Political Economy of Jurisdictional Changes in China: A Theoretical Analysis

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Abstract

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During the past decades, China's overlapping system of jurisdictions has evolved towards strengthening the prefecture level and promoting rural-urban integration, through the spread of the regime of prefecture-level cities governing counties and the expansion of cities by incorporating county-level jurisdictions into urban districts. Recently, there has been growing debate raising a number of questions: Are there too many tiers of governments and should the prefecture level be removed? Should the present rural-urban unified administration be replaced by rural-urban separate administration? Should the current system of cities governing counties be removed and should a system of provinces directly governing counties be introduced?

This thesis attempts to develop a game-theoretic framework to answer the aforesaid questions and make sense of China's jurisdictional changes by capturing the strategic interactions among stakeholders. Our models highlight a set of tradeoffs related to the different designs of jurisdictional systems. The tradeoffs include the administrative costs in running different jurisidictional systems, the danger of government predation and overtaxation caused by too many tiers of governments, inter-jurisdictional market barriers induced by local protectionism, the economies of scale in the provision of public goods and the cost resulting from divergent preference heterogeneity. Taking into account China's geographic and institutional landscape, this thesis shows how these tradeoffs vary across space and time, resulting

in different choices of jurisdictional systems. Furthermore, the study also explores the distributional effects of jurisdictional changes by identifying the gainers and losers when different systems of jurisdictions are introduced.

Our study arrives at a set of findings. One system may not be always "better" than the other given the different geographic and economic conditions. The policy choice may be further complicated by the fact that the interests of different stakeholders does not coincide in general, resulting in widely observed conflicts between them. Aside from providing a better understanding of the forces driving the jurisdictional changes as well as their distributional consequences, these findings bear policy implications in designing China's future jurisdictional systems. Besides, the study contributes to a strand of political economy literature that is focused on the endogenous formation and evolution of different jurisdictional systems.

摘　要

过去数十年间，中国复杂的政区层级历经多次变动，逐步强化了地区这一层级，促进了城乡合治。这些变动特包括了 80 年代初以来市管县体制的扩张和 90 年代末以来地级市改县级市或县为城区。然而近年来，有关地方政区层级的争论日趋激烈，并提出了一系列问题：当前中国的政区层级是否过多以及地级政区是否应被撤销以压缩政区层级？目前城乡合治模式是否应代之以城乡分治？简言之，是否应废除当前的市管县体制并建立省直管县的体制？

为探讨上述问题，本文尝试发展出一个基于博弈论的研究框架，从不同主体间的策略性互动着手，探究中国地方政区变动的深层次因素。模型将阐明政区体系变动带来的不同的收益与成本，包括：行政体系运转中的行政管理成本，更多政府层级导致的税负过重问题，地方保护主义下的市场分割，公共品生产和供给中的规模效应以及不同公共偏好带来的效率损失等。将中国地理与制度背景纳入考量后，我们发现政区变动带来的成本与收益将随地区和时间的不同而变化，从而要求在不同的地区和时期采用不同的政区体系。同时，通过考察政区变化对不同主体利益的影响，我们也着重揭示不同主体在政区变动中如何收益或受损。

本项研究获得了一些发现和结论。一种政区体系并非在任何条件下都优于另一种体系，因此某种区划模式非放之四海而皆准。不同主体在选择政区模式时的利益分歧又使得政策选择变得更加困难，同时也造成了政策选择中广泛出现的矛盾和冲突。这些发现有助于更加深入理解中国政区变化背后的动因及其带来的结果，同时也对未来中国政区体系的设计有所助益。此外，本文也对当前有关内生政区形成与变迁的政治经济学研究做出了自己的贡献。

Acknowledgements

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Chapter 1 Introduction

Ever since the formation of a vast and centralized empire, China has been seeking an appropriate system for organizing its many political jurisdictions.[1] In recent years, China's complex system of jurisdictions has been in the limelight once again. From the bold vision of re-partitioning this large country into 50 provinces so as to the experiment with a system of provinces governing counties (*shengguanxian*, PGC), reforming the existing five-tier system has been a subject of much contention.[2]

The debates on jurisdictional changes often put into focus the tradeoffs with respect to the different proposed blueprints of jurisdictional reforms. For example, the addition of an intermediate tier of prefecture-level governments between the province and the counties is often thought to promote market integration and horizontal cooperation among subordinate jurisdictions. However, critics of such a system point to the danger of creating an additional tier of predatory governments. Other potential tradeoffs related to the vast expanse of China also raise questions whether one system of jurisdictions suits a huge country like China.

Accordingly, this thesis contributes to such policy debates by introducing a theoretical framework that includes these tradeoffs. Instead of treating jurisdictional systems as exogenously determined, the theoretical framework of this study represents jurisdictional changes as the outcome of political and economic agents responding to the incentives induced by China's institutional landscape. In addition, we examine the political economy of the different jurisdictional changes, their benefits, and their distributional effects.

In what follows, we first briefly introduce the major issues related to the jurisdictional changes in Section 1.1. Section 1.2 presents the ongoing debates regarding the prevailing jurisdictional systems and reviews three concrete cases of

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[1] Xu (1991), Pu, Chen and Zhou (1995), Liu (1996) and Dai (2000) review in detail the history of local government systems in ancient and modern China.
[2] See the literature review in Chapter 2.

jurisdictional changes. For a better understanding of these regimes changes, Section 1.3 gives an overview of China's geographic and institutional landscape which shapes its system of jurisdictions and the changes in this system over time. In doing so, we highlight the tradeoffs with respect to the different regime changes mentioned in in Section 1.4. Finally, we briefly discuss the theoretic framework to be repetitively applied in the following chapters which considers the tradeoffs and China's institutional landscape.

1.1 The Main Question

The current system of jurisdictions in China can be considered as one of the most complex in the world. This system consists of five formal levels: the center (*zhongyang*), province (*sheng*), prefecture (*diqu*), county (*xian*), and township (*xiangzhen*).[3] Perhaps it is not surprising that China has such a complex system not least because running such a huge country with vast disparities in geographical, economic and social conditions is by no means an easy task. Jurisdictional changes may be seen as responses to such a challenge.

Table 1-1 The Five-Tiered Government System in China

Administrative hierarchy	Type of jurisdictions
1. The central	The central government
2. The province level	Provinces, municipalities under central authority, autonomous regions
3. The prefecture level	Prefectures, prefecture-level cities, ethnic states or leagues
4. The county level	Urban districts, counties, county-level cities, ethnic units
5. The township level	Street agencies, towns, townships, ethnic units, county district offices

Among the many issues related to the five-tier government structure, only those involving the province-prefecture-county setup, which in recent years has been under

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[3] The system is even more complicated in reality. For example, there are cities which have been given the deuty-provincial city status which is above that of prefecture-level cities but below that of a province.

frequent adjustments, will be the focus of this thesis. In particular, whether or not there should be an intermediate tier between the provinces and the counties is a major bone of contention. In connection with this, Table 1-2 provides an overview of jurisdictional changes in the reform era related to the province-prefecture-county setup which takes two forms. At the start of the reform era, the urban and rural sectors were administered separately by a prefecture and city government respectively. The prefectures made up a *quasi* layer of authorities as representatives of the provinces in administering the rural counties. Table 1-2 likewise shows that there were 241 prefectures in 1978. Concomitantly, city governments set up with urban districts (*shixiaqu*) under them were in charge of urban affairs and industrialization. It was not uncommon for city governments to co-exist side-by-side with prefecture governments. However, the prefectures were progressively replaced in the 1980s and 1990s by a *formal* tier of prefecture-level cities (*dijishi*) equipped with a full range of political, administrative and fiscal powers; the transition took place when the central government gave its blessings to the establishment of a city-governing-county system (*shiguanxian*, CGC).[4] By 2007, only 50 prefectures were left mostly in the inland provinces whereas the number of prefecture-level cities increased from 99 in 1978 to 283 in 2007. Incidentally, many prefecture-level cities rapidly expanded their spheres of influence by incorporating neighboring county-level jurisdictions as their urban districts (*shixiaqu*), which are often under tighter control by prefecture-level cities. As a result, the number of counties and county-level cities has been on the decline since the late 1990s.

Table 1-2 The Changes in the Number of Local Jurisdictions in China, 1979-2007

Year	Prefectures	Prefecture-level cities	Counties and county-level cities	Urban districts
1979	209	104	2246	520
1980	209	107	2250	511
1981	208	110	2249	581

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[4] See Organic Law of the Local People's Congress and Local People's Governments of the PRC (*zhonghua renmin guoheguo difang geji renmindaibiao dahui he difang geji renmin zhengfu zuzhi fa*).

1982	210	109	2266	527
1983	183	137	2236	599
1984	175	148	2218	595
1985	165	162	2205	620
1986	159	166	2201	629
1987	156	170	2194	623
1988	151	183	2178	647
1989	151	185	2181	648
1990	151	185	2182	651
1991	151	187	2183	650
1992	148	191	2171	662
1993	139	196	2166	669
1994	127	206	2148	697
1995	124	210	2143	706
1996	117	218	2141	717
1997	110	222	2135	727
1998	104	227	2126	737
1999	95	236	2109	749
2000	74	259	2074	787
2001	67	265	2053	808
2002	57	275	2030	830
2003	51	282	2016	845
2004	50	283	2010	852
2005	50	283	2010	852
2006	50	283	2004	856
2007	50	283	2004	856

Source: *China Civil Administrative Statistical Yearbook, 2008.*

What are the forces driving these jurisdictional changes? Who are the gainers and losers? Is the by-now dominant CGC system "better" than PGC system which has been favored by the central government? These are the questions hotly debated by scholars and policymakers (for arguments on both sides of this debate see e.g., Liu, 1996; Zhang, 1999; Dai, 2000; Yu, 2002; Wang, 2004; Xiao, 2004, as well as the literature review in Chapter 2). The debate often revolves around a set of tradeoffs essential to the designing of a hierarchical system of jurisdictions. The design of an administrative hierarchy is not only a mechanical exercise in minimizing administrative costs; it also affects the wellbeing of the people as well as the distribution of fiscal resources and administrative powers between governments.

The political economy involving the conflicting interests of the stakeholders ultimately shapes the policy debate and the trajectory of jurisdictional changes over time.

Our thesis attempts to put the policy debate on a rigorous footing by developing a theoretical framework to better understand the debates about the jurisdictional system of China and the changes in this system over time. Specifically, the thesis explores two issues:

- What are the issues and tradeoffs involved in the designing of a system of jurisdictions?

- How do the different designs of the administrative hierarchy (e.g., the CGC vs. PGC) embedded in China's institutional landscape impinge on the interests of public and private agents?

The thesis scrutinizes these questions through the lens of three types of jurisdictional reforms alluded to above:

- *City-governing-county (CGC) regime and the creation of prefecture-level cities*: This system was promoted to tackle the problems created by the rural-urban divide. As has already been mentioned, the urban and rural sectors during the pre-reform era were under separate administrative systems. The urban system included cities and the urban districts under these cities with the aim of fostering industrialization. The rural system encompassed the rural counties under prefectures which form a quasi tier of governments representing the provincial governments. The two systems ran parallel to each other and were segmented by administrative barriers (Dai, 2000), resulting in market segmentation and a lack of horizontal coordination in the provision of public goods. As stated in a key document, the CGC was originally introduced as an institutional innovation to promote interaction and create synergy between industry and agriculture by entrusting prefecture-level cities with administrative powers needed to dismantle administrative barriers between its urban part and subordinate

counties.[5] Prefecture-level cities are created in two ways:

- Merging an existing city government governing districts with a neighboring prefecture government, or

- Abolishing the existing prefecture government and transforming an existing county-level jurisdiction into a prefecture-level city.

● ***Province-governing-county regime (PGC):*** In recent years, many have proposed that a more compressed jurisdictional system should be implemented. Instead of an intermediate tier of prefecture-level jurisdictions, the counties should be put directly under the administration of provinces. This proposal seems to have gained supports from the central government. In addition, many provinces have begun to experiment with this new type of jurisdiction structure.

● ***Conversion of county-level jurisdiction into urban districts (shi/xian gai qu)***: Since the late 1990s, a number of prefecture-level cities have expanded by transforming county-level jurisdictions into urban districts, thereby putting the county-level jurisdictions as well as their fiscal and land resources under tighter control in support of rapid industrialization and urbanization.

To better motivate the above questions and highlight the tradeoffs in the choice of different systems of jurisdictions, the next section looks into several concrete cases of jurisdictional changes from which we infer the major issues and tradeoffs that are the focus of this thesis.

1.2 Jurisdictional Changes through the Lens of Three Case Studies

Jiangsu was one of the few provinces that embraced the CGC regime in the early 1980s. Among its prefecture-level cities where the CGC regime was created are

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[5] See *Opinions of the Central on Expanding Properly Some Power of the Prefecture Government* cited in Wang. 2004.

Changzhou and Yancheng. The experience of these two prefecture-level cities sheds light on the major tradeoffs related to the CGC system as well as the potential gainers and losers under such a system.[6] As regards the number of tiers of governments China should have and the need for an intermediate tier of prefecture-level governments, we review the experience of Zhejiang, which has effectively espoused the PGC system even though it nominally has a CGC system. The stylized facts derived from these cases provide the ingredients for building our models in order to study the jurisdictional changes in subsequent chapters.

1.2.1 Changzhou

At the dawn of the reform era, Changzhou was a relatively industrialized and urbanized city situated at the Yangtze River Delta. Figure 1-1 shows that the city controlled a number of urbanized districts, while the neighboring rural counties, namely, Wujin, Jintan and Liyang, were under Zhenjiang Prefecture, another authority with the same administrative rank. As has been previously pointed out, the co-existence of two authorities separately governing the urban and rural areas was the product of the pre-reform strategy of exploiting the rural sector to boost industrialization. This resulted in an urban-rural split which blocked the movement of commodities and factors across jurisdictions and rendered horizontal cooperation in the provision of public services difficult if not impossible. For example, Changzhou could not conduct direct trade with adjacent rural counties. Instead, inter-jurisdictional trade had to go through the relevant agencies of Zhenjiang. In addition, there was little coordination in such public services as transport facilities.

The problems induced by the rural-urban divide were not peculiar to Changzhou. With a view to lowering inter-jurisdictional barriers and promoting resource and factor mobility, Jiangsu was among those pioneers that embraced the CGC system in the 1980s as an attempt to break down regional barriers. Under the new regime, Zhenjiang Prefecture was abolished and three of its subordinate counties, Wujin,

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[6] Our discussion of jurisdictional changes involving Changzhou and Yancheng are based on *Gazette of Changzhou City 1995* and *Gazette of Yancheng City 1998*.

Jintan and Liyang, were placed under Changzhou, thereby subjecting both the urban districts and neighboring counties to one administrative rubric.[7] In those days when the administrative bureaucracy maintained a very tight control over every aspect of the economy, the visible hand of Changzhou City as a higher ranking government was supposed to help break down administrative barriers. A set of measures was introduced to foster market integration and horizontal coordination. For instance, the city-owned wholesale companies were allowed to sell industrial products directly to the counties and their towns. County and township enterprises were also encouraged to open shops in urban districts. Wholesale markets and trade centers were built up one by one to facilitate rural-urban trade.[8] Favorable policies were employed to foster cooperation among urban and rural enterprises.[9] Infrastructure projects were also coordinated by the city authority. From 1983 to 1985, the city centralized fiscal resources to develop an integrated network linking the counties and towns. Such measures allegedly brought about bigger markets and better coordination in the provision of public services, hence benefitting both the urban districts and the counties.

Figure 1-1 The Jurisdictions of Changzhou City

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[7] Other counties of Zhenjiang prefecture were put under several other prefecture-level cities.
[8] For instance, the city opened the Industrial Trade Center in July 1984, the Commercial Wholesale Market and the Food and Oil Trade Center in August 1984, and the Agricultural Trade Center in September 1984, etc.
[9] By 1985, a total of 56 industrial groups were founded with 443 membership factories, 259 out of which were county and township factories.

The benefits of CGC were not without costs. With the urban districts and counties put under one roof, the prefecture-level governments could now mobilize the fiscal resources not just of the urban districts but also of their rural counterparts. However, how to allocate the centralized fiscal resources quickly became a source of conflict among the county-level jurisdictions. The policies of the prefecture-level government were often criticized as biased for the urban districts. For example, eight out of the ten public projects scheduled by the city government in 1984 were located in the urban districts. The city government also centralized part of the fiscal resources of the counties to promote urban development, including 1.5 percent of incremental VAT, 10 percent of urban land use tax, 20 percent of land VAT and resource tax after the tax reform in 1994. Consequently, the prefecture-level city government was perceived by subordinate counties as predatory.

The Changzhou experience suggests that the benefits of the CGC system change over space and time. For one thing, the CGC regime did not equally benefit all the county-level jurisdictions. With the urban biased policy and the concentration of public facilities closer to the urban core of the jurisdiction, residents and enterprises in counties closer to the city could better tap the urban market and enjoy better infrastructural facilities in the urban districts. It is often argued that Wujin, which is just seven kilometers from Changzhou, developed much faster than did other two

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counties.

The conditions that apparently made this regime desirable also changed over time. When this jurisdiction structure was first introduced in the early 1980s, China's economy was still dissected by administrative fault lines so that the need for a higher-level government with the administrative clout to break down administrative barriers was pressing. During the 1980s through the 1990s, the CGC regime appeared to have produced desirable outcomes for both the city and the counties, and the introduction of CGC coincided with a period of spectacular economic growth. With the expansion of the market and the gradual retreat of the state, there was growing doubt that the prefecture level was still performing a useful coordinating function. With benefits waning and the economic strength of some counties rivaling that of the city, the counties found the urban-biased policy increasingly unpalatable, resulting in growing conflicts between the city and the counties.

The rivalry intensified further when Changzhou had almost exhausted all land resources in the urban districts by 1995 and found itself totally surrounded by Wujin, restricting its urban expansion. To solve this problem, Changzhou followed the example of other prefecture-level cities in Jiangsu and successfully lobbied superior governments to incorporate Wujin as one of its districts in 2003. This change allegedly brought about significant benefits to the city. For one thing, the growing conflicts between the city and Wujin were put to a final rest in favor of the city. Furthermore, large tracts of land are now at the city's disposal for future urban expansion and industrial development. By controlling the land resources in Wujin, the city authority gained access to lucrative land-related fiscal incomes. In return, Wujin was promised better roads and transport networks under the unified administration of the city authority. Wujin also had access to many public services of Changzhou including better primary and technical education.

1.2.2 Yancheng

In Changzhou's case, the jurisdictional change involved merging some part of

Zhenjiang Prefecture with the city of Changzhou to form a new prefecture-level city. As for Yancheng, however, it became a prefecture-level city *via* a different route common to underdeveloped regions without a central city. Located on the coastal plain of North Jiangsu, Yancheng was a rural prefecture with eight backward counties within its jurisdiction. When the CGC regime was introduced in 1983, one of its counties, Yancheng County, gained prefecture-level city status not because it was developed and urbanized, but primarily because it was where the original prefecture government was seated. The newly created city was then split into two parts. The relatively developed urban part, Yancheng Township, was transformed into an urban district while the rest became the suburb, which subsequently became Yandu County in 1996.[10] Major officials of the defunct prefecture government were directly transferred to the government of the new city with their administrative ranks unchanged.

Figure 1-2 The Jurisdictions of Yancheng City

Compared with that of Changzhou, Yancheng's change was not as drastic. The newly created city government — with the same personnel — was still governing the

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[10] This county was again converted into the district of the city in 2003.

same eight counties. Since the prefecture government already played an important role in coordinating subordinate counties before the regime change, the CGC regime produced far fewer benefits of market integration and horizontal coordination as it allegedly did for Changzhou.

