

# The Local Benefit-Transfers Issue in China <sup>\*</sup>

## Based on Game Analysis between Central and Local Governments

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**Abstract:** In the process of China's reform, an underlying reason that arouses economic and political challenges is the local benefit-transfers issue. This paper frames the game between central and local governments of China to provide insightful policies for addressing the issue under the current political-economic mechanism. Empirical study on provincial panel data between 1995 ~ 2005 is then conducted to verify propositions of the general model and effects of parameters. Supporting evidence is found that (1) fiscal incentives promote social welfare while benefit-transfers impair it; (2) governmental competition aggravates the benefit-transfers issue while fiscal incentives alleviate it.

## 1 Introduction

Initiated in 1978, China's far-reaching reform involves political and economic aspects. It is known that the domestic authority of governments mainly includes administration, fiscal, and personnel appointment powers. The essence of the ongoing political reform is to delegate local governments with the ultimate authority in allocating economic resources within their regions, yet meanwhile central government maintains the power of personnel nomination by *ex post* performance evaluation. That is, central government wishes to hold local officials accountable for the local economy and citizens' livelihood by both incentives and controls.

The economic reform is the core of China's national policy of "Reform and Openness". Led by the *invisible hand* after gradually removing price controls in the previous central-planned economy, market players will pursue their own private benefits and end up with the Socialism Market Economy. Additionally, openness is the extension of domestic economic liberalization so that free trade and FDI will benefit China in terms of global specialization of labor force and resource endowment.

Remarkable as the miracle was, China still faces the challenges of sustainable improvement of social welfare. There has been a growing volume of literatures analyzing goals and challenges of China's reform, such as economic growth, legal system establishment, environmental protection, and regional disparity etc. However, these phenomena are just symptoms of the imperfect underlying political-economic system. In particular, under the current fiscal incentive and cadre evaluation system, there exists a game between central and local governments of China, which not only hampers the alignment but also blocks policy transmission. When power is devolved from the central to local levels, it not only stimulates the latter to promote local economy but also facilitates benefit-transfers from certain interest groups to local officials that distort central policy and local economy. If the central policies cannot be rigorously executed at local levels, then it makes no sense how many laws are passed and policies are adopted.

To the best of my knowledge, there are relatively few researches on China's benefit-transfers issues from the perspective of the inter-governmental game. Thus the aim of this paper is twofold: to explore and abstract the political and economic mechanism of those interlaced interests of stakeholders both theoretically and empirically, and to provide insights into the institutional design for Chinese administrators.

In the theoretical analysis, we introduce a three-player model (citizens, central and local governments) to describe stakeholders' relationships. Citizens have little power to make economic decisions, and their payoff is determined endogenously by the overall economy less the loss caused by benefit-transfers of local government. Central government is assumed as "semi-benevolent", which combines both its own fiscal revenue and citizens' satisfaction into consideration. Local officials (or cadres) are modeled as "self-interested"

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by maximizing their own fiscal income and benefit-transfers<sup>1</sup>. The central government is responsible for disciplining the local government, but it cannot impose any real-time monitor on the local level due to information asymmetry and the cost of inspection. However, *ex post* performance evaluation on the local officials concerning both economic performance and citizens' livelihood will be periodically fed back to the central government, through supervision channels such as the National People's Congress and media exposure etc. In the model, we describe fiscal incentives in both ways of the stimulation on the economy and the effect on private benefit-transfers. Besides, regulation policies such as public opinion, evaluation systems and institutional constraints are discussed to reveal feasible political and societal solutions for better alignment in central policies and local executions. Lastly, by loosening some assumptions, we provide a competing model to explain the potential effects brought by regional economic competition of multiple local governments.

Then, we conduct empirical analysis to verify the theoretical propositions. As direct data on the players' payoffs and local benefit-transfers are not available, we take an alternative two-step approach in the empirical test. Firstly, we test the general model to figure out whether there is a significant relationship between social welfare (dependent variable) and fiscal incentives and benefit-transfers (two key independent variables). Here we take social welfare as economic growth and regional salary of employees (livelihood). Fiscal decentralization is employed to stand for the degree of fiscal incentives. As for the most difficult part—benefit-transfers, we reasonably infer that they are directly related with some public data. For example, policy-related subsidies of local government might be proportional to the benefit-transfers, as a reciprocating behavior. Secondly, we test the empirical effects of policy parameters in the model. Constrained by the availability of data, we only focus on regional competition and fiscal incentives. Supporting evidence is found that fiscal incentives improve social welfare while benefit-transfers impair it. The empirical study also reveals that current economic competition at the provincial level aggravates benefit-transfers (which is somewhat contrary to intuition) but fiscal decentralization helps to relieve it.

The plan of this paper is as follows. In section 2, we give a brief review of background and related literatures of fiscal decentralization, political mechanism and the definition of benefit-transfers. we then cover the theoretical game models (including linear and nonlinear parts) as well as the competing model in section 3, and presents four propositions for administrations. Section 4 is the empirical analysis using a panel data of 31 provinces in China over 1995 ~ 2005 . Section 5 concludes and suggests future directions.

## 2 Background and Related Literatures

### 2.1 Fiscal Decentralization

Within the previous centrally planned economy, there were three planning mechanisms that the central authority exercised to control the local governments: planning of production, centralized allocation of resources, and budgetary control of revenues and expenditures . As a consequence, fiscal reform was a major task undertaken by the Chinese government during the economic transition (see, e.g., Qian and Weingast, 1996; Wong, 1997; Wang and Chang, 1998), reflecting the world trend of local participation (Alesina et al., 2001; Lockwood, 2002). It has undergone mainly two stages, though still far from being highly decentralized (Bahl and Roy, 1999).

**Fiscal Responsibility System Period of 1985~1994** Formal fiscal reform took place in 1985 with the introduction of “Fiscal Responsibility System” (FRS), which allowed local governments to retain portion of tax revenues after a fixed amount of remittance to the central government. Thereby, local governments would have the motive to gain more revenues by promoting local economy aiming at collecting more tax

<sup>1</sup>The basic idea of benefit-transfers is inspired by Acemoglu et al. (2008), which is used to modeling government. A formal definition of benefit-transfers will be discussed in subsection 2.3.

