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1           **How Horizontal Integration affects Transaction Costs of Rural Collective**  
2           **Construction Land Market? An Empirical Analysis in Nanhai District,**  
3           **Guangdong Province, China**  
4

5   **Abstract:** High transaction costs caused by dispersed and fragmented tracts, insecure tenure and  
6 incomplete information in rural land market has become a common issue in the transition economies.  
7 Horizontal integration may economize on transaction costs but aggrandize governance inputs.  
8 Therefore trade-off between integration and governance is one of the biggest challenges in land  
9 commercialization and rural restructuring worldwide. Resorting to a field survey in Nanhai District,  
10 Guangdong Province, this work estimates how the transaction costs of rural collective construction  
11 land are influenced by the horizontal integration degree and the level of self-organization governance  
12 of collectives. Four Tobit models are constructed based on the scale of collectives and the results show  
13 that: (1) There is an almost U-shaped relationship between the horizontal integration degree of the  
14 collectives and the transaction costs. The horizontal integration among shareholders can not only  
15 centralize the fragmented land assets from individual farmers and reduce the transaction costs of rural  
16 construction land, but also result in organization costs. The transaction costs are not decreasing as the  
17 horizontal integration increases until the transaction costs saved are equal to resultant organization  
18 costs. (2) The more collective leaders, the higher organization costs and the more opportunism  
19 behaviors, which will give rise to the transaction costs. This suggests that the Chinese authorities  
20 should strengthen the ongoing efforts to reduce the transaction costs of market and improve the  
21 efficiency through a more transparent and accessible market and optimal scale of horizontal integration  
22 of the collective. Our work sheds some light on the mechanisms at play in the reform and innovation of  
23 rural grass-root governance and it contributes to a better understanding of land-based shareholding  
24 cooperation system and nature of ongoing rural construction land market in China and transitional  
25 economies.

26   **Keywords:** horizontal integration; organization governance; transaction costs; asset specificity;  
27 transaction uncertainty; transaction frequency; rural collective construction land (RCCL)  
28

29   **1. Introduction**

30       The inability to convert property into usable assets is the main barrier to economic  
31 prosperity in the developing countries (De Suto, 2000). Rural land market could help the  
32 economy to realize considerable gains in productivity (Benjamin and Brandt, 2002). In order  
33 to activate land asset, many transition countries, including the former Soviet Union (Lerman  
34 and Shagaida, 2005; Shagaida, 2005; Borodina, 2007), Central and Eastern Europe  
35 (Deininger *et al.*, 2012; Jazoj *et al.*, 1997; Ciaian, 2001), Southeast Asia (Vietnam, Laos and  
36 Cambodia) (Deininger and Jin, 2005, 2010; Do and Iyer, 2008; Nguyen, 2012), have tried to

37 construct market mechanism through land reform targeting de-collectivization and  
38 transformed the economies from centrally-planned to market-oriented since 1990s. The  
39 restitution and distribution of land property to individuals in the transitional economies have  
40 largely minimized the self-organization and supervision costs and released household  
41 production potentials in comparison with that in large state and collective farms in the  
42 centrally planned period. For example, Vietnam has become the fastest economic growth and  
43 rice export country from the poor and rice importer (Deininger and Jin, 2005).

44 However the restitution and distribution of land property greatly increased fragmentation  
45 of tracts at the same time (Lerman, 2005; Bordina, 2007; Savasanao and Scanidizzo, 2009;  
46 Melnychuk *et al.*, 2005). Without complete land registration and certification system, clear  
47 delineation of property rights, symmetry information, the land market may not work  
48 efficiently because of extremely high transaction costs associated with the overly fragmented  
49 land ownership (Deininger *et al.*, 2012; Shagaida, 2005). Thus, the optimal scale of farm that  
50 coordinates transaction and governance costs through horizontal and vertical integration  
51 among individual households (Angelovska *et al.*, 2012) is one of the most important issues  
52 facing the governments and rural governance in deepening reform and land market  
53 construction in the transitional economies.

54 As one of the fastest growing countries, China has undergone the similar process of  
55 successful land reform and brought about rural prosperity as above mentioned transitional  
56 economies worldwide since 1978. The rapid rural development fuels industrialization and  
57 urbanization with agricultural surplus (Chen, 2004). While the rapid development of  
58 industrialization and urbanization in China has drawn migrants from inland rural areas to  
59 coastal urban areas (Long *et al.*, 2007, 2009, 2012; Tang *et al.*, 2012), stimulating the  
60 increasing demand for construction land (Tang *et al.*, 2012). The construction land for urban  
61 developers in urban areas became more and more expensive year by year.

62 Compared with urban construction land, rural collective construction land (RCCL) is  
63 abundant and relatively cheaper. In the early 1980s, taking the advantage of the geographical  
64 location and the reform and opening up policy, the local governments in China's southeastern  
65 coastal areas, such as Guangdong Province, encouraged the development of township and  
66 village enterprises (TVEs). A great number of Hong Kong, Taiwanese and foreign investors  
67 have been building their factories on the rural land there (Po, 2008), which stimulated rural  
68 villagers to convert the arable land into non-agricultural uses. However, some TVEs have  
69 experienced a boom period and then gone bankruptcy because of inappropriate management  
70 and weak competitiveness, leading to a large number of stocks of scattered RCCL. For the  
71 sake of minimizing production costs, some small and medium scale urban developers  
72 preferred RCCL to urban construction land, on one hand; rural villagers have spontaneously  
73 developed a variety of strategies to sell or lease their construction lands to urban developers  
74 for non-agricultural uses, on the other (Po, 2008). So the urban developers have the incentives  
75 to conspire with village cadres to trade the RCCL privately, even take the adventure of legal  
76 punishment. And implicit RCCL market was pervasive at that time, whereas numerous rural  
77 land assets were embezzled by a few collective leaders. China tried to use market mechanism

78 to activate the sleeping rural land assets which are two times more than urban construction  
79 land.

80 However, a well-functioning RCCL market relies on low transaction and organization  
81 costs. Unlike the contiguous and large scale urban construction land, the RCCL is fragmented  
82 by farmland and scattering distributed. And high costs of information searching and contract  
83 negotiation hinder the functioning of RCCL market (Zhang *et al.*, 2017a).