In addition, this newly created city was small and backward, with GDP and GDP per capita only one-sixth and one-third of those of Changzhou in 1983. Given its limited resources, the city had to govern eight counties covering an area of 14,984 km^2, much larger than the size of Changzhou. Economic backwardness, vast distances and poor transport conditions all undermined the role of the prefecture-level city in facilitating the economic development of its subordinate counties. In particular the remote counties at the periphery of the prefecture gained little from their subordination to the city. Instead, these counties had to contribute a lot to support the development of the city. At the same time, the city complained that it was burdened by these distant and backward counties.

Despite the problems mentioned, Yancheng has spared no effort in developing its local economy. In 2004, it converted Yandu County, which used to be its suburb before 1996, into a district. One reason for the change was to accommodate the rapid urbanization and to fulfill the dream of making Yancheng a major city of North Jiangsu. Converting Yandu into a district gave the city government a golden opportunity to revise the land use plan and requisition more rural land for urban and industrial uses.[11]

1.2.3 Province Governing Counties: the Case of Zhejiang

As pointed out above, the CGC system became dominant by the end of the 1990s with prefecture-level cities mediating between the provinces and the counties. There is, however, in recent years a crescendo of dissenting voices challenging the CGC regime. There are calls to compress the five-tier administrative hierarchy (e.g., Liu, 2002; Dai, 2001; Jia and Bai, 2005). In particular, the prefecture-level cities are often

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[11] For instance, around 21.6 km^2 of land in Yandu was used for establishing the Western Industrial Park, which is still under construction and has attracted hundreds of enterprises (*Yanfu People Daily*, August 15, 2006).

criticized as predatory putting onerous responsibilities on their subordinate counties, shifting fiscal resources upward, and stunting the counties' development.

Entering the debate is Zhejiang Province which was often cited in support of the PGC system, the main contender to the CGC system. This province is nominally subscribed to the CGC system but maintains a fiscal version of the PGC whereby counties have direct tax-sharing systems with the province. The prosperity of this coastal province is often attributed to such a distinct arrangement. Supporters of this system argue that, with one tier out of the structure, the counties are relieved of the heavy burdens imposed from above and retain larger shares of their fiscal resources. In addition, many of the counties have been granted administrative powers usually the preserves of the prefecture-level governments; therefore, they are practically on a par with the prefecture-level cities. Autonomous counties are freer to take care of their specific local needs and shape their economic development strategies.

The specific geographical, economic, and political environment of Zhejiang may be critical to the success of the PGC system. For one thing, the province is one of the smallest in China. Even without a prefecture level, the administrative burden induced by the provinces directly managing the counties may not be particularly heavy. More importantly, with the provincial government delegating many authorities to the county governments, Zhejiang has a less interventionist and liberal-minded tradition in managing the economy. With fewer administrative restrictions, it has a thriving private economy that facilitates freer flows of factors and resources. Therefore, there is less need for an intermediate level equipped with administrative powers to break down inter-jurisdictional barriers. This could be contrasted with Jiangsu, the first province to implement the CGC system, which is often thought to have a more state-directed economy (see e.g., Huang, 2008). The CGC system may be more appropriate for such provinces as Jiangsu whose markets are less developed and local governments are more interventionist.

The PGC system however does not gain unanimous praises. While giving local economies more autonomy to develop their potential, the PGC system is handicapped when the planning and development of large-scale infrastructures to

exploit the economies of scale require coordination among a few counties. Prefecture-level governments often lack enough power to play a coordinating role similar to their counterparts under a CGC system. In addition, the PGC system apparently slowed down the growth of many central cities of Zhejiang Province. In comparison with Jiangsu and Guangdong which stuck to the CGC system, Zhejiang has fewer large central cities to serve as the engine of the local economy (*The 21st Century Economic Report*, Dec. 13, 2003).

1.3 Geography and Institutional Landscape Shaping Jurisdictional Changes

Jurisdictional changes in China did not occur in a vacuum. The three case studies illustrate how China's geography and peculiar institutions shape the direction of jurisdictional changes. This section deduces from these cases a representation of China's institutional landscape, paving the way for the establishment of our models incorporating the important features of China's institutional landscape in subsequent chapters.

1.3.1 Geography and Administrative Hierarchy

Why are there so many levels of governments in China? Related to this question is the choice between the PGC and the CGC systems. Not surprisingly, geography and distance figure prominently in the debate on the design of administratively hierarchy (see He and He, 2004; He and Li, 2005). Governing such a huge country as China is administratively costly not least because of the cost in processing a large amount of information traversing vast distances (Yuan and Huang, 2002; Dai, Yang and Wu, 2005). The five-tier system of jurisdictions may be thought of as a response to such a challenge. Jurisdictional changes as experiments with different designs of administrative hierarchy may thus be interpreted as attempts to render administration more efficient in response to changing circumstances.

The three cases above involve issues related to spatial distance. Administrative

costs often increase with the size of a jurisdiction as transportation and communication costs go up in governing distant subordinate jurisdictions (Xiao, 2004). Chinese jurisdictions are usually large in size (see Table 1-3). With an average area of 309,677 km^2 and a population of 38.71 million, a Chinese province is easily the size of a European country and larger than most countries in the world.[12] On the average, a province has almost 100 county-level jurisdictions.[13] Governing a large area with countless subordinate governments means enormous administrative costs if such a manner of governing is possible at all. The rationale often put forward for a prefecture level is to reduce the number of subordinate governments under the direct administration of the provincial government, thereby saving its administrative costs. The choice between the different designs of the system of jurisdictions (i.e., a CGC vs. a PGC system) thus hinges *inter alia* on the administrative costs induced by distance.[14]It follows that changing circumstances, such as falling transportation and communication costs, may affect such a choice.

Table 1-3 The Size, Population and Number of County-level Jurisdictions for Provinces

Province	Size (km^2)	Population (10000)	Number of county-level jurisdictions
Hebei	190 000	6809	172
Shanxi	156 000	3335	119
Inter Mongolia	1183 000	2384	101
Liaoning	145 700	4217	100
Jilin	187 400	2709	60
Heilongjiang	454 000	3817	128
Jiangsu	102 600	7433	106
Zhejiang	101 800	4720	90

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[12] According to 2005 data provided by the World Bank (see http://www.ocma.cn/article/182392.html), a Chinese province ranks 34th by population out of 172 countries, after Argentina and before Poland.
[13] In 2006, there are 32 province-level units and 2860 county-level ones (exclusive of Hong Kong and Macao). On average, a province level jurisdiction consists of 92 county level units.
[14] This is the reason why the two-tier regime is only strictly employed in Hainan Province, a small island only consisting of twenty county level units. For this reason, it is reasonable to assume that the provincial government can not directly coordinate counties.

Anhui	139 600	6461	105
Fujian	121 400	3511	85
Jiangxi	166 947	4284	99
Shandong	157 100	9180	140
Henan	167 000	9717	159
Hubei	185 900	6016	103
Hunan	211 875	6698	122
Guangdong	179 800	8304	121
Guangxi	236 300	4889	108
Hainan	35 000	818	20
Sichuan	485 000	8725	181
Guizhou	176 100	3904	88
Yunnan	394 000	4415	129
Tibet	1 228 400	274	73
Shaanxi	205 600	3705	107
Gansu	455 000	2619	86
Qinghai	722 000	539	43
Ningxia	66 400	588	22
Xinjiang	1 660 000	1963	98

Source: Data are from *Administrative Jurisdiction Net* (www.xzqh.org). Province-level municipalities under the central authority, Beijing, Shanghai, Tianjin and Chongqing, are not included. Taiwan, Hong Kong and Macau are not included either.

As shown in Changzhou's case, while the CGC system facilitates horizontal coordination through, for example, a centralized provision of public goods, counties at the periphery far away from the public facilities receive fewer benefits. This is further aggravated by urban-biased policies. Therefore, long distance and poor transport conditions make horizontal coordination in the provision of public goods difficult. The location of a public facility or service such as a port or a bridge

determines how accessible the facility is to residents in different jurisdictions. Even if the joint provision of public facilities may help exploit the economies of scale, users remote from the location of the public service have to pay more in terms of time and transport costs. Such costs increase with the size of the area a public facility is supposed to serve. This partly explains why horizontal coordination in the provision of local public goods is very difficult and why neighboring jurisdictions in China lobby their superiors to locate public facilities such as highways or bridges closer to their localities.

Therefore, administrative costs and less accessibility to centralized public services induced by vast distances are among the key factors we capture in our theoretical framework in subsequent chapters where we explore the tradeoffs stemming from the different designs of the administrative hierarchy, e.g., CGC vs. PGC. However, as discussed below, the costs of control and supervision incurred by higher level governments are also important as a result of local strategic interactions as shall be explained below.

1.3.2 The Top-Down Administrative System and Strategic Interactions

The three case studies previously discussed show that jurisdictional changes can reshuffle administrative and fiscal powers in the different tiers of governments. Since the governments involved are stakeholders who play an important role in the political decision-making process, a background on how China's multi-tiered system of governments works is pertinent to our understanding of China's jurisdictional changes.

Local governments in China's multi-tiered administrative hierarchy are far from being automata dutifully transmitting information and carrying out instructions. Behind the five-tier system of jurisdictions is a top-down political system that shapes the incentives driving self-interested local officials.[15] Understanding the incentives

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[15] When the Party took power by force in late 1940s, the government system was organized in an army-like way emphasizing hierarchy and compliance. This feature remained in the following years of central planning, and each level of local government served as a branch of its superior mainly fulfilling assigned mandates. In China, responsibility and power is only clearly divided between the central and provincial government. In reality, each

in such a system serves as the foundation of our game-theoretic approach so that we can capture the interactions between the different tiers of government induced by the different designs of jurisdictional systems. Higher-level governments can promote, discipline and dismiss subordinate officials to ensure that mandates from above are implemented out of career concerns (see e.g., Huang, 1995). Since the mid-1990s, such a setup has evolved into the so-called target responsibility system (*muhiao zerenzhi*, TRS), which is a performance evaluation system with explicit targets for subordinate cadres to fulfill.[16]

There is a general perception that local governments respond strategically to the mandates handed down from above in pursuit of their local interests. Indeed, local opportunistic behaviors are commonly observed in many policy arenas; examples range from tax sharing (He, 2000; Zhang and Wang, 2003) and the design of fiscal transfer systems (Liu, 2000), to expenditure responsibilities division (Tao, Liu and Zhang, 2000) and land protection (Huang, Pu and Shang, 2001), among numerous others. Higher-level governments often have the advantage in setting the agenda and laying down the mandates; in contrast, subordinate governments take the advantage of information asymmetry to respond strategically.[17]

In subsequent chapters of this thesis, we focus on the interactions between the prefecture-level and county-level governments with particular reference to the debate on the CGC and PGC systems. From the case studies, there are two issues especially pertinent to the debate. One of them is the sharing of fiscal resources between the prefecture-level cities and their subordinate jurisdictions. County-level governments allege that their prefecture-level bosses abuse their power by shifting fiscal resources upward and expenditure responsibilities downward.[18] The other one is local

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level of local government is more like a mini-copy of its superior and holds nearly all powers from taxation, infrastructural construction, to public security (Wei and Liu, 2004).

[16] Mandates determined by superior governments are translated into quantitative targets assigned to subordinate governments. Evaluating cadres is thus reduced to examining whether they fulfill assigned targets on time (see , e.g., Edin, 2000; Tsui and Wang, 2004).

[17] As a preview to our modeling strategy in the subsequent chapters, the delineation of the administrative setup above motivates us to conceptualize strategic interactions induced by the hierarchical system as a Stackelberg game with the upper-level governments as first movers deciding the policy parameters (tax rates, targets, etc.) and subordinates respond by taking these parameters as given to maximize their local interests.

[18] There is a large literature on the misalignment of local revenues and expenditures. A World Bank report (2002) concludes that sub-provincial levels of government assume onerous expenditure responsibilities, resulting in local fiscal crises, see, e.g., Song (2004). Local governments have to rely more on extra-budgetary finance (Wong,

protectionism in the form of local barriers set up to block free flows of resources and factors. Closely related to these two issues is the rural-urban segmentation as proved by the cases involving the two cities in Jiangsu. In what follows, we look into these two issues and explain their relevance to jurisdictional changes.

1.3.3 Public Finance and Self-Interested Local Governments

The debate on the choice of jurisdictional designs often points to the different fiscal burdens upon the economy induced by the different levels of governments. To understand why—as often argued—additional layers of governments may exert onerous fiscal burden on the local economy, a brief sketch of the intergovernmental fiscal system in the reform era seems warranted (see e.g., Wong, 1997). Before the reform, China employed a highly centralized fiscal system.[19] The 1970s witnessed the onset of fiscal decentralization, often referred to as cooking in separate stoves (*fenzao chifan*) and fiscal contracting (*caizheng baogan*). How to split fiscal revenues between the five tiers of governments has been a focus of contention and a driving force behind reforms of the central-local fiscal system. This culminates in the tax-sharing reform which is often seen as a move by the central government to recentralize fiscal resources.[20]

The current tax-sharing system put in place in 1994 mandated uniform rules for sharing the different taxes between the central governments and the provinces. For sub-provincial fiscal arrangements, two successive levels of governments negotiate their own fiscal system to share the fiscal pie and split expenditure responsibilities. As a result, sharing rules vary widely between sub-provincial governments. While setting the types and rates of taxes in the formal tax system are the preserves of the

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1998; World Bank, 2002). Regional fiscal disparities also increase quickly with the paucity of an effective transfer system. West and Wong (1995) explore the provision of social service in rural areas and report growing regional disparities. Park, Rozelle, Wong and Ren (1996) also find that extra-budgetary finance exacerbates regional disparities. Tsui (2003) uses a comprehensive county-level data set and systematically examines how the local tax system and fiscal transfer schemes contribute to regional fiscal disparities.

[19] Fiscal centralization is often referred to as *tongshou tongzhi*. All revenues collected by the local governments were turned over to the central government which would then allocate the funds back to local governments. Although attempts were once made for more decentralization in late 1950s and early 1970s (see Li and Gu, 2005), no fundamental change occurred until the reform.

[20] For a history of the changes in the central-local fiscal system in the reform era, see, e.g., Tong (1989), Wong (1991, 1997), and Bahl (1999). Up to 1993, there were a number attempts to revise the rules stipulating how fiscal revenues and expenditures were shared among the different levels of governments.

central governments, local governments often have much discretion in deciding the *effective* rates which are at the end of the day determined by local governments' tax efforts (see Yan and Wang, 2000).[21]

Being close to the top of the administrative ladder, higher-level governments often have an edge over subordinate jurisdictions. They may strive to retain as much resources as possible and shift responsibilities downwards, all the more so when the outcome determines the fiscal resources available to promote local economic development, which is important for the career of local officials. There are different ways that higher-level governments shift revenues upward. They may revise the local fiscal system to tap into taxes originally accruing to lower-level ones (see Feng, 2001). Oft-cited examples include the value-added tax under the tax-sharing system first introduced in 1994 with 75 percent of the tax accruing to the central government. The centralization of VAT allegedly set off a scramble among higher-level governments to shift revenues upward and expenditures downward (Jia and Bai, 2002). Some prefecture-level governments even held back central rebates of VAT and consumption tax to counties (Song, 2004). Such predatory actions result in serious revenue-expenditure mismatch for lower-level governments (see World Bank, 2002).

To fill fiscal shortfalls resulting from revenue-expenditure mismatch, local governments at the bottom of the administrative hierarchy often resort to off-budget fees, a problem especially serious in the 1990s (see Tsui and Wang, 2004). Although sub-provincial governments have no authority to introduce new taxes and their rates, it is not unrealistic to perceive local tax rates as endogenously set by local governments if the large-scaled arbitrary fees are taken into account. How the different designs of the administrative hierarchy impinge on local *effective* tax rates and ultimately the tax burden falling on local residents is thus an important question in the assessment of jurisdictional changes. Indeed, a higher fiscal burden is often

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[21] In October 2001, the tax-sharing system was revised such that enterprise and income tax are to be shared between the central and provincial governments. A tax-rebate provision using 2001 tax revenue collected as a basis was included to avoid sharp declines in local revenues. Local governments had the incentive to increase their effect in the collection of income and enterprise tax, so much so that local enterprise income taxes skyrocketed by 139.4% in November and by 187.1% in December (800% for some regions) compared to the previous year. The astonishing tax effort in the last two months resulted in an annual increase of 63%.

cited as an important argument for replacing the present CGC regime with some form of the PGC regime (e.g., Liu, 1996; Dai, 2000).[22]

1.3.4 Local Barriers and Rural-Urban Segmentation

Recalling the cases of Yancheng and Changzhou previously discussed, dismantling local barriers and fostering market integration and horizontal cooperation in public affairs were the motivations behind promoting the CGC regime. China's top-down administrative hierarchy is often unfavorable to horizontal coordination. During the Maoist era, local self-reliance was popular, thus discouraging horizontal cooperation between jurisdictions (Donnithorne, 1972).[23] As our case studies suggested, the quest for rapid industrialization during the pre-reform era also resulted in rural-urban segmentation. Even though central planning has been gradually phased out in the reform era, many of the institutions left over from the pre-reform era have remained intact.

Local barriers are also the result of fiscal decentralization in the reform era which oriented local governments to engage in fierce inter-jurisdictional competition. The incentives of the top-down administrative hierarchy has the perverse effect of aggravating local protectionism as a result of a cadre evaluation system, which attaches much importance to those factors related to *local* economic growth (Tsui and Wang, 2002; Li and Zhou, 2005). In pursuit of limited opportunities of promotion, local officials worked to surpass their counterparts in neighboring jurisdictions in the race for economic development. Such a zero-sum game largely intensified the inter-jurisdictional competition, resulting in serious local protectionism.

Anecdotes and empirical evidences abound painting a picture of local protectionism persisting in the reform era, even though there is no consensus whether or not local protectionism is on the decline (for opposing opinions see Shen and Dai,

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[22] For instance, Tao and Li (2003) find in their survey that a prefecture level incurs more than fifty million yuan each year to pay official salaries.
[23] This problem arose as early as in the period of planning economy, possible related to repeated decentralization attempts in late 1950s and early 1970s.

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1990; Liu and Shu, 1993; Shu, 1995; Shu and Zhou, 2003; Poncet, 2003, 2005; Bai, Du, Tao and Tong, 2004). One consequence of local protectionism is market segmentation, which blocks the free flow of factors and goods. Local governments bogged down in yardstick competition for economic growth out of fiscal and career concerns try their best to obstruct capital from flowing to other jurisdictions.[24] Insofar as local enterprises are important sources of tax revenues and employment, the local governments also erect barriers blocking the export of factors needed for local production and the import of commodities produced in other jurisdictions.[25] Estimates provided by Poncet (2005) suggest that inter-jurisdictional trade barriers may even be higher than international trade barriers.

The protection of local interests also manifests itself in the lack of inter-jurisdictional cooperation. There are numerous reports of duplication in infrastructure such as bridges, highways, and airports, because local governments fail to collaborate in the design and planning of these public facilities to exploit the economies of scale for fear of losing their own competitive edges. An often cited example is the construction of international airports in the three closely neighboring cities in the Pearl River Delta. There are similar stories about the construction of cross-bay bridges and international ports in the Yangtze River Delta.[26] In addition, local governments sometimes discourage adjacent jurisdictions from using their public services by means such as charging non-local vehicles higher fees (see Shu, 1995; Shu and Zhou, 2003).

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[24] On restrictions in the mobility of labor and capital, see, e.g., Wang, 2000. In his book *Selling China: foreign direct investment during the reform era*, Huang (2003) argues that local jurisdictions have found it hard to attract capital from their neighboring jurisdictions not least because of local protectionism. In his view, this is an explanation why there is a bias towards attracting foreign investments; see also, Geneveive and Wei (2004).