(see, e.g., Knight and Shi, 1999; Jin et al., 2005). However, FRS has two severe drawbacks. One is that the local governments would attempt to retain revenue implicitly by favoring local state-owned enterprises (hereafter SOEs) with more resources at the expense of the proportion of central government's revenues<sup>2</sup>. The other is that given the lack of strict tax laws in China, over budgeting would serve a tax shield and finance the local governments' expenditures.

**Tax Sharing System Period of 1994~2009** To overcome the shortcomings of FRS, "Tax Sharing System" (TSS) was adopted in 1994 by setting up uniform tax-sharing rates for major tax categories so as to strengthen the central government's ability in collecting and retaining fiscal revenues. In this new system, taxes are divided into three levels: the central, the local, and the shared taxes. Both FRS and TSS stimulated local development by the intra-governmental fiscal sharing. Comparatively speaking, TSS provides more flexibility and incentives for local governments since *de facto* the ceiling in FRS was removed; yet, TSS has not completely cut off local channels for pursuing private benefits that distorts the market. In this paper, we will focus on current TSS system and formulate the theoretical models by incorporating both economic promotion and private benefit-transfers.

The effects of fiscal decentralization on economic growth are open to debate. Most literatures support the positive effect of fiscal decentralization on growth. Hayek (1945) emphasizes the competitive advantage of local governments in accessing local information over the central government, based upon which Musgrave (1983), Tiebout and Charles (1956) and Oates (1972) further build theories of fiscal federalism that lower levels of governments are more conducive to efficiency of allocation. However, some argued that although fiscal decentralization has positive relation with economic growth in developed countries such as the US, (Oates, 1993; Brueckner, 2000), it can be detrimental to economic growth and efficiency in undeveloped countries (see Zhang and Zou, 1998; Davoodi and Zou, 2000; Jin and Zou, 2003). To the contrary, mainstream literatures hold more optimistic attitudes (see, e.g., Lardy, 1998; Brandt and Zhu, 2000; Jin et al., 2005).

Debates also spread to the side effects of fiscal decentralization on other fields, for example, equality among regions and market fragmentation. While some studies (see, e.g., Lee, 1995; Wei and Wu, 2001) maintain that regional income distribution remains unaffected, a larger quantity of researches conclude that fiscal decentralization coincides with expanding inequality in regional income per capita (see Sun and Chai, 1998; Kanbur and Zhang, 1999; Shi, 2001; Gulati and Husain, 2002; Demurger et al., 2002; Qiao et al., 2008). Additionally, Yang (1997) argues that revenue incentives promote local protectionism, which eventually leads to fragmented markets and the absence of regional specialization (see also Young, 2000; Bai et al., 2004, 2008). Qian and Weingast (1997), on the other hand, believes that fiscal decentralization contributes eventually to the reduction of regional disparities.

## 2.2 Political Mechanism

The fundamental structure of China's current political mechanism is a hierarchical bureaucratic control system with five tiers of governments: (1) center; (2) province; (3) prefectures; (4) county; (5) township. Targets are decomposed from the top down to steer the local from deviation from central policies. A wide range of quantitative targets are decomposed from the top to the lower levels in order to steer local governments in executing central policies (see, e.g., Muramatsu and Iqbal, 2001).

Quite different from the federal political landscape, where local officials are elected by citizens under their jurisdiction, officials in China are appointed directly by the central government in consultation with the opinions of local citizens. Thus, local governments act as agents of the central government in implementing regional fiscal and administrative tasks. Conditioned to the imperfect political constraints such as absence

<sup>2</sup>The share of the central government expenditures declined from 60% in 1970 to 37% in 1993 (Cullen and Fu, 1997).

of local elections in China, Huang (1995, 1996, 2001) observes that central government supervises the local ones through maintaining absolute stranglehold on personnel appointment, promotion and dismissal with the “Cadre Evaluation System”. This also can be accounted for by the fact that there is virtually no external opportunity outside the political labor market (see also Edin, 2000; Whiting, 2001; Tsui and Wang, 2004).

In parallel with the economic reform, the reform of cadre evaluation is to substitute economic performance and other competence-related indicators for previous political conformity (Li and Zhou, 2005). In recent years, other considerations are also of more importance since the *debut* of the fourth generation of Chinese leaders in 2002. The major strategic change was made in Third Plenum of the 16<sup>th</sup> CPC Central Committee in 2003, which included policies of comprehensive development and five overall planning on grass-root governmental organization, aiming to align central-local inconsistency among different functional departments. President Hu Jintao also proposed two famous concepts. The first one is the political guideline of building a “*Harmonious Society*”, which implies the central government would pay more attention to citizens’ livelihood and social stability rather than mere economic growth. Social contradictions and interest conflicts arising from the previous expanding economy will be eliminated in the harmonious society. The second one, “*Scientific Outlook on Development*”, denoted the government’s concern on rampant environmental pollution and rocketing consumption of resources and energy in China.

However, institutional control from the central government is far from omnipotent. For one thing, local cadres will endeavor to fulfill their mandates from above for career promotion; for another, they have both motives and approaches in carrying policies that reciprocate senders of private transfers that are detrimental to the welfare of local citizens as a whole. Consequently, delegated authority in local economic policies, information asymmetry between central and local governments, plus the lack of instantaneous monitoring, foster opportunities for local officials’ rent-seeking behaviors. In fact, they tend to trade off between the personal benefits from transfers and the risk of ruining their own political career. As a conclusion, fiscal decentralization, if without efficacious vertical or local disciplining instruments, will be a double-edged sword to local welfare (Blanchard and Shleifer, 2001). We term the local officials’ private profit seeking procedure as “benefit-transfers”. A more precise definition will be given in the following subsection.

Competition among regions and its effects on benefit-transfers is another pivot in this paper. Within the multi-divisional structure of China’s economic system, promotion and dismissal decision for officials depends largely on yardstick competition (Qian and Xu, 1993; Maskin et al., 2000). In the US’s political setting, Besley and Case (1996) show a positive relation between re-election probabilities of state leaders and relative economic performance to neighboring states. Similarly, local cadres in China, for the sake of their career concern, will attempt to excel their counterparts by achieving better economic performance.

