangzhou most of them are located in central urban areas). However, it cannot be simply interpreted as Shenzhen having more suburbanisation and urban growth than Guangzhou. These two megacities have very different urban structures, as Guangzhou should be regarded as basically a network of cities. The central area of Shenzhen is denser and more urbanised than of Guangzhou. The land price of central areas in these megacities is much higher than it in suburban areas. Cities like Guangzhou and Shenzhen no longer need to develop large amounts of suburban land to generate capital, as small-scale projects in central areas may be more profitable. Thus, Shenzhen has small-scale new town projects in its central area for urban renovation and upgrading, mid-scale new towns in district cores as new development poles, and large-scale new towns in suburbs. Second, although similar urban concepts and functions are used in new town development in Shenzhen and Guangzhou, a much more organized and planned pattern of new towns can be observed in Shenzhen. The local government tends to have a more cautious attitude towards property development. Rather than boosting land-leasing revenue, the main goal of new town projects in Shenzhen is to build a leading model of innovative and sustainable urban development in the PRD region. The increase of competitiveness and attractiveness by prestigious projects outweighs the sheer economic benefits from land development.

### 5.3. Foshan

Foshan is the closest neighbour of Guangzhou. The two cities not only share common borders, but their urban areas are closely linked. Foshan's urban development history is similar to that of Guangzhou as Foshan also incorporated four independent cities (Shunde, Nanhai, Sanshui, and Gaoming) in 2003 (Figure 7). Like Guangzhou, its urban structure can be also regarded as a network of cities. However, the local government of Foshan is much weaker than Guangzhou. Foshan municipal government has less control over the former-city districts compared to Guangzhou, resulting in the fact that Foshan's district governments have higher levels of autonomy when it comes to the deployment of land and capital. As a result, Foshan district governments have more decision-making powers regarding urban development, including new towns. This is apparent in the case of Shunde, which became a special district level government directly under the administration of Guangdong provincial government. Thus, Foshan and Shunde, even after their integration, are still independent from each other and have separate fiscal and budgetary systems. As such, Foshan's municipal government has little administrative power over Shunde.

The local government of Foshan has two main goals in the area of urban development: To strengthen the urban development of central area; and to build closer relationship with Guangzhou for more cross-border business and communications with the concept of 'Guangzhou and Foshan as one city' (*Guang Fo tongcheng*). New towns play a key role in Foshan's urban development and are the main mechanism to achieve the two goals outlined above. By mapping new town development in Foshan, one of the noticeable differences between Foshan, Guangzhou, and Shenzhen is that Foshan's new towns are generally much bigger in size. Many of them are as big as the largest ones in Shenzhen and Guangzhou, and the average size is several times bigger. This suggests that Foshan is more ambitious in land development and urban expansion.



**Figure 7.** New town projects in Foshan.

There are six new towns (No. 1–5 and 8 in Table 4) located in and near the urban central area, and other four new towns (No. 6, 7, 9, 10) located in suburban district centres (Figure 7). Qiandenghu (No. 4) was the pilot project of Guangzhou and Foshan integration strategy as the two cities signed an official integration cooperating agreement in 2009. Qiandenghu is regarded as a successful bridge linking two cities and it also became Foshan’s ‘urban living room’. This has become a prestigious brand of new town development in Foshan. As a result, some new town projects have branded themselves as ‘the second Qiandenghu’. Sanshan low-carbon city (No. 8) is one of these projects. It is considered as an integration project due to its proximity to Guangzhou’s high-speed rail station area, which provides fast connections to the high-speed rail network. Although it was branded as the first low-carbon city in Guangdong province, it is not much different to other residential new towns close to railway stations. Foshan new town (No. 3) was one of the first new towns planned by Foshan local government but is located inside Shunde administrative area, resulting in conflicts about property rights and land-leasing revenues between the governments of Foshan and Shunde. In 2013, Foshan new town was transferred to the government of Shunde, together with land and fiscal rights.

**Table 4.** Information of new towns in Foshan.

	Name	Initiative	Branding	Overall Area/Booting Area	First Planned
1	Chanxi New Town	Municipal	CBD	36.8 km <sup>2</sup>	2013
2	Zhangcha/Foshan Smart City	Municipal	Smart city	26.5 km <sup>2</sup>	
3	Foshan/Dongping New Town	Municipal	CBD	88.6 km <sup>2</sup>	2003
4	Qiandenghu/Guangdong Financial and High-tech Zone	Municipal	CBD axis	6.5 km <sup>2</sup> /18 km <sup>2</sup>	1999/2007
5	Foshan West Station New Town	Municipal	High-speed Railway new town	92 km <sup>2</sup> /8.58 km <sup>2</sup>	2015
6	Gaoming Xijiang New Town	District gov.	District centre	20 km <sup>2</sup>	2009
7	Beijiao New Town	District gov.	-	-	2008
8	Sanshan low-carbon city	Municipal	Eco-city	23.8 km <sup>2</sup>	2010
9	Sanshui New Town	District gov.	RBD	13.95 km <sup>2</sup> /56.9 km <sup>2</sup> / 128.22 km <sup>2</sup>	
10	Desheng/Shunde New Town	District gov.	District centre	70 km <sup>2</sup> /6.5 km <sup>2</sup>	2001