[25] In the 1980s, many regions set up checkpoints to prevent raw materials like cotton and wool from flowing out of their jurisdictions (Li and Gu, 2005). In the 1990s, protection of locally produced goods was more rampant (Wu and Zhang, 1994; Zhao, 2000). For instance, Gushi county in Henan province only permitted selling locally produced chemical fertilizers and Gezhou city in Liaoning province only permitted selling locally produced beers (Shu and Zhou, 2003).

[26] Shanghai and Ningbo, two of the largest cities in this region, built international ports only 179 km from each other. Hang Zhou and Ningbo are also separately building cross-bay bridges although they are only 171km apart.

1.4 Basic Tradeoffs

The institutional landscape discussed above creates tradeoffs which play a vital role in our theoretical analysis of the welfare and distributional effects of jurisdictional changes. Accordingly, it is essential that the potential tradeoffs in terms of the choice between a CGC and a PGC system are examined. For ease of reference, these tradeoffs are summarized in Table 1-4.

One tradeoff stems from the vertical tiers of governments in a system of jurisdictions. Compared with the PGC system, the CGC system has an additional tier of prefecture-level governments. Insofar as the administrative cost of the provincial government increases with the number of subordinate jurisdictions spreading out over vast distances, the prefecture level is said to help relieve the administrative burden of the provincial government by delegating the management of counties to the prefecture-level governments. The cost, as mentioned above, may be increasing fiscal burdens imposed on the local economy. In subsequent chapters, we refer to this as the problem of overtaxation. In short, the tradeoff is between reductions in the administrative cost set against overtaxation with an additional layer of governments.

Related to an additional tier of government is another margin of tradeoff. Horizontally, between different jurisdictions in the same tier, the presence of the prefecture level helps break down local barriers among subordinate county-level jurisdictions, thereby promoting market integration. Besides that, the prefecture level also facilitates horizontal cooperation in the provision of public goods and thus the exploitation of the economies of scale. In the CGC system, placing the urban and rural areas under one administrative rubric is also supposed to result in technological spillovers from urban into rural areas. However, this supposed benefit has to oppose the reduction in the autonomy of the counties which are now subject to an additional tier of governments. As a result, local preferences have to be compromised. Furthermore, in the context of the CGC regime, the city government may have incentives to pursue urban-biased policies to the detriment of the rural counties.

Table 1-4 Basic Tradeoffs in Our Study

	Tradeoffs	Institutional features
Related to vertical tiers of governments	Benefits: Saving in administrative cost	Large provincial size
	Costs: Overtaxation	Overlapping governments taxing the same tax base
Related to horizontal tiers of government	Benefits: Market integration Urban-rural spillovers (for CGC) Horizontal cooperation	Local barriers and rural-urban divide
	Costs: The accessibility problem Urban-biased policy (for CGC)	Vast distances Rural-urban divide

The prominence of the tradeoffs discussed varies across the vast area of China. In Zhejiang, for example, the gains from market integration and horizontal coordination are small when the market is given a larger role in the allocation of resources. Therefore, there is less pressing need for a prefecture level to lift administrative barriers. Another illustrative example is that the costs induced by the distance and backward transport infrastructure may be more important for inland provinces. In addition, the tradeoffs may have different impacts on the stakeholders. Not everyone has equal gains in these jurisdictional changes. Understanding the distributional effects induced by the tradeoffs thus sheds light on the political economy and direction of jurisdictional changes.

1.5 Methodology and Thesis Organization

This thesis is intended to incorporate the discussed tradeoffs into a theoretical framework which evaluates the different designs of the administrative hierarchy. To do this, we examine how different designs affect the interests of the different stakeholders, namely, the different levels of governments and the residents of the jurisdictions involved, to determine the gainers and losers. Specifically, our theoretical models include both a private and a public sector. In the private sector, producer-household uses a private input (say, labor) and an industrial public good

(say, infrastructure) in production. After paying taxes proportional to the output, the producer-household keeps all post-tax output for private consumption. In the public sector, self-interested governments maximize their interests. At the bottom are county-level jurisdictions collecting taxes and supplying public services. Accordingly, we explore different scenarios with and without an intermediate prefecture level between the provincial and county governments. The provincial government is assumed to tax the local economy and incur administrative costs. A prefecture tier of government, when introduced, plays a coordinating role and collects its taxes.

Agents in the private and public sectors interact with one another. The resident's welfare is affected by taxation and the supply of public good which may be different with jurisdictional arrangements changing. Our model also incorporates strategic interactions between different tiers of governments in a top-down political system. In the model, we use Stackelberg games to illustrate the distribution of powers between the different levels of governments. For each of the models introduced below, equilibrium is attained when all the agents maximize their functionality. Producer-households maximize their utility while the different levels of self-interested governments maximize their fiscal rents, say, revenues net of the costs of administration or public production. The different equilibria under different systems of jurisdictions can then be compared to help us evaluate their welfare and distributional effects.

The remaining parts of this thesis are organized as follows. Chapter 2 surveys the relevant literature on China's system of jurisdictions and highlights the tradeoffs often mentioned in debates on jurisdictional reforms. We also review those studies which suggest to us tractable ways of incorporating these tradeoffs into our models. Chapter 3 introduces the basic building blocks and line of reasoning common to our models introduced to study jurisdictional changes. As a first attempt to show how this theoretical framework may shed light on real-world jurisdictional changes, this chapter explores how many tiers of governments China should have by comparing the proposed PGC system and the prevailing province-prefecture-county setup. Chapter 4 looks into the motivations and consequences of the CGC regime by

developing a model with special attention to the debate on the choice between rural-urban divide and integration. In Chapter 5, we explore the regime change of converting county-level jurisdictions into urban districts with focus on the incentives to requisition rural land. Finally, Chapter 6 concludes by summarizing the major findings, discussing their policy implications, and exploring directions of future research.

Chapter 2 Literature Review

This chapter reviews several strands of research that are relevant to our study. We begin by examining previous studies on China's jurisdictional systems, with particular emphasis on the potential tradeoffs with respect to the various blueprints put forward to reform China's administrative hierarchy; these tradeoffs form the core of our theoretical framework. Insofar as these tradeoffs are to be incorporated into our theoretical models, we next survey those studies that provide us with valuable insights as to how we may incorporate the tradeoffs into our models tractably and parsimoniously.

2.1 Literature on Chinese System of Jurisdictions

As pointed out in the introductory chapter, this thesis is focused upon the province-prefecture-county arrangement. The reform era has witnessed the spread of the CGC system. Moreover, the prefecture-level city governments have consolidated their strength and expand their sphere of influence by converting neighboring counties into urban districts which are subject to their tighter control. In recent years, there is however a crescendo of opposition to the CGC system. The discussion often relates to whether China's Byzantine administrative system may be simplified by removing the prefecture level in the present CGC system. The review below elucidates the different arguments whether China's administrative hierarchy is too complicated. Also from the debate, we may distill the tradeoffs often put forward regarding the different architectures for China's political jurisdictions. In what follows, we focus on three issues of jurisdictional changes which are the themes in the next three chapters.

2.1.1 How Many Tiers of Governments?

How China's local government system should be designed has been a perennial issue in Chinese history. Xu (1991), Pu, Chen and Zhou (1995), Liu (1996), Dai (2000) and Chung and Lam (2004) provide detailed reviews of the evolution of China's administrative divisions and the issues involved. In recent years, the debate on the number of layers of governments has been rekindled, an understanding of which provides an important backdrop for our analysis in the subsequent chapters. Often in the limelight is the current five-tier hierarchy which is often perceived as too complicated in comparison with the three-tier norm prevailing in other countries (see e.g., Liu, 1996). The discussion often focuses on whether there should be an intermediate tier of prefecture-level governments between the provinces and counties. As pointed out in Chapter 1, the reform era has witnessed the spread and consolidation of the CGC with prefectures being transformed into prefecture-level cities, which made up a *formal* tier of jurisdictions. The rest of the section reviews the different arguments for or against CGC.

The cost of managing a country the size of China is a major concern in designing a system of jurisdictions for China. In support of the CGC system, Wang (2000), for example, argues that the prefecture level helps alleviate the administrative burdens of the provincial government in governing the subordinate counties. For such a large country as China, direct administration of the counties by the provinces may be too costly especially when transportation networks for some provinces are not all that well developed. This explains why those in support of the PGC regime often simultaneously propose reducing the size of provinces (e.g., Dai, 2000).[27]

However, critics of the prevailing CGC system such as Dai (2000), Liu (1996), and Zhang (1999) point out that the additional tier of government hurts administrative efficiency insofar as information processing through administrative hierarchy may be slowed down or even distorted. From a public-finance perspective, Jia and Bai (2005) contend that it is difficult to share fiscal resources among so many

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[27] Zhou (1990) mentioned a proposal in 1941 to increase the number of provinces from 28 to 66. Recently, Dai (2000) again proposes increasing the number of provinces to fifty.

tiers of governments without inducing conflict and animosity among them. There is by now a large literature on the revenue-expenditure mismatches often seen as an important reason behind China's local fiscal crisis in recent years (e.g., World Bank, 2002). In particular, there are allegations of prefecture-level cities shifting fiscal resources upward from but expenditure responsibilities downward to county-level governments, adding weight to the argument that the prefecture level should be removed. Jia and Bai (2005) therefore advocate a compressed administrative hierarchy by removing the township layer and replacing the CGC regime by a system of provinces *directly* governing counties. The idea has recently gained currency not least because it has got the stamp of approval from the central government (see the Central Government, 2009).[28]

By putting the prefecture-level cities on a par with the county-level jurisdictions, there will be one fewer layer of governments and the counties are put directly under the provinces. There is however no consensus among scholars on the issue, though the official stance seems to be moving in that direction. In what follows, we shall take a deeper look at the CGC system. Reviewing the existing literature on the CGC system provides us with a better understanding of the logic behind this system and what its costs and benefits are as compared with, say, the PGC system.

2.1.2 City-Governing-County Regime

Despite official support of such the CGC system up to the end of the last millennium, there is a growing body of literature clamoring to remove the CGC system (e.g., Liu, 1996; Dai, 2001). The debate on whether the CGC system should be replaced by the PGC has in recently years spawned a growing literature on the pros and cons of CGC regime which we shall review below. As mentioned in Chapter 1, the CGC regime gradually came into being and spread nationwide in tandem with the increasing status of urban cities in economic development.

Dai (2000), He (2004) and Wang (2004) and many others have looked into the

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[28] See *Some Opinions of The Central of CCP and State Council on Promoting the Agricultural Development and Increasing Peasants' Income in 2009 (zhonggong zhongyang guowuyuan guanyu 2009 nian cujin nongye wending fazhan nongmin chixu zengshou de ruogan yijian).*

reasons put forward to justify the CGC. Initially introduced in the 1950s, the system was supposed to guarantee food supply and raw materials to the urban area. But in the reform era, the revival and spread of the system was motivated by arguments to be reviewed in the rest of this section.

Other than the reduction in the administrative costs of the provinces pointed out above, many Chinese commentators argue that the CGC system introduced in the 1980s met the needs of the time because the prefecture-level cities helped integrate the urban and rural markets by lowering inter-jurisdictional barriers blocking the mobility of commodities and factors (e.g., Dai, 2000; Wang, 2000). As a legacy of the socialist system, the urban and rural sectors were compartmentalized (recall the case of Changzhou in Chapter 1), resulting in rural-urban segmentation among county-level jurisdictions. Such segmentation was then further aggravated by local protectionism. In addition, insofar as local protectionism are inimical to horizontal coordination, Xiao (2004) points out that prefecture-level cities help break down local barriers and facilitate inter-county cooperation in public affairs, making possible the exploitation of the economies of scale in the provision of public goods. According to Dai (2000), the coordinating role of the prefecture-level city is particularly prominent in the planning of infrastructure projects such as road networks benefiting both the urban and rural areas.

While some scholars (Dai, 2000; He, 2004) conclude that the CGC system has by and large achieved its initial purpose of enhancing market integration and generating technological spillovers from the more advanced city to promote the development of rural counties, they are also quick to point out that the CGC system is not without its problems. Dai (2000) laments that administrative control exerted by the city government curtails the autonomy of subordinate counties. Administrative decisions made by the superior city government such as how much and where to supply local public services may not match individual county's specific needs. Furthermore, even if there are benefits generated by the CGC regime, they are not equally distributed. Those counties farther away from the city usually gain little, resulting in backward areas along the borders between the cities (Shu and Zhou,

2003).

The benefits of the CGC system predicates on the often untenable assumption that prefecture-level city governments are benevolent. In reality, rather than the city helping its subordinate counties, Liu (1996), Dai (2000), and Wu (2003) criticize the CGC system for the alleged phenomenon of "cities exploiting counties". Li (2000), for example, investigates a case of two counties in Sichuan Province with similar initial levels of development. One of them was promoted to become a prefecture-level city governing the other, and then the newly created city grew at a much faster rate. In another example, Sun and Wu (2004) reported that some counties in Anhui Province had to pick up part of the tab for urban construction in the city.

The administrative setup of CGC is also blamed for urban-bias policies. Even though the prefecture-level city is supposed to represent the general interest of all the jurisdictions under its governance, Xie and Wu (2004) argue that the city government is in fact more concerned with the wellbeing of urban districts which is often the political seat of the city government. Devoting more fiscal resources into urban industry and business than agriculture is considered more rewarding not only because the non-farm sector often generates more fiscal revenues given the configuration of China's tax system, but also because the cadre evaluation system emphasizes industrialization and urbanization as an important way to promote economic development. In addition, districts are less autonomous than counties, being an inseparable component of the city. They are more tightly controlled by the city regarding political and fiscal matters.

The problem of the city exploiting its subordinate counties may also manifest itself prominently when a small and underdeveloped city administers many counties. Dai (2000) refers to this phenomenon of "a small horse pulling a heavy cart". Rather than contributing to the development of counties through the expected technological spillovers, the prefecture-level city more often than not shifts fiscal resources upward to promote its own development at the expense of the counties (Wu, 2003). The tension may be particularly high when cities and subordinate counties are at similar levels of development and are thus more likely to compete head-on for foreign direct

investment and industrial projects (Sun and Wu, 2004). It is not surprisingly that those developed subordinate county-level jurisdiction may try hard to free itself from the political shackle of the prefecture-level city, whereas the superior city government perceives the ambition of its subordinate as posing an economic threat and a political challenge to its leadership status. Such a rivalry is particularly acute between prefecture-level cities and economically powerful county-level cities (Wang, 2000).

2.1.3 Converting Counties or County-Level Cities into Urban Districts

Related to the CGC regime is the conversion of county-level jurisdictions into urban districts. This type of jurisdictional changes has gained currency in recent years. According to the statistics reported in Dai (2003), this type of regime changes accounted for around two thirds of 130 cases of adjusting administrative jurisdictions approved by the central government from 2000 to 2002. In what follows, we review the existing literature to find out the rationale behind such conversions.

Driving the conversion of county-level jurisdictions into urban districts are two main incentives. As alluded to above, a county or county-level city is a more autonomous jurisdiction whereas an urban district is often considered an integral part of the city and is more tightly controlled by the city authority (see Wei and Liu, 2004; Shi, 2005). The regime change thus centralizes administrative powers from county-level governments to the city government, bringing about a higher degree of economic integration and facilitating urban planning. In some cases, the change reduces the number of county-level governments and saves administrative costs by incorporating a county or county-level city into existing districts (see Dai, 2003).

As pointed out by Chung and Lam (2004), the other driving force behind such a conversion is the requisition of rural land for urban use. In particular after the central government has imposed more stringent regulations on land requisition since the mid-1990s, this jurisdictional change has more often been used by the local governments as an alternative way to acquire more land for urban development (see

Deng, 2005; Wang, 2005). By incorporating a rural jurisdiction into an urban jurisdiction, the government has an opportunity to revise the land use plan to allocate more land for industrial and urban uses. This not only satisfies the growing demand for land in support of rapid urbanization and industrialization, but also it provides the government with huge land-related fiscal revenues.

Chung and Lam (2004) point out that the prefecture-level city receives most of the benefits. In contrast, the government of the converted jurisdiction is usually a loser. It has to give up its autonomy (Dai, 2003), and it must surrender some land-related revenues to the superior. It is thus not surprising that counties and county-level cities more often than not oppose such a change rigorously, a case in point being the incorporation of Wujin, a county-level city, into Changzhou.

2.2 Literature related to Our Modeling Strategy

By reviewing the important arguments and issues related to those jurisdictional changes relevant to this thesis, we have tried to sort out from the jumble of studies on the subject the major tradeoffs based on which we will construct models for our theoretical analyses. The next question is how we should model these tradeoffs embedded in China's peculiar institutional landscape. The modeling strategy has to be parsimonious enough to render the analysis tractable. In this regard, our modeling techniques benefits from several strands of literature which tackle similar tradeoffs but in different contexts. Many of these studies are related to the new political economy literature. By reviewing this relevant literature, we can also put our thesis into perspective and show the contribution of this thesis to the broader field of new political economy.

2.2.1 On The Political Economy of Jurisdiction Formation

There are two strands of literature which are relevant to our study of jurisdictional formation and changes. One of them is the textbook exposition on the provision of local public goods in a multi-tiered system of governments (see e.g., Fisher, 1996).

An up-to-date survey may be found in Oates (2005), who refers this line of research as the first-generation fiscal federalism. This strand of research revolves around the normative question about the design of a system of jurisdictions that ensures an efficient supply of local public goods. Unlike first-generation fiscal federalism which often assumes benevolent governments, a second approach --- sometimes referred to as New Political Economy or second-generation fiscal federalism --- focuses on how a system of jurisdictions is shaped by incentives embedded in a political system involving self-interested voters or bureaucrats. At a more general level, these two branches of research study political centralization and decentralization as the allocation of administrative and fiscal powers between different tiers of governments. This is also the fundamental question underlying our analysis of China's system of jurisdictions. For example, the introduction of the prefecture level in the CGC system is equivalent to shifting some of the administrative and fiscal powers away from the counties, thereby undermining their autonomy. The opposite is true under the PGC system. Next, we shall review the two approaches in turn.

Based on the pioneering work of Oates (1972), the key question in the literature on first-generation fiscal federalism is the extent to which the provision of local public goods should be decentralized to lower levels of governments. An implicit assumption of this literature is that a benevolent planner chooses a multi-tiered system of jurisdictions to maximize social welfare and explores the optimal principle under which the responsibilities for supplying local public goods are allocated between different tiers of governments. The pioneering work of Oates has spawned a large literature surveyed in Oates (2005).

Our models in the subsequent chapters are closer to the New Political Economy approach (or second-generation fiscal federalism *a la* Oates), which has challenged the assumption of benevolent governments and instead explored the role of political systems ranging from revenue-maximizing government to electoral democracy in public decision-making (for a survey of the New Political Economy approach, see e.g., Persson and Tabellini, 2000).

Particular of interest to us are two segments of this literature. One of them

studies the factors shaping the system of jurisdictions within a federal system. Revisiting Oates' decentralization theorem in the context of a federal system, Besley and Coates (2003) replace the social planner by a legislature of locally elected representatives and study the tradeoff between centralized and decentralized provision of public goods within a federal system. Another paper very much in the spirit is Lockwood (2002). In both cases, they incorporate a legislative system as the political institutions.

The second segment includes studies which are concerned with the forces shaping the breakup and merge of nations. Though in a different context, they are very similar in substance to the tradeoffs we tackle in this thesis and are therefore worth looking into. An early pioneer of this branch of studies is Freidman (1977) analyzing how the size of a country is shaped by revenue-maximizing rulers trading off more tax revenues against the increasing cost of tax collection. In the same vein, Alesina and Spolaore (2003, chapter 5) explore how the size of nations is chosen by revenue-maximizing Leviathans, putting their emphasis on the tradeoff between more fiscal revenues and increasing costs in suppressing potential insurrections when including more distant and thus heterogeneous populations. Rather than assuming a revenue-maximizing state, a different group of studies including Casella and Feinstein (1990), Alesina and Spolaore (1995, 1997 and 2003), Bolton and Roland (1997) study the issue within the context of electoral democracy. Voters' choice of the size of nations involves trading off the economies of scale in the provision of public goods and heterogeneity in local preferences.

