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How to reduce local government decision-making competition in China's new urbanization process

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Abstract

Purpose – The purpose of this paper is to analyze the impact of local government decision-making competition new urbanization, further to seek measures to weaken the negative effect of local government decision-making competition.

Design/methodology/approach – This paper first puts forward the three paths which make local government decision-making competition: construction of new-style urbanization, economic development and construction of people's livelihood and take China's new-style urbanization as an example, the authors analyzed the internal mechanism of decision making of local government competition which caused by above three paths. Second, using the prospect theory, risk aversion theory and Cournot duopoly model, the authors analyzed how to avoid the local government decision-making competition and how to reduce the harm caused by local government decision-making competition.

Findings – The central government can curb the appearance of local government competition strategy through regulating and controlling the effectiveness of local government protective-investment policy, improving the degree of market competition and punishment coefficient of government decision-making failure and further, the authors can reduce the detriment of decision-making competition between local governments through adjusting the revenue function of local government in the process of new-style urbanization.

Originality/value – New-style urbanization is the main driving force of China's future economic development, however, in the process of new-style urbanization, because of the "principle-agent" relationship between central government and local government, officials achievements appraisal mechanism and promotion game, they all cause competition between local government decision making, and this will weaken the positive effect of urbanization. Although, there are many researches on horizontal and intergovernmental competition, most researches devoted to how to avoid it from the angle of institutional economics, and the suggestions put forward by these researches are hardly applied. Anyone interested in how to avoid local government decision-making competition and reduce the negative influences of it from the angle of unitary government state's reality will find this paper valuable.

Keywords Behaviour, Game theory

Paper type Conceptual paper

Introduction

Kuznets and Chenery believed that a series of changes of social and economic structure would happen with economic growth. Two of the most remarkable changes are

industrialization and urbanization (Kuznets, 1967; Chenery, 1960). Joseph E. Stiglitz, winner of the Nobel Prize in economics, believes that "China's urbanization" and "America's high-tech" are two key factors that affect the course of human development in the twenty-first century (Stiglitz, 2001). China's urbanization has a very important influence on world economy and the development of the entire human race.

China's central government had a meeting about new urbanization and put forward China's new urbanization development planning in 2013. The principles of this planning were promoting the coordinated development of cities and towns, adapting industry development to the advantages of town, developing small towns and urban agglomeration is sectors of new urbanization construction. Six major tasks about new urbanization were put forward in this planning: transforming rural population into urban population; improving utilization efficiency of urban construction land; sustaining the quantity of farm land, forest area and vegetable land, guarantying supply of grain; adjusting economic structure and optimizing regional industrial form, thinning areal division of labor in economic production, shifting the mode of economic growth; reducing interference and harm exerted on ecological environment in rural areas, intensive use of land, water and fossil energy; constructing a beautiful city which transfers historical culture, has national and regional characteristic. Under the guidance of this planning, local government devote to promote the new urbanization.

However, in the process of new urbanization construction, local government decision-making competition would be caused by the "principle-agent" relationship between central government and local government, the promotion tournament among local government officials, "self-interstation" and "short-term action" among local government officials, the differences of regional resource endowment. Local government decision-making competition would have negative effect on new urbanization construction (Li, 2013). It would result in disorder of attracting investment competition, financing difficulty (Xiong, 2008); regional economic cannot achieve Pareto optimal, regional industrial structure would be convergent, economic structure would fluctuate (Guo and Zhao, 2012); market is highly fragmented, industrial structure is hardly optimized, the areal division of labor in economic production is hardly thinned, coordinated development between cities and towns are hardly achieved (Li, 2010); repeated construction of infrastructures (Wang, 2013); low efficiency of public goods supply (Holcombe and Williams, 2011; Lin, 2014); "arable land wasting" is serious (Wang, 2010). Thus, how to avoid local government decision-making competition and reduce the negative effect brought by local government decision-making competition have strong practical and theory guidance significance.

In a country with unitary political systems, because of the principal-agent relationship between central government and local governments, there is promotion game between local governments, resulting in local government competition; these competitive behaviors were implement mainly by the local government's decision. In this paper, it is known as the local government decision-making competition.

The concept of local government competition originated from the concept of "competitive government" (Breton, 1996). From the point of evolutionary path of local government competition theory, research on China's local government competition mainly experienced four stages. First, "Brother competition," according to Chinese situation, horizontal competition in the field of investment among local governments and vertical competition in same field between local government and central government are generalized as "brother competition" (Fan and Zhang, 1990). Second, economic federalism and government decentralization competition: as for economic

federalism, the main reason of local government competition is economic growth; and local government competition can promote economic growth conversely (Zhang and Xu, 2004). As for government decentralization competition, through researching the relationship between fiscal decentralization and development of local economy (Zhang, 2005; Fu, 2007), government competition and its consequences are discussed standardly. Third, local government competition (promotion tournament): establishing industrial organization model to research the property and consequences of local government competition (Feng, 2010). Fourth, decision-making competition among local governments: describing theoretically the main ways and means of decision-making competition among local governments mainly using motivation theory, agency theory and game theory, etc. Research on local government competition has attracted much attention in recent years. Regional "inner-born resource" and the relationship of adjacent local governments affect the collaboration between local government and enterprises (Hawkins, 2010); increasing the number of government's candidate would promote the supply of public goods in federal states (Arvate *et al.*, 2010); adjustment of tax policy would affect the extent of local government competition (Lyytikäinen, 2012); local government competition is caused by local interest group and local government policies (Vladimir, 2012); the nature of local government competition has been changing, "brother competition" and local protectionism are weakening, variation competition are strengthening (Zhou and Wang, 2008); the influences brought by local government competition depend on the role local government played in the shift of economic growth mode in new economic development stage (Chi and Kuang, 2010); local government competition would happen in new urbanization (Jin and Gong, 2013).

In summary, from research perspective, about the decision-making competition among local governments, most scholars focus on its single cause, characteristic and consequences and put forward some system suggestions which are difficult to apply in practice. However, the following three aspects are rarely involved. First, generation path of decision-making competition among local government (it is caused by a number of joint reasons); second, how to avoid decision-making competition; third, means used to reduce the effect resulted by decision-making competition among local government. Therefore, it is necessary to carry out overall thorough research about how to reduce decision-making competition among local governments in unitary government states, especially during new urbanization process. This research has a very important practical significance.

About how to avoid decision-making competition among governments, this paper abandons the planning theory used to research behavior normally. We select prospect theory and Arrow-Pratt coefficient of absolute risk aversion, based on bounded rational hypothesis, integrate seeking maximization benefit with value sensitivity into a normal unit and the decision-making behavior of decision maker under risk and uncertainty can be analyzed more accurately. As for how to reduce the effect resulted by decision-making competition among local government, this study uses Cournot duopoly model. This model can not only describe the effect degree of decision-making competition among local government, but also can find means to reduce the effect. Thus, it is necessary to research how to avoid local government decision-making competition and reduce the negative influences of it from the angle of s reality.

In this paper, first we put forward three paths that cause local government decision-making competition in the process of China's new urbanization: new urbanization construction, regional economic development, livelihoods construction.

Second, we analyze how to avoid local government decision-making competition and how to reduce the effect brought by local government decision-making competition. Third, the conclusion and implication are given.

Literature review and hypothesis
The theory of local government competition originated from "voting foot" theory which is put forward in *A Pure Theory of Local Expenditures* (Tiebout and Charles, 1956). However, because of the difference of unitary government and federalism, researches on local government competition are also different.