### 2.3 Benefit-Transfers

Based on the *status quo* of fiscal and political mechanism, we give a formal definition for benefit-transfers. They are local governments’ implicit private benefits transferred from certain persons and groups, which are usually ascribed to the local authority of accessing public resources. As a result, local officials will provide explicit reciprocating privileges or favors to transferrers, conflicting central policies at the cost of common citizens’ welfare. Thus, put more broadly, anything that motivates local governments to maintain private agendas that are inconsistent with those of the central and distort market efficiency can be categorized into benefit-transfers.

Benefit-transfers can take various forms, and the key difference between benefit-transfers and definitions of corruption (see e.g., White, 1996; Heidenheimer and Johnston, 2002) is that our definition includes a broader range of distortion conducts and behaviors (either legal or illegal). They can further be classified into two categories: the direct and the indirect. Direct benefit-transfers, with both senders and recipients being local officials themselves, are the results of spontaneous rent-seeking. It includes explicit illegal or

semi-illegal economic behaviors such as fraud, embezzlement, extortion, and extravagance of public wealth. Indirect ones are those from regional vested-interest groups in exchange for private privileges and protections. They are more implicit, and sometimes deemed as common practice as “guanxi” in China. The transfers, aiming to create and maintain “guanxi” with local governments, works as an “investment” (such as graft, bribe or explicit lobby sponsors) for potential returns in the future. Nepotism and favoritism that bend the rules by preferential treatment to “friends”, then emerge as a means of reciprocation from local officials.

To our understanding, there are four reasons accounting for the benefit-transfers issue in China’s economic reform process. Firstly, fiscal decentralization authorizes local governments with partially independent economic decisions. However, Prud’homme (1995) and Tanzi (1996) warned that unfettered fiscal incentives can be conducive to corruption at local levels because it confers discretion on local politicians who are more susceptible and accessible to the benefits provided by local interest groups. Secondly, the issue is a reflection of the reorganization of interest groups during China’s gradual reform. The co-existence of planned and market economic systems, as well as the breakdown of public proprietorship of resources, spawned new interest strata which pool the senders of local benefit-transfers. Thirdly, in the initial stage of reform, central government overemphasized “efficiency” instead of “equality” in economic development, and tolerated the benefit-transfers issue to some extent. Lastly, given the geographic and economic diversity in the world’s third largest economy, loopholes in laws and regulatory policies at the transitional stage are inevitable. When weak legal and political systems fail to clarify authority and duty for local officials, it undermines the anti-corruption efforts and fosters further benefit-transfers in turn.

It is straightforward that efficiency of public administration will be undermined by “business bureaucrats”, because some clients can buy facilities through transfers while others are left to suffer from cumbersome red tapes. Once the officials have been involved in any particular interest group, they become the strong latent force to block democratic political and economic reform, which would threaten their power and interests (He, 2000). To make things worse, the more cadres participate in accepting benefit-transfers, the stronger the peer pressure and the pressure from outside vested-interest groups will be imposed on other clean cadres. At last, the vicious cycle in such deleterious atmosphere renders someone who rejects benefit-transfers as the special or the abnormal, which hence crumbles anti-corruption efforts<sup>3</sup>. The failure of central policies execution at the local level has been the worst bottleneck of China’s sustainable development, which makes *de facto* implementation different from *de jure* developmental plans and policies.

One distinct feature of benefit-transfers is that, once they have been started, there will be a self-protection mechanism that promotes more of them. Lured by the immediate and potential benefits, “corrupt” officials will be the strongest opposite power to political democracy and economic reforms that endanger their future interests (He, 2000). The snow-ball effect also exists in that the more cadres take benefit-transfers, the more political pressure and pecuniary temptation on their “clean” peers, most of whom finally give up their moral standards and get captured. Therefore, it is not surprising that most disclosed corruption cases involve large numbers of cadres, huge amounts of money and long periods of time, such as the notorious corruption case in Northeast China around 2002. The distorted motives of being a public official result in maintaining the maladministration merely for selfish interests rather than providing public service for the mass of the population.

The most severe concern of benefit-transfers is the accumulated harm on moral standards and social stability. This issue has centralized lots of resources from the general public to privileged classes. Gradually, it will damage the image of public officials, the social web of mutual trust, and the credibility of government administration. The negative role model of government officials is as far-reaching as to contaminate the

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<sup>3</sup>According to Zhu (2006), consumption by Chinese government officials in 2006 was RMB 900 billion yuan, accounting for 30% fiscal income of the nation. Even from the conservative data published by Ministry of Finance of P.R.C., fiscal expenditure for officials’ consumptions of traffic, dining and travel still amounted to RMB 120 billion yuan in 2006.

ethics and morality of the next generation. Moreover, discontentment may spread among the victims; the worst case, however, is that the dissatisfaction of normal citizens escalates into the rage and hatred against the government, and shakes the groundwork of the CPC's governance. The public outrage with the mounting corruption partially explains 1989 Tianmen Square event (Simmie and Nixon, 1989). Plenty of similar events have already happened in many other developing countries (see e.g., Harsch, 1993, 1998; Heidenheimer and Johnston, 2002), which are beyond our discussion in this paper.

### 3 Benefit-Transfers Game Model

#### 3.1 Strategic Form of The Game

To abstract the essence of the local benefit-transfers issue, we establish citizens, “semi-benevolent” central government, “self-interested” local government into the following strategic game.

- Payoff of local citizens (CTs):  $u = u(e^+, t^-)$
- Payoff of central government (CG):  $v = v(e^+, u^+)$
- Payoff of local government (LG):  $w(t) = w(e^+, t^+, p^+)$

where  $e$  and  $p$  stand for two explanatory variables: gross economy and CG's evaluation of LG's performance. Variable  $t$  denotes the key concept of benefit-transfers.