84 Under this circumstance, land-based shareholding reform initiated in Guangdong  
85 Province in the early 1990s, and later spread to other regions in China (Fu and Davis, 1998;  
86 Po, 2008; Ito *et al.*, 2016). Individual farmers converted their land assets into shares and  
87 voluntarily joined together to establish the Rural Shareholding Cooperatives (RSCs) (Yi, *et al.*,  
88 2017; Yep, 2015). The RSCs could re-collectivize the fragmented land from individual  
89 farmers and trade them in the market, transforming the multiple transactions between  
90 enterprises and individual farmers into one (Deng *et al.*, 2016). The bottom-up institutional  
91 innovation greatly reduces the costs of information searching, contract negotiation and  
92 transaction, and provides the necessary condition for RCCL market to operate.

93 Some local regulations and central institutional arrangements make RSCs transaction  
94 legalization. In 2005, Guangdong Provincial government locally issued *Regulation and*  
95 *Administration for the Management of Collective Construction Land Use Rights Transfer in*  
96 *Guangdong Province*, which is the first local regulation about the circulation of rural  
97 construction land. Eight year later, “*Establishing a unified market of urban and rural*  
98 *construction land*” and “*Rural collective construction land can enter the market, and has the*  
99 *coequal rights and prices with state-owned land*” was passed in the Third Plenary Session of  
100 the eighteen of the Communist Party of China (CPC) in 2013. Then 33 pilots of RCCL  
101 commercialization around China have also been legalized since 2015. The once implicit  
102 RCCL market can run explicitly.

103 However, due to the fact that the RSCs are formed by the horizontal integration of many  
104 individual farmers, the transaction costs can be economized, meanwhile resultant  
105 organizational costs are incurred. So the trade-off between integration and governance is a key  
106 to efficient RCCL market. What is the relationship between the size of the organization and  
107 the transaction costs in the transaction process?

108 Therefore, this paper tries to study the relationship between the horizontal integration of  
109 RSCs and transaction costs in RCCL market. In theory, the findings may enrich the literature  
110 on transaction cost economics which may provide the theoretical basis for the further study of  
111 organization efficiency and transaction efficiency in RCCL market. In practice, it sheds light  
112 on the reform of rural collective organizations, the innovation of internal governance structure  
113 and the improvement of the efficiency of rural asset disposal in transitional economies.

114 The paper is structured as follows: Section 2 proposes the research hypotheses. Section 3  
115 introduces the study area, methodology and data. The results of the Tobit model will be  
116 presented and discussed in Section 4. Section 5 closes the work.

117

## 118 2. Theoretical framework and hypotheses

119 2.1. Theoretical framework

120 As shown in Fig.1, RCCL market in China has several characteristics. First of all, the  
121 suppliers (farmer households, rural enterprises and rural collectives) co-own the RCCL which  
122 is dispersed and fragmented spatially (Tan *et al.*, 2006; Zhang *et al.*, 2016). Without spatial  
123 replacement and consolidation of the RCCL, it is difficult for the owners to supply large and  
124 spatially connected plots in the market. Secondly, different suppliers play different roles in  
125 the market. Farmer households are always disadvantageous groups who have low negotiation  
126 ability to directly trade the collectively owned RCCL with urban developers because of weak  
127 organization degree and asymmetry information available (Cai and Qi, 2007). Contrary to  
128 farmer households, the collective cadres are *de facto* owners of the RCCL, who often take  
129 advantage of their powers and collude with enterprises to sell and rent the RCCL privately on  
130 behalf of the collectives. Thirdly, the demanders- urban enterprises prefer large scale and  
131 contiguous land to small and scattered one so as to meet the requirements of industrial  
132 agglomeration. Fourthly, mismatch of supply and demand of the RCCL incurs high costs and  
133 risks of transaction.

134 From Coasian transaction cost theory, each transaction in the market will generate  
135 transaction costs, including the costs of information searching, contract negotiation, and  
136 subsequent rental monitoring and enforcement (Coase, 1937). In general, the transaction costs  
137 depend on asset specificity, transaction uncertainty and transaction frequency (Williamson,  
138 1971, 1979). The stronger the asset specificity, the higher the degree of uncertainty in the  
139 transaction and the higher the transaction frequency, the higher the transaction costs are. The  
140 RCCL is getting more and more expensive, and farmers are more dependent on it, which  
141 means that the asset specificity is high and easily leads to the “hold-up” behavior of the other  
142 parties, resulting in higher transaction costs. Transaction uncertainty includes uncertainty of  
143 behavior and environment. According to above analysis, rent-seeking and opportunism  
144 behaviors of village leaders driven by interests, lead to higher transaction costs. The  
145 uncertainty of transaction environment caused by the imperfect market mechanism and  
146 information asymmetry increases the costs of information searching and negotiating between  
147 the enterprises and farmers. In the case of high asset specificity and uncertainty, multiple  
148 bargaining between enterprises and farmers which means higher transaction frequency will be  
149 happened in the RCCL market, so the transaction costs will increase significantly (Deng *et al.*,  
150 2016).