Even though the context is different and their basic units of analysis are often nations, the same line of reasoning and modeling strategies can obviously be applied to the study of China's system of sub-national jurisdictions, though we have to incorporate the political system specific to China in the analysis.

2.2.2 Market Integration, Horizontal Coordination, and Preference Heterogeneity

The different strands of literature reviewed above invariably frame the discussion in terms of different tradeoffs induced by market/political integration, horizontal coordination, and preferences heterogeneity, suggesting to us a very fruitful way of thinking about the forces shaping China's system of jurisdictions. Indeed, as already discussed in Chapter 1, the jurisdictional changes we study below also center around a number of tradeoffs embedded in China's institutional landscape. We next take a closer look into the tradeoffs in the above studies and comparing them with those in this thesis.

Market integration and the promotion of inter-jurisdictional coordination figure prominently in the design of China's local government system. These issues are also important in the two strands of literature discussed above. Though the contexts are different, their focus is also on the tradeoff between efficiency gains from freer flows of resources and heterogeneity in preferences as in our analysis. In the case of first-generation fiscal federalism, there may be a potential tradeoff between the extent of the spatial spillover effects and heterogeneity in local preferences in choosing the size of a jurisdiction. The larger size of a jurisdiction is, the more heterogeneous the preferences are and the weaker the spillover effects. The celebrated decentralization theorem proposed by Oates (1972) explores how to balance such a tradeoff in arriving at an optimal multi-tiered system of jurisdictions. Such a tradeoff also emerges naturally in our models to be introduced in the next three chapters.

Such a tradeoff is also a popular subject in the New Political Economy literature. Besley and Coates (2003) revisit Oates' tradeoff embedded in a legislative setting (see also Lockwood, 2002) involving sub-national jurisdictions. In the context of the breakup and merger of nations, Casella and Feinstein (1990) explore whether economic agents may or may not opt for political integration. In a world with trade restrictions and thus market segmentation, political integration, which transforms

international into domestic trade, lowers transaction costs, thereby facilitating free mobility of factors and resources. The benefit of political integration in enhancing market efficiency is also a subject explored in Alesina and Spolaore (1995, 1997 and 2003), Bolton and Roland (1997) and Bolton, Roland and Spolaore (1996). For these studies, political integration not only removes trade restrictions resulting in market integration and enhanced efficiency, but also it may facilitate horizontal coordination in the exploitation of economies of scale through the joint provision and consumption of public goods because public production usually involves large fixed costs (see Chakraborty, Biswas and Lewis, 2000). Ostrom, Tiebout and Warren (1961), Oates (1972), Barro (1991) and Alesina and Spolaore (2003) all point out that a jurisdiction with a large population would gain from sharing the fixed cost.

Notwithstanding the efficiency-enhancing gains above, Casella and Feinstein (1990) and Alesina and Spolaore (1995, 1997 and 2003) also draw our attention to the costs of centralized decision-making when preferences become more heterogeneous as a result of larger jurisdictions. Political integration (both within and between nations) may put under one rubric populations with heterogeneous preferences that are now subject to uniform decisions from above. There is thus a tradeoff between efficiency gains from market integration and the cost of centralized decision making. If the initial degree of market integration is high, the above studies predict that the efficiency-enhancing benefit of political integration may be outweighed by the cost of preference heterogeneity. This actually echoes a result in our analysis in the subsequent chapters. When local protectionism is not serious and local governments less interventionist, there is less need for a prefecture level between the provinces and counties.

It is however not always true that there is a tradeoff between market and political integration. Diverse local preferences may be the result of culture, income level, and geographic factors. When the source of preference heterogeneity is income, Bolton and Roland (1997) and Bolton, Roland and Spolaore (1996) arrive at a different prediction on market and political integration. Their logic is that market integration facilitates factor mobility, which in turn narrows inter-regional disparity in income

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and wealth thereby reducing preference heterogeneity. Political integration may gain more support from voters as a result of increasing economic integration. Furthermore, voting with feet serves as a substitute for voting for secession, and the incentives to secede may therefore be weakened with market integration.[29]

The tradeoff at the center of the above literature is very similar to that between horizontal coordination by prefecture governments and heterogeneity in preferences which, in our case, is induced by spatial distance as explained in Chapter 1. As explained before and in the subsequent chapters, the accessibility problem as the source of preference diversity in this thesis is modeled in terms of a higher level government (e.g., a prefecture-level government) deciding the location of a local public good which may be less accessible to residents in some of its subordinate jurisdictions. This way of formulating preference heterogeneity is not without precedence. Williams (1966) assumes that users in different geographic locations incur different costs getting access to a common local public facility. Also, in Alesina and Spolaore (1995, 1997, 2003), preference heterogeneity is generated by different costs in accessing local public goods.

2.2.3 Savings in Administrative Costs

Running a large country and processing inter-governmental flows of information are costly. In our model, lowering administrative costs of the provincial government constitutes an important reason behind the introduction of the prefecture level. Though savings in administrative cost is rarely a focus in the strands of research we have reviewed so far, there are exceptions. Freidman (1977) cited above assumes tax administration cost which is positively related to the size of a jurisdiction. In one of their models, Alesina and Spolaore (2003) assume an administrative cost in preventing insurrections and suppressing opposition in order to maintain political power.

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[29] Leite-Monteiro and Sato (2003) investigate the relationship between economic integration and political integration by focusing on capital mobility. They argue that the net benefit from political integration is not monotonic with capital market integration, so political integration is only preferred for intermediate levels of capital mobility.

Insofar as the issue of administration costs is a factor shaping a political hierarchy, the literature on organization often based on transaction cost economics and agency theory is relevant (see e.g., Williamson, 1981). Although this line of research primarily focuses on the efficient size and structure of an organization, the underlying logic may provide valuable insights as to how we incorporate administrative costs into our study. The administrative cost inherent in an organization is usually associated with collecting and processing information (see Galbraith, 1973 and 1977). To work well, an organization must maintain communication channels and exchange messages between different agents (see Baligh and Richartz, 1967). However, administration is costly. Although such costs can hardly be accurately measured (Masten, Meehan and Snyder, 1991), they depend on a set of factors. Many agree that a long superior-subordinate distance leads to high administrative cost (see Allen, 1977; Grinter, Herbsleb, and Perry, 1999), and so do backward transport and communication facilities (see Malone, 1987).

The organization literature usually compares alternative forms of organizations and investigates the optimal structure from a viewpoint of minimizing the internal transaction cost (e.g., Williamson, 1985; Masten, Meehan and Snyder, 1991; Hennart, 1993).[30] Our study differs from this approach in that the efficiency of a government system does not just depend on the administrative cost. Instead, this cost is only one of the tradeoffs in our models in evaluating different local jurisdictional systems.

2.2.4 Overtaxation in a Multi-Level System of Governments

An important question in the design of a system of jurisdictions for China is whether a more overlapping system of governments may result in overtaxation. This is an important reason why such commentators as Jia and Bai (2002) propose replacing the CGC by the PGC system. Such a concern is shared by the literature on overtaxation in a multi-tiered system of governments to be reviewed below. Indeed,

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[30] Hennart (1993) asserts that the transaction cost theory and the comparative institutional approach developed by Williamson (1985) provides a "complete theory of economic institutions." However, in the view of many scholars, minimizing the transaction cost does not surely make up a well-performed economic organization because it does not take into account organizational capability (Rumelt, 1984; Barney, 1991; Conner, 1991; Madhok, 1996).

some of the results of our analysis in subsequent chapters remind us of the findings in this literature.

When governments in a multi-tiered system impose their taxes on a common tax base independently, does concurrent taxation lead to higher taxes? How do the tax rates of lower-level governments interact with those higher up the hierarchy of governments? These questions are the focus of a literature on vertical tax externalities in a multi-tiered system of governments (see surveys by Keen, 1998, and Wilson, 2006). When each government tier neglects the effect of its taxation on the revenues of other levels, their competitive taxing behaviors result in overtaxation. The underlying logic is reminiscent of the problem of overgrazing the common. Some earlier studies tackling these questions, e.g., Cassing and Hillman (1982) and Flowers (1988) show that taxation independently by different levels of government result in an aggregate tax rate higher than the tax rate that maximizes the total fiscal revenues.[31] Similar ideas are extended in subsequent studies (e.g., Dahlby, 1994; Boadway and Keen, 1996; Keen and Kotsogiannis, 1996; Boadway, Marchand and Vigneault, 1998). Wrede (1999) furthers the study by showing that the degree of overtaxation increases with the number of government tiers.

The findings derived from this line of research are redolent of similar questions often raised in the debate on jurisdictional reforms in China. Our theoretical analysis in subsequent chapters explores the question of overtaxation within the context of China's jurisdictional changes by way of modeling techniques similar to those used in the literature on vertical tax externalities. In particular, we assume a Stackelberg fiscal game whereby higher-level governments set their tax rates first. We also explore whether such a setup may result in higher aggregate tax rates. The answer to this question turns out to be important in the political economy of jurisdictional changes and highlights the tradeoff between the coordinating role of an additional tier of governments (e.g., the prefecture level) and the potential of overtaxation.

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[31] In a broader sense, all levels of government share the same tax base: the local economy. In a stricter sense, federal nations often allow two or more levels of government to share one or several tax resources. For example, taxes on income are shared by the federal and the state government in the U.S. and Nordic countries.

2.3 Conclusion

In the first part of the literature review, we try to summarize the debates related to jurisdictional changes in China. The issues and tradeoffs elicited from the review provide the ingredients for building the models in the subsequent questions. The second part of the literature review tries to go through the different strands of research related to the different issues engendered by a multi-tiered system of jurisdictions in general. Though the literature may not be directly related to China's jurisdictional changes, their lines of reasoning are suggestive and furnish useful cues and ideas for the study of China's administrative hierarchy.

In developing our theoretical framework, there is much that we can learn from these studies. In particular, we follow the approach of the new political economy literature by assuming local governments in China as rent-seeking Leviathans and explore how politics shape the formation of China's system of jurisdictions. Many of the tradeoffs related to jurisdiction formation and multi-tiered system of governments are similar to those in the Chinese context. These tradeoffs are engendered, among other things, by preference heterogeneity, market segmentation, and overtaxation, etc., as detailed above. They provide us with foods for thought on how we may parsimoniously incorporate these tradeoffs into our model. Indeed, our modeling strategies adopted in subsequent chapters are in many ways similar to those in the studies reviewed above.

Chapter 3 How Many Tiers of Governments?

Are there too many tiers of governments in China? Should the PGC system with one fewer tier of governments replace the present province-prefecture-county (PPC) setup? These questions have recently attracted much attention in the policy arena. Chapters 1 and 2 have already provided background information on these questions. This chapter introduces a model incorporating the tradeoffs discussed before to explore whether China has too many tiers of governments with a focus on the recent policy debate whether the prefecture level should be maintained. To concentrate our discussion on how many tiers of governments China should have, other key issues related to our study such as rural-urban divide *versus* rural-urban integration will be relegated to the next chapter.

In what follows, Section 3.1 reviews briefly the on-going debate on how many government layers China should have and whether the prefecture level should be removed from the local government system. Section 3.2 introduces the basic framework and building blocks of our models in the present and following chapters. Section 3.3 uses the model to compare different scenarios with and without a prefecture level between the provinces and counties. Section 3.4 analyzes the distributional effects of switching from PPC to PGC, identifying the gainers and losers among the different tiers of governments and residents in the jurisdictions involved. Finally, Section 3.5 concludes the chapter.

3.1 Background and Issues

As explained in Chapter 1, the present province-prefecture-county system of local jurisdictions is a legacy of the pre-reform era. When they were first set up in the

1950s, prefectures did not make up a formal tier of governments and were just representative agents of provincial governments.[32] Nevertheless, they played an increasingly important role in the pre-reform era partly because the central government tried to use prefectures as vehicles in its quest for local industrialization and inter-jurisdictional coordination.[33] Notwithstanding the ebb and flow of such an arrangement since their creation in the 1950s, the prefecture level in the reform era has become more entrenched not least because of the spread of the CGC regime since the 1980s, leading to surges in the number of prefecture-level cities, which make up a *formal* tier of governments equipped with a full range of administrative powers.

Reviewing the jurisdictional changes related to the province-prefecture-county setup in the reform era, there are a number of observations worth mentioning:

- The spread of the CGC system was not embraced throughout China in a short time, but it was a gradual process initially involving the more developed coastal provinces. In this connection, Jiangsu was the first province to adopt the CGC system in the 1980s.

- Even among the coastal provinces, it is interesting to point out that Zhejiang has never really taken up the CGC system. Instead, it has a system which is akin to the PGC.

- The inland provinces, which are often large in size with poor transport conditions and are lagging behind in market reforms, have only started to adopt the CGC system since the second half of the 1990s.

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[32] The 1954 Constitution clearly excluded the prefecture from the formal hierarchy of governments. Only in the *Rules Governing Government Organization* were the provinces given the authority to set up prefecture commissioner's offices if necessary.

[33] In the mid-1950s, the Party began to question the Soviet model of highly centralized industrialization, and Chairman Mao argued in his famous article *On Ten Cardinal Relations* (*Lun shida guanxi*) that a certain degree of decentralization might be good for industrial development. While the province was too large and the county too small, the prefecture level was seen as having the right span of administrative control needed to coordinate local industrialization (Wang, 2004). In order to "develop local industries" and "facilitate mutual support between industry and agriculture", the prefecture was granted more administrative power such as the creation of non-agricultural enterprises in 1958. Some cities were also put under a prefecture to achieve the policy goal of creating "one industrial center in each prefecture" (See *Opinions of the Center on Appropriately Expanding the Powers of the Prefecture Government* in Wang, 2004). Prefectures kept moving up the political pecking order during the Cultural Revolution (1966-1976) reaching a peak in 1975 when the revised Constitution promoted it to a formal tier of governments having its own people's congress. However, they were soon reverted back to their informal status in the 1982 Constitution.

- At the beginning of the millennium just when the spread of the CGC system to the whole country is almost complete, there has been a crescendo of complaints about the problems of the CGC system and calls to replace it by the PGC system. The central leadership has withdrawn their support of the CGC and seemed to have put more weights on the PGC system.

There are thus spatial and temporal variations in the adoption of the CGC system. How should we interpret the above observations about jurisdictional changes involving the prefecture level? As already explained in Chapter 1 and 2, a good starting point to think about the above question is through the lens of the different tradeoffs induced by jurisdictional changes. The concluding section of this chapter will return to the above observations and explain why thinking along such a line may shed light on these salient observations.

While the readers are referred to the previous chapters for details on the tradeoffs, let us briefly recap, for ease of reference, the tradeoffs with regard to the introduction of a prefecture level into the local government system. On the benefits, the provincial government saves on administrative costs by governing fewer jurisdictions directly under it. Coordination by the prefecture level helps remove inter-county barriers blocking factor and commodity mobility caused by local protectionism. It also facilitates horizontal cooperation in exploiting the economies of scale in the provision of public goods. Regarding the costs, a more overlapping system of governments imposes higher fiscal burdens in the form of, say, overtaxation upon the economy as well as upon the lower levels of governments. In addition, the benefits of horizontal cooperation have to be balanced against the loss in decision-making power on the provision of public goods, which may not exactly match local preferences; heterogeneity of preferences are conceptualized as an accessibility problem in our models. For ease of references, the costs and benefits as well as the potential gainers and losers are summarized in Table 3-1.

Table 3-1 Tradeoffs Induced by the Introduction of a Prefecture Level

	Tradeoffs	Gainers/Losers
Benefits	Market integration	All stakeholders
	Economies of scale in public consumption	All stakeholders
	Economies of scale in public production	The county-level govt.
	Savings in administrative costs	The provincial govt.
Costs	Overtaxation	All stakeholders
	Costs related to the accessibility problem	All stakeholders

The above tradeoffs affect differently the interest of the stakeholders. Our model sheds light on the political economy of jurisdictional changes by analyzing their distributional effects. For example, the gain of reducing the administrative burdens induced by an intermediate level of prefectures may mainly go to the provincial government. Benefits derived from economies of scale in public good production may accrue to the county-level government as lower cost in the provision of public goods. Insofar as there are gainers and losers, the trajectory of jurisdictional changes depends on how a political process resolves the conflicting interests of the stakeholders. While anecdotes abound, much remains to be done to unravel the black box of such a political process. By identifying the gainers and losers of the jurisdictional changes in question, our model is a preliminary attempt to better understand the political economy of jurisdictional changes in China.

All in all, the model introduced below provides us with a theoretical framework to comprehend the debate on how many tiers of governments China should have. We phrase our analysis in terms of the choice of a prefecture level between the province and counties. By exploring the gainers and losers in a system with and without a prefecture level, the model elucidates the political economy of jurisdictional changes. With these in mind, we first introduce the basic building blocks of our theoretical framework.

3.2 An Outline of the Basic Building Blocks

This section outlines the basic building blocks of our models, paving the way for subsequent analyses. We introduce the behavioral assumptions for the different agents including the producer-household and rent-maximizing governments. Then, we outline our modeling strategies for the different tradeoffs. Hopefully, this section provides the reader with a general overview of the model's setup so as to facilitate a better understanding of the analysis in the subsequent sections. Many of these features and assumptions will be repeatedly used in the models in subsequent chapters.

3.2.1 Stakeholders

The stakeholders in our model are producer-households in the different jurisdictions and the different tiers of governments. To capture their interactions, our model includes a private and a public sector. The producer-household uses both a private and public input in production, and the output is subject to taxation by the different tiers of governments. The governments use fiscal revenues to produce the public good that is necessary in private production. In equilibrium, all the agents maximize their objectives by choosing their control variables.

Producer-Household

In the private sector, local residents, *viz.*, the producer-household, produce output for private consumption, using a private input (e.g., labor) and an industrial public good (e.g., infrastructure) provided by the government.[34] To simplify our analysis, the utility function of the producer-household is assumed to be:

$$u = C - e, \tag{3.1}$$

where C is consumption and $-e$ is the disutility of labor, measuring the utility cost of labor effort. The household is also engaged in production. We assume a log-linear production function:

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[34] We can alternatively assume the private input is capital. In fact in out model the private input can be interpreted as a mix of labor and capital.

$$y(e,g) = A e^{\alpha} g^{\beta}. \tag{3.2}$$

where e is the labor input, and g is the public good. A is an index representing total factor productivity and, as discussed below, is introduced to capture the degree of market integration in our model.[35] Parameters α and β are respectively the elasticity of output with respect to labor and public input related to the productivity of the respective factors of production. We assume a strictly concave production function, i.e., $\alpha + \beta < 1$.[36]

The local output is subject to taxation at the rate t. Whenever more than one level of governments jointly taxes the economy, t is the aggregate tax rate. After paying taxes, the household keeps $(1 - t) \cdot y$ for private consumption C. The producer-household's utility thus becomes:

$$u(e,g) = (1 - t) \cdot y(e,g) - e. \tag{3.3}$$

The problem for the household is to choose the labor input e to maximize its utility. In our analysis, if more than one producer-household are involved, social welfare is the sum of the utilities of all households.