The result of benefit-transfers is distorted policies and the loss of market efficiency, therefore we describe the detriment with the a negative relationship  $e = e(t^-)$ . Note  $t$  also reduces CG's payoff in that it arouses CTs' dissatisfaction and turns out to be a latent threat to the “*Harmonious Society*”. To the extent that information asymmetry exists between the central and local governments,  $t$  does not explicitly come into the payoff of CG, but into that of CTs. The latter ( $u$ ), in turn, serves an important portion of the former ( $v$ ) with various supervision channels that local CTs can appeal to the CG. The semi-benevolent CG takes both the economy and CTs' satisfaction in evaluating local cadres, so both  $e$  and  $u$  should have a positive relationship with  $p$ , which is modeled as  $p = p(e^+, u^+)$ .

#### 3.2 Linear Model

Based upon the above discussion, we firstly extend the strategic form into a linear version.

- CT:  $u(\alpha) = e - \alpha t$
- CG:  $v(\gamma, \lambda, \beta) = (1 - \gamma)e + \beta u$
- LG:  $w(t) = \gamma e + \lambda p + (1 - \lambda)t$

where  $\alpha$ ,  $\gamma$ ,  $\lambda$  and  $\beta$  are all positive and linear coefficients.  $\alpha \in \mathbb{R}_+$  illustrates the detriment of benefit-transfers on local CTs' payoff. The larger  $\alpha$  is, the more unsatisfied CTs feel about benefit-transfers. Intuitively,  $\alpha$  can represent the severity of societal contradictions on benefit-transfers, and the transparency of public media on publishing the issue. In other words, both aversion and awareness to the issue will influence the size of  $\alpha$ , so it reflects the intensity of supervision by public opinion to some extent.

All coefficients  $\gamma$ ,  $\lambda$  and  $\beta$  are decision variables for CG.  $\gamma \in [0, 1]$  indicates the proportion of total fiscal income allocating to LG, so  $1 - \gamma$  is the share for CG. This reflects current TSS fiscal system. For the sake of simplicity but without losing its explanatory power, we assume tax is levied on the gross economy  $e$  instead of aggregated household incomes. In general,  $\gamma$  stands for the degree of fiscal incentives to LG.

The basic idea of  $\lambda \in [0, 1]$  is the local officials' trade-off between the benefit-transfers and performance evaluation, which is shaped by general institutional constraints on LG. If  $\lambda = 1$ , benefit-transfers, whatever the amount is, become irrelevant in LG's payoff, which implies that CG has absolute control over LG. Besides, improved consciousness against corruption can also depress their desire for transfers. Generally speaking, we take  $\lambda$  as the institutional constraints while holding cadres' ethics exogenous.

we also specify the economy and performance evaluation functions in linear forms:

- Performance:  $p = (1 - \beta)e + \beta u$
- Economy:  $e = e^* - t = (1 + \gamma)e_0 - t$ .

The performance evaluation function exhibits how CG weights economic development and CTs' satisfaction in the cadre evaluation system. Larger  $\beta$  indicates more emphasis on CTs' livelihood. For the sake of parsimony, we logically assume  $\beta u$  enters both the performance function and CG's payoff.

The transition from fiscal centralization to decentralization is to stimulate LG to boost the local economy (Jin et al., 2005; Qiao et al., 2008). In our model, it is formulated by  $e^* = (1 + \gamma)e_0$ , where  $e_0$  is the natural output of absolute centralization in a central-planned economy. Fiscal decentralization emancipates the previous confined economic activities, which pulls the natural output, given current fiscal incentives level  $\gamma$ , up to  $e^* = e_0 + \gamma e_0$  in a perfect market without any transfer. Additionally, as mentioned in the strategic form, benefit-transfers distort the market, the detrimental effect of which is then simply formulated as the item  $-t$ . Here to prevent unrealistic results, we restrict  $t \in [0, \gamma e_0]$  because it is fiscal decentralization, but not inside planned system, that provides a fertile ground but also puts bounds for transfers.

A simple transformation of linear framework reveals that

- CTs:  $u_l(\alpha) = (1 + \gamma)e_0 - (1 + \alpha)t$
- CG:  $v_l(\gamma, \lambda, \beta) = (1 + \gamma)(1 + \beta - \gamma)e_0 - [1 - \gamma + (1 + \alpha)\beta]t$
- LG:  $w_l(t) = (1 + \gamma)(\gamma + \lambda)e_0 + (1 - \lambda)t - (\lambda + \gamma + \alpha\beta\lambda)t$ .

It is obvious to find that the contribution of  $\gamma$  to payoffs are all positive. Besides, CG's and CTs' payoffs are encroached by transfers considering negative coefficients of  $t$ . As for the effect of transfers on LG, the benefit  $(1 - \lambda)t$  might well compensate the loss part  $-(\lambda + \gamma + \alpha\beta\lambda)t$ . We summarize it as follows:

**Proposition 1** *The payoffs of three players are all positively related with fiscal incentives. But benefit-transfers worsen payoffs of citizens and central government while the effect on local government's payoff remains uncertain.*

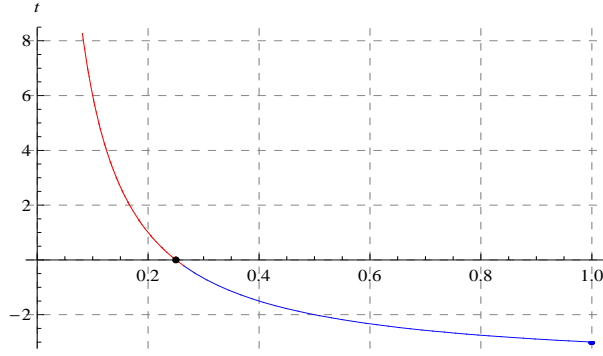
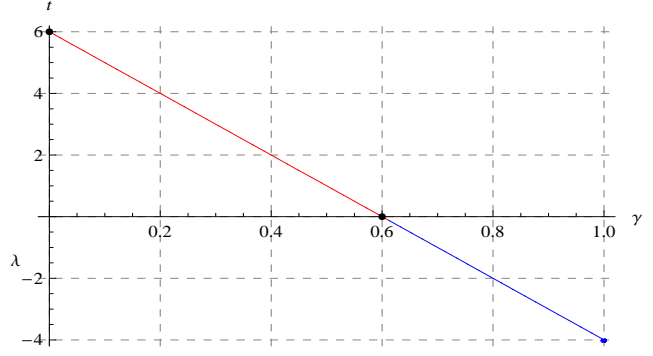
During the game cycle, CG publishes tax policy, institutional constraints and performance evaluation policy, i.e.  $(\hat{\gamma}, \hat{\lambda}, \hat{\beta})$ , as common knowledge. Then LG optimizes its transfers amount according to

$$\max_t w_l(t) = (1 + \hat{\gamma})(\hat{\gamma} + \hat{\lambda})e_0 + [1 - \hat{\gamma} - (2 + \alpha\hat{\beta})\hat{\lambda}]t.$$