From the aspect of target
Local governments in federal states are in a state of competition, because of pressure from candidate's aim to garnet votes, voter and main body of election market. Local governments attract more economic development resources to maximize economy utility, through tax and fiscal expenditure (Rizzo, 2010); intergovernmental competition would happen when one or more tax base are shared among governments at different levels (Baybeck *et al.*, 2011; Hindriks, 2012); local government officials are elected directly by voters in democratic states. Information asymmetry leads to yardstick competition. Some government officials would carry out rent-seeking activities, using information asymmetry. Citizens vote only taking the officials of neighbor city as reference object, so yardstick competition happened (Dubois and Paty, 2010). However, in unitary government state as China, horizontal competition, the aim of which is Promotion Tournament among local government officials rather than citizen's votes, is the major mode of local government competition (Ma, 2013). The entire government system is considered as a decision maker when researching local government competition:

H1. The entire government system is considered as a decision maker. It has individual rational and individual value character.

H2. The research object of this paper is local government decision-making competition rather than intergovernmental competition or competition within local government.

From the aspect of competitive means
Along with the utilizing of game theory, information economics, the theory of endogenous growth, the main means of local government competition are fiscal expenditure (Baybeck *et al.*, 2011), tax (Overesch and Rincke, 2011; Kiss, 2012), yardstick competition (Dubois and Paty, 2010). However, in unitary government state as China, researches on local government competition means mainly focus on "Xiongdi competition" (Wang *et al.*, 2010), fiscal decentralization (Fu, 2007; Feng, 2011), viewpoints of industry organization (Feng, 2010), promotion tournament among local government officials (Ma, 2013). On the basis of researches above, third hypothesis are put forward:

H3. Means of local government decision-making competition are local governmental administrative policies, fiscal expenditure and tax policy. In this paper, we assume that fiscal expenditure is the main mean of competition, because that fiscal expenditure is the main way of governmental administrative policies and local government cannot decide tax rate which is decided by central government.

From the aspect of effect of local government competition
First, it promotes economic growth (Grassmueck and Shields, 2010; Fu and Qiao, 2011; Fu and Zhu, 2013; Cheng, 2013); second, it causes macroeconomic fluctuation (Guo and Zhao, 2012); third, it causes repeated construction of infrastructure, "feudal economy" and local protectionism (De Paola and Scoppa, 2010; Wang, 2013; Yang *et al.*, 2014); fourth, it leads to low efficiency of public goods supply (Holcombe and Williams, 2011; Liu, 2010). The fourth and fifth hypotheses:

H4. An entire local government system has two develop target: regional economic development and increasing governmental performance. Central government judges the performance of local government, depending on regional economic development (Ma, 2013), because of the main reasons are the "principle-agent" relationship between central government and local government and information asymmetry. Thus, in this paper, we assume that the purpose of local government is to maximize regional economic utility.

H5. Utility function of local government is the Cobb-Douglas function (Li, 2010):

$$R = (1-t)(I+mI)^{\alpha}(N-nN)^{\beta}, \quad 0 \leqslant \alpha, \beta \leqslant 1, \quad 0 \leqslant n, m \leqslant 1 \qquad (1)$$

Causes and effects of local government decision-making competition
Causes of local government decision-making competition
In this paper, we put forward the basic analysis frame of government competition about unitary government states, on the basis of competitive governments: an *Economic Theory of Politics and Public Finance* and Government Competition; the analysis Paradigm for the System Transformation of Powerful Countries (Herrmann-Pillath, 1999). The internal mechanism of this analysis frame is seen in Figure 1. On the basis of this analysis frame, three paths that cause local government decision-making competition are put forward. The internal mechanism of these three paths is analyzed, taking China's new urbanization as an example.

(1) Path 1: new urbanization construction. New town construction is one of the important aspects of new urbanization, and one of the most important factors of new town construction is resource of construction fund. *China's new urbanization programming 2014-2020* point out that government fiscal, government bonds and government financing are the main sources of new town construction fund. The
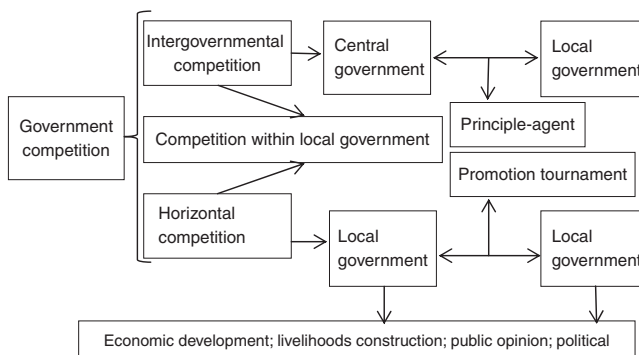

Figure 1.
The internal
mechanism of
local government
competition in
unitary government
state

internal mechanism that new urbanization construction drives local government decision-making competition is shown in Figure 2.

Government revenue and land finance are main sources of local government fiscal. Because that local government cannot decide tax rate which is decided by central government and local governments' fiscal revenue through land sale had been paid close attention to by central government. Zhou Xiaochuan (2013) considered that the main source of infrastructure and municipal facilities construction fund could be financial instruments, such as asset securitization, government financing. Li (2013) considered that the main source of public goods construction fund could be local government financing, local government bonds and private capital. We can see that local government financing is the main source of new urbanization construction fund. However, the main subject of new urbanization is China's central and west regions which lack of resource used to economic development, the economic development extent of which is relatively backward. Thus, if wanted to attract more enterprise investment, local government must give these enterprises some policy preferences (Huang, 2005). In conclusion, local government decision-making competition would be caused by new urbanization construction.

(2) Path 2: regional economic development. Local government decision-making competition would be caused by the thing that local government develops regional economic to increase governmental performance. The internal mechanism that regional economic development drives local government decision-making competition is shown in Figure 3.

At present, the main evaluation standard of official promotion is officials' contribution to local economic growth (Liu, 2008). Thus, on the premise of promotion tournament among local government officials, if local government officials wanted to get promotion, local government officials must devote to develop local economy. Two paths to develop local economy are enlarging original enterprises and establishing new enterprises. And introducing FDI into the development of new enterprises mainly relies

Figure 2.
The internal mechanism that new urbanization construction drives local government decision-making competition
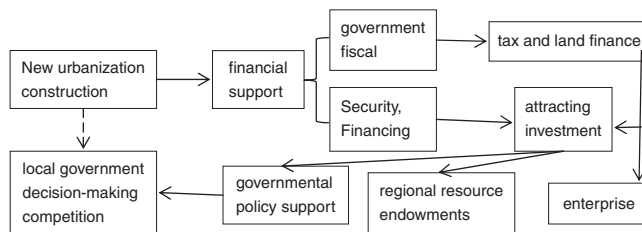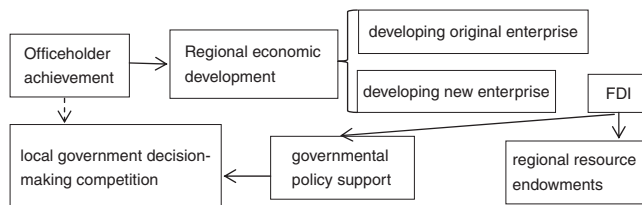

Figure 3.
The internal mechanism that regional economic development drives local government decision-making competition

on local government's policy support (Huang, 2005). Thus, local government decision-making competition would be caused by regional economic development.