In the general literature, the public good is usually a consumptive good entering the utility function (e.g., Persson and Tabellini, 2000). But it may alternatively be modeled as a productive factor entering the production function (e.g., Arrow and Kurz, 1970; Barro, 1990; Barro and Sala-I-Martin, 1992; Qian and Roland, 1998). Examples include infrastructural facilities such as water supply, power supply and transport facilities that are necessary for modern production and often promote productivity. Our model employs the second specification not least because it is better aligned with the reality that Chinese local governments engaged in inter-jurisdictional competition are keen to provide public infrastructure facilities to

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[35] In our model, the TFP parameter A is assumed to be related to exogenously given knowledge stock and the degree of economic integration between the jurisdictions. It is introduced mainly to examine how the grees of market segmentation between the jurisdictions changes the stucture of organizing these jurisdictions. If we assume endogenous growth models, we may investigate how technological changes affect the choice of jurisdictional systems. Although this will not be a focus of our thesis, it may be an interesting topic for the future study.

[36] We can alternatively assume constant returns to scale, i.e., $\alpha + \beta = 1$, as long as we assume a convex public cost function at the same time. The main conclusions with respect to our study are similar. For simplicity, we assume that $\alpha + \beta < 1$ throughout this thesis.

boost industrial production and thus local economic development (see e.g., Walder, 1995). A large proportion (almost 40 percent) of revenues is devoted to the construction of industrial facilities even at the expense of welfare expenditures (see Park, Rozelle, Wong, and Ren, 1996; Ren, 2006).[37] In the present context, this specification can also accommodates more complex and interesting interactions between the residents and governments, thereby providing more insights as to why local governments in China are so eager to boost investment in local public infrastructure. By directly assuming the pubic input g as a factor of production, a government has the incentive to boost investment in g which ultimately leads to more output and thus tax revenues.

Rent-Maximizing Governments in a Multi-Tiered System

There is more than one tier of governments in our model. Governments are assumed to maximize their self interests. While the specifications of the model are to be explained in greater detail below, we first briefly outline how administrative and fiscal powers are allocated among the different tiers of governments.

Administrative and fiscal powers of county governments. At the lowest level are the county governments. Their range of powers includes taxing output and providing local public goods. The objective function for a typical county-level government is

$$R_c = t_c \cdot y(e,g) - C(g). \tag{3.4}$$

where R_c is referred to as the fiscal rent, t_c is rate of the tax imposed by the county, $t_c y(e,g)$ is tax revenues and $C(g)$ is the cost of producing the public good.[38] The tax rate t_c is assumed to be a choice variable of the county government. We interpret "tax" here as encompassing revenues from both budgetary and off-budget sources. Even though county governments in China do not control the statutory tax rates, one may think of t_c as the *effective* tax rate determined by the county government insofar as arbitrary fees are common at the county level (see Tsui and Wang, 2004).

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[37] In China, developmental expenses sometimes account for nearly forty percent of the aggregate budgetary expenditures, much higher than other countries (averagely 8 percent for developed countries, 14 percent for under-developed countries and 20 percent for transitional countries, see Ren, 2006).

[38] In many studies the government simply maximizes the budgetary revenue because the fiscal rent is assumed to be proportional to the total fiscal revenue, e.g., Niskanen, 1971; Brennan and Buchanan, 1980; Nelson, 1986; Persson and Tabellini, 2000.

While boosting public revenues, a high tax rate t_c produces a disincentive effect on the supply of labor input. On the other hand, an increase in the supply of g stimulates production but incurs a higher production cost.

In our subsequent analysis, how the county-level government chooses g depends on the system of jurisdictions. Without the prefecture government, a rent-maximizing county government chooses a tax-expenditure buddle (t_c, g) to maximize its fiscal rent; g is located within the county so that there is no problem for local residents to get access to g. With prefecture coordination, however, the decision on where to locate g is surrendered to the prefecture government, and the amount of public good and the sharing of the production cost are negotiated between the counties through a bargaining process (more details below).

It is assumed that the cost of producing the public good $C(g)$ is made up of a fixed cost F and a variable cost cg:

$$C(g) = \begin{cases} 0, & \text{if } g = 0, \\ F + cg, & \text{if } g > 0, \end{cases} \tag{3.5}$$

where the parameter c is the marginal cost. We introduce F to capture the economies of scale in public production.[39] With horizontal cooperation between counties, the joint provision of public goods lowers the unit cost of production.

Under whichever system, the industrial public input g necessary for private production is assumed to be produced and supplied by the county government which defrays the cost $C(g)$. Indeed, grassroots governments in China, namely, counties, districts and townships, often assume major responsibilities in the provision of a wide range of public goods (World Bank, 2002; Song, 2004).

Administrative and fiscal powers of higher-level governments. Above the county governments are the prefecture and provincial governments under the present province-prefecture-county setup. In the PGC system, the provincial government directly governs the counties. In both cases, the higher-level governments incur administrative costs governing subordinate governments. Recalling the discussion in

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[39] Recall our discussion in Chapter 2 on the tradeoff between the economies of scale and differences in taste, see, e.g., Ostrom, Tiebout and Warren, 1961; Oates, 1972; Barro, 1991; Alesina and Spolaore, 2003.

the literature review in chapter 2, we model the administrative cost as a function of the physical distance d between the superior and subordinate government. We follow Malone (1987) by assuming a linear cost function which exhibits a constant marginal cost:[40]

$$V(\sigma;d) = \sigma d, \tag{3.6}$$

where d is the distance between a superior government and its subordinate. The marginal administrative cost with respect to distance σ is a parameter which implicitly depends on transport conditions. The poorer the transport network, the higher is the marginal cost of administering the subordinate jurisdictions.

To highlight the role of prefecture-level governments in horizontally coordinating their subordinate counties, the model assumes that the prefecture government, if it is introduced, is assigned the following administrative powers:

- to decide where to locate g (e.g., a bridge, road or airport, etc.), and
- to bring together counties to hammer out the amount of public good g as well as a formula for sharing the costs of producing the public good.

The prefecture government does not actually produce g but delegate the task to the subordinate counties.

Regarding the taxing power of upper levels of governments to cover their administrative costs, China's current tax system is mainly the result of the 1994 fiscal reform. At the sub-provincial levels, local governments determine how they share fiscal revenues resulting in widely varying fiscal systems. To make our model simple and tractable and at the same time to capture the fact that different tiers of governments share the same tax base, we assume that, like their county counterparts, higher-level governments set their own tax rates. Again, these rates may be interpreted as *effective* rates insofar as different layers of governments may have access to off-budget revenues (e.g., land revenues are an important source of revenues for prefecture-level cities). Higher-level governments are assumed to be

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[40] We can alternatively assume a convex function with an increasing marginal cost. It is a priori difficult to determine which of the two specifications is closer to reality not only because the administrative cost inside an organization is difficult to gauge, but also because there is no quantitative study on how the administrative cost is related to distance in the context of China. The linear specification however renders the analysis more tractable.

Stackelberg leaders in setting their tax rates.

Taking into account how the administrative and fiscal powers are allocated, the fiscal rent of the higher-level governments is defined as their tax revenue net of administrative cost. Insofar as administrative costs are assumed to be exogenously decided by distance, the problem for these two levels of government is therefore to maximize revenues by choosing a tax rate:

$$R = t_i \cdot y(e, g) - V(\sigma; d). \tag{3.7}$$

where t_i is the effective tax rate for the prefecture or the provincial government.

3.2.2 Modeling Strategies for Tradeoffs

With the above in mind, we next explain how we model the tradeoffs as summarized in Table 3-2.

Table 3-2 Tradeoffs and Corresponding Model Strategy

	Tradeoffs	Modeling Strategy and relevant variables
Benefits	Market integration	Market integration by removing local barriers increases knowledge/technological spillovers, γ, and thus total factor productivity A
	Economies of scale in public production and consumption	Two regions jointly produce and supply the public good and share the fixed cost F
Costs	The accessibility problem caused by horizontal cooperation	The attenuation function $\Phi(\sigma; d)$ discounts the effective amount of public good with distance
	Overtaxation	Overlapping taxation by different layers of governments results in an increase in the aggregate tax rate.

As mentioned before, the introduction of a prefecture level may help bring down local protectionist barriers and foster an integrated market for the jurisdictions

involved, thereby increasing efficiency ranging from freer mobility of factors and commodities to knowledge/technological spillovers (see Zheng and Li, 2003; Liu, 2004).[41] To model the efficiency-enhancing effect of market integration and keep the analysis tractable, we follow Romer (1986), Lucas (1988) and Alesina and Spolare (2003) by assuming that market integration benefits the local economy by boosting total factor productivity (TFP).[42] In this connection, we interpret A in (3.8) as a stock of knowledge. Productivity-enhancing knowledge spillover is assumed to increase with the degree of market integration. If there are n counties, the TFP for the jth county, $j = 1, 2, ..., n$, is:

$$A_i = A + (n - 1)\gamma A, \quad i \in \{1, 2, ..., n\},$$ (3.9)

where $\gamma \in [0, 1]$.[43] Parameter γ is a proxy for market integration such that the spillover effect $(n - 1)\gamma A$ into the jth county depends on γ. Markets are completely segmented when $\gamma = 0$ but completely integrated when $\gamma = 1$. We assume for simplicity that the knowledge spillover does not depend on distance. TFP thus increases with γ, capturing the productivity-enhancing effect of market integration.[44]

Another benefit of horizontal coordination is the economies of scale resulting from the joint provision of public goods. To model such a benefit, we assume that, without horizontal cooperation by the prefecture-level government, each of the county-level jurisdictions separately provides the public good that is exclusively used

[41] Zheng and Li (2003) estimate that the output loss caused by local protectionism may be as high as 20 percent of GDP in 1996. But other studies give much lower estimations. In a study on selected 21 industries, Liu (2003) estimates that the output would increase by around five percent if local protectionism is significantly alleviated.

[42] Market integration is modeled in several ways in the literature. In some studies, it is modeled as a decline in transaction and transport costs (e.g., Casella and Feinstein, 1990).

[43] In our model, by assuming that one jurisdiction receives knowledge spillovers from other jurisdictions, the level of TFP in one jurisdiction is positively related to the number of jurisdictions. Intuitively, the more jurisidictions, the more knowledge stock spilled over to jurisdictions. This may be similar to the ideas presented in the endogenous growth models that a large population helps increase technology levels through knowledge externalities. But it is noted that the number of jurisdictions n as well as the knowledge stock A in each jurisdiction are both exogenously given in our model, so the specification can not be interpreted as that dividing a region with a fixed size into more jurisdictions will lead to higher productivity in every jurisdiction.

[44] In our model, coordination from above alleviates inter-jurisdictional competition and thus local protectionism. Although our focus is on its efficiency-improving effect of dismantling local barriers blocking the flow of facotr and commodity, we must keep in mind that inter-jurisdictional competition is often perceived as a key factor promoting China's fast economic growth. Many agree that such yard-stick competition between neighboring jurisdictions forced Chinese local govermemnts to offer business-favorable policies (e.g., Qian and Roland, 1998). In theory, removing such copetition may reduce the economic efficiency. But as has been introduced before, inter-jurisdictional competition is often to an excessive extent, driven by local cadres running in the race for the scare promotion opportunities. So proper coordination from above may mainly produce a welfare-improving effect.

by its residents. Horizontal cooperation renders possible the joint provision of the public good at a centralized location. The production cost of the public good is shared among the jurisdictions. Obviously, the economies of scale in the provision of public goods increase if horizontal cooperation may be better exploited with more jurisdictions.[45]

However, the jointly provided public good located at one location may be less accessible to residents in some participating jurisdictions. We have all along referred to this issue as the accessibility problem, which is reminiscent of the modeling of transport cost in the trade and new economic geography literature. Samuelson (1954) proposed the so-called iceberg technology to capture transport cost by assuming that a traded good dissipates with the distance traveled, just like a melting iceberg when moving from one spot to another (for a similar specification see Krugman, 1991). Motivated by this specification, we introduce a function $\Phi(\sigma; d)$ to capture the dissipation in the consumption of g with distance d; the parameter σ controls the speed of dissipation. Multiplying $\Phi(\sigma; d)$ to G arrives at the effective amount of public good consumed:

$$g_{\mathit{eff}} = G \cdot \Phi(\sigma; d), \quad 0 \le \Phi(\sigma; d) \le 1. \tag{3.10}$$

$\Phi(\sigma; d)$ is assumed to be concave and decreases with respect to the physical distance between the county and the location of the public good, d, i.e., $\Phi'(\sigma; d) < 0$ and $\Phi''(\sigma; d) < 0$. When the public good is supplied within a jurisdiction so that $d = 0$, there is no dissipation and $\Phi(\sigma; d) = 1$; on the other hand, the public good is completely dissipated if d is sufficiently large, i.e., $\Phi(\sigma; d) = 0$ for $d > d^*$.[46] We assume that $\partial^2\Phi(\sigma; d)/\partial d \partial \sigma < 0$ to capture how the poor quality of transport networks corresponding to a large value of σ increases the rate of dissipation.

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[45] In the public economics, an often used assumption is that local jurisdictions seperately supplying public goods may choose to supply a sub-optimal amount of public goods because of the externalities in using these goods. Coordination from above thus helps correct such distortions and increase the supply of public goods to the optimal level.

[46] This specification is analogous to the way Craig (1987) used to model the congestion problem in consuming a local public good. A convex function was used in earlier studies (e.g., Borcherding and Deacon, 1972; Bergstrom and Goodman, 1973), which in fact suggests a decreasing marginal rate of congestion (Edwards, 1990; Oates, 1988; Means and Mehay, 1995). Craig (1987) argues that the concavity assumption captures more accurately the essence of a club good: the marginal dissipation increases and a "gridlock" effect occurs at the margin. He argues that it is the "gridlock" effect that renders a public good "local". On the contrary, the local public good under the convexity specification would become closer to pure public goods as the distance increases infinitely.

3.3 The Model

Putting together all the components introduced in the previous section, the resulting model is used to analyze and compare the scenarios with and without prefectures. In this regard, we first explore the PGC regime in which a provincial government directly governs n counties. For simplicity all counties are assumed to be identical.[47] Next, the prefecture level is introduced as an intermediate layer between the provincial government and county governments. Our model tries to analyze the strategic interactions between the different stakeholders under different systems of jurisdictions in affecting their choice of tax rates, public good supply, and labor input. In particular, by comparing equilibria under these two types of systems, the model will shed light on the tradeoffs and consequences of introducing a prefecture level into the local government system and outline the different conditions under which one regime may be more desirable than the other.

3.3.1 The Model of Provinces Governing Counties

Under the PGC system, there are two levels of governments. The representative province consists of n identical counties. The size of each county is assumed to be D such that the province is nD in size. The provincial government is assumed to be located in the midpoint of the province while the county government is located at the centre of each county, as shown in Figure 3-1.

Figure 3-1 The PGC Regime with n Counties

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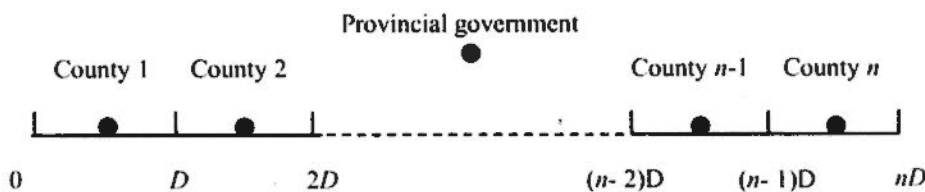
[47] We will assume heterogeneous county-level jurisdictions in the next chapter to address the issues relevant on rural-urban difference in the examination of the CGC regime.

Under the PGC regime, local cadres are only answerable to higher-level governments in a top-down administrative hierarchy. The system is inimical to horizontal coordination, breeding local protectionism and market segmentation. As explained above, we model this scenario in terms of a market integration index γ being less than one and the total factor productivity of county j is $A_j = A + (n - 1)\gamma A$, $\gamma < 1$. Using (3.2), the local production function is thus:

$$y_j\left(e_j, g_j\right) = \left[A + (n - 1)\gamma A\right]e_j^\alpha g_j^\beta, \quad j = 1, 2, \ldots, n. \tag{3.11}$$

In the absence of horizontal cooperation under the PGC system, we assume that the county governments separately supply the public good g_j which is exclusively used by the resident in their own jurisdictions.

We model the interactions between the different stakeholders as a Stackelberg game as summarized in Table 3-3. As the leader, the provincial government takes the first step to determine its tax rate t_p. In the second stage, the county governments choose the tax-expenditure bundles (t_{cj}, g_j). Finally, the residents choose labor input e_j, given the policies prescribed by the different levels of governments. In what follows we shall explain the responses of the different stakeholders in the game.

Table 3-3 The Stackelberg Game and Choice Variables of Different Agents

Stages	Agents	Choice Variables
1	The provincial government	t_p
2	The county government	t_{cj} and g_j
3	The producer-household	e_j

The Problem of the Producer-Household

We go backward by starting with the last stage. The producer-household in county j chooses labor input e_j to maximize utility, taking as given the policies of the provincial and county governments, say, t_p, t_{cj}, and g_j:

$$\max_{e_j} \; u_j = \left(1 - t_p - t_{cj}\right) \cdot y_j\left(e_j, g_j\right) - e_j. \tag{3.12}$$

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The first order condition is $(1 - t_p - t_{cj})\partial y_j/\partial e_j = 1$, implying that the optimal labor input for the producer-household is such that the marginal return of labor effort should be equal to its marginal disutility. Solving this condition yields:

$$e_j^*\left(t_p, t_{cj}, g_j\right) = \left\{(1 - t_p - t_{cj})[A + (n-1)\gamma A]\alpha\right\}^{\frac{1}{1-\alpha}} g_j^{\frac{1}{1-\alpha}}. \tag{3.13}$$

The components in (3.13) illustrate how e_j is chosen by the utility-maximizing resident who trades off the benefits and costs of labor input induced by different economic and policy environments. $(1 - t_p - t_{cj})$ pertains to the proportion of output retained by the resident after taxation. $[A + (n-1)\gamma A]$ refers to TFP that is related to the degree of market integration. α is the elasticity of labor input, and g_j is the amount of public good supplied by the government. To better understand how these variables and parameters affect the choice of labor input, we introduce a set of useful comparative static results which reappear in models discussed in subsequent chapters. It can easily be shown that:

$$\frac{\partial e_j^*\left(t_p, t_{cj}, g_j\right)}{\partial t_p} < 0; \quad \frac{\partial e_j^*\left(t_p, t_{cj}, g_j\right)}{\partial t_{cj}} < 0; \quad \frac{\partial e_j^*\left(t_p, t_{cj}, g_j\right)}{\partial g_j} > 0. \tag{3.14}$$

Holding all other things constant, the producer-household's labor supply responds negatively to the tax rates but positively to the public good supply. Intuitively, high tax rates pertain to a larger share of output claimed by the governments, thereby reducing the marginal return of labor input and producing a disincentive effect upon the labor effort of household. On the contrary, an increase in the supply of industrial public good boosts productivity and thus produces a higher marginal return for the producer-household.

In addition, the labor input of resident also responds to the different degrees of market integration:

$$\frac{\partial e_j^*\left(t_p, t_{cj}, g_j\right)}{\partial \gamma} > 0. \tag{3.15}$$

A higher degree of market integration results in higher TFP, thereby increasing the marginal return of private input and encouraging the producer-household to supply more labor.