At last, *ex post* performance is fed back to CG. So when the coefficient of  $t$  is negative, namely  $1 - \hat{\gamma} - (2 + \alpha\hat{\beta})\hat{\lambda} \leq 0$ , then the acceptance of benefit-transfers makes no sense to LG.

**Proposition 2** *Given the exogenous policies  $(\hat{\gamma}, \hat{\lambda}, \hat{\beta})$ , in **Civil Autonomous Society** when  $\alpha \geq \bar{\alpha}_l \equiv \frac{1 - \hat{\gamma} - 2\hat{\lambda}}{\lambda\hat{\beta}}$ , the local government will not take benefit-transfers.*

It illustrates that when "rigid" political, economic and legal system cannot be modified flexibly and frequently, more easily maneuvered measures, such as (1) building up a transparent political environment, (2) supporting an open media opinion that uncovers negative reports, and (3) promoting civic awareness against transfers to supervise LG, are also utterly efficacious solutions for the benefit-transfers issue. To sum up, supervision through local public opinion and media opinion can serve the alternative and expedient tool in **Civil Autonomous Society** to prevent LG from benefit-transfers.

Figure 1: The effect of  $\lambda$  on benefit-transfersFigure 2: The effect of  $\gamma$  on benefit-transfers

### 3.3 Nonlinear Model

Theoretically attractive as the basic model is, it suffers from the main drawback of oversimplifying collective behaviors of citizens. We hence introduce  $t^2$  item such that  $u = e - \alpha_1 t - \alpha_2 t^2$ . It is consistent with the reality because occasional minor benefit-transfers that seldom arouse sensational news are usually negligible; also, human psychology tends to amplify bad news of extreme cases. So  $t^2$ , bringing an accelerating payoff decline as transfers increase, captures the very nature that CTs' lack of response and over reaction on negative reports. For the sake of conciseness, we further simplify the nonlinear form into  $u = e - \alpha' t^2$  with possible coordinate translation. Holding other conditions, the simplified payoffs are

- CTs:  $u_n(\alpha') = (1 + \gamma)e_0 - t - \alpha' t^2$
- CG:  $v_n(\gamma, \lambda, \beta) = (1 + \gamma)(1 + \beta - \gamma)e_0 - (1 + \beta - \gamma)t - \alpha' \beta t^2$
- LG:  $w_n(t) = (1 + \gamma)(\gamma + \lambda)e_0 + (1 - \gamma - 2\lambda)t - \alpha' \beta \lambda t^2$ .

Let  $\partial w_n / \partial t = 0$ , then the best response of LG is

$$t^* = \arg \max_t w(t) = \max \left\{ \frac{1 - \hat{\gamma} - 2\hat{\lambda}}{2\hat{\alpha}'\hat{\beta}\hat{\lambda}}; 0 \right\}, \quad \text{with } t_+^* = \frac{1 - \hat{\gamma} - 2\hat{\lambda}}{2\hat{\alpha}'\hat{\beta}\hat{\lambda}}.$$

Thus whether there are transfers is determined together by  $\lambda$  (the institutional checks on LG),  $\gamma$  (the degree of fiscal incentives),  $\alpha'$  (the intensity of supervision by public opinion) and  $\beta$  (evaluation weight on CTs' satisfaction). A clean governance means  $t_+^* \leq 0 \Rightarrow 1 - \hat{\gamma} - 2\hat{\lambda} \leq 0$ , so we can easily conclude:

**Proposition 3** *Suppose that  $\lambda \geq \bar{\lambda} \equiv 0.5$ , namely sufficiently strong institutional constraints that make local cadres concern career more than benefit-transfers, then no transfers will ever occur. Moreover, for  $\lambda \in [0, 0.5)$ , it is still possible that sufficiently large  $\tilde{\gamma}$  that lets  $\lambda \geq \frac{1 - \tilde{\gamma}}{2}$  can prevent benefit-transfers issue.*

The numerator part of  $t_+^*$  reveals that  $\lambda$  and  $\gamma$  possess stronger effects on benefit-transfers issue than  $\alpha$  and  $\beta$ . Figure 1<sup>4</sup> shows that institutional constraints, with critical point  $\bar{\lambda} = 0.25$ , have a significant effect of prevention as indicated in **Proposition 3**. It inspires CG to establish strong and aligned conformity, either in political or legal ways, as well as to shape the philosophy and value belief for local governance. However,  $|\partial t_+^* / \partial \lambda| = (1 - \gamma) / (2\alpha' \beta \lambda^2)$ , which indicates marginal effect of institutional constraints is diminishing while figure 2<sup>5</sup> shows that of fiscal incentives remains steady. Also, any increase in  $\alpha'$ ,  $\beta$  and  $\gamma$  will abate the incremental effect of institutional constraints  $\lambda$ . Thus, CG should maneuver miscellaneous policies comprehensively and switch the focus when one policy has become weak.

<sup>4</sup>For simple qualitative analysis, we thus assume all the other three parameters equal 0.5 when assessing the effect of  $\lambda$ .

<sup>5</sup>To exhibit the effect of parameters on benefit-transfers, we choose  $\lambda = 0.2$  to ensure there is positive transfers.