(3) Path 3: livelihoods construction. To establish the thought of people first, livelihoods construction is the most aspect of new urbanization construction (*New urbanization programming 2014-2020*, 2014). Because that promotion tournament exists among local government officials (Chen and Liu, 2011), and livelihoods construction is paid close attention to when central government evaluates official performance (Chen and Zhu, 2014), local government decision-making competition would be caused by livelihoods construction. The internal mechanism that livelihoods construction drives local government decision-making competition is shown in Figure 4.

In the process of urbanization in China, there are two different mechanisms driving farmers entering city: "initiatively" and "passively." "Initiatively" means that the motivation of farmers entering city is initiative. Farmers choose to work and settle down in city initiatively because of the superior material living conditions and numerous employment opportunities in city. "Passively" is a "by-urbanization" process. Some rural regions, the economic and social condition of which are immature, are "pulled into" urbanization because of local government policy (Si and Meng, 2011). Labor resources and competitive cost advantage would be increased when numerous surplus rural labor appear because of "by-urbanization" and "image project." "By-urbanization" is a way local government used to increase governmental performance, seeking quick benefits. In conclusion, local government decision-making competition would be caused by livelihoods construction.

The effects
(1) Effects on economic development. In new urbanization process, local government decision-making competition would be caused by promotion tournament among local government officials and fiscal decentralization (Liu, 2008; Cheng, 2013). Because of local government decision-making competition, the efficiency of market allocation of resources is low, Pareto optimality cannot be achieved (Li, 2010). Because that local government officials' tenure is fixed, local government would carry out extension type of development (the internal mechanism of this mode is to promote economic growth through investment to obtain short-term excess earnings), which leads to local government's investment impulsion. Local government carries out discretion of macro-control policies to restrain investment impulsion, resulting in economic fluctuation (Guo and Zhao, 2012).
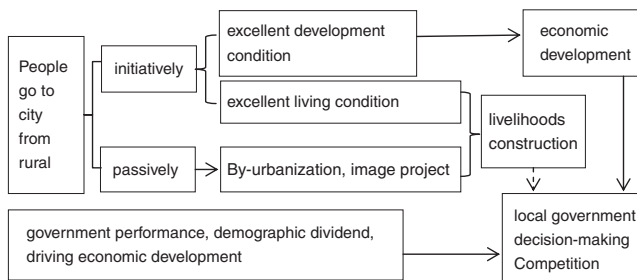

Figure 4.
The internal mechanism that livelihoods construction drives local government decision-making competition

The main subjects of new urbanization are small towns in the central and west part of China. The economic industries in the regions are at the downstream of industrial chain, are labor-intensive and resource-intensive industries. Because of local government decision-making competition, regional economic structure would become toward identity seriously (Wu and Wang, 2013; Luo and Zhang, 2013).

(2) *Effects on government financing*. Local government decision-making competition leads to chaos of attracting outside investment competition and the market financing order. In order to attract investment, many heavy energy-consumption enterprise and high-pollution enterprise are invited (Xiong, 2008). Because the negative influences of local government decision-making competition are far greater than its positive influences, the efficiency of public goods supply is subjected to serious threaten (Holcombe and Williams, 2011).

(3) *Effects on land using*. Because of local government decision-making competition, especially "yardstick competition" (Dubois and Paty, 2010), local government officials increase governmental performance competitively, city size is enlarged, "By-urbanization" is serious (Si and Meng, 2011), arable land wasting is serious and the efficiency of land intensive utilizing is low (Wang, 2010).

(4) *Effects on public goods construction*. In the new urbanization process, effects that local government decision-making competition has on public goods supply and infrastructure construction are especially obvious. Local governments would devote to infrastructure construction and relative public goods supply, in order to develop local economy and attract FDI (Zhang and Xu, 2004). Under fiscal decentralization, local government decision-making competition changes local government budget, leading to deviation of public expenditure (Pi and Wang, 2013). Because of local governments' eager efforts to attract FDI and the lack of long-term and comprehensive planning, infrastructure construction and relative public goods supply present a state of chaos. Local government public expenditure presents a distorted structure (Fu, 2007). On the one hand, local government decision-making competition leads to low efficiency of infrastructure construction and public goods supply (Holcombe and Williams, 2011). On the other hand, local government decision-making competition leads to reconstruction of infrastructure and resource waste (Wang, 2013).

How to reduce the effects

According to discussion above, in the new urbanization process, local government decision-making competition would affect the development of new urbanization, especially the financing of new town construction, the regional economic utility, the economic structure and the supply of public goods and so on. Thus, how to avoid government decision-making competition and how to reduce the effects that local government decision-making competition brings are crucial.

Model 1: how to avoid the local government decision-making competition

(1) *Methodology*. Prospect theory (Kahneman and Tversky, 1979) applies researches that experimental psychology and cognitive psychology made on individual decision-making psychology to the behavior economics, to research the process of individual decision making. Compared with traditional rational choice theory, Prospect theory, taking individual decision making in reality as the research object, unifying the individual value feeling and rational decision making, can explain the actual

decision-making mechanism and decision-making behavior of individual under the condition of risk and uncertainty more accurately. Prospect theory is applied in many areas, e.g. government management (Wang, 2011), investment decisions making (Erner *et al.*, 2013), driver's behavior choice (Liu *et al.*, 2012), multi-objective decision making (Elhumnusrat and Koichi, 2012) and so on. Model 1, using prospect theory and risk theory, studies how to avoid local government decision-making competition.

(2) *Variable definitions.* x: the income of a government's policy that is made for local government decision-making competition; w: the income that without any government's policies which was made for local government decision-making competition; p: the probability that government's policy which is made for local government decision-making competition did not exert an effect, otherwise, the probability is $1-p$; $x+bx$: the loss that government's policy which is made for local government decision-making competition dose not exert an effect; b: penalty coefficient (including: government reputation, economic construction, attracting investment and so on); v: value function in prospect theory; and $w-xb$: income of decision makers when government's policy which is made for local government decision-making competition is invalid.

(3) *Discussion.* The programming of local government decision-making competition:

$$\begin{cases} Max\ F(\mathrm{x}) = \pi(1-p)\ \mathrm{v}\ (\mathrm{x+w})+\pi(\mathrm{p})\ \mathrm{v}\ (w-\mathrm{bx}) \\ \mathrm{s.t.}\ F(\mathrm{x}) > 0, x \geqslant 0 \end{cases} \tag{2}$$

Define: $y_1 = w-xb,\ y_2 = w+x$:

$$\begin{cases} Max\ F(\mathrm{x}) = \pi(1-p)\ v\ (y_2)+\pi(p)\ v\ (y_1) \\ \mathrm{s.t.}\ F(\mathrm{x}) > 0, x \geqslant 0 \end{cases} \tag{3}$$

The derivative of the implicit function of the programming:

$$\frac{\mathrm{d}(F(\mathrm{x}))}{\mathrm{d}(y_1)} = \pi(p)v'(y_1);\ \frac{\mathrm{d}(F(\mathrm{x}))}{\mathrm{d}(y_2)} = \pi(1-p)v'(y_2) \tag{4}$$