The Problem of the County Government

In the second stage of the game, the county government chooses $t_{c,i}$ and g_i to maximize its fiscal rent. As an intermediary between the provincial government and households, it has to take into account expected responses of residents and is subject to policies laid down by the superior government:

$$\max_{t_i, g_i} R_{i} = t_{i} \cdot y_{i}\left(e_{i}^{*}\left(t_{p}, t_{i}, g_{i}\right), g_{i}\right) - C\left(g_{i}\right). \tag{3.16}$$

$$\text{s.t.} \quad t_{i} \leq 1.$$

Assuming an interior solution,[48] the optimal tax rate and the public good are determined by the following equations:

$$y_{i}\left(e_{i}^{*}\left(t_{p}, t_{i}, g_{i}\right), g_{i}\right) = -t_{i} \cdot \frac{\partial y_{i}}{\partial e_{i}} \cdot \frac{\partial e_{i}^{*}\left(t_{p}, t_{i}, g_{i}\right)}{\partial t_{i}}. \tag{3.17}$$

$$t_{i} \cdot \left[\frac{\partial y_{i}}{\partial e_{i}} \cdot \frac{\partial e_{i}^{*}\left(t_{p}, t_{i}, g_{i}\right)}{\partial g_{i}} + \frac{\partial y_{i}}{\partial g_{i}}\right] = \frac{\partial C\left(g_{i}\right)}{\partial g_{i}}. \tag{3.18}$$

Eq. (3.17) captures the calculus behind the optimal tax rate in that the government has to balance two opposite effects of taxation on the fiscal revenue. A high tax rate increases the share of output going to the government; but it has a disincentive effect on labor input, resulting in a decline in the tax base $((\partial y/\partial e)\cdot(\partial e^{*}(t, g)/\partial t) < 0)$. Intuitively, the tax rate is optimal when the two opposite effects are equal at the margin. Similarly, Eq. (3.18) captures the logic behind the choice of the optimal supply of public goods. A large amount of g boosts the revenues not only by directly increasing the tax base $(\partial y/\partial g > 0)$, but also by inducing more labor input and thus increasing the tax base $((\partial y/\partial e)\cdot(\partial e^{*}(t, g)/\partial g) > 0)$. However, producing more public goods incurs more production costs $(\partial C(g)/\partial g > 0)$. The optimal supply is such that the benefit and cost are equal at the margin.

Solving (3.17) and (3.18), we obtain the optimal tax rate and the supply of public goods chosen by the county government as functions of the provincial tax rate:

$$t_{i}^{*}\left(t_{p}\right) = (1 - \alpha)\left(1 - t_{p}\right). \tag{3.19}$$

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[48] The Lagrange function is $Z(t, g, \lambda) = t \cdot y(e^{*}(t, g), g) - C(g) + \lambda(1 - t)$. The Kuhn-Tucker conditions may be found in the Appendix of this chapter. We assume that the solution is interior, i.e., $0 < t < 1$.

$$g_i^*\left(t_p\right) = \left(1 - t_p\right)^{\frac{1}{\alpha} - 1}\left[A + (n - 1)\gamma A\right]^{\frac{1}{\alpha - 1}}\alpha^{\frac{\alpha}{\alpha - 1}}\left(\frac{\beta}{c}\right)^{\frac{1}{\alpha - 1}}. \tag{3.20}$$

The above are reaction functions of the county government with respect to the policies laid down by the provincial government. An increase in the provincial tax rate may induce the county government to lower its tax rate and reduce the provision of public goods, capturing the negative effects of taxation by an upper level of government on the incentives of lower levels of governments. To understand this, (3.14) shows that taxation by the provincial government has a disincentive effect on labor effort of household. Increasing the provincial tax rate may result in a decline in output, thereby reducing the county government revenues. To protect its own interests, the county government has to lower its tax rate to partly counterbalance the negative effect on the tax base caused by provincial taxation.[49] At the same time, since the marginal returns of public input decline with provincial taxation, the county government in response cuts down its input of public services.

The Problem of the Provincial Government

Finally, we look into the policy choice of the provincial government. It collects taxes by choosing its tax rate t_p and incurs the administrative cost V_p as specified in Eq. (3.21). The cost is related to the distance between a superior and a subordinate government. In view of the layout of the counties in Figure 3-2, it is not difficult to see that the distance from the provincial government to county j is $|(n+1)/2 - j|D$. The total administrative cost of the provincial government is assumed to be the sum of the distance-related costs in administering the n counties:

$$V_p = \sum_{j=1}^{n}\sigma\left|\frac{n + 1}{2} - j\right|D = \begin{cases} \dfrac{\sigma n^2 D}{4}, & \text{if } n \text{ is even,} \\[2ex] \dfrac{\sigma\left(n^2 - 1\right)D}{4}, & \text{if } n \text{ is odd.} \end{cases} \tag{3.22}$$

In view of (3.19) and (3.20), we economize on notation by expressing local output as a function of the provincial tax rate, i.e., $y_j^*(t_p)$. Given the responses of the

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[49] The parameter α, the elasticity of output to labor input, determines the sensitivity of the county tax rate to the prefecture tax rate. It can be shown that the elasticity of the county tax rate to the prefecture tax rate increases with the prefecture tax rate. The elasticity of t_c with respect to t_d is $\eta = t_d / (1 - t_d)$ and is increasing in t_d.

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residents and the county governments, the provincial government chooses t_p to maximize its fiscal rent:

$$\max_{t_p} R_p = t_p \sum_{i=1}^{n} y_i^* (t_p) - V_p. \tag{3.23}$$

It is to be noted that, at this point, V_p is a constant. The first order condition with respect to t_p gives the optimal provincial tax rate:

$$t_p^* = 1 - \alpha - \beta. \tag{3.24}$$

Before we proceed, it may be helpful to examine why the choice of the tax rate by the provincial governments depends on α and β, which are the elasticity of output with respect to labor input and public input respectively. We have:

$$\frac{\partial t_p^*}{\partial \alpha} < 0; \quad \frac{\partial t_p^*}{\partial \beta} < 0. \tag{3.25}$$

Specifically, the provincial government chooses to lower its tax rate t_p if the output is more elastic with respect to labor input or public input (a large value of α and β). A high provincial tax rate exerts disincentive effects on both labor effort e and the supply of public goods g, resulting in a decrease in output y. The extent of the decline in output depends on both the elasticity of local output to private or public input, i.e., α and β as reflected in (3.24). The provincial government takes the disincentive effect into account and it has to self-restrain its predatory hand whenever output is highly elastic with respect to private or public input. Eq. (3.24) is reminiscent of the Ramsey optimal tax rule.

Next, substituting (3.24) into (3.19), the optimal county tax rate becomes:

$$t_d^* = (1 - \alpha)(\alpha + \beta). \tag{3.26}$$

The aggregate tax rate imposed on the local economy is thus:

$$T^* = t_p^* + t_d^* = 1 - \alpha(\alpha + \beta). \tag{3.27}$$

Using (3.20) and (3.24), the optimal supply of public goods chosen by the county government is:

$$g_i^* = (\alpha + \beta)^{\frac{1}{1-\alpha}} [A + (n-1)\gamma A]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{1-\alpha}{1-\alpha}}. \tag{3.28}$$

The optimal choice of the public good supply by the county governments is also contingent on a set of parameters:

$$\frac{\partial g_j^*}{\partial \alpha} > 0; \quad \frac{\partial g_j^*}{\partial \beta} > 0; \quad \frac{\partial g_j^*}{\partial \gamma} > 0; \quad \frac{\partial g_j^*}{\partial c} < 0. \tag{3.29}$$

The expression (3.29) is not hard to interpret. A high elasticity of output with respect to both labor input and public goods (a large value of α and β) increases the marginal returns of public input and thus induces the government to supply more goods. So is a high degree of market integration (a large value of γ) which promotes productivity. In contrast, the government would reduce the supply of public goods if they are more costly (a large value of c).

Equilibrium Configuration

The equilibrium of the model is defined as the configuration with all the agents maximizing their respective objective functions. In equilibrium, household utility in county j is obtained by using the optimal solutions derived above:

$$u_j^* = \left[A + (n-1)\gamma A \right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{1+\alpha-\beta}{1-\alpha-\beta}} (1-\alpha)(\alpha+\beta)^{\frac{1}{1-\alpha-\beta}} \left(\frac{\beta}{c} \right)^{\frac{\beta}{1-\alpha-\beta}}, \tag{3.30}$$

which is positively related to the degree of market integration γ. Any increase in market integration promotes productivity of the counties involved, thereby inducing both the household and government to provide more g to increase production. As a result, utility (and thus social welfare) increases. This finding clarifies the logic that market integration enhances productivity insofar as a prefecture level facilitates horizontal coordination thereby fostering market integration.

The county government receives an equilibrium fiscal rent equal to:

$$R_{cj}^* = \left[A + (n-1)\gamma A \right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{2\alpha}{1-\alpha-\beta}} (1-\alpha-\beta)(\alpha+\beta)^{\frac{1}{1-\alpha-\beta}} \left(\frac{\beta}{c} \right)^{\frac{\beta}{1-\alpha-\beta}} - F. \tag{3.31}$$

Fiscal rent also depends on how integrated the markets are because tax revenues depend on productivity which in turn hinges on market integration. The expression also makes clear that fiscal rent depends on F. Each county government has to separately produce the public good and pay the total amount of the fixed cost F. Thus without effective cooperation making possible cost sharing, the county governments

fail to exploit the economies of scale in public good production.

Finally, the provincial fiscal rent is:

$$R_p^* = n\left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{2\alpha}{1-\alpha-\beta}} (1-\alpha-\beta)(\alpha+\beta)^{\frac{\alpha+\beta}{1-\alpha-\beta}} \left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha-\beta}} \quad (3.32)$$

$$-\begin{cases} \dfrac{\sigma n^2 D}{4}, & \text{if } n \text{ is even,} \\[2ex] \dfrac{\sigma(n^2-1)D}{4}, & \text{if } n \text{ is odd.} \end{cases}$$

The provincial government also receives a higher level of fiscal rent when county economies are more integrated. In the present context without an intermediate level of prefecture governments, the provincial government directly governs all of the counties so that it has to bear the full administrative costs.

The equilibrium conditions suggest that all the stakeholders benefit from a higher degree of market integration. They also suggest that horizontal coordination may reduce the cost of producing the public input. But, as discussed before, adding a prefecture level, while facilitating market integration and horizontal coordination, may increase the overall tax burden and cause the accessibility problem, a tradeoff to be examined in the following subsection.

3.3.2 The Model of the Province-Prefecture-County Setup

This subsection looks into the consequences of introducing a prefecture level. For simplicity, we assume m identical prefectures and each of them contains n/m counties (we assume that n/m is an integer). Evidently, a small value of m pertains to a large size of a prefecture-level jurisdiction. The county under prefecture i, $i \in \{1, 2, ..., m\}$, is labeled as ij, $j \in \{1, 2, ..., n/m\}$, as shown in Figure 3-3. Before we proceed, an explanation of our notation is in order. Since prefectures are assumed to be identical, we focus on the leftmost prefecture and omit the subscript i for the counties for precise expression.

Figure 3-3 The Province-Prefecture-County System

Provincial govt.

Prefecture 1

County 1   County 2   County n/m -1 County n/m County n-1   County n

0 D $2D$ $(n/m-2)D$ $(n/m-1)D$ n/mD $(n-2)D$ $(n-1)D$ nD
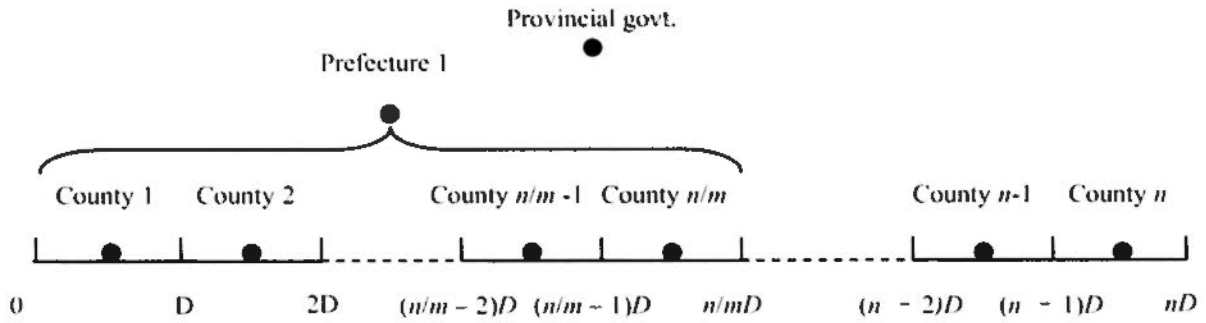
For simplicity, we assume that horizontal coordination by the prefecture government brings about full market integration within a prefecture, i.e., $\gamma = 1$, whereas local protectionism persists between prefectures. A county thus receives full knowledge spillovers from other counties within the same prefecture but only partial spillovers from those under different prefectures. Productivity in county j is:

$$A_j = \frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A. \tag{3.33}$$

The term $(n/m)A$ is the spillover effect with full market integration with a prefecture and the second term $(n-n/m)A$ is partial spillover from other prefectures. Obviously, A_j increases if m decreases for any $\gamma < 1$. A prefecture larger in size with more counties generate a larger productivity-enhancing effect for each county when markets are fully integrated,.

Horizontal coordination by the prefecture also makes possible the joint supply of public goods among counties. We assume that the pooled public good G is located by the prefecture government at a place x within the interval $[0, nD/m]$. The distance from this good to county j is $|j - {}^1/_2 - x|D$. According to the function specified in (3.10), the effective amount of public goods used by the resident in county j is $G\Phi_j(\sigma; x)$, where $\Phi_j(\sigma; x) = \Phi(\sigma; |j - {}^1/_2 - x|D)$. The local production function of county j is thus:

$$y_j \left(e_j, G, x \right) = \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right] e_j^a \left[G\Phi_j (\sigma; x) \right]^t. \tag{3.34}$$

Including the prefecture level as an additional tier, we model the strategic interactions between the different agents as a four-stage Stackelberg game, as

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summarized in Table 3-4 which lists the variables controlled by the different agents. Again, the provincial government as the first mover determines its tax rate t_p. In the second stage, the prefecture government chooses its tax rate t_d and the location x of pooled public good. Then, the county governments under prefecture coordination choose their tax rates t_{ij}, the amount of public good G and the shares s_i of the production cost as the outcome of inter-jurisdictional bargaining, a mechanism often used by Chinese jurisdictions to resolve their differences.[50] Finally, the residents choose labor input, given public decisions of the different levels of governments made in the previous stages. This game may again be solved by backward deduction.

Table 3-4 The Stackelberg Game and Choice Variables of Different Agents

Game Stage	Agent	Choice Variables
1	The provincial government	t_p
2	The prefecture government	t_d and x
3	The county governments	t_c, G, and s
4	The producer-household	c

The Problem of the Producer-Household

As before, the household chooses an optimal input of labor to maximize utility:

$$\max_{c_i} \ u_i = (1 - t_p - t_d - t_{ij})y_i(c_i, G, x) - c_i, \tag{3.35}$$

The first order condition gives its reaction function to the policies set by the governments:

$$c_i^*(t_p, t_d, t_{ij}, G, x) = (1 - t_p - t_d - t_{ij})^{\sigma} \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\sigma} \tag{3.36}$$

$$\alpha^{\sigma} \left[G \Phi_i(\sigma; x) \right]^{\sigma}.$$

Unlike (3.13) under the PGC system, the household has to pay taxes to three levels of

[50] For instance, Foshan City in Guangdong Province decided to construct a circling road in 2005. Under the coordination of the city government, its five districts negotiated out the detailed construction plan and shared the costs according to the length of the road in their jurisdictions.

governments. The right hand side of (3.36) is made up of three terms capturing the different tradeoffs. The term involving the tax rates capture as before the disincentive effects of taxation; the household would reduce labor supply e if any of the three levels of governments in question increases its tax rate. In the present context, an additional tier of governments aggravates the problem of overtaxation which is one of the reasons behind those advocating the removal of the prefecture level. The expression involving A singles out the knowledge spillover effect given the degree of market integration. Finally, the term involving $G\Phi$ depends negatively on the distance from the location of the pooled public goods, capturing the negative effect induced by the accessibility problem. Farther away from the pooled public good, the household may use fewer effective public goods so that the marginal returns of labor input decrease.

The Problem of the County Governments

The county governments choose their tax-expenditure programs to maximize fiscal rents. Recalling Table 3-4 and the discussion above, the decision-making process is as follows:

- The prefecture-level government decides the location x of the public good;

- The prefecture-level government then uses its administrative power to bring the county governments to the bargaining table. The negotiation hammers out the amount of public good G to be produced and a cost-sharing formula s_j for the jth county;

- Given G and s_j set by the bargaining, each county then separately chooses a tax rate t_{cj} to collect revenues financing the expenditure.

We derive the equilibrium values of the different decision variables by first finding the equilibrium county tax rate. Then, going backward, equilibrium G and s_j are derived based on a Nash bargaining setup below.

First, given G and s_j set by the bargaining, each county separately chooses a tax rate t_{cj} to maximize:

$$\max_{t_{cj}} R_{cj} = t_{cj} \cdot y_j^{**}\left(t_p, t_d, t_{cj}, G, x\right) - s_j C(G). \tag{3.37}$$

The optimal county tax rate is a function of the tax rates of superior governments:

$$t_c^* \left(t_p, t_d \right) = (1 - \alpha)\left(1 - t_p - t_d \right). \tag{3.38}$$

The county governments adjust their tax rate in response to variations in either the provincial or the prefecture tax rate, because the taxation by an upper-level government changes the incentives of household labor supply, thereby impinging on fiscal revenues of lower levels of governments.

With the tax rate chosen, the county governments jointly set G and s_j through a bargaining process as alluded to above. We model the negotiation as a Nash bargaining process.[51] The bargaining problem is to maximize the product of R_{cj}, $j = 1, \ldots, n/m$, assuming that the county governments have equal bargaining power:[52]

$$\max_{G, s_i} \prod_{i=1}^{n/m} R_i \left(G, s_i, t_p, t_d, x \right),$$
$$\text{s.t. } \sum_{i=1}^{n/m} s_i = 1. \tag{3.39}$$

Solving this problem gives the optimal supply of public good G as a reaction function of t_p, t_d and x:

$$G^{**}(t_p, t_d, x) = \left(1 - t_p - t_d \right)^{\frac{1}{\eta}} \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\frac{1}{\eta-1}} \tag{3.40}$$
$$\alpha^{\frac{\eta}{\eta-1}} \left(\frac{\beta}{c} \right)^{\frac{1}{\eta-1}} \left[\sum_{i=1}^{n/m} \Phi_i (\sigma; x)^{\frac{1}{\eta}} \right]^{\frac{1-\eta}{\eta}}.$$

This expression summarizes the different tradeoffs impinging on the supply of public good. Clearly, the supply of public good jointly chosen by the counties responds negatively to the provincial and prefecture tax rate, capturing the disincentive effect of taxation by upper levels of governments on the supply of public goods. The underlying logic is similar to that in (3.20). In addition, the number of counties in a prefecture also affects the supply of public goods as captured by the term n/m in the expression. With more counties under a prefecture (i.e., larger n/m), the technological

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[51] For a full discussion on the solutions of a Nash bargaining, see the axioms presented in Nash (1953) and following works (e.g., Binmore, Rubinstein and Wolinsky, 1986).

[52] Equal bargaining power is a simplification. Assuming different bargaining power complicates the analysis without adding more insight. One may also interpret the Nash product as representing the preference of the superior government who serves as the arbiter choosing G and x on behalf of the county governments.

spillover effects due to a bigger and more integrated market are more prominent. The above two effects induce counties to supply more public goods. But the accessibility problem caused by the centralized provision of the public good produces a disincentive effect on the county governments, as captured by the term involving $\Phi(\sigma; x)$.

The expression for optimal cost-sharing ratio s_j is:

$$s_j^{**}(t_p, t_d, x) = \frac{m}{n} + \Lambda \left[G^* \Phi_j(\sigma; x)^{\frac{t}{1-\sigma}} - \frac{m}{n} \sum_{k=1}^{n/m} G^* \Phi_k(\sigma; x)^{\frac{t}{1-\sigma}} \right]. \tag{3.41}$$

where $\Lambda = (1 - \alpha)/C(G^*)$. The share s_j^{**} is related to the distance between the county in question and the location of the public good because the effectiveness of the public good decreases with distance. To see this, the second term on the right hand side of (3.41) captures the difference between the *effective* amount of public good used by the *j*th county and the *average effective* amount of public good used by all the counties. If the *j*th county just uses an average effective amount of public good, this term reduces to zero and the county pays an average cost ($s_j^{**} = m/n$). Otherwise, it must pay a larger (smaller) share of the cost if it uses an effective amount of public goods above (below) the average level. It follows that the counties closer to the public good should pick up larger shares of the production cost.