In general, new town development in Foshan is different from that in Guangzhou and Shenzhen in several respects. First, Foshan is still in a period of rapid urban expansion, in which new towns are the major mechanism for implementing urban growth. Most new towns in Foshan are large-scale projects. Unlike in Guangzhou and Shenzhen, new towns in Foshan are outlined in a district plan (*fenqu guihua*), a detailed version of an urban master plan for urban districts [61]. Second, Foshan is highly dependent on land-leasing revenue. Its pro-growth model of urban development resembles the model found in typical medium sized cities in China, which carry the risks of overdevelopment and local debt.

#### 5.4. Zhuhai

Zhuhai is the smallest city among the four selected case studies and has only 1/10 of the population of Guangzhou. Within the PRD, however, Zhuhai has a unique and important position. Like Shenzhen, Zhuhai is also a special economic zone (SEZ) because of its proximity to Macau. However, just as the city of Macau can be hardly compared to world-financial centre of Hong Kong, Zhuhai has never attempted to become a second Shenzhen. Instead, it has developed its own reputation of liveability and lifestyle. In terms of its urban structure, Xiangzhou forms its central area and Hengqin joined as a new district in 2009. Doumen county has weaker connection to Zhuhai central area, although it has been a part of Zhuhai since the 1980 s. Doumen county split into Doumen district and Jinwan district in 2001, and Jinwan became a national industrial park with a harbour. However, the key area of urban development in Zhuhai remained in Xiangzhou and Hengqin.

The number of new town projects in Zhuhai is lower than in other cases, and all of them are contained in the master plan. However, the situation is more complicated as will be outlined below. In 2013, the Singaporean urban planner Liu Thai Ker was commissioned to develop a new spatial plan for Zhuhai up to 2060, setting Zhuhai's new CBD in Hezhou island, an uninhabited wetland located between the Jinwan and Hengqin districts. The idea was to provide a connection between the central area with the western Jinwan and Doumen districts. A year later, however, the idea of a new CBD in Hezhou was dropped from the revised Zhuhai master plan in 2014. Instead, the master plan identified six new town projects as shown in Figure 8. Some of the new town projects were poorly justified. For example, Fushan city (No. 6 in Table 5) has very little information about its development goals and roles in Zhuhai urban structure. Airport city (No. 3) and Binjiang city (No. 4) were together branded as 'western ecological new town', without explanation of how two new towns could be connected and related to ecology. Many of them were named with ambiguous concepts. Additionally, these new town projects are quite large compared with the small central area of Zhuhai. Strangely, the new CBD in Hezhou and Liu Thai Ker's plan are still referenced by Zhuhai official media, despite the fact that almost none of it was ever implemented and they are still excluded from the most recent urban master plan. This appears to be a branding technique designed to sell land.



**Figure 8.** New town projects of Zhuhai.

**Table 5.** Information of new towns in Zhuhai.

	Name	Initiative	Branding	Overall Area/Booting Area	First Planned
1	Hengqin New District	Central gov.	Free Trade Zone	28 km <sup>2</sup>	2009
2	Science and Education City/Tangjiawan New Town	Municipal	Technology city	17.07 km <sup>2</sup>	2008
3	Airport City	Municipal	Airport city/eco-city	193 km <sup>2</sup>	2004
4	Binjiang City	Municipal	Eco-city		2004
5	Harbour City/Pingsha New Town	Municipal	Harbour city	25 km <sup>2</sup>	
6	Fushan Industrial City	Municipal	Industrial city	47.94 km <sup>2</sup>	2016

In general, as the smallest city in our selection, Zhuhai is quite ambitious in terms of new town development and is similar to Foshan in several ways, such as its large-scale district-level planning for new towns and its high dependency on land-leasing revenues. Analysis indicates that urban development in Zhuhai aims to achieve spatial growth and generate land revenue. New town projects are used as the main vehicle to implement such growth. Although its new town projects are well connected with its urban master plan, it is likely that these new town plans serve entrepreneurial purposes than urban transition despite heavy use of sustainability-related concepts such as transit-oriented development and eco-city.

## 6. Discussion

The four case studies illustrate that cities adopt an ‘entrepreneurial’ stance to promote urban growth and compete with each other to attract capital. In the highly competitive PRD region, a city’s competitiveness is not only defined by its infrastructure, institutional set-up, and physical attractiveness, but also about the ‘differences in image’ [62]. This is the reason that these cities are keen to embrace innovative and sustainable urban concepts, since being more innovative and sustainable can reconstruct city’s image to enhance its importance of rankings in regional development. Since the 1990s, land and financial reforms have given local governments more scope for deploying two critical resources:

land and capital. Local governments have adopted pro-growth approaches in urban development, focusing on large projects like new towns to boost economic development, to project new city images and to accumulate capital. This has also resulted in a general dependency on urban growth mechanisms and consequently the risk of urban overdevelopment and local debt. A two-step examination has been used to illustrate the dependency on land-leasing revenue of four selected cities and their respective strategies of new town development.