According to the existence theorem of implicit function:

$$\frac{dy_2}{dy_1} = \frac{\pi(p)v'(y_1)}{\pi(1-p)v'(y_2)} \tag{5}$$

where $y_1 = w-xb,\ y_2 = w+x$, that is, $y_2-y_1 = (1+b)x$, define $k = (1+b)x$:

$$\frac{dy_2}{dy_1} = \frac{\pi(p)v'(y_1)}{\pi(1-p)v'(y_1+k)},\quad \frac{d\left(\frac{dy_2}{dy_1}\right)}{dy_1} = \frac{\pi(p)}{\pi(1-p)}\frac{v'(y_1)}{v'(y_2)}\left(\frac{v''(y_2)}{v'(y_2)}-\frac{v''(y_1)}{v'(y_1)}\right) \tag{6}$$

According to the absolute coefficient of risk aversion $A(Y) = -V''(Y)/V'(Y)$, the higher the numeric of $A(Y)$ is, the more the decision-making subject averse risk:

$$\frac{d\left(\frac{dy_2}{dy_1}\right)}{dy_1} = \frac{\pi(p)}{\pi(1-p)}\frac{v'(y_1)}{v'(y_2)}(-A(y_2)+A(y_1)) \tag{7}$$

On the basis of the concave-convex character of value function, $\pi(p) > 0$, $\pi(1-p) > 0$, $v'(y_1) > 0$, $v'(y_2) > 0$, the result is that $A(y_1)$, $A(y_2)$ determine the numeric of $(d(dy_2/dy_1))/dy_1$

In the process of regional economic development, local government decision-making competition will be avoided, when $A(y_2)$ is greater than $A(y_1)$:

$$\frac{\partial F(x)}{\partial x} = \pi(1-p)v'(x+w)-b\pi(p)v'(w-xb) \tag{8}$$

$$\frac{\partial F(x)}{\partial x} = \pi(1-p)v'(x+w)-b\pi(p)v'(w-xb) = 0 \tag{9}$$

$$\pi(1-p)v'(x+w)-b\pi(p)v'(w-xb) = 0 \tag{10}$$

The result is:

$$\frac{1}{b} = \frac{\pi(p)}{\pi(1-p)}\frac{v'(y_1)}{v'(y_2)} \tag{11}$$

According to $H1$ and regional economic growth, $1/b > (\pi(p)/\pi(1-p))$, $(v'(y_1)/v'(y_2)) > 1$, Local government decision-making competition will be avoided when the formulation is $1/b = (\pi(p))/(\pi(1-p))$.

To summary, there are two ways that can avoid local government decision-making competition.

First: local government decision-making competition will be avoided, when the numeric of penalty coefficient (b) is increased when the numeric of p is fixed. Increasing the numeric of b means that, when a policy which is made for local government decision-making competition is invalid, the policy increases negative effects on local government.

Second: local government decision-making competition will be avoided, when fixing the numeric of b and increasing the numeric of p, when the numeric of p is increased when the numeric of b is fixed. The numeric of p can be increased through formulating and promulgating relevant policies which aim at weakening the relationship between attracting investment and government's policy which was made for local government decision-making competition by the central government.

Model 2 how to reduce the effects caused by local government decision-making competition

(1) *Methodology*. Cournot duopoly model (Cournot, 1838) is the most fundamental model of oligarch theory analysis. There are three hypotheses in the Cournot duopoly model: there are only two decision makers in one product market, there is no collusion behavior between each other, and symmetry information. Cournot duopoly model is used to resolve the problem how decision makers determine the optimal production to maximize their utility. Cournot duopoly model is applied in many areas, e.g. the real estate market competition (Kalashnikov *et al.*, 2012), the economic development model (Wu *et al.*, 2010), competitive advertising (Ahmed *et al.*, 1999) and so on. Model 2, using Cournot duopoly model, explains how to reduce the effects brought by local government decision-making competition.

(2) *Variable definitions*. A and B are two adjacent towns; R_A is the economic utility function of A, R_B is the economic utility function of B, $R = (1-t)(I+mI)^\alpha (N-nN)^\beta$; t is the tax rate of A, T is the tax rate of B; r_A is the capital rationing invested by A, r_B is the capital rationing invested by B; I is enterprising-competition investment, it has positive external effects, that is to say that the utility of both towns would increase when this behavior occurs; N is protective-competition investment, it has negative external effects, that is to say that the utility of one town would increase when it takes this behavior, however, the utility of the other town would decrease; m is a parameter used to measure the extent of positive external effect of a win-win behavior. If m was greater (less), the positive external effect of a win-win behavior would be greater (less); and n is a parameter used to measure the extent of negative external effects of a self-interest behavior. If n was greater (less), the negative external effects of a self-interest behavior would be greater (less);

(3) *Discussion*. When A and B make investment decisions, respectively, using Cournot duopoly model, the programming function.

The programming function of A:

$$\begin{cases} \text{Max } R_A = (1-t)(I_A+mI_B)^\alpha(N_A-nN_B)^\beta \\ s.t.\, I_A+N_A \leqslant r_A, I_A \geqslant 0, N_A \geqslant 0 \end{cases} \qquad (12)$$

The programming function of B:

$$\begin{cases} \text{Max } R_B = (1-T)(I_B+mI_A)^\alpha(N_B-nN_A)^\beta \\ s.t.\, I_B+N_B \leqslant r_B, I_B \geqslant 0, N_B \geqslant 0 \end{cases} \qquad (13)$$

According to *H1* and tax law that local tax rate is determined by central government in China, the Lagrangian programming functions of A and B could be described as:

$$\begin{cases} 0 = (1-t)(I_A+mI_B)^\alpha(N_A-nN_B)^\beta + \lambda(r_A-I_A-N_A) \\ 0 = (1-T)(I_B+mI_A)^\alpha(N_B-nN_A)^\beta + \mu(r_B-I_B-N_B) \\ r_A = I_A+N_A = r_B = I_B+N_B = r \end{cases} \qquad (14)$$

$$I_A^* = I_B^* = \frac{\alpha - n\alpha}{\alpha + \beta + m\beta - n\alpha} r; \quad N_A^* = N_B^* = \frac{\beta + m\beta}{\alpha + \beta + m\beta - n\alpha} r \tag{15}$$

$$R^* = R_A^* = R_B^*$$

$$= (1-t)\left(\frac{\alpha - n\alpha}{\alpha - n\alpha + \beta + m\beta}(1+m)r\right)^{\alpha}\left(\frac{\beta + m\beta}{\alpha - n\alpha + \beta + m\beta}(1-n)r\right)^{\beta} \tag{16}$$

When central government make decisions, the target of which is to maximize total utility of A and B, the programming function could be described as:

$$\begin{cases} Max \quad R = R_A + R_B \\ s.t. \quad r_A = r_B \leqslant r, I_A \geqslant 0, I_B \geqslant 0, N_A \geqslant 0, N_B \geqslant 0 \end{cases} \tag{17}$$

$$I_A^\& = I_B^\& = \frac{\alpha}{\alpha + \beta} r; \quad N_A^\& = N_B^\& = \frac{\beta}{\alpha + \beta} r \tag{18}$$

$$R^\& = (1-t)\left(\frac{\alpha}{\alpha + \beta}(1+m)r\right)^{\alpha}\left(\frac{\beta}{\alpha + \beta}(1-n)r\right)^{\beta} \tag{19}$$

From the aspect of enterprising-competition:

(1) $(\partial I_A^*)/(\partial n) = (\partial I_B^*)/(\partial n)(-\alpha\beta(1+m)r/((\alpha+\beta+m\beta-n\alpha)^2) < 0$, define $Z = (-\alpha\beta(1+m)r)/((\alpha+\beta+m\beta-n\alpha)^2)$:

$(\partial Z)/(\partial\alpha) = 0$, $\alpha = ((1+m)/(1-n))\beta$, With the increasing of the numeric of α, if $\alpha < ((1+m)/(1-n))\beta$, then $(\partial Z)/(\partial\alpha) < 0$; if $\alpha > ((1+m)/(1-n))\beta$, then $(\partial Z/\partial\alpha) > 0$. It can be concluded that the numeric of Z decreases initially, but then turns to increase, the rate of the numeric variation of $((\partial I_A^*)/(\partial n)) = ((\partial I_B^*)/(\partial n))$ increases initially, but then turns to decrease. With the increasing of the numeric of β, if $\beta < ((1-n)/(1+m))\alpha$, then $(\partial Z/\partial\beta) > 0$, if $\beta > ((1-n)/(1+m))\alpha$, then $(\partial Z/\partial\beta) < 0$; it can be concluded that the numeric of Z increases initially, but then turns to decrease; the rate of the numeric variation of $((\partial I_A^*)/(\partial n)) = ((\partial I_B^*)/(\partial n))$ decreases initially, but then turns to increase. The numerical simulation of the changing of $((\partial I_A^*)/(\partial n)) = ((\partial I_B^*)/(\partial n))$ is shown in Figure 5.

(2) $(\partial I_A^*)/(\partial m) = (\partial I_B^*)/(\partial m) = (-\alpha\beta(1-n)r)/((\alpha+\beta+m\beta-n\alpha)^2) < 0$, define $Z = (-\alpha\beta(1 - n)r)/((\alpha+\beta+m\beta-n\alpha)^2)$.

$(\partial Z/\partial\alpha) = 0$, $\alpha = ((1+m)/(1-n))\beta$. With the increasing of the numeric of α, if $\alpha < ((1+m)/(1-n))\beta$, then $(\partial Z/\partial\alpha) < 0$; if $\alpha > ((1+m)/(1-n))\beta$, then $(\partial Z/\partial\alpha) > 0$. It can be concluded that the numeric of Z decreases initially, but then turns to increase; the rate of the numeric variation of $(\partial I_A^*)/(\partial m) = (\partial I_B^*)/(\partial m)$ increases initially, but then turns to decrease. With the increasing the numeric of β, if $\beta < ((1-n)/(1+m))\alpha$, then $(\partial Z/\partial\beta) > 0$; if $\beta > ((1-n)/(1+m))\alpha$, then $(\partial Z/\partial\beta) < 0$; it can be concluded that the numeric of Z increases initially, but then turns to decrease; the rate of the numeric variation of $(\partial I_A^*)/(\partial m) = (\partial I_B^*)/(\partial m)$ decreases initially, but then turns to increase. The numerical simulation of the changing of $(\partial I_A^*)/(\partial n) = (\partial I_B^*)/(\partial n)$ is shown in Figure 6.

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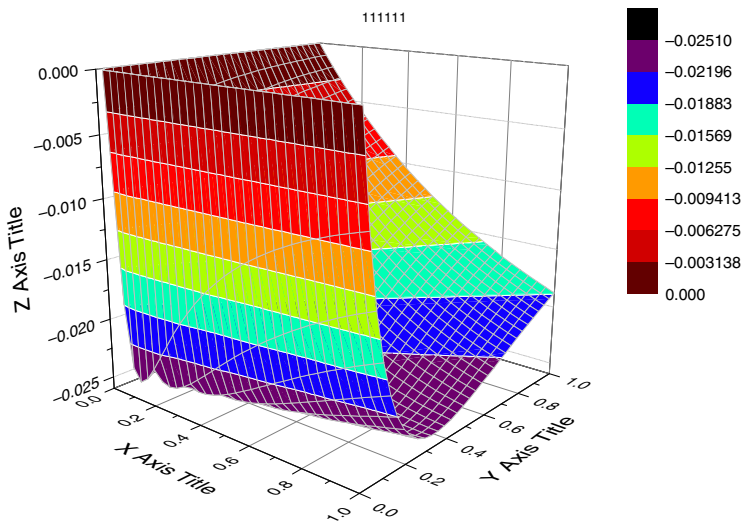
Note: x: α; y: β; $\quad Z = (\partial I_A^*)/(\partial n) = (\partial I_B^*)/(\partial n)$

Figure 5.
The variation of
$(\partial I_A^*)/(\partial n) =$
$(\partial I_B^*)/(\partial n)$
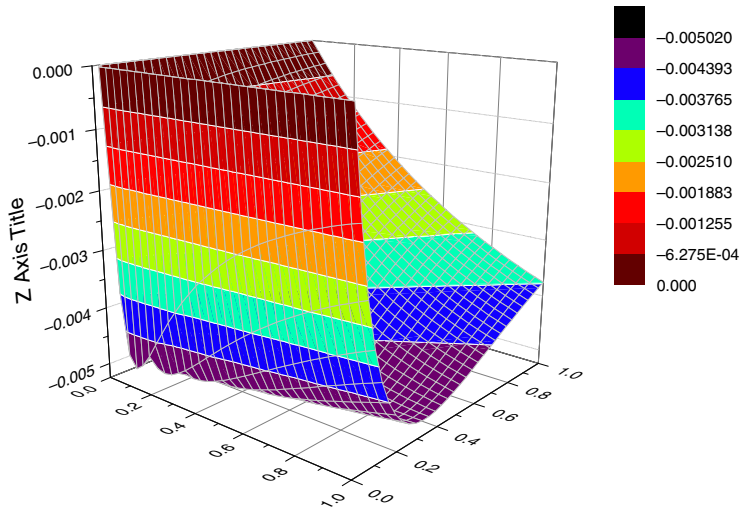
Note: $Z = (\partial I_A^*)/(\partial m) = (\partial I_B^*)/(\partial m)$

Figure 6.
The variation of
$(\partial I_A^*)/(\partial m) =$
$(\partial I_B^*)/(\partial m)$

Third: when local government decision-making competition has had effects, enterprising-investment is not related with n and m, but only related with α and β. And with the increasing of the numeric of α, the decreasing rate of the utility of enterprising-investment decreases initially, but then turns to increase; with the increasing of the numeric of β, it initially increases, but then turns to decrease. Central government will adjust the relationship between α and β in $R = (1-t)(I+mI)^\alpha(N-nN)^\beta$

(e.g. increasing the financial subsidy of enterprising-investment and tax rate of protective-investment), which is wanted to be $\alpha = \beta(1+m)/(1-n)$.

Then the decreasing rate of utility of enterprising-investment would be slow, local government would pass the initial period of competition and reduce the effect that local government decision-making competition brings.

From the aspect of protective-competition:

(1) $(\partial N_A^*)/(\partial n) = ((\partial N_B^*)/(\partial n)) = ((\alpha\beta(1+m)r)/((\alpha+\beta+m\beta-n\alpha)^2)) > 0$, define $Z = ((-\alpha\beta(1-n)r)/(\alpha+\beta+m\beta-n\alpha)^2)$:

$(\partial Z/\partial\alpha) = 0$, $\alpha = ((1+m))/(1-n))\beta$, with the increasing of the numeric of α, if $\alpha < ((1+m)/(1-n))\beta$, then $(\partial Z/\partial\alpha) < 0$; if $\alpha > ((1+m)/(1-n))\beta$, then $(\partial Z/\partial\alpha) > 0$; it can be concluded that the numeric of Z decreases initially, but then turns to increase; the rate of the numeric variation of $((\partial I_A^*)/(\partial m)) = ((\partial I_B^*)/(\partial m))$ increases initially, but then turns to decrease. With the increasing of the numeric of β, if $\beta < ((1-n)/(1+m))\alpha$, then $(\partial Z/\partial\beta) > 0$; if $\beta > ((1-n)/(1+m))\alpha$, then $(\partial Z/\partial\beta) < 0$; it can be concluded that the numeric of Z increases initially, but then turns to decrease; the rate of the numeric variation of $(\partial N_A^*)/(\partial n) = (\partial N_B^*)/\partial n)$ decreases initially, but then turns to increase. The numerical simulation of the changing of $(\partial N_A^*)/(\partial n) = (\partial N_B^*)/(\partial n)$ is shown in Figure 7.