The Problem of the Prefecture Government

Given the responses of the residents and county governments, the prefecture government in question chooses its tax rate and the location of the public good to maximize its fiscal rent. Note that it incurs a cost for administering n/m counties. We assume that the prefecture government is located at the midpoint of its jurisdiction, so its distance from county j is $|j - \frac{1}{2} - \frac{n}{2m}|D$. The total administrative cost assumed by the prefecture government is thus:

$$V_d = \sum_{j=1}^{n/m} \sigma \left| j - \frac{1}{2} - \frac{n}{2m} \right| D = \begin{cases} \dfrac{\sigma n^2 D}{4m^2}, & \text{if } \dfrac{n}{m} \text{ is even,} \\[2mm] \dfrac{\sigma(n^2 - m^2) D}{4m^2}, & \text{if } \dfrac{n}{m} \text{ is odd.} \end{cases} \tag{3.42}$$

The maximization problem for the prefecture government is thus:

$$\max_{t_d, x} R_d = t_d \sum_{j=1}^{n/m} y_j^{**}\left(t_p, t_d, x\right) - V_d. \tag{3.43}$$

The first order condition with respect to t_d yields the optimal prefecture tax rate given the provincial tax rate:

$$t_d^{**}\left(t_p\right) = (1 - \alpha - \beta)\left(1 - t_p\right). \tag{3.44}$$

Similar to the county tax rate, the prefecture tax rate also responds negatively to the provincial tax rate, $\partial t_d^{**}(t_p) / \partial t_p < 0$. In the Stackelberg game, whenever the superior increases the tax rate, the prefecture government has to lower its tax rate to protect its revenue intake by partly offsetting the negative effects on labor supply and output induced by taxation of the provincial government.

The first order conditions also imply that the pooled public goods will be located at the midpoint of the leftmost prefecture:

$$x^{**} = \frac{n}{2m} D. \tag{3.45}$$

To see why this is in the best interest of the prefecture government, one has to keep in mind that each of the counties would reduce labor input if the public good is located farther away from them and they would prefer smaller amounts of the public good when bargaining with other counties. The prefecture government thus has to weigh the benefit of gains from locating the public good closer to one county and the losses due to reductions in both private and public input of other counties. By locating the public good at the midpoint, the prefecture government may induce the amount of labor effort and public input to maximize its fiscal rent.

The Problem of the Provincial Government

In the province-prefecture-county setup, the provincial government no longer directly governs n counties. Instead it delegates the management of the counties to the m prefectures. We assume that the provincial government is located at the midpoint of the province $n/2$ and each prefecture government is located at the midpoint of its jurisdiction, so the distance between them is $|n/2 + n/2m - ni/m|D$, where $i \in \{1, 2, \ldots, m\}$. The total cost of administering prefectures is thus

$$V_p = \sum_{i=1}^{m} \sigma \left| j + \frac{n}{2m} - \frac{ni}{m} \right| D = \begin{cases} \dfrac{\sigma m n D}{4}, & \text{if } m \text{ is even,} \\ \dfrac{\sigma n (m^2 - 1) D}{4m}, & \text{if } m \text{ is odd.} \end{cases} \tag{3.46}$$

Taking into account the responses of the residents and subordinate levels of governments, the provincial government chooses its tax rate to maximize its fiscal rent:

$$\max_{t_p} R_p = t_p \cdot m \sum_{j=1}^{m/n} y_j^* (t_p) - V_p. \tag{3.47}$$

The first order condition corresponding to (3.47) gives the optimal provincial tax rate:

$$t_p^{**} = 1 - \alpha - \beta. \tag{3.48}$$

The comparative static analyses are similar to those regarding (3.24).

It follows that the tax rates of other two levels of governments are respectively:

$$t_d^{**} = (1 - \alpha - \beta)(\alpha + \beta). \tag{3.49}$$

$$t_{cj}^{**} = (1 - \alpha)(\alpha + \beta)^2. \tag{3.50}$$

The aggregate tax rate levied on the economy is thus:

$$T^{**} = t_{cj}^{**} + t_d^{**} + t_p^{**} = 1 - \alpha(\alpha + \beta)^2. \tag{3.51}$$

Comparing (3.27) and (3.51), it is not difficult to see that the economy is more heavily taxed when an additional level of prefecture governments is introduced:

$$T^{**} > T^*. \tag{3.52}$$

This result, often referred to as overtaxation in the literature of fiscal federalism (e.g., Cassing and Hillman, 1982; Dahlby, 1994; Boadway and Keen, 1996; Wrede, 1999, 2000), is induced by vertical externalities whereby one level of government may ignore the impact of its taxation on the fiscal revenues of other levels. Similar to the issue of overgrazing the common, overlapping levels of governments exploiting a common tax base result in overtaxation: the aggregate tax rate is higher than the optimal tax rate that maximizes the total fiscal revenues (see Flowers, 1988).

In the Chinese context, this result is reminiscent of the frequent complaints about

heavy tax burdens and arbitrary charges imposed by local governments on the population and in particular the peasants. It is a common perception that fiscal decentralization since the late 1970s in China has created a system of overlapping Leviathans which competitively exploit the economy in pursuit of their own fiscal interests. Our model offers an explanation why fiscal burdens imposed on the economy may increase with the number of government layers. In the context of jurisdictional reforms, our finding provides a theoretical underpinning for the concern that the prefecture level adds one more layer of predatory governments to the system of jurisdictions.[53]

Interests of Stakeholders in Equilibrium

Using the results above, we derive the equilibrium household utility for county j:

$$u_j^{**} = \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{1+\alpha-\beta}{1-\alpha-\beta}} (1-\alpha)(\alpha+\beta)^{\frac{\beta}{1-\alpha-\beta}}$$

$$\Phi\left(\sigma; \left| j - \frac{1}{2} - \frac{n}{2m} \right| D \right)^{\frac{\alpha}{1-\alpha}} \left[\frac{\beta}{c} \sum_{k=1}^{n/m} \Phi\left(\sigma; \left| k - \frac{1}{2} - \frac{n}{2m} \right| D \right)^{\frac{\alpha}{1-\alpha}} \right]^{\frac{\beta}{1-\alpha-\beta}}. \tag{3.53}$$

By (3.45), the prefecture government locates the pooled public good at the midpoint of its jurisdiction. Since the public good becomes less effective with distance, counties closer to the location of centralized public goods (also the prefecture centre) can make more effective use of them. As a result, household welfare decreases the farther a county is from to prefecture center:

$$u_1^{**} < u_2^{**} < \cdots < u_{n/2m}^{**} > \cdots > u_{n/m-1}^{**} > u_{n/m}^{**}. \tag{3.54}$$

Within the prefecture, the level of welfare is highest at the centre and then gradually decline towards the periphery; we refer to this as the "central peak" phenomenon. Even though counties are originally identical and they receive identical welfare under the PGC system, their different distances to the public facility under prefecture coordination generate inter-jurisdictional disparities in welfare. As mentioned in our discussion about tradeoffs, horizontal coordination may help exploit the economies

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[53] Interestingly, although the aggregate tax rate is higher, the individual tax rates of the prefecture and county levels are lower under the PPC regime than under the PGC system. In other words, when there are more tiers of overlapping Leviathans, the lower levels of governments have to be less predatory to protect the tax base from too shape a decline.

of scale and reduce the cost of producing the public good. But such benefits are offset by the costs induced by heterogeneity in preferences caused by distance from the location of the public facility.

As an example of the central peak phenomenon, we again resort to the Yancheng case discussed in Chapter 1. As shown in Table 3-5 that lists GDP per capita and growth rates of Yancheng's subordinate counties, economic performance seems to be tapering off from the prefecture center and is consistent with such the central peak phenomenon. Yancheng is not alone in exhibiting such a pattern. Indeed, Shu (1995) has noted that such a configuration is quite common throughout the administrative hierarchy. Within a province, the capital city may be the most developed, and the same is true for the central city within a prefecture and the central town within a county. However, those regions on the periphery are usually underdeveloped and public goods such as infrastructural facilities are poorly supplied.[54]

Table 3-5 Economic Performance of Counties with Different Distances to the City, Yancheng

County	GDP per capita 1983 (yuan, 1978 price)	GDP per capita 2002 (yuan, 1978 price)	Annual growth rate (%)	Distance to the city (km)
Xiangshui	325.76	1390.49	7.84	100
Binhai	250.66	1288.76	9.00	80
Funing	275.11	1734.01	10.17	60
Sheyang	348.47	2374.06	10.63	45
Jianhu	406.99	2583.00	10.21	40
Dafeng	468.12	3717.58	11.52	35
Dongtai	424.45	2909.22	10.66	60

Source: Data of GDP per capita are from *Yancheng Statistical Yearbook, 2003*, adjusted by the retail price index from *P.R.C Yearbook 2006*. Data of city-county distance are collected from the web.

[54] Shu (1995) attributes such a central peak in economic distribution to the fact that each level of government holds the dominant power of allocating economic resources within its own jurisdiction. This idea is captured by our model that the government decides the location of public services.

We next present below the equilibrium fiscal rents of the different levels of governments. As output decreases with distance, a county government farther away from the prefecture center collects less tax revenues. But at the same time, it bears a lesser share of the cost in the joint production of the public good (see (3.41)) as an outcome of the bargaining process. The Nash bargaining is such that all the county governments involved would receive the same revenue in equilibrium, *viz.*:

$$R_{cj}^{**} = \frac{m}{n}\left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{\alpha}{1-\alpha-\beta}}(1-\alpha-\beta)(\alpha+\beta)^{\frac{\alpha+\beta}{1-\alpha-\beta}} \tag{3.55}$$

$$\left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha-\beta}}\left[\sum_{k=1}^{n/m}\Phi\left(\sigma;\left|k - \frac{1}{2} - \frac{n}{2m}\right|D\right)^{\frac{\beta}{1-\alpha}}\right]^{\frac{1-\alpha}{1-\alpha-\beta}} - \frac{mF}{n}.$$

As before, the terms on the right hand side are generated by the different costs and benefits. In particular, the expression captures the benefit due to cost sharing and exploitation of the economies of scale as a result of prefecture coordination. Cost sharing provides the incentive for the county governments to jointly supply the public input, which may not otherwise be produced if the fixed cost F is inordinately high. Each county pays mF/n instead of the full fixed cost F. This cost-saving effect is likely to be prominent for such infrastructural facilities such as highways, airports and power supply, etc., often with a large fixed cost.

As an additional level in the present context, the equilibrium fiscal rent of the prefecture government is:

$$R_d^{**} = \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha-\beta}}(1-\alpha-\beta)(\alpha+\beta)^{\frac{\alpha+\beta}{1-\alpha-\beta}}\alpha^{\frac{\alpha}{1-\alpha-\beta}}\left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha-\beta}} \tag{3.56}$$

$$\left[\sum_{k=1}^{n/m}\Phi\left(\sigma;\left|j - \frac{1}{2} - \frac{n}{2m}\right|D\right)^{\frac{\beta}{1-\alpha}}\right]^{\frac{1-\alpha}{1-\alpha-\beta}} - \begin{cases} \dfrac{\sigma n^2 D}{4m^2}, & \text{if } \dfrac{n}{m} \text{ is even,} \\[2ex] \dfrac{\sigma\left(n^2 - m^2\right)D}{4m^2}, & \text{if } \dfrac{n}{m} \text{ is odd.} \end{cases}$$

Obviously, a prefecture larger in size collects taxes from more counties and benefits from larger spillover effects induced by market integration as well as horizontal cooperation on a larger scale. But its administrative cost is higher with counties spreading over a larger jurisdiction.

Finally, the equilibrium fiscal rent of the provincial government is:

$$R_p^{**} = m \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\frac{1}{1-\alpha-\beta}} (1-\alpha-\beta)(\alpha+\beta)^{\frac{\alpha+\beta}{1-\alpha-\beta}} \alpha^{\frac{\alpha}{1-\alpha-\beta}} \left(\frac{\beta}{c} \right)^{\frac{\beta}{1-\alpha-\beta}} \quad (3.57)$$

$$\left[\sum_{k=1}^{n/m} \Phi \left(\sigma; \left| j - \frac{1}{2} - \frac{n}{2m} \right| D \right)^{\frac{1}{1-\alpha}} \right]^{\frac{1-\alpha}{1-\alpha-\beta}} - \begin{cases} \dfrac{\sigma m n D}{4}, & \text{if } m \text{ is even,} \\ \dfrac{\sigma n \left(m^2 - 1 \right)}{4m}, & \text{if } m \text{ is odd.} \end{cases}$$

Part of its administrative cost is saved as the provincial government directly governs fewer subordinates (note that $\sigma m n D/4 < \sigma n^2 D/4$ and $\sigma n(m^2 - 1)D/4m < \sigma(n^2 - 1)D/4$).

3.4 Distributional Effects of the Two Regimes

Equipped with the results above, this section explores the distributional effects in the context of the choice between the province-prefecture-county setup and its PGC counterpart. In what follows, we first identify the gainers and losers under the two regimes by comparing the welfare of the different stakeholders with and without the prefecture level. Next, our analysis focuses on the conditions under which the interests of the different stakeholders may diverge.

3.4.1 Gainers and Losers under the Two Regimes

As explained above, the two systems of jurisdictions induce different tradeoffs which exert differential impact on the stakeholders. Who then are the gainers and losers? We try to answer this question next by comparing the equilibrium configurations of the two systems. The answer sheds light on the political economy of jurisdictional changes.

Household and Social Welfare

In the final analysis, jurisdictional changes should benefit the people. In what follows, we first explore how individual welfare changes with and without the prefecture level. With distance-induced heterogeneity in preferences under the province-prefecture-county setup, some households may gain while others may lose. An increase or decreases in *individual welfare* does not thus imply a corresponding

change in *social welfare*. We thus invoke two criteria to assess whether society as a whole gains or loses.

To clarify how the different tradeoffs affect household utility, it is illuminating to take the log of equilibrium utility and then derive the expression of $\ln u_j^{**} - \ln u_j^{*}$, which can then be neatly decomposed into the different effects attributable to the different tradeoffs:

$$\ln u_j^{**} - \ln u_j^{*} = \underbrace{\frac{1}{1-\alpha-\beta}\ln\frac{n+n(m-1)\gamma}{m+m(n-1)\gamma}}_{\text{(1) market integration}} + \underbrace{\frac{1}{1-\alpha-\beta}\ln(\alpha+\beta)}_{\text{(2) overtaxation}} \quad (3.58)$$

$$+ \underbrace{\frac{\beta}{1-\alpha-\beta}\ln\sum_{k=1}^{n\,m}\Phi\left(\sigma;\left|k-\frac{1}{2}-\frac{n}{2m}\right|D\right)^{\frac{1}{1-\gamma}}}_{\text{(3) service pooling and the accessibility problem}}$$

$$+ \underbrace{\frac{\beta}{1-\alpha}\ln\Phi\left(\sigma;\left|j-\frac{1}{2}-\frac{n}{2m}\right|D\right)}_{\text{(4) the accessibility problem}}.$$

For ease of reference, we number each term in (3.58) and link it to one of the tradeoffs. The term (1) in Eq. (3.58) records the gain from market integration. The increase in utility is large if the initial degree of integration γ is low because market integration greatly increases γ to 1. In the Chinese context when market segmentation was very serious in the 1980s and 1990s as suggested by Dai (2000) and Wang (2000), our result suggests that the coordinating role of the prefecture might have brought about significant benefits.

Second, the term (2) is negative since $\alpha + \beta < 1$, capturing the effect of overtaxation on welfare as predicted by some scholars arguing that an additional tier of governments may impose a heavier fiscal burden upon residents (see e.g., Liu, 1996; Dai, 2000). To understand the expression of this term, recall that the aggregate tax rate increases from $1 - \alpha(\alpha + \beta)$ to $1 - \alpha(\alpha + \beta)^2$ with the introduction of a prefecture level. Accordingly, the share of output retained by the household decreases from $\alpha(\alpha + \beta)$ to $\alpha(\alpha + \beta)^2$. Taking the log of these terms, the difference is $\ln(\alpha + \beta)$, which corresponds to the reduction in the share of output kept by the household caused by overtaxation.

The term (3) pertains to the benefit induced by the economies of scale in the

provision of public goods. With horizontal cooperation, a county may use a joint public good. As (3) suggests, this benefit is more prominent if more counties are included (a large value of n/m). Of course, the presence of Φ in this term pertains to the disincentive effect on the supply of public good caused by the accessibility problem as explained before.

Fourth, the term (4) captures the cost associated with the accessibility problem for the jth county in question. If the county is located farther away from the center, the pooled public good is less accessible, producing negative effects on private output and public provision of public inputs, ultimately resulting welfare losses. The problem is aggravated by long distance and poor transport conditions, i.e., a large value of D and σ.

Physical distance and the attendant accessibility problem effectively result in preference heterogeneity so that the change in the welfare of a household depends very much on where it resides. In the case of the province-prefecture-county setup with a centralized public input, household utility declines from the center towards the periphery and counties on the periphery lose out (see Eq.(3.54)). To get a clearer and visual picture of how the various tradeoffs involving distance and market integration work, we resort to a simple case in which the province has four counties and two prefectures ($n = 4$ and $m = 2$). The condition for province-prefecture-county regime to be better than the PGC regime is $u_j^{**} > u_j^{*}$, which reduces to:

$$\frac{1+3\gamma}{2+2\gamma} < (\alpha + \beta)\left[2\Phi\left(\sigma;\frac{D}{2}\right)\right]^{j}. \tag{3.59}$$

We depict condition (3.59) in Figure 3-4. Keeping σ constant, we obtain the locus AB in the γ-D space such that $u_j^{**} = u_j^{*}$.[55] The downward sloping locus captures the tradeoff between market integration and distance-induced preference heterogeneity. If the index for market integration increases from γ_1 to γ_2 given D_1, the productivity-enhancing effect of market integration is overwhelmed by the negative impact of distance so that $u_j^{**} < u_j^{*}$. But if D goes down to D_2, the equality $u_j^{**} = u_j^{*}$

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[55] The diagram is obtained by assuming that $\Phi(d) = 1 - \sigma d^2$, $\alpha = \beta = 0.3$ and $\sigma = 1$. All plots are generated by Scientific Workplace 4.0 throughout the thesis, except mentioned otherwise.

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is restored. Within the area AOB, the province-prefecture-county regime is more efficient. Outside AOB, PGC results in higher utility.

Figure 3-4 The Condition for the Province-Prefecture-County Regime to Be More Efficient
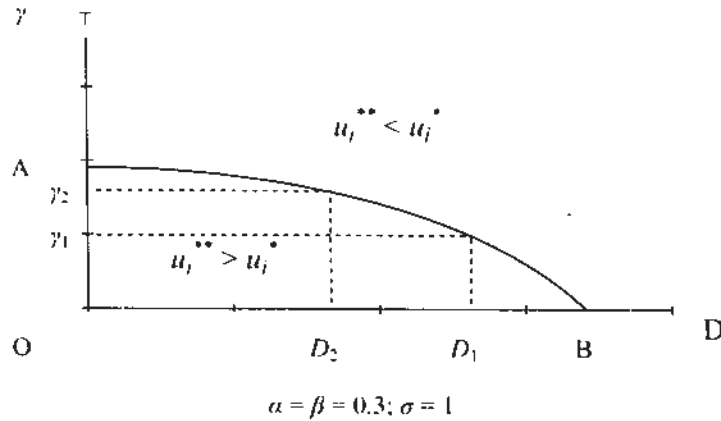
The result of comparing the two jurisdictions systems illustrated by Figure 3-4 may vary with different transport conditions. As poor transport networks aggravate the cost related to the accessibility problem, prefecture coordination plagued by vast distances is less likely to be welfare-enhancing. Figure 3-5 modifies Figure 3-4 by assuming different values of σ. For any given γ, $D_1 < D_2 < D_3$ when $\sigma_1 > \sigma_2 > \sigma_3$, suggesting that distances between counties should be shorter for prefecture coordination to be welfare-improving if transport conditions are worse.