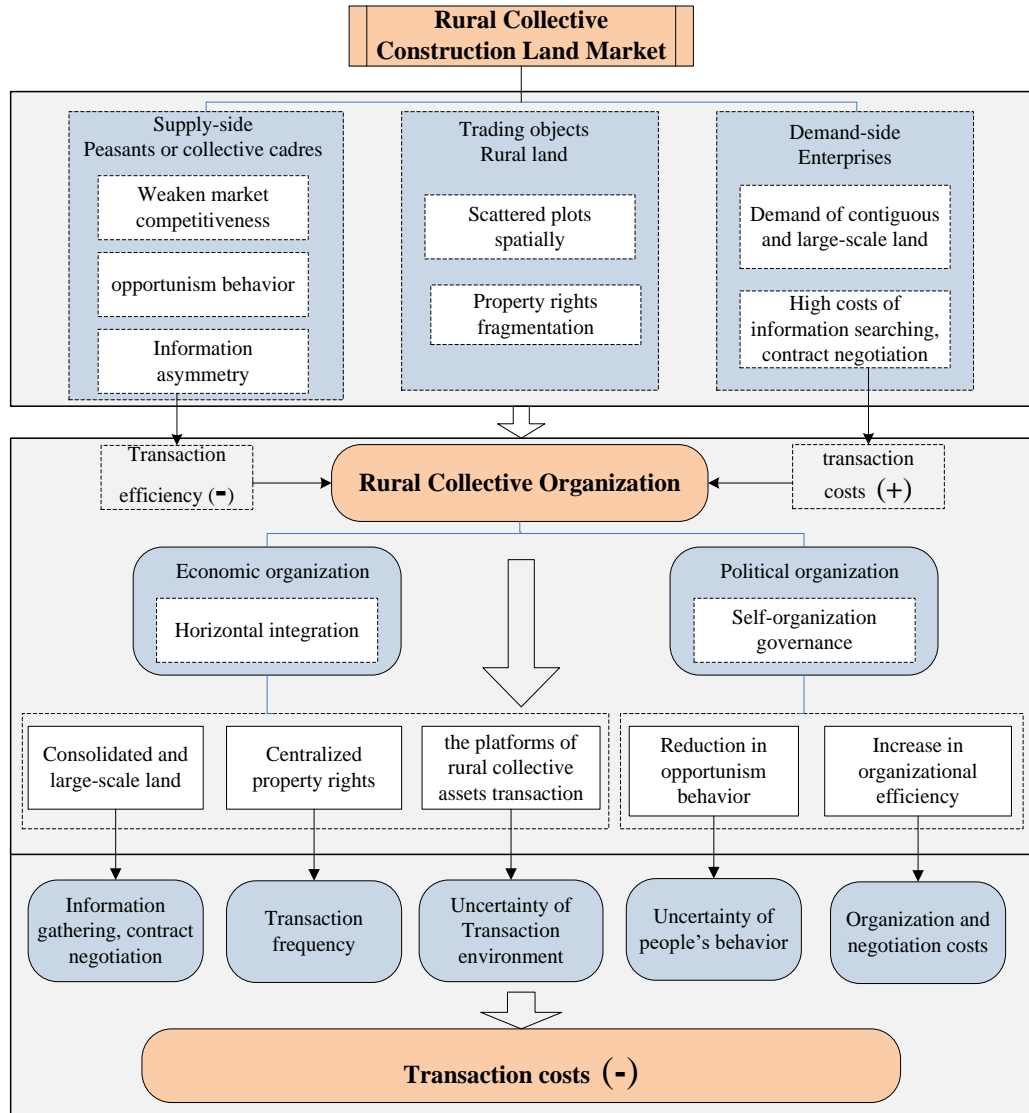
151 In such a context, the RSCs have emerged and demonstrated its necessity and advantages  
152 in the early 1990s in several regions like Guangzhou, Nanhai and Shunde in Guangdong  
153 Province. As one of the pioneers, Nanhai’s shareholding reform operated on the basis of the  
154 village as an administrative unit, which is responsible for converting its collective lands and  
155 assets into shares so as to establish a land-based shareholding co-operative organization  
156 named RSCs (Po, 2008). This paper will study how the RSCs help to lower transaction costs  
157 based on empirical analysis in Nanhai District.

158 Firstly, through horizontal integration of individual farmers or households, the RSCs  
159 could concentrate the property rights of rural lands from individual farmers, then trade in the  
160 market, which avoids the frequent negotiation between the enterprises and individual farmers.

161 Secondly, before being traded in the market, the scattered land plots are often centrally  
162 consolidated into sufficiently large scale contiguous ones by RSCs (Jiang and Liu, 2004).  
163 These consolidated lands can not only meet the requirements of enterprises, but also reduce  
164 the costs of information searching in the process of RCCL transaction.

165 Thirdly, as the supplier of RCCL market, rural collective organization, whose  
166 governance structure has been innovating continuously since the reform of shareholding  
167 system. Rural collective economic organizations (RSCs) have taken their economic powers  
168 away from political organizations (Po, 2011; Chen, 2016), and the leaders of each  
169 organization have clear division of powers and responsibilities from 2012. This could not  
170 only promote the degree of self-organization governance, but also prevent the opportunism  
171 behavior of village leaders to some extent. Subsequently, the Corporations of Rural Collective  
172 Assets Management were established by rural collective economic organization since 2015,  
173 so that collective assets could be managed and supervised by all the shareholders, reducing  
174 the moral hazards of collective leaders.

175 Finally, in order to establish a formal and open RCCL transaction market, the rural  
176 collective assets trading platforms at the level of district, township and village have been set  
177 up since 2010. These platforms provide the information about traded land for both parties and  
178 reduce the transaction costs caused by information asymmetry. In addition, the mechanism of  
179 bidding adopted in land transaction is of great importance for the formulation of transparent  
180 and formal transaction rules and environment, which helps to supervise each other and avoid  
181 opportunism behavior.



182  
183  
184  
185

Fig. 1. The theoretical framework

186 2.2. Hypothesis

187 As Coase (1937) noted that, the horizontal integration can be defined as “When a  
188 transaction that was originally organized by two or more entrepreneurs was organized by an  
189 entrepreneur, a coalition appeared that called horizontal integration”. Many enterprises often  
190 adopt the integration strategy (horizontal integration and vertical integration) to save  
191 transaction costs and improve the efficiency.

192 In Nanhai District, the model of “separation of economic organization and political  
193 organization” was adopted to separate the economic functions from self-governing functions.  
194 The economic organizations are responsible for the disposal and management of rural assets,  
195 and political organizations mainly hold responsibilities of the overall coordination, public  
196 service and supervising the behavior of economic organizations. So we analyze the

197 relationship between horizontal integration and transaction costs from the perspective of rural  
198 economic organization and political organization.