### 3.4 Competing Model

In this subsection, we extend the linear model more realistically to postulate more than one LG, whose competition on economy reflected in performance evaluation might bring different results.

Theoretically, we assume there are  $n$  ( $n \geq 2$ ) local governments (LGs) in the game and CTs are separated by this geographical division as well. To put it simply, we assume that in every region the gross economy is  $e^*/n$  and transfers are  $t_i = t/n$  equally. The essence of economic contest is embodied in the performance evaluation function. All the other aspects of competition can be ultimately concluded into the evaluation function since only the CG's power of appointment or removal is the very pressure of regional competition. Thereby, the competing model extended from the linear model can be formulated as below:

- CTs:  $u_i = e_i - \alpha t_i$
- CG:  $v = (1 - \gamma) \sum_{i=1}^n e_i + \beta \sum_{i=1}^n u_i$
- LG:  $w_i = \gamma e_i + \lambda p_i + (1 - \lambda) t_i$

with the performance and economy function of LGs as

- Performance:  $p_i = (1 - \beta) e_i + \beta u_i - \eta e_{-i}$
- Local economy:  $e_i = e/n = e^*/n - t/n = (1 + \gamma) e_0/n - t_i$ .

Subscript  $i \in \{1, \dots, n\}$  denotes  $n$  regions, while  $e_{-i}$  denotes the gross economy of other regions, namely  $e_{-i} = \sum_i e_i - e_i$ . Coefficient  $\eta \in \mathbb{R}_+$  is the key parameter that characterizes the degree of economic competition among regions, which might be published by CG or internally perceived by central-local communication. The more fierce the *de facto* competition of economic performance, the larger  $\eta$  will be.

Lack of political and economic compensation for the loss item  $-\eta e_{-i}$  in LGs' payoff, this is *strict* evaluation policy on governmental competition. Negative item  $-\eta e_{-i}$  will definitely decrease performance evaluation of every local cadre and eventually lead to loss in their payoffs. In other words, this *strict* policy just makes LGs to compete with each other with only “sticks” but no “carrots”.

After summing up the payoffs of different regions, i.e.  $u_c = \sum_i u_i$  and  $w_c = \sum_i w_i$ , we can get

- CTs:  $u_c(\alpha) = (1 + \gamma) e_0 - (1 + \alpha) t$
- CG:  $v_c(\gamma, \lambda, \beta, \eta) = (1 + \gamma)(1 + \beta - \gamma) e_0 - (1 - \gamma + \beta + \alpha\beta) t$
- LGs:  $w_c(t) = (1 + \gamma)[\gamma + \lambda(1 + \eta - n\eta)] e_0 + [1 - \gamma - \lambda(2 + \eta - n\eta + \alpha\beta)] t$

The equilibrium outcomes of CTs and CG hold the same with the linear model. The number of competitors  $n$  has negative impact on the constant items  $(1 + \gamma)[\gamma + \lambda(1 + \eta - n\eta)] e_0$  of LGs, which is consistent with assumption. Surprisingly, both  $n$  and  $\eta$  will induce more benefit-transfers at the aggregate scale, which can also be captured by the difference, where the loss is partially compensated by transfers of  $(n - 1)\eta\lambda t$ .

$$\Delta w_{cl} = w_c - w_l = (n - 1)\eta\lambda[t - (1 + \gamma)e_0] = (n - 1)\eta\lambda t - (n - 1)\eta\lambda(1 + \gamma) e_0$$

Though the competition as mutual constraints on LGs is seemingly attractive, why is it instead conducive to benefit-transfers? In a simple situation ( $n = 2$ ), the payoff of first LG is

$$w_1 = \frac{1}{2}(1 + \gamma)(\gamma + \lambda - \lambda\eta)e_0 + (1 - \gamma - 2\lambda - \alpha\beta\lambda)t_1 + \eta\lambda t_2.$$

Except  $(1 - \gamma - 2\lambda - \alpha\beta\lambda)t_1$  item showing it enjoys the same level of transfers with the linear model,  $\eta\lambda t_2$  tells us transfers accepted by another LG can also contribute to its payoff because only relative performances are measured! Thus there is no surprise that the net effect of *strict* policy is stimulating LGs to “cooperate”

in taking transfers for the sake of compensating their loss in performance evaluation. Competition also harms effects of other policy parameters, which makes the issue difficult to tackle. Take **Proposition 2** for example, if other conditions are held unchanged, stronger media supervision is required such that  $\bar{\alpha}_c > \bar{\alpha}_l$  with new critical  $\bar{\alpha}_c \equiv \frac{1-\hat{\gamma}-2\hat{\lambda}+(n-1)\hat{\eta}\hat{\lambda}}{\hat{\lambda}\hat{\beta}}$ .

As an alternative to *strict* evaluation policy, we provide **balanced** evaluation policy that  $p_i = (1-\beta)e_i + (\beta + \eta)u_i - \eta e_{-i}$ . It takes a comprehensive viewpoint to balance LGs' payoff because the increased weight on CTs' satisfaction  $\eta u_i$  ("carrots" for LGs) compensates for the loss in economic competition.

- CTs:  $u_{\bar{c}}(\alpha) = (1 + \gamma)e_0 - (1 + \alpha)t$
- CG:  $v_{\bar{c}}(\gamma, \lambda, \beta, \eta) = (1 + \gamma)(1 + \beta - \gamma)e_0 - (1 - \gamma + \beta + \alpha\beta)t$
- LG:  $w_{\bar{c}}(t) = (1 + \gamma)(\gamma + \lambda)e_0 + (1 - \lambda)t - (\lambda + \gamma + \alpha\beta\lambda)t - \alpha\eta\lambda t$ .