(2) $(\partial N_A^*)/(\partial m) = (\partial N_B^*)/(\partial m) = (\alpha\beta(1-n)r)/((\alpha+\beta+m\beta-n\alpha)^2) > 0$, define $Z = ((\alpha\beta(1-n)r)/((\alpha+\beta+m\beta-n\alpha)^2))$:

$(\partial Z/\partial\alpha) = 0$, $\alpha = ((1+m))/(1-n))\beta$. With the increasing of the numeric of α, if $\alpha < ((1+m)/(1-n))\beta$, then $(\partial Z/\partial\alpha) < 0$; if $\alpha > ((1+m)/(1-n))\beta$, then $(\partial Z/\partial\alpha) > 0$; it
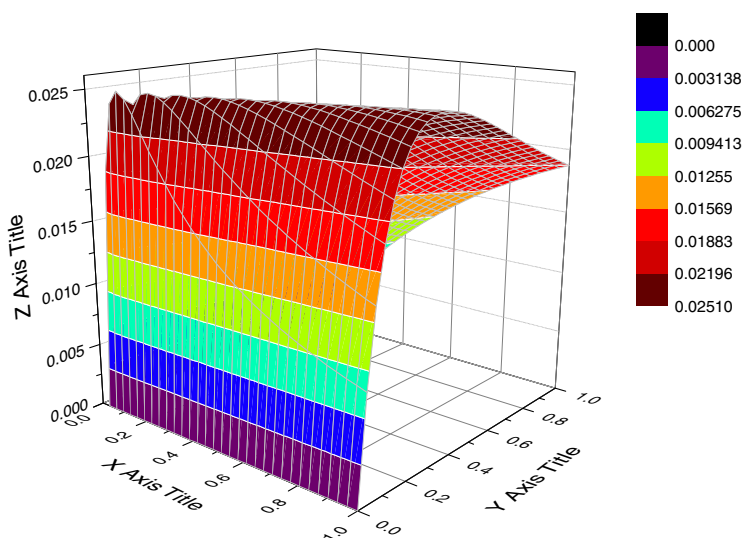

Figure 7.
The variation of
$(\partial N_A^*)/(\partial n) =$
$(\partial N_B^*)/(\partial n)$

Note: x: α; y: β; $Z = (\partial N_A^*)/(\partial n) = (\partial N_B^*)/(\partial n)$

can be concluded that the numeric of Z decreases initially, but then turns to increase; the rate of the numeric variation of $(\partial N_A^*)/(\partial m) = (\partial N_B^*)/(\partial m)$ increases initially, but then turns to decrease. With the increasing of the numeric of β increases, if $\beta < ((1-n)/(1+m))\alpha$, then $(\partial Z/\partial \beta) > 0$; if $\beta > ((1-n)/(1+m))\alpha$, then $(\partial Z/\partial \beta) < 0$; it can be concluded that the numeric of Z increases initially, but then turns to decrease; the rate of the numeric variation of $(\partial N_A^*)/(\partial m) = (\partial N_B^*)/(\partial m)$ decreases initially, but then turns to increase. The numerical simulation of the changing of $(\partial N_A^*)/(\partial m) = (\partial N_B^*)/(\partial m)$ is shown in Figure 8.

Fourth: when local government decision-making competition has had effects, protective-investment is not related with n and m, but only related with α and β. And with the increasing of the numeric of α, the increasing rate of the utility of enterprising-investment increases initially, but then turns to decrease; with the increasing of the numeric of β, it initially decreases, but then turns to increase. Central government will adjust the relationship between α and β in $R = (1-t)(I+mI)^\alpha(N-nN)^\beta$ (e.g. increasing financial subsidy of enterprising-investment and tax rate of protective-investment), which is wanted to be $\alpha = \beta(1+m)/(1-n)$. Then the advantage of protective-investment would be waken, the effects that local government decision-making competition brings would be reduced.

Conclusions and implications
To conclude, in this paper, we first put forward three paths that cause local government decision-making competition in the process of China's new urbanization: new urbanization construction, regional economic development, livelihoods construction. Second, we analyze how to avoid local government decision-making competition and how to reduce the effect brought by local
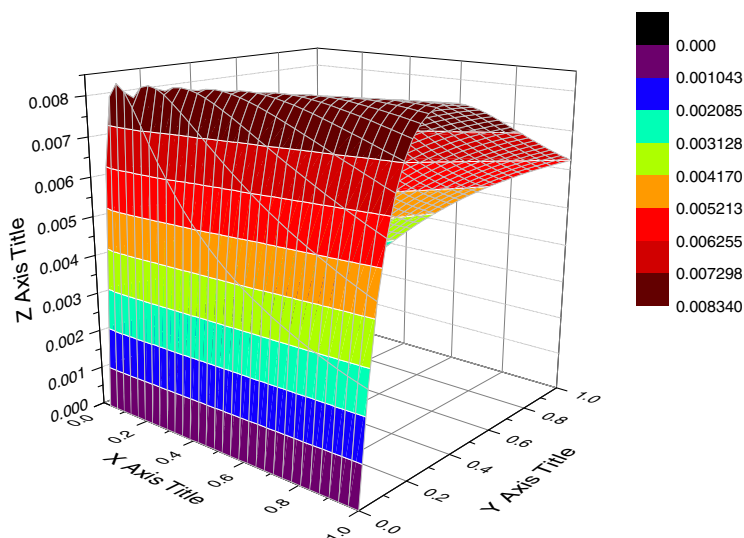
Note: $Z = (\partial N_A^*)/(\partial m) = (\partial N_B^*)/(\partial m)$

Figure 8.
The variation of
$(\partial N_A^*)/(\partial m) =$
$(\partial N_B^*)/(\partial m)$

government decision-making competition. The following two results are concluded: first, when local government are making investment policies, according to the function $1/b = [\pi(p)v'(y_1)]/[\pi(1-p)v'(y_2)]$, central government can restrain local government decision-making competition, through weakening the effectiveness of local government protective-investment policy, improving the degree of free market competition, increasing the penalty coefficient (b) to using macro-policy. Second, after the happening of local government decision-making competition, central government, using fiscal policy and tax policy, can regulate the relationship between α an β (in the function $R = (1-t)(I+mI)^{\alpha}(N-nN)^{\beta}$). When $\alpha = \beta(1+m)/(1-n)$, game equilibrium between two local governments can be achieved, reducing the negative effects brought by local government decision-making competition.

The primary reason that caused local government decision-making competition is promotion tournament among local government officials. And the promotion tournament is caused primarily by China's present performance evaluation system of local officials, the key of which is economic development. Revising index system and relative laws about performance evaluation of local government officials could avoid local government decision-making competition directly to some extent.