199 In the economic organization, individual shareholders or households can be seen as a  
200 special form of firm, assuming two shareholders  $i$  and  $j$ , the horizontal integration would  
201 happen when the following condition is satisfied (Sexton, 1986):

$$202 \quad \beta(i \cup j) < \beta_i + \beta_j, \quad (\beta(i \cup j) > 0) \quad (1)$$

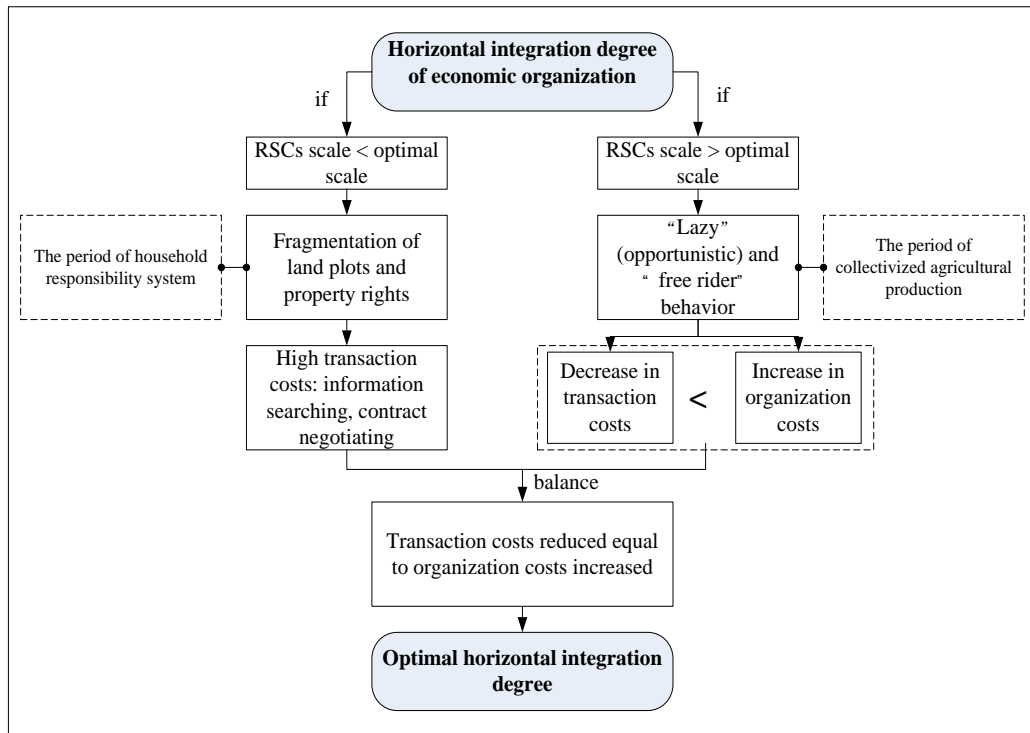
203 Here,  $\beta_i$  and  $\beta_j$ , represent the transaction costs of the two shareholders  $i$  and  $j$ , respectively,  
204 ( $\beta_i > 0$  and  $\beta_j > 0$ ).

205 As shown in Fig. 2, through horizontal integration, RSCs could help to internalize the  
206 external transaction costs between the individual shareholders or households and enterprises,  
207 reducing total transaction costs. However, this horizontal integration among shareholders will  
208 also result in organization costs at the same time. So the optimal scale of RSCs is determined  
209 by the transaction costs saved by the horizontal integration between shareholders and  
210 resultant organization costs ((Luo, 2000; Lin and Ma, 2006).

211 If the RSCs scale is much greater than optimal scale, the “lazy” (opportunistic) and  
212 “free-rider” behavior will increase, just like the period of collectivized agricultural production  
213 during 1957-1978 (Long *et al.*, 2009), which will result in higher organization and negotiation  
214 costs and inefficient internal governance. Whereas, if the scale of RSCs is smaller than  
215 optimal scale, the fragmentation of land plots and property rights under the period of  
216 household responsibility system (HRS) will lead to higher transaction costs and lower work  
217 efficiency. So, this paper proposes the following hypothesis.

218 *Hypothesis 1: The horizontal integration degree of rural collective organization will not*  
219 *reduce the transaction costs of RCCL until the resulting organization costs are equal to the*  
220 *transaction costs saved ceteris paribus.*

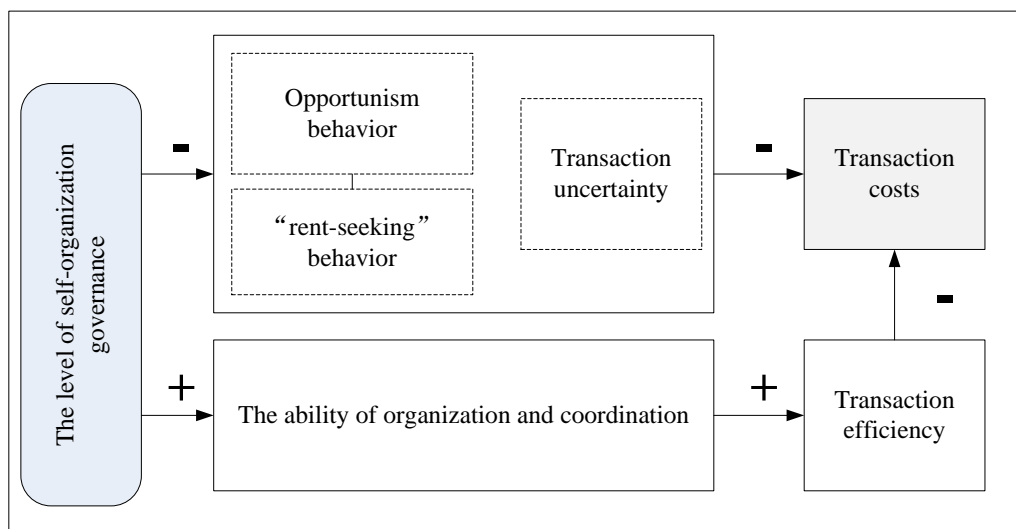




221  
222 **Fig.2.** The relationship between horizontal integration of economic organization and transaction costs  
223

224 As the important decision-makers and supervisors, rural political organization may play  
225 an important role in the process of RCCL transaction. As shown in Fig. 3, the higher level of  
226 self-organization governance will reduce the opportunism and “rent-seeking” behavior and  
227 enhance the efficiency of internal organization and coordination. Accordingly, the other  
228 hypothesis can be presented.