The payoffs of CTs and CG still hold the same. At this time, the item  $-\alpha\eta\lambda t$  indicates that *balanced* policy does make competition counteract the avarice of taking benefit-transfers. Another interesting result is that  $n$  is irrelevant with the overall payoff of LGs as a whole. So it is easier for CG to control the degree of competition merely based upon evaluation parameter  $\eta$ . The difference of LGs' payoff is  $\Delta w_{\bar{c}l} = w_{\bar{c}} - w_l = -\alpha\eta\lambda t$ . It sends LGs a signal that the higher degree of competition ( $\eta$ ), media transparency ( $\alpha$ ) and institutional checks ( $\lambda$ ), the less attractive to taking benefit-transfers. we summarize it as follows:

**Proposition 4** *Strict evaluation policy based upon regional economic competition actually facilitates more benefit-transfers and makes it more difficult to solve. On the contrary, balanced policy renders governmental competition as an efficacious instrument to deal with this issue.*

## 4 Empirical Analysis

### 4.1 Data and Measurement

All macroeconomic data are derived from "China Economic Information Web" (*db.cei.gov.cn*) and treated as no measurement errors (see Feltensteina and Iwatab, 2005). The data include 31 provinces, autonomous regions, and directly administered municipalities during 1995 ~ 2005 except Taiwan, Hong Kong and Macau.

**Social Welfare** is taken as an alternative indicator of payoffs of citizens. It is divided further into two parts—economic growth and other welfare. The former ( $Growth_{i,t}$ ) is measured by real GDP growth at provincial level. The latter is only measured by employee salary ratio ( $Salary_{i,t}$ ) as the first trial. It is defined as the provincial employees' salary *per capita* divided by the national salary *per capita* each year.

**Fiscal Incentives** are denoted by fiscal decentralization in expenditure aspect (see, e.g., Qiao et al., 2008). The corresponding formula is  $DEC_{i,t} = \frac{LX_{i,t}/POP_{i,t}}{LX_{i,t}/POP_{i,t} + CX_t / \sum_i POP_{i,t}}$  where  $LX_{i,t}$  denotes the fiscal expenditure for province  $i$  in year  $t$ ,  $POP_{i,t}$  denotes the population for province  $i$  in year  $t$ , and  $CX_t$  denotes the central expenditure in year  $t$ . It at least captures the direction of decentralization.

**Benefit-Transfers** are the most difficult to measure directly. Thereby, we take an indirect approach to measure its degree by local governments' abilities, motives or benefits of protecting their revenues assuming a proportional relation in between. Since the outcome of transfers is reciprocating privilege that favors certain people or groups, it inspires us to use the ratio of policy-related subsidies to local fiscal expenditure ( $TRS_{i,t}$ ) as the indicator of benefit-transfers. This ratio measures the ability and propensity of provincial government to provide priority to some vested-interest groups, such as local SOEs.

**Governmental Competition** is defined as  $COMP_{i,t} = -(Growth_{i,t} - Growth_t)$  where  $Growth_t$  denotes the average real growth rate nationwide. It goes with common sense that the regions outperforming their counterparts tend to have relatively less pressure from competition.

## 4.2 General Model Test

The following econometric models examine how fiscal incentives and benefit-transfers affect social welfare.

$$Growth_{i,t} = \phi DEC_{i,t} + \theta TRS_{i,t} + \varphi CAPITAL_{i,t} + \zeta LABOR_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$Salary_{i,t} = \phi DEC_{i,t} + \theta TRS_{i,t} + \varphi NSOE_{i,t} + \zeta OP_{i,t} + \varepsilon_{i,t} \quad (2)$$

where the error item  $\varepsilon_{i,t}$  captures all omitted influences. In the estimation of economic growth, the growth rate of capital investment ratio ( $CAPITAL_{i,t}$ ) and logarithm of aggregate labor force ( $LABOR_{i,t}$ ) are included as the control variables according to the neoclassical model of Barro (1990). In the estimation of salary, we use the reform stage of SOEs ( $NSOE_{i,t}$ )<sup>6</sup> and the degree of openness ( $OP_{i,t}$ )<sup>7</sup> to control the regional disparity in geographic superiority and favoring policies. Regression results and the robustness test, using panel data techniques (Baltagi, 2001; Wooldridge, 2002), are shown in Table 1 and Table 2<sup>8</sup>.

Table 1: Regression results of GDP growth rate.

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
Real GDP growth rate						
<i>DEC</i>	0.047*** (2.769)		0.060*** (4.639)	0.128*** (6.348)		0.127*** (8.187)
<i>TRS</i>		-0.204*** (-4.646)	-0.166*** (-3.825)		-0.169*** (-3.935)	-0.095** (-2.356)
<i>CAPITAL</i>				0.325*** (8.591)	0.173*** (5.082)	0.206*** (6.587)
<i>LABOR</i>				0.011*** (5.706)	0.001 (0.618)	0.009*** (5.867)
Intercept	0.079*** (6.440)	0.116*** (54.910)	0.072*** (7.395)	-0.063** (-2.364)	0.109*** (11.817)	-0.044** (-2.147)
R <sup>2</sup>	0.017	0.062	0.120	0.218	0.132	0.280
Adjusted R <sup>2</sup>	0.015	0.059	0.114	0.213	0.124	0.271

In the perspective of economic growth, there is strong evidence indicated in Table 1 that fiscal decentralization alone contributes to the growth. That is, assigning more expenditure down to sub-national level leads to higher growth rate. It is still very significant when we introduce benefit-transfers in column (3), as well as in column (4) and (6) of robustness test by adding control variables *CAPITAL* and *LABOR*. Secondly, benefit-transfers do significantly deter economic growth both alone and together with decentralization. Thus, the general framework of adverse impact of transfers on economy is affirmative and elimination of benefit-transfers will be beneficial to growth. Moreover, it is interesting that the negative impact of transfers declines when decentralization is included together as regressors according to column (2) vs (3) and column (5) vs (6). It illustrates that decentralization is a very attractive policy to promote economy because it can somewhat alleviate the detriment of benefit-transfers issue<sup>9</sup>.

## 4.3 Parameter Effects Test

The second step is to verify the effects of parameters on the benefit-transfers issue. There are five parameters:  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\lambda$  and  $\eta$ . Due to unavailability of data, we only test the parameter effects of decentralization degree

<sup>6</sup> $NSOE_{i,t} = 1$ —the ratio of employees engaged by state-owned enterprises (SOEs) to the total employees of the nation.