Many local governments fail to understand the conception of "urban management" well (Huang, 2006), confuse urban management, the orientation of which is political assignment, with urban management, the basis of which is market competition mechanism, the orientation of which is breaking the regional resource constraints reasonably and sustainable development strategy. They misled the effective of government function utility. Making full sense of "urban management" could avoid local government decision-making competition effectively to some extent.

Research limitation and future research directions
Despite advantages above, this study does have some limitations:

(1) Unable to measure the local government decision-making competition degree. Most researches about local government decision-making competition mainly focus on effects and suggestions. However, there is not a unified metrics of the degree of e local government decision-making competition yet, and its degree is unable to be measured.

(2) In statistical terms, local government often tends not to count this part of data, or they may not know how to do it. Therefore, the next focus of this study is data statistics of local government decision-making competition, and suggesting that related department should perfect this statistical system.

(3) This study made qualitative theoretical analysis based on prospect theory and game theory. Due to related data is unable to get, this paper can only carry out numerical simulation without empirical analysis. Therefore, the next focus is to made empirical analysis about local government decision-making competition to perfect the theoretical results and this research subject.

References

Ahmed, E., Agiza, H.N. and Hassan, S.Z. (1999), "On modeling advertisement in Cournot duopoly", *Chaos Solitons & Fractals*, Vol. 10 No. 7, pp. 1179-1184.

Arvate, P.R., Curi, A.Z., Rocha, F., Miessi, S. and Fabio, A. (2010), "Corruption and the size of government: causality tests for OECD and Latin American countries", *Applied Economics Letters*, Vol. 17 No. 10, pp. 1013-1017.

Baybeck, B., Berry, W. and Siegel, D. (2011), "A strategic theory of policy diffusion via intergovernmental competition", *The Journal of Politics*, Vol. 73 No.1, pp. 232-247.

Breton, A.,(1996), *Competitive Governments: An Economic Theory of Politics and Public Finance*, Cambridge University Press, Cambridge.

Chen, L. and Zhu, W.P. (2014), "Causes and governance of regional administrative monopoly", *Journal of Systems & Management*, Vol. 23 No. 2, pp. 229-237.

Chen, T. and Liu, X.Y. (2011), "Tournament system, promotion game and local political theatre", *Journal of Public Management*, Vol. 8 No. 2, pp. 21-33.

Cheng, J.H. (2013), "Decentralization, intergovernmental competition, and economic growth: a critical review", *Legal Forum*, Vol. 27 No. 4, pp. 33-42.

Chi, F.L. and Kuang, X.M. (2010), "The future direction of local competition", *People's Tribune*, Vol. 5 No. 15, pp. 28-29.

Cournot, A.A. (1838), "Recherchessur les principesmathématiques de la théorie des richessespar Augustin Cournot", L. Hachette.

De Paola, M. and Scoppa, V. (2010), "Effort observability, incentive systems, and organizational forms", *Labour: Review of Labour Economics and Industrial Relations*, Vol. 24 No. 3, pp. 221-237.

Dubois, E. and Paty, S. (2010), "Yardstick competition: which neighbours matter?", *The Annals of Regional Science*, Vol. 44 No. 3, pp. 433-452.

Elhum, N. and Koichi, Y. (2012), "A descriptive decision-making model under uncertainty: combination of Dempster-Shafer theory and Prospect theory", *World Scientific*, Vol. 21 No. 1, pp. 79-102.

Erner, C., Klos, A. and Langer, T. (2013), "Can prospect theory be used to predict an investor's willingness", *Journal of Banking & Finance*, Vol. 37 No. 6, pp. 1960-1973.

Fan, G. and Zhang, S.G. (1990), *Public Macroeconomic Theory Outline*, Joint Publishing Company, Shanghai.

Feng, X.Y. (2010), "The crux of the relationship between central governments and local governments and the strain", *People's Tribune*, Vol. 296 No. 7, pp. 12-14.

Feng, X.Y. (2011), "Land finance, local government financing vehicles and their rules", *China Market*, Vol. 3 No. 304, pp. 21-23.

Fu, Q. and Qiao, Y. (2011), "How did government competition promote China's rapid economic growth: to explore the relationship between market segmentation and economic growth", *World Economics and Politics*, Vol. 7 No. 34, pp. 43-63.

Fu, Q. and Zhu, H. (2013), "The local government competition mechanism guided by central government-the perspective of institution to explain economic growth of China", *Journal of Public Management*, Vol. 10 No. 1, pp. 19-29.

Fu, Y. (2007), "Chinese style decentralization: local finance pattern and public goods supply", PhD thesis, Fudan University, Shanghai.

Grassmueck, G. and Shields, M. (2010), "Does government fragmentation enhance or hinder metropolitan economic growth?", *Papers in Regional Science*, Vol. 89 No. 3, pp. 641-657.

Guo, Q.W. and Zhao, X.J. (2012), "Local government investment competition and economic cycle fluctuation", *World Economics and Politics*, Vol. 5 No. 405, pp. 3-21.

Hawkins, T. (2010), "Assessing the promise of Jonathan Franzen's first three novels: a rejection of 'refuge'", *College Literature*, Vol. 37 No. 4, pp. 61-88.

Herrmann-Pillath (1999), "Government competition: theoretical analysis system transformation country paradigm", workpaper, UniHalle, Wittenberg.

Hindriks, J. (2012), "Political failures and intergovernmental competition", *Economics Research International*, Vol. 2012, pp. 1-7.

Holcombe, R.G. and Williams, D.W. (2011), "The cartelization of local governments", *PublicChoice*, Vol. 149 No. 2, pp. 65-74.

Huang, W.H. (2006), "City management: the special economic function of city government", *Urban Problems*, Vol. 9 No. 137, pp. 18-22.

Jin, F.Z. and Gong, X.W. (2013), "Research on local government competition in the new urbanization in China", *Economic Vision*, Vol. 9 No. 229, pp. 148-175.

Kalashnikov, V.V., Curiel, D.F. and Gonzalez, J. (2012), "Application of the Cournot and Stackeberg mixed duopoly models for Mexican real estate", *Intelligent Decision Technologies*, Vol. 15, pp. 389-396.

Kiss, r. (2012), "Minimum taxes and repeated tax competition", *International Tax and Public Finance*, Vol. 19 No. 5, pp. 641-649.

Li, W. (2010), "Analysis on the externality local government competition behavior has on regional economic development", *Commercial Times*, Vol. 12 No. 487, pp. 123-124.

Li, Y.N. (2013), "China's new urbariazation process construction funds come from where", *LILUNDAOBAO*, Vol. 11, p. 47.

Lin, J. (2014), "On the supply efficiency of public goods", *Academic Exploration*, Vol. 2, pp. 57-61.

Liu, J.X. (2008), "An analysis on Chinese political tournament", *Journal of Public Management*, Vol. 5 No. 3, pp. 24-29.

Liu, Q. (2010), "Research on public goods supply mechanism and the orientation of government, based on the analysis of experimental economics", PhD thesis, Nankai University.

Liu, Y., Fan, Z.P. and Zhang, Y. (2012), "Risk decision analysis in emergency response: a method based on prospect theory", *Computers & Operations Research*, Vol. 42, pp. 75-82.

Luo, R.Y. and Zhang, L.P. (2013), "Local government competition and economic growth performance in undertaking industrial transfer of western China", *Chinese Public Administration*, Vol. 337 No. 7, pp. 112-116.