229 *Hypothesis 2: The transaction costs in the RCCL will decrease with the higher level of*  
230 *self-organization governance.*

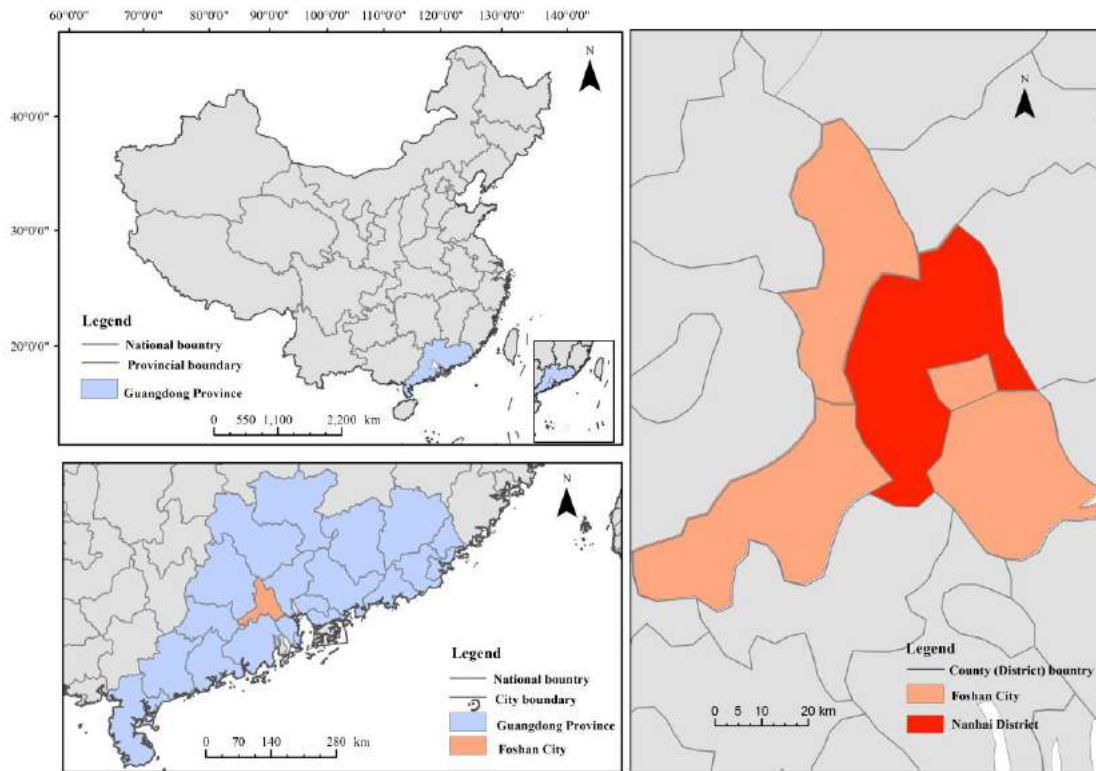


231  
232 **Fig.3.** The relationship between the level of self-organization governance and transaction costs  
233

### 234 3. Study area, data and methodology

#### 235 3.1. Study area

236 Nanhai District (22°48'03"-23°18'00" N, 112°51'55"-113°15'47"E) is located in Foshan  
 237 City, Guangdong Province (Fig. 4), adjacent to Hong Kong. The study area is in the  
 238 hinterland of the Pearl River Delta Region and is one of the fastest growing industrial and  
 239 urban regions in China, comprising seven townships and 274 villages. It covers 1073.82 km<sup>2</sup>  
 240 of which 536.93 km<sup>2</sup> are construction land. Of the total construction land, RCCL accounts for  
 241 approximately 46.69% and state-owned construction land is about 53.31%. We choose  
 242 Nanhai District as our study area as it is the earliest land shareholding system and also the  
 243 typical market-oriented RCCL transaction.



244  
 245 **Fig.4.** Location of the study area  
 246

247 **3.2. Data collection**

248 We conduct an empirical study basing on the data collected from village collectives in  
 249 Nanhai District, Guangdong Province in 2016. The respondents in the survey were village  
 250 leaders who were responsible for the RCCL transaction. In order to test the hypotheses above,  
 251 we designed the questionnaire with the following three sections. The first section is about the  
 252 information of RCCL transaction including the land information, the surroundings and the  
 253 costs in different phases of RCCL transaction. The second part includes the uncertainty of  
 254 behaviour and environment in the process of trading. The third is the transaction frequency.  
 255 The socioeconomic data of the village are from the yearbooks and the government website.  
 256 We obtained 380 questionnaires, of which 324 were valid.

257 **3.3 Variables**

258 Based on the hypotheses, transaction costs is the dependent variable, the horizontal  
 259 integration degree and the level of self-organization governance are independent variables. A

260 RSC is a horizontal association of farmers who hold the land shares. So in order to identify  
261 the horizontal integration degree, the “RSC scale (the number of shareholders)” can be  
262 introduced. In Nanhai District, the RSC is a two-hierarchy organization- Economic  
263 Cooperative (EC) (*Jingjishu*)<sup>1</sup> (the lowest RSC) and Economic Joint Community (EJC)  
264 (*Jinglianshe*) (the upper RSC) which is composed of several ECs. So we will study which  
265 organization form is more efficient. According to our investigation, there are generally  
266 171-1479 shareholders in EC, 1493-11000 shareholders in EJC. In order to further illuminate  
267 the relationship between the horizontal integration degree and transaction costs in different  
268 scales, this paper will divide the scale of EJC into three parts: 1493-3310, 3310-5460, >5460  
269 basing on cluster analysis.

270 The level of self-organization governance relates to the number of collective cadres and  
271 the proportion of CPC in principle.

272 In addition, other variables including asset specificity<sup>2</sup>, transaction uncertainty and  
273 transaction frequency are control variables. The following indicators are designed based on the  
274 transaction cost theory of Williamson (1979; 1985; 1989) (Table1):

275 **Physical asset** includes the area of trading land parcels. The villagers in Nanhai District  
276 are increasingly dependent on the construction land as the land becomes more and more  
277 expensive, if the construction land is developed for other purposes, the value will be reduced,  
278 thus result in high transaction costs. The larger size of land parcel traded which means higher  
279 asset specificity may give rise to higher coordination and bargaining costs among shareholders.

280 **Geographical location** can be characterized as the distance from the land parcel traded  
281 to the town center. The closer to the town center, the higher value of construction land is, more  
282 factors should be considered by the collectives in the trading process, resulting in higher  
283 organization costs.