<sup>7</sup> $OP_{i,t}$ —the provincial foreign direct investment (FDI) divided by provincial GDP.

<sup>8</sup>For Table 1, Table 2 and Table 3, (1) Sample size is 330, (2) T-statistics are in parentheses, (3) Asterisks indicate variables whose coefficients are significant at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels.

<sup>9</sup>The result in Table 2 is quite similar with Table1, but much more significant and supporting, in views of larger R<sup>2</sup> and adjusted R<sup>2</sup>. Because of limited pages, its analysis is omitted in this extracted version.

Table 2: Regression results of provincial salary.

Dependent Variable: Provincial salary ratio	(1)	(2)	(3)	(4)	(5)	(6)
<i>DEC</i>	2.232*** (23.929)		2.397*** (22.658)	2.122*** (21.422)		2.253*** (20.240)
<i>TRS</i>		-4.097*** (-7.318)	-2.571*** (-7.216)		-2.905*** (-5.367)	-2.033*** (-5.599)
<i>NSOE</i>				0.542*** (7.002)	0.488*** (3.769)	0.367*** (4.245)
<i>OP</i>				0.271*** (2.767)	1.038*** (6.982)	0.221** (2.065)
Intercept	-0.586*** (-8.690)	1.174*** (43.330)	-0.605*** (-7.531)	-0.678*** (-9.554)	0.908*** (17.906)	-0.645*** (-7.689)
R <sup>2</sup>	0.561	0.140	0.666	0.629	0.297	0.689
Adjusted R <sup>2</sup>	0.560	0.138	0.663	0.627	0.291	0.685

( $\gamma$ ) and competition degree ( $\eta$ ) on local benefit-transfers in the following econometric model:

$$TRS_{i,t} = \phi COMP_{i,t-1} + \theta DEC_{i,t-1} + \varphi OP_{i,t-1} + \varepsilon_{i,t}. \quad (3)$$

*OP* is also employed as the control variable because openness can be regarded as a general indicator of the overall developing stage of the region. Note that the lagged form of competition and decentralization is included as regressors because local governments make optimal decisions according to “*ex post*” information on fiscal incentives and competition degree they have perceived .

Table 3: Regression result of parameter effects.

Dependent Variable: Benefit-transfers	(1)	(2)	(3)	(4)	(5)	(6)
<i>COMP</i> <sub>-1</sub>	0.188*** (2.981)		0.149** (2.306)	0.174*** (2.791)		0.154** (2.400)
<i>DEC</i> <sub>-1</sub>		-0.049*** (-3.058)	-0.039** (-2.403)		-0.033* (-1.902)	-0.023 (-1.276)
<i>OP</i> <sub>-1</sub>				-0.046*** (-3.047)	-0.036** (-2.153)	-0.037** (-2.254)
Intercept	0.034*** (15.204)	0.074*** (6.444)	0.063*** (5.151)	0.038*** (14.831)	0.066*** (5.448)	0.054*** (4.224)
R <sup>2</sup>	0.026	0.028	0.043	0.053	0.041	0.058
Adjusted R <sup>2</sup>	0.023	0.025	0.037	0.047	0.035	0.049

Table 3 indicates that governmental competition significantly induces more benefit-transfers behaviors according to column (1), (3), (4) and (6). This phenomenon reminds us of the *strict* evaluation policy in **Proposition 4** with only “sticks” but no “carrots”. Thereby, we highly suggest the adoption of *balanced* evaluation policy in order to align local agendas through proper compensation for regional competition.

Table 3 also shows that decentralization can alleviate the benefit-transfers issue. The results in column (2), (3) and (5) are statistically convincing. Since this issue mainly arises at local levels, why can re-centralization not resolve the issue as usually expected? Notice that re-centralization harms the benefits, authorities and fiscal incentives of local officials, who then resort to private benefit-transfers to compensate the loss in their payoffs. Thus generally speaking, while decentralization provides fertile ground for transfers

at first, it also spurs local governments to hold broader accountability for the local economy from grabbing hand to helping hand (see Olson, 1993; Chen, 2004, for the notion of grabbing hand).

Lastly, the control variable  $OP$  significantly abates benefit-transfers. Openness in China is usually positively associated with cleaner governance style and a sounder legal system ( $\lambda \uparrow$ ), as well as a stronger civil awareness ( $\alpha \uparrow$ ). So it also confirms the relevant results in theoretical models.

## 5 Conclusion and Further Study

In this paper, we have argued that the essence to resolve miscellaneous issues during China's reform is to provide a sound political economic infrastructure. The kernel concept we propose is the local benefit-transfers issue, which results in a distortional execution of central policy at the local level.

The benefit-transfers game model involves three players: citizens, central and local government in China's political-economic context. Five critical parameters serve as crucial policies to control and resolve the benefit-transfers issue—the intensity of supervision by public opinion ( $\alpha$ ), weight on citizens' livelihood of cadre evaluation system ( $\beta$ ), the degree of fiscal incentives ( $\gamma$ ), the institutional constraints on local government ( $\lambda$ ), and the degree of local governmental competition ( $\eta$ ).

In this framework, **Proposition 1** exhibits an adverse influence of benefit-transfers on social welfare while the impact of fiscal incentives is positive, which is verified in a general model test empirically. **Proposition 2** proposes supervision through public opinion in *civil autonomous society*. After considering citizens' irrational behaviors, **Proposition 3** suggests that institutional constraints are the most powerful measures of preventing or even eliminating benefit-transfers. Finally, regional governmental competition is considered in the competing model, and **Proposition 4** shows the competition can either facilitate or reduce transfers, depending on whether *strict* or *balanced* evaluation policy is adopted. Empirical analysis on parameter effects testifies the effects of  $\gamma$  and  $\eta$ , and implies *strict* evaluation policy is now adopted in China.

The general insights of this paper is that the analysis of China's political and economic reform should start with the underlying game analysis between central and local governments, because China's reform is highly policy-oriented. Future researches can delve into specific economic and political issues based on this general framework. In the long run, we can also experiment institutional designs with the theoretical framework to solve the local benefit-transfers issue eventually.

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