Lyytikäinen, T. (2012), "Tax competition among local governments: evidence from a property tax reform in Finland", *Journal of Public Economics*, Vol. 96 Nos 7-8, pp. 584-595.

Ma, L. (2013), "Promotion incentive of government officials and government performance target-setting: an empirical analysis of provincial panel data in China", *Journal of public management*, Vol. 10 No. 2, pp. 28-39.

Overesch, M. and Rincke, J.,(2011), "What drives corporate tax rates down? A reassessment of globalization, tax competition, and dynamic adjustment to shocks", *Scandinavian Journal of Economics*, Vol. 113 No. 3, pp. 579-602.

Pi, S.W. and Wang, L.R. (2013), "Horizontal tax competition and government public expenditure", *Surveys and Thoughts*, Vol. 343 No. 12, pp. 74-76.

Rizzo, L. (2010), "Interaction between federal taxation and horizontal tax competition: theory and evidence from Canada", *Public Choice*, Vol. 144 Nos 1-2, pp. 369-387.

Si, L.B. and Meng, W.D. (2011), "Analysis on the 'by-urbanization' phenomenon and its countermeasures in the process of the rural communities", *Urban Studies*, Vol. 18 No. 4, pp. 35-39.

Stiglitz, J.E. (2001), "Principles of financial regulation: a dynamic portfolio approach", *The World Bank Research Observer*, Vol. 16 No. 1, pp. 1-18.

Tiebout and Charles, M. (1956), "A pure theory of local expenditures", *Journal of Political Economy*, Vol. 64 No. 5, pp. 416-424.

Vladimir, K. (2012), "Representation, competition, and institutional development in American local government", PhD paper,University of California, San Diego, CA, available at: http://finance.eastmoney.com/news/1371,20140913423515998.html

Wang, D. (2010), "Research on the incomplete urbanization problem in China", Master Degree Thesis, Tianjin University of Finance & Economics, Tianjin.

Wang, M.J., Lin, J.H. and Yu, Z.X. (2010), "The identification of the characteristics of the financial competition of China's local governments: does 'the competition among brothers' coexist with 'the controversy between the father and sons'?", *Management World*, Vol. 3 No. 25, pp. 22-30.

Wang, Y. (2011), "Research on model comparison for travel decision based on Expected Utility theory and Prospect theory", Master Degree Thesis, Southwest Jiaotong University.

Wang, Y.L. (2013), "Deduction research on the mechanism of impact financial competition has on public service supply", *Statistics and Decision*, Vol. 384 No. 12, pp. 152-155.

Wu, W., Chen, Z.Q. and Ip, W.H. (2010), "Complex nonlinear dynamics and controlling chaos in a Cournot duopoly economic model", *Nonlinear Analysis. Real World Applications*, Vol. 5 No. 5, pp. 4363-4377.

Wu, Z.Q. and Wang, J.J. (2013), "Local government competition and the transformation of economic growth pattern:1998-2010 empirical study based on chinas provincial panel data", *Economist*, Vol. 1 No. 169, pp. 38-47.

Xiong, Z. (2008), "The effect of disorderly competition of attracting investment in districts and counties of Chongqing", *Co-operative Economy & Science*, Vol. 357 No. 11, pp. 96-97.

Yang, D., Wang, R. and Xia, Y. (2014), "A review of research on local government debts based on government competition", *Journal of Audit & Economics*, Vol. 1 No. 155, pp. 94-101.

Zhang, G. and Xu, X. (2004), "Attracting investment and performance evaluation of local government", *The Journal of Quantitative & Technical Economics*, Vol. 3 No. 20, pp. 84-90.

Zhang,Y. (2005), *Fiscal policy and Economic Growth Under the Decentralized System*, Shanghai People's Publishing House, Shanghai.

Zhou, Y.A. and Wang, X. (2008), "Fiscal decentralization and education development in China", *Public Finance Research*, Vol. 11 No. 28, pp. 16-19.

Further reading

Aron, K. (2012), "Minimum taxes and repeated tax competition", *Int Tax Public Finance*, Vol. 19 No. 5, pp. 641-649.

Besley, T. and Case, A. (1995), "Incumbent behavior: vote seeking, tax setting and yardstick competition", *American Economic Review*, Vol. 85 No. 1, pp. 25-45.

Brady, B., William, D.B. and David, A.S. (2011), "A strategic theory of policy diffusion via intergovernmental competition", *The Journal of Politics*, Vol. 73 No. 1, pp. 232-247.

Carsten, H.P. (2009), "Government competition: the analysis paradigm for the system transformation of powerful countries", *Journal of Guangdong University of Business Studies*, Vol. 24 No. 3, pp. 4-21.

Christopher, V.H. (2010), "Competition and cooperation: local government joint ventures for economic development", *Urban Affairs Association*, Vol. 32 No. 2, pp. 253-275.

Eric, D. and Sonia, P. (2010), "Yardstick competition: which neighbor's matter?", *Original Paper*, Vol. 44 No. 3, pp. 433-452.

Georg, G. and Martin, S. (2010), "Does government fragmentation enhance or hinder metropolitan economic growth?", *Papers in Regional Science*, Vol. 89 No. 3, pp. 641-657.

Huang, H. (2007), "Research on west local government attracting investment behavior", Master Degree Thesis, Huazhong University of Science & Technology, Wuhan.

Jean, H. (2012), "Political failures and intergovernmental competition", *Economics Research International*, Vol. 7, pp. 1-7.

Kogan, V. (2012), "Representation, competition, and institutional development in American local government", PhD degree thesis, University of California.

Leonzio, R. (2010), "Interaction between federal taxation and horizontal tax competition: theory and evidence from Canada", *Public Choice*, Vol. 144 Nos 1-2, pp. 369-387.

Lode, L. (2002), "Information sharing in a supply chain with horizontal competition", *Management Science*, Vol. 48 No. 9, pp. 1196-1212.

Ma, L. (2012), "Promotion incentive of government officials and government performance target – setting: an empirical analysis of provincial panel data in China", *Journal of Public Management*, Vol. 10 No. 2, pp. 28-39.

Maria, D.P. and Vincenzo, S. (2011), "Political competition and politician quality: evidence from Italian municipalities", *Public Choice*, Vol. 148 No. 201005, pp. 547-559.

Michael, O. and Johannes, R. (2011), "What drives corporate tax rates down? A reassessment of globalization, tax competition, and dynamic adjustment to shocks", *Journal of Economics*, Vol. 113 No. 3, pp. 579-602.

Oguzhan, C.D., Christopher, J.E. and Glen, R.W. (2010), "Corruption, decentralization and yardstick competition", *Economics of Governance*, Vol. 11, pp. 269-294.

Paulo, R.A., Andrea, Z.C., Fabiana, R. and Fabrio, A.M.S. (2010), "Corruption and the size of government: causality tests for OECD and Latin American countries", *Applied Economics Letters*, Vol. 17 No. 10, pp. 1013-1017.

Randall, G.H. and DeEdgra, W. (2011), "The cartelization of local governments", *Public Choice*, Vol. 149 Nos 1-2, pp. 65-74.

Teemu, L. (2012), "Tax competition among local governments: evidence from a property tax reform in Finland", *Journal of Public Economics*, Vol. 96 Nos 7-8, pp. 584-595.

Zhou, Y. (2010), "Local competition evolution and the current situation", *People's Tribune*, Vol. 5 No. 17, pp. 16-17.

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