284 **Uncertainty of transaction environment** is composed of: (1) the way to determine price,  
285 (2) land certificate, (3) trading platform. Compared with negotiating, transaction through  
286 bidding may be more open and fair, which can reduce the uncertainty of transaction  
287 environment and the transaction costs. The land certificate can guarantee the safety of property  
288 rights and thus reduce transaction costs. The trading platforms at the level of village, township  
289 and district have been established in Nanhai District respectively. The transaction environment  
290 on the platforms at the district level may be more open and fair, thus may improve the  
291 transaction efficiency and reduce the transaction costs.

292 **Uncertainty of people’s behavior** includes: (1) the market form, (2)  
293 contract notarization, (3) government intervention. Compared with the rental market,

---

<sup>1</sup> In Nanhai District, Economic Cooperative (EC) is the lowest RSC and Economic Joint Community (EJC) is the upper RSC which is composed of several ECs. Village is a political and administrative unit which is consistent to EJC in geographical scope only on condition of villagers are landholders. It is usually that villagers are greater than landholders because married women, newborn children and migrants are often excluded in holding cooperatives unless they buy the land shares from EJs or ECs.

<sup>2</sup> Asset specificity: refers to the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrifice of productive value (Williamson, 1989). The stronger the asset specificity, the higher the degree of uncertainty in the transaction and the higher the transaction frequency, the higher the transaction costs are.

294 transaction in the sale market is more likely to be “locked-in” by the opportunism behavior of  
 295 the other parties because of the larger parcels traded and longer term of contract with more  
 296 uncertainty, thus gives rise to higher transaction costs. The contract notarization guarantees the  
 297 rights of two parties and reduces the risk of default. The government intervention may lead to  
 298 the rent-seeking, uncertainty and high transaction costs.

299 **Transaction frequency** can be presented as 50 (the longest years of industrial land use  
 300 rights) divided by the actual contract term in the RCCL market. The negotiation and  
 301 organization costs will increase with transaction frequency.

302

303 **Table 1**

304 The definition of variables and description of statistics

Variables		Definition	Mean	Std. Dev.	
Asset specificity	horizontal integration degree $x_1$	the number of shareholders of collectives (person)	3542.18	2046.90	
	Human capital	the level of self-organization governance 1 $x_2$	6.22	1.95	
		the level of self-organization governance 2 $x_3$	129.11	71.21	
	Physical asset	area of the land parcel traded $x_4$	the actual value (m <sup>2</sup> )	32032.73	105793.99
	Geographical location	geographical location $x_5$	distance from the land traded to the town center (km)	8.16	5.19
Transaction uncertainty		the way to determine price $x_6$	bidding=1, negotiating=0	0.64	0.48
	Uncertainty of transaction environment	land certificate $x_7$	yes=1, no=0	0.76	0.43
		trading platform $x_8$	Economic Cooperative ( <i>Jingjishe</i> ) =1; Economic Joint Community ( <i>Jinglianshe</i> ) =2 , Town=3, District=4	2.40	0.89
	Uncertainty of people’s behavior	the market form $x_9$	sale market=1, rental market=0	0.30	0.46
		contract notarization $x_{10}$	yes=1,no=0	0.47	0.50
	government intervention $x_{11}$	yes=1,no=0	0.31	0.46	
Transaction frequency	Transaction frequency	transaction frequency $x_{12}$	50/years of the contract	5.49	7.79

305

### 306 3.4. Methods

#### 307 3.4.1. Estimation of transaction costs

308 In the RCCL market, the transaction process includes the following steps: preliminary  
 309 transaction contract application; democratic voting in the village; public notice on the trading  
 310 platform; bidding; contract signing; contract notarization.

311 The total transaction costs can be calculated as follows (Zhang *et al.*, 2017a, 2017b):

$$312 C_{\text{total}} = \sum_{i=1}^n (Labor_i \times Time_i \times 68.64 + Cash_i) \quad (2)$$

313 Where,  $C_{total}$  is the total transaction costs (unit: Yuan);  $Labor_i$  is the number of people  
 314 involved in the stage  $i$ ;  $Time_i$  is the days spend on the trading stage  $i$ ; 68.64 is daily salary (unit:  
 315 Yuan/Day);  $Cash_i$  is the direct expense in the step  $i$  (unit: Yuan).

### 316 3.4.2. Tobit model

317 Considering that the transaction costs are all above zero, the limited dependent variable  
 318 model (Tobit) should be adopted when the independent variable is truncated or censored. This  
 319 model can not only analyze consequent numeric variables, but also virtual variables by using  
 320 maximum likelihood estimation method. Tobit model is constructed as (Tobin, 1958):

$$321 Y = \begin{cases} \beta^T X_j + \varepsilon_j, & \beta^T X_j + \varepsilon_j > 0 \\ 0, & otherwise \end{cases} \quad (3)$$

322 Where,  $Y$  is the independent variable;  $X_j$  is the independent variables;  $\beta$  is the parameter to  
 323 be estimated;  $\varepsilon_j$  is the stochastic disturbance term, and  $\varepsilon_j \sim N(0, \sigma^2)$ .

## 324 4. Results

### 325 4.1. Transaction costs

326 According to equation (2), the total transaction costs can be measured by the sum of costs  
 327 in each stage of transaction process, which include the labor costs, time costs and cash.  
 328 According to Price Bureau in Foshan City (the upper administrative unit of Nanhai),  
 329 Guangdong Province, the lowest standard of monthly salary is 1510 Yuan/Month (223.18  
 330 USD), that is, the daily salary is 68.64 Yuan/Day, which can be used to calculate the labor costs  
 331 and time costs, the value of transaction costs is obtained as Table 2. In the RCCL market in  
 332 Nanhai District, the average transaction cost organized by ECs (*Jingjishe*) is about 6405 Yuan,  
 333 the lowest cost is 1579 Yuan, and the maximum is 15375 Yuan. The average transaction cost in  
 334 the scale of “1493-3310”, “3310-5460”, “>5460” is 16202 Yuan, 33907 Yuan, 52577 Yuan,  
 335 respectively.