Guangzhou and Shenzhen are in competition for the leading role in the PRD region. Although they share many similarities in terms of social and economic performance and sustainable urban development goals, Guangzhou has a much higher dependency on land-leasing revenue than Shenzhen. Their reliance on the urban pro-growth mechanism has impacts on their new town development strategies. Although Guangzhou does not need large-scale land development to generate capital, it has more small-scale new town projects than other cities and some of them are similarly branded. The hasty planning of new towns to boost land-lease revenue and cover the debts generated by hosting the Asian Games reveals a hidden agenda behind the sustainability-related concepts and labels. On the other hand, Shenzhen has tried to align its new town projects, partly due to its compact urban development tradition for land scarcity and high population density, and partly due to its low dependency on land-leasing revenue. New town projects in Shenzhen indicate more attention to fulfilling its innovation-driven ambitions and for generating more quality-based prestige in the region other than boosting short-term land revenue. Foshan and Zhuhai both have higher dependency on land-leasing revenue than Guangzhou. Their new town projects are much larger than those in Guangzhou and Shenzhen since they need more land development to achieve their land-leasing revenue targets. Prestige projects still matter in Foshan and Zhuhai, but since they are not competing for the best of the best in PRD, land revenue can easily eclipse other goals. Even in Zhuhai, with more attention to liveability, the city has adopted very ambitious pro-growth approaches in urban expansion. Its urban development strategies and plans are the results of a gap between its urban development objectives on paper and the hidden agenda of promoting urban growth. The innovative and sustainable brands it proposed are therefore unlikely to be realised. The study illustrates that local governments' land-leasing revenue can be used as an indicator for how a city depends on urban pro-growth mechanisms (Table 6). This has policy implications to decision makers, urban planners, and researchers that the reliance on urban pro-growth strategy can bring potential risk to any sustainable urban transition.

**Table 6.** Comparison of land-leasing revenue dependency and new town development strategies of four selected cities.

City	Dependency on Land-Leasing Revenue & Growth Pattern	Typical Location of New Town Projects	Average Size of New Town Projects	New Town Development Strategy
Guangzhou	Medium (Mixed)	Central & fringe	25 km <sup>2</sup>	Compactness & revenue growth
Shenzhen	Low (Quality)	Suburban	25 km <sup>2</sup>	Compactness
Foshan	High (Quantity)	Central & fringe	46 km <sup>2</sup>	Spatial growth
Zhuhai	High (Quantity)	Suburban	51 km <sup>2</sup>	Spatial growth

## 7. Conclusions

The results of the case study support the assumption that there is a linkage between urban growth mechanisms and urban outcomes in Chinese cities, as proposed in the analytical framework (Figure 1). The higher the dependency on land-leasing revenue in a city, the higher possibility it adopts a growth-at-all-costs approach, which increases the likelihood of overdevelopment. On the contrary, the lower the dependency on land-leasing revenue, the higher the possibility that the city pays more attention to promoting urban quality, where innovative and sustainable urban transition is more likely to be realised. Because the formation of urban growth approaches in China is deeply embedded in its institutional systems (e.g., tax-sharing system, land and housing reform, and cadre appointment system), institutional reforms are needed to achieve more sustainable forms of urban development.

Currently, central government tends to use macroeconomic controls and administrative orders to stop the overgrowth of land-driven economy and local debts, but these tools cannot solve the fundamental problem of fiscal deficit of local governments under the current tax-sharing system. The central government can easily fall in the dilemma of “control then it dies, leave it then it becomes chaotic” (*yiguanjiusi, yifangjiuluan*) [63]. Furthermore, the strategies and behaviours of local governments in urban development are only supervised by the upper-tier governments. The lack of local supervision contributes to the formation of systematic risks in urban development of Chinese cities.

This study also calls urban entrepreneurialism into question in China. Chinese local governments act as both market regulators and players, holding two critical resources of capital and land, using market instruments for the recreation and reconfiguration of space. China is not a rule-of-law based society, and local leaders are not elected but officials appointed by high level governments. Local governments can go beyond budgetary constraints and apply a market logic to recklessly mobilise resources for urban development and political objectives. This often creates a trend of overspending and excessive investment in infrastructure and urban development. In this sense, their ‘entrepreneurial nature’ has uncertain and debateable long-term consequences. Even though local leaders are often proud of the ‘Chinese speed’ in urban development and use it for political performance, the risks of overdevelopment, misallocation of social resources, and potential debt crisis may eventually do more harm than good from the perspective of long-term sustainable urban development.

**Author Contributions:** Y.S. is first author. He developed the concepts and methods, collected the data, and wrote the first draft of the paper. D.S. and M.d.J. advised on the structure of the article, the analytical framework, and the overall content of the manuscript. D.S. edited the final version of the article and M.d.J. was responsible for project management. All authors have read and agreed to the published version of the manuscript.

**Funding:** The first author is funded by the China Scholarship Council (CSC).

**Conflicts of Interest:** The authors declare no conflict of interest.

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