336 **Table 2**

337 The transaction costs (yuan)

RSCs	Scale	Number of samples	Minimum	Maximum	Mean
Economic Cooperative ( <i>Jingjishe</i> )	171-1479	51	1579	15375	6405
Economic Joint Community ( <i>Jinglianshe</i> )	1493-3310	116	1064	38507	16202
	3310-5460	96	1922	75229	33907
	>5460	61	2540	112020	52577

### 338 4.2. Tobit model results

339 The results of Tobit regression models are listed in Table3.

340  
 341  
 342

343 **Table 3**  
 344 The results of Tobit model

Coef.	Economic Cooperative (Jingjishe)		Economic Joint Community (Jinglianshe)	
	Model 1	Model 2-1	Model 2-2	Model 2-3
	171-1479	1493-3310	3310-5460	>5460
horizontal integration degree $x_1$	-0.2534	-1.2702***	0.4288	1.8847*
the level of self-organization governance 1 $x_2$	0.3648	0.3548*	1.4516***	0.6199
the level of self-organization governance 2 $x_3$	0.2203	0.2739	-0.3667	0.1751
area of the land parcel traded $x_4$	0.3868***	0.5639***	0.5391***	0.4486***
geographical location $x_5$	-0.0870	0.0884	0.0481	-0.1167
the way to determine price $x_6$	-0.1766	0.0434	-0.4309**	-0.5656**
land certificate $x_7$	0.1316	0.0435	-0.0214	-0.1618
trading platform $x_8$	--	-0.2235*	-0.3278**	-0.2003
the market form $x_9$	0.3699**	0.2488*	-0.3154	-0.3010
contract notarization $x_{10}$	--	-0.1349	0.1034	0.3373
government intervention $x_{11}$	0.3492*	0.2491**	0.0356	0.1939
transaction frequency $x_{12}$	0.1134	-0.0721	-0.1668	-0.3102
constant	7.8816***	16.2303***	5.1752	-8.1995

345 Notes: Significant at: 1%\*\*\*, 5%\*\*\*, and 10%\*; Sample size: 324; In the Model 1, the indicators of “trading  
 346 platform” of each sample are all “the platform of ECs”, the indicators of “contract notarization” of each example  
 347 are all “no”.  
 348

349 With the increase of RSCs scale, the impact of the degree of horizontal integration of  
 350 collectives on transaction costs has shown a trend from negative to positive. In Model 1,  
 351 through the horizontal integration among shareholders, the transaction costs in RCCL market  
 352 could be saved, but the impact is insignificant. We can see from the results of Model 2-1, the  
 353 transaction costs is decreasing as the horizontal integration increases. While the horizontal  
 354 integration degree has positive impact on transaction costs insignificantly in Model 2-2 and  
 355 significantly in Model 2-3. The reason may be that the horizontal integration can reduce  
 356 transaction costs, but also result in high organization costs, and the resultant organization  
 357 costs are much higher than transaction costs saved, especially when the scale of EJC  
 358 (Jinglianshe) is more than 5460. The results confirms the Hypothesis 1, namely the horizontal  
 359 integration degree of rural collective organization will not reduce the transaction costs of  
 360 RCCL until the resulting organization costs are equal to the transaction costs saved *ceteris*  
 361 *paribus*. And the optimal scale of the RSCs is 1493-3310 shareholders.

362 In terms of the level of self-organization governance of the collectives, the number of the  
 363 leaders of the collective is positively correlated with the transaction costs. A larger number of  
 364 collective leaders increase the coordination and administrative costs, indicating a lower  
 365 self-organized level. This finding confirms the hypothesis that the transaction costs can be  
 366 reduced with the improvement of the organization governance.

367 The scale of the trading parcel (physical asset) positively impact on transaction costs. The  
 368 larger trading parcel with higher asset specificity increases the uncertainty. The RSCs may

369 conduct multiple democratic voting, in order to obtain the maximum benefits from the land,  
370 resulting in higher transaction costs.

371 In regard to the uncertainty of transaction environment, the index “the way to determine  
372 price” shows a negative impact on transaction costs. Compared with “negotiating”, the  
373 transaction costs will be lower when the price is determined by “bidding”. The trading  
374 information is highly transparent in the process of “bidding”, while the parties in the process  
375 of “negotiating” tend to inform the information that is beneficial for them, in order to obtain  
376 higher land value income, resulting in higher uncertainty of the trading environment, which  
377 will bring higher transaction costs.

378 A significantly negative impact of “trading platform” on transaction costs in Model 2-1  
379 and Model 2-2 reveals that the upper platform reduces the transaction costs of the market.  
380 Compared with the platforms at the level of village, more open and fair environment on the  
381 district ones could reduce the information asymmetry between trading parties, the costs of  
382 information searching and negotiating will be reduced accordingly. In addition, according to  
383 our survey, the perfect trading rules and procedures have been established on the district  
384 platforms, which reduce the transaction uncertainty and risk, saving a lot of labors and time in  
385 the process of RCCL transaction.

386 The coefficient of “the market form” is significantly positive in Model 1 and Model 2-1,  
387 which shows that the transaction costs in the sale market are higher than in the rental market.  
388 The reason may be that compared with the rental market, the larger scale land parcels and  
389 longer transaction terms in the sale market may increase the uncertainty of people’s behavior  
390 and risk, and thus give rise to higher transaction costs.

391 The index of “government intervention” in Model 1 and Model 2-1 has a significantly  
392 positive effect on transaction costs. Without the intervention of the government, the RCCL  
393 market will be more market-oriented, while the participation of government maybe increase  
394 the “rent-seeking” and opportunism behavior, thus the transaction costs will be higher.

395 Contrary to conventional wisdom, transaction frequency shows an insignificant effect on  
396 the transaction costs. Transaction frequency is defined based on the contract term of a parcel  
397 traded in this study, and it cannot reflect the actual transaction times (one-time, occasional or  
398 recurrent). Hence, the transaction frequency shows the insignificant impact on the transaction  
399 costs.

## 400 **5. Conclusions and discussions**

### 401 *5.1. Conclusions*

402 This study estimates the transaction costs of RCCL market in Nanhai District, Guangdong  
403 Province, and further explores the impact of the horizontal integration degree and the  
404 self-organization governance of collectives on the transaction costs based on the transaction  
405 cost theory of Williamson. We have drawn several conclusions as follows:

406 Firstly, there is an almost U-shaped relationship between the horizontal integration degree  
407 of the collectives and the transaction costs. Through horizontal integration, the RSCs in Nanhai  
408 District can not only consolidate the spatially scattered plots into contiguous and large-scale  
409 land, but also can re-collectivize the fragmented property rights from individual farmers,

410 reducing the costs of information searching and contract negotiating between the farmers or  
411 households and enterprises. However, the organization costs will increase with the expansion  
412 of RSCs scale. The degree of horizontal integration will reach a point where the transaction  
413 costs saved are equal to the increasing organization costs. After reaching the point of the  
414 optimal scale, transaction costs will increase when the horizontal integration degree increases.  
415 In Nanhai District, the RCCL market is more efficient in Economic Joint Community  
416 (*Jinglianshe*) compared with Economic Cooperative (*Jingjishe*). Nevertheless, if the scale is  
417 expanded without limit, it will result in high organizational costs and low market efficiency.

418 Secondly, the higher level of self-organization governance can reduce transaction costs  
419 and improve the efficiency. More leaders in the village in Nanhai District lead to more  
420 organization costs and the opportunism behavior (Zhang *et al.*, 2017a). This means that the  
421 current number of collective leaders in Nanhai District has exceeded the optimal, leading to  
422 low level of governance. However, leaders are too few to supervise opportunism behavior. So,  
423 proper control of the number of village leaders can improve the level of self-organization and  
424 transaction efficiency of market.

## 425 5.2. Policy implication

426 This study contributes to the reform and innovation of rural grassroots organization  
427 governance and land-based shareholding system (LBSS) (Yep, 2015). The rural management  
428 pattern in Nanhai District which separates the economic and political functions of the  
429 administrative villages should be encouraged to implement nationwide. We should encourage  
430 the bottom-up collectivization of some individual villagers to merge into the big economic  
431 organization which can reduce transaction costs of land and property fragmentation, but the  
432 government should control the size of the rural economic organizations and release the power  
433 to the rural grassroots organizations. At the same time, the political organization should control  
434 the number of leaders, clarify the labor division, optimize the organizational governance  
435 structure and improve the self-organization level, which can improve governance efficiency.

436 Both household responsibility system (HRS) and LBSS in China are bottom-up induced  
437 institutional change, but have different institutional performance. The former targets low  
438 production potential and high supervision cost of collectivization. The later mainly focuses on  
439 high transaction costs and scale diseconomy of de-collectivization. Since 1949 China has  
440 experienced an arduous institutional path of privatization- nationalization- collectivization-  
441 de-collectivization, which is similar to what happened in the transition countries such as the  
442 former Soviet Union and Vietnam. Reorganization of rural households and restructuring  
443 countryside like Nanhai along the line of LBSS can be followed by other China Eastern  
444 coastal areas and the transitional economies above mentioned on the condition of the  
445 trade-offs between transaction and governance costs. Radical extremely forward privatization  
446 or backward collectivization up-down enforced institutional change will incur huge  
447 institutional costs disregarding of the acceptance willingness of the rural households and surly  
448 jeopardize the ongoing reform.

## 449 5.3. Discussions



450 The land fragmentation, transaction costs and market efficiency in land market have  
451 become the common issues, especially in transition countries (Lerman and Shagaida, 2005;  
452 Deininger *et al.*, 2012). As a global leading developing country, China has taken a series of  
453 measures to address these issues. Nanhai District, Guangdong Province has established a  
454 typical RCCL market and RSCs. The horizontal integration among shareholders of RSCs  
455 could help to reduce the transaction costs in RCCL market. However, as Coase (1937) argued,  
456 if the certain transaction costs can be eliminated by organizing one, why all of the shareholders  
457 and land asset are organized by a big cooperative? The reason is that when the horizontal  
458 integration degree gets higher, the organization costs of the cooperative may arise. Therefore,  
459 exploring the relationship between horizontal integration degree and transaction costs in  
460 RCCL market and the optimal scale of RSCs is significant to balance the organization  
461 efficiency and market (transaction) efficiency.

462 This paper calculates the transaction costs (Y) in RCCL market, that is, the sum of labor  
463 costs and cash costs at different stages of transaction process. And we also measures  
464 horizontal integration degree ( $X_1$ ). This work will fill the gap in literature regarding  
465 quantifying the relationship between transaction costs and three attributes- interdependence,  
466 uncertainty and timing (Williamson, 1988; Zhang, *et al.*, 2017a; 2017b; Tan, *et al.*, 2009),  
467 which may contribute to the reform and innovation of rural basic-level cooperation  
468 organization, but can be improved in several ways in the future.

469 (1) The optimal scale of RSCs in this study disregards rural rental market of farmland  
470 transaction. The land assets of RSCs are composed of farmland, RCCL and other rural assets  
471 in rural areas. If we fully consider the rental market of farmland, the optimal scale maybe  
472 decreases.

473 (2) Land-based economic activities and political governance in plains in eastern coastal  
474 China occur onsite<sup>3</sup>, while the same behaviours in mountainous areas in inland and western  
475 China happen offsite<sup>4</sup>. The optimal scale in densely populated areas, like Nanhai District  
476 within realm of administrative units, is reasonable. Nevertheless the determination of the  
477 efficient scale in sparsely populated areas like inland mountainous regions may be  
478 problematic.

479 (3) The measurement of the horizontal integration degree ( $X_1$ ) can be alternative.  
480 Horizontal integration often occurs when rivals in the same production line cooperate due to  
481 their financial interests (Dietzenbacher *et al.*, 2012), but much less on cooperatives. The nature  
482 of the cooperative form can be seen at two levels: the one is with respect to its farmer members;  
483 and the other is the inter-organizational network – the participation in federated structures and  
484 other inter-organizational networks along with other cooperatives and investor-owned firms  
485 (Karantininis, 2007). The cooperative form in this work is the former and the number of  
486 shareholders in the village is adopted to measure the horizontal integration degree subject to the

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<sup>3</sup> onsite: In most eastern coastal plain areas, both transaction of RCCL and social governance take place in the same land shareholding cooperative within the realm of administrative region.

<sup>4</sup> offsite: Contrary to plain areas, transaction of RCCL occurs in the land shareholding cooperative within the realm of administrative region, but social governance happens outside because farmers in most remote mountainous area migrate to urban areas.

487 data availability. We can try to measure the horizontal integration alternatively in the future  
488 studies.

489 (4) Both static and dynamic optimal scales should be considered in the future. We  
490 estimate transaction costs and its influencing factors only based on the cross-sectional data,  
491 rather than spatial-temporal data. It is necessary to make a dynamic analysis in Nanhai District  
492 later on.

493

494

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