Figure 3-5 Varying Transport Conditions for the Province-Prefecture-County Regime to Be More Efficient
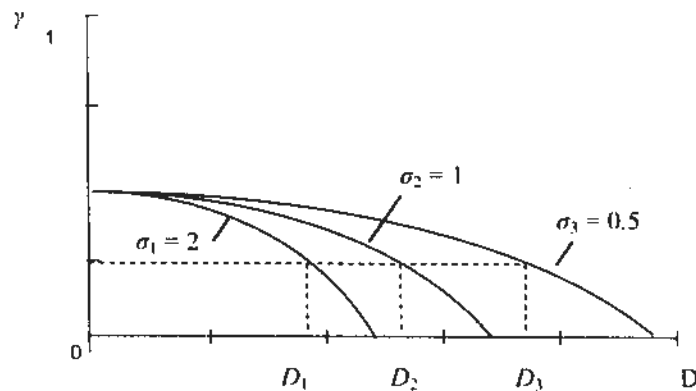
So far, our focus is on how the tradeoffs impinge on *individual* welfare. It is interesting to find out whether society as a whole gains or loses. Owing to distanced-induced preference heterogeneity, some criteria for measuring social welfare have to be used to explore such a question. We invoke two criteria as follows:

- Whether there is Pareto improvement, i.e., whether *all* households are better off, and

- Whether aggregate social welfare defined as the sum of all household utilities is higher.

When is a switch to the province-prefecture-county setup a Pareto improvement? Invoking the central peak phenomenon (see eq. (3.54)), all households are better off if the county at the border of a prefecture-level jurisdiction with the *lowest* utility $\underline{u}^{**}$ fares better, i.e., $u_j^{**} > \underline{u}^{**} > u_j^{*}$. To find out when this scenario holds, we make use of (3.30) and (3.53) for u_j^{*} and u_j^{**}. The resulting inequality depends on a range of parameters. As an illustration, we choose to rearrange the terms involved to come up with the following expression which highlights the role of market integration:

$$\gamma < \frac{n/m \, \Theta - 1}{n - 1 - (n - n/m)\Theta} = \Delta_1, \qquad (3.60)$$

where $\Theta = (\alpha + \beta)\Phi\left(\sigma;(n/2m - 1/2)D\right)^{\frac{n-n-n}{1-n}}\left[\sum_{j-1}^{n/m}\Phi\left(\sigma;|j - 1/2 - n/2m|D\right)^{\frac{1}{1-n}}\right]^{j}$.

The initial degree of market integration γ should be smaller than the right-hand side expression of (3.60) for all households to be better off under the PPC system.

We also look at the other extreme case where all counties are worse off under the province-prefecture-county regime. This is true if household with the highest utility $\overline{u}^{**}$ at the center of the prefecture jurisdiction is worse off, i.e., $u_j^{**} < \overline{u}^{**} < u_j^{*}$. The condition for such a scenario to occur is:

$$\gamma > \frac{n/m \, \Theta' - 1}{n - 1 - (n - n/m)\Theta'} = \Delta_3, \qquad (3.61)$$

where $\Theta' = (\alpha + \beta)\left[\sum_{j=1}^{n/m} \Phi\left(\sigma: \left|j - \frac{1}{2} - \frac{n}{2m}\right| D\right)^{\frac{1}{1-\varepsilon}}\right]^{1-\varepsilon}$. It implies that all counties

may be worse off under the province-prefecture-county if their markets are already highly integrated.

It can be shown that Δ_1 in (3.60) is always smaller than Δ_3 in (3.61) because $\Theta' > \Theta$ holds for $\Phi(\cdot) < 1$. It follows that there is an interval $\Delta_1 < \gamma < \Delta_3$ in which some counties are better off whereas others are worse off under the PPC setup. This leads us to the second criterion using the utilitarian social welfare as the sum of all the household utilities to evaluate the welfare effects of the two systems. The social welfare functions under the PPC and PGC regime are $U' = \sum_{j=1}^{n} u'_j$ and $U'' = m\sum_{j=1}^{n/m} u''_j$ respectively. If $U'' > U'$, prefecture coordination improves social welfare. Again invoking (3.30) and (3.53) such a condition holds whenever:

$$\gamma < \frac{\frac{n}{m}\Theta'' - \left(\frac{n}{m}\right)^{1-\varepsilon}}{(n-1)\left(\frac{n}{m}\right)^{1-\varepsilon} - \left(n - \frac{n}{m}\right)\Theta''} = \Delta_2. \tag{3.62}$$

where $\Theta'' = (\alpha + \beta)\left[\sum_{j=1}^{n/m} \Phi\left(\sigma: \left|j - \frac{1}{2} - \frac{n}{2m}\right| D\right)^{\frac{1}{1-\varepsilon}}\right]^{1-\varepsilon}$. While there are many ways to present such an inequality, we again choose to present the inequality in such a way as to highlight the role of γ in affecting welfare.

It is interesting to put together (3.60), (3.61) and (3.62). it can be shown that $\Delta_1 < \Delta_2 < \Delta_3$. Keeping this in mind, one can explore how different degrees of market integration γ affect the welfare results of the two systems in question. Households in all counties are better off under prefecture coordination if market segmentation is so serious that $\gamma < \Delta_1$. For higher values of γ, some peripheral counties are worse off even though aggregate social welfare U'' is higher. For even higher γ, aggregate social welfare is lower under the PPC regime, although households in some counties close to the centre of the jurisdiction may still be better off. Finally, all counties are worse off under the PPC regime with γ above a large value. The above analyses are summarized in Table 3-6.

Table 3-6 Welfare Effects of Prefecture Coordination under Different Initial Degrees of Economic Integration

Intervals of initial degree of market integration	Welfare Effect
(1) $\gamma < \Delta_1$ (see Eq. (3.60))	All counties better off
(2) $\Delta_1 < \gamma < \Delta_2$ (see Eq. (3.60) and (3.62))	Some peripheral counties worse off but social welfare better off
(3) $\Delta_2 < \gamma < \Delta_3$ (see Eq. (3.62) and (3.61))	Social welfare worse off but some counties closer to the center better off
(4) $\gamma > \Delta_3$ (see Eq. (3.61))	All counties worse off

So far we have focused on how the degree of market integration affects the choice of a system of jurisdictions from the perspective of welfare. No matter which of the welfare criteria we use, the PPC system does not always dominates the PGC system or *vise versa*. Though we have highlighted the role of γ, the expressions (3.60), (3.61) and (3.62) also depend on other parameters capturing, *inter alia*, the size of counties D, transport conditions, etc. As the physical, social and economic conditions captured by these parameters actually vary widely across the vast expanse of China, one interesting implication of the above findings is that there does not seem to exist an optimal system of jurisdictions for China from the perspective of the people and one size does not fit all. If Chinese households have a say in the choice of the system of jurisdictions, the outcome is likely to have different systems across the country.

County Government

Insofar as jurisdictional changes depends very much on the support of the local governments involved, it is interesting to find out whether the county government prefers the PPC to the PGC, i.e. whether $R_{ij}^{**} > R_{ij}^{*}$. To answer this question, we compare the equilibrium fiscal rent received by the county government under the two system of jurisdictions. Based on (3.31) and (3.55), we have:

$$R_{ij}^{**} - R_{ij}^{*} = \Lambda \left\{ \left[\frac{n + n(m-1)\gamma}{m + m(n-1)\gamma} \right]^{\frac{1}{1-\alpha-\beta}} \underbrace{(\alpha+\beta)^{\frac{1}{1-\alpha-\beta}}}_{\text{Overtaxation}} \right. \tag{3.63}$$

$$\left. \underbrace{\frac{m}{n} \left[\sum_{k=1}^{n/m} \Phi\left(\sigma; \left| k - \frac{1}{2} - \frac{n}{2m} \right| D \right) \right]^{\frac{1}{1-\alpha}} \Bigg]^{\frac{1}{1-\alpha-\beta}}}_{\substack{\text{Service pooling and} \\ \text{accessibility problem}}} - 1 \right\} + \underbrace{\frac{(n-m)F}{n}}_{\text{Cost sharing}}.$$

where $\Lambda = \left[A + (n-1)\gamma A \right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{2\alpha}{1-\alpha-\beta}} (1-\alpha-\beta)(\beta/c)^{\frac{\beta}{1-\alpha-\beta}}$. Under the PPC regime, the benefits and costs of county governments are similar to those of the residents. In addition, they gain from sharing the public production costs.

To better understand the expression and render its interpretation more transparent, we, as before, resort to a simple case with $n = 4$ and $m = 2$ again. The condition $R_{ij}^{**} > R_{ij}^{*}$ reduces to:

$$\frac{F}{2} > \Lambda \left\{ (1+3\gamma)^{\frac{1}{1-\alpha-\beta}} - [(2+2\gamma)(\alpha+\beta)]^{\frac{1}{1-\alpha-\beta}} \left[2\Phi\left(\sigma; \frac{D}{2} \right) \right]^{\frac{1}{1-\alpha-\beta}} \right\}. \tag{3.64}$$

where $\Lambda = \left[A(\alpha+\beta) \right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{2\alpha}{1-\alpha-\beta}} (\beta/c)^{\frac{\beta}{1-\alpha-\beta}} (1-\alpha-\beta)$. The left hand side of (3.64) obviously captures the benefit of cost saving while the right hand side combines all the other tradeoffs. Note that the right hand side is negative whenever Condition (3.59) holds, in which case, (3.64) always holds for any value of F. This implies that the county governments will always be better off if social welfare improves under the prefecture coordination, regardless of how large F is. However, if Condition (3.59) fails to hold, i.e., the right hand side of (3.64) assumes positive values, the fixed cost has to be sufficiently large for county governments to support another tier of governments above them.

Note that another condition must also hold if the county government is to receive a *non-negative* fiscal rent, i.e, $R_{ij}^{**} > 0$, under prefecture coordination:

$$\frac{F}{2} < \Lambda \left[(2+2\gamma)(\alpha+\beta) \right]^{\frac{1}{1-\alpha-\beta}} \left[2\Phi\left(\sigma; \frac{D}{2} \right) \right]^{\frac{1}{1-\alpha-\beta}}. \tag{3.65}$$

where Λ is as in (3.64). We depict conditions (3.64) and (3.65) in Figure 3-6 with γ

as the x-axis, D, the y-axis, and F, the z-axis.[56] (3.64) holds above the surface $ABCD$ while (3.65) is satisfied below $AEFG$. There is thus an enclosed space $AHCDOG$ inside which (3.64) and (3.65) hold simultaneously. For any combination of (γ, D, F) in $AHCDOG$, the county governments receive positive and higher fiscal rents under the PPC than the PGC regime. In general, counties across China vary widely in their geographical endowments and stages of socio-economic development, so there is no presumption that the county government always supports a PPC as opposed to a PGC system.

Figure 3-6 The Condition for the County Governments to Be Better Off under the

Province-Prefecture-County Regime
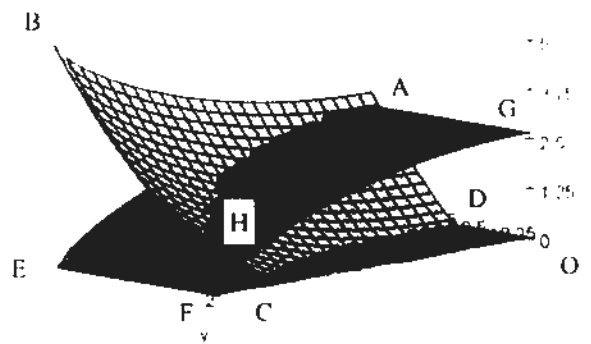
Provincial Government

We repeat the same exercise for the provincial government. The provincial government is also affected by the tradeoffs related to market integration, service pooling, overtaxation, and the accessibility problem. But unlike other stakeholders, it receives an additional gain in the form of reduction in administrative costs when it delegates the governance of the many counties to prefecture-level governments. The expression of $R_p^{**} - R_p^{*}$ is as follows:

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[56] We again assume that $\Phi(d) = 1 - \sigma d^2$, $\sigma = 1$, $\alpha = \beta = 0.3$. For simplicity the knowledge stock A is assumed to have a value such that A is normalized to one.

$$R_p^{**} - R_p^* = \Lambda \left\{ \underbrace{\left[\frac{n + n(m-1)\gamma}{m + m(n-1)\gamma} \right]^{\frac{1}{2}}}_{\text{Market integration}} \underbrace{(\alpha + \beta)^{\frac{1}{2}}}_{\text{Overtaxation}} \right. $$

$$\underbrace{\frac{m}{n} \left[\sum_{k=1}^{n} \Phi \left(\sigma : \left| k - \frac{1}{2} - \frac{n}{2m} \right| D \right)^{\frac{1}{2}} \right]^{\frac{1}{2}} - 1}_{\text{Service pooling and accessibility problem}} \left. \right\}$$

$$+ \underbrace{\begin{cases} \dfrac{\left(n^2 - mn \right) \sigma D}{4}, & \text{if } n \text{ and } m \text{ are even.} \\[2mm] \dfrac{(n+m)(mn-1)\sigma D}{4}, & \text{if } n \text{ and } m \text{ are odd.} \end{cases}}_{\text{Cost saving}}$$

(3.66)

where $\Lambda = n[A + (n-1)\gamma A]^{\frac{1}{2}} \alpha^{\frac{1}{2}} (1 - \alpha - \beta)(\beta/c)^{\frac{1}{2}}$.

The provincial government may choose the PPC setup as long as $R_p^{**} > R_p^*$. For the case $n = 4$ and $m = 2$, this conditions is:

$$3\sigma D > \frac{\Lambda}{\alpha + \beta} \left\{ (1 + 3\gamma)^{\frac{1}{2}} - (\alpha + \beta)^{\frac{1}{2}} (2 + 2\gamma)^{\frac{1}{2}} \left[2\Phi \left(\sigma : \frac{D}{2} \right) \right]^{\frac{1}{2}} \right\}. \quad (3.67)$$

where Λ is as defined in (3.64).

The left hand side of Condition (3.67) pertains to the saving of administrative cost, while the right hand side captures other tradeoffs. This additional benefit exclusively received by the provincial government may be more significant if the distance to counties is vast or transport conditions are bad (large values for D and σ).

3.4.2 The Political Economy of Jurisdictional Changes

The trajectory of jurisdictional changes is often shaped by stakeholders exerting their influence on the political decision process. To study the political economy of jurisdictional reforms, it is therefore a prerequisite to find out whether the interests of the stakeholders converge or diverge. The analyses in the last subsection furnish us with the means to do so. In the following analysis, we ask when the interests of the households and the different tiers of governments coincide, in which case

jurisdictional reforms may encounter less resistance. To simplify analysis, we abstract from the heterogeneity of household preferences by assuming that there are only two counties in each prefecture (i.e., $n/m = 2$). This is an expediency to render household utilities in the two counties the same under the CGC system because they are of equal distance from the center of the prefecture.

Let us first explore whether there is any divergence in interests between the provincial government and the producer-household. We superimpose on Figure 3-4 a locus CE on the γ-D space such that $R_p^{**} = R_p^*$ (i.e., the provincial government is indifferent between the two systems of jurisdictions) and then come up with Figure 3-7. Condition (3.67) holds in the area COE while condition (3.59) holds in AOB. In the shaded area between AB and CE, the provincial government is better off while households are worse off under the PPC system. For sufficiently high γ and holding all other parameters constant, the gain to the producer-household due to market integration is small and is overwhelmed by the higher cost in accessing the centralized public goods. On the other hand, the reduction in administrative costs is still attractive enough for the provincial government to favor the PPC system.

Figure 3-7 The Conflicts between the Provincial Government and Social Welfare
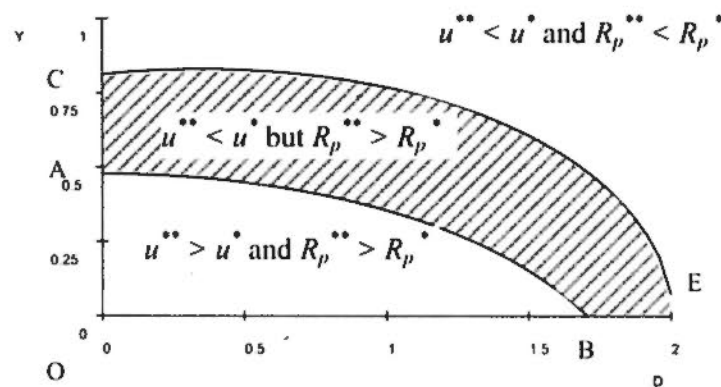
Next, we repeat the exercise for the county governments. The county governments are better off when conditions (3.64) and (3.65) hold simultaneously. Clearly, this is true as long as the right hand side of (3.65) is larger than that of (3.64)

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resulting in the following expression:

$$\frac{1+3\gamma}{2+2\gamma} < 2^{1-\alpha-\beta}(\alpha+\beta)\left[2\Phi\left(\sigma;\frac{D}{2}\right)\right]^{\prime}. \tag{3.68}$$

By adding condition (3.68) into Figure 3-4, we obtain Figure 3-8. In the shaded area *ABEC*, the households are worse off but the county governments may still be better off as long as the fixed cost is sufficiently large. Again, if γ is large, the gain from market integration for the household cannot offset the higher cost in accessing the public input. But if the fixed cost F incurred in producing the public good is high, the benefit from cost saving may render the PPC system sufficient attractive to the county government.

Figure 3-8 The Conflicts between the County Governments and Social Welfare
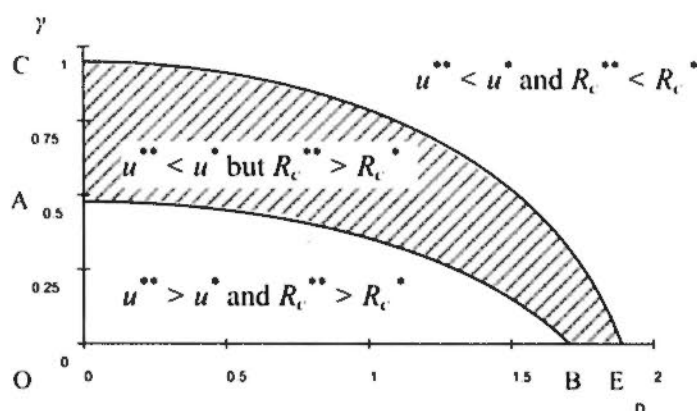
Not only may the interest of the household be at odd with those of the governments, the different levels of governments may also have divergent interests regarding the choice of a system of jurisdictions. The conflicting interests of the county and provincial governments are depicted in Figure 3-9. Recalling conditions (3.68) and (3.67), for specific values of the parameters in these equations, CE is the locus for the condition $R_c^{**} = R_c^{*}$ while AB is that for $R_p^{**} = R_p^{*}$. The shaded areas correspond to the combinations of γ and D such that their interests are divergent.

Figure 3-9 Conflicts between the Provincial Government and County Governments

$R_p^{**} > R_p^{*}$ but $R_c^{**} < R_c^{*}$

$R_p^{**} < R_p^{*}$ but $R_c^{**} > R_c^{*}$

$R_p^{**} > R_p^{*}$ and $R_c^{**} > R_c^{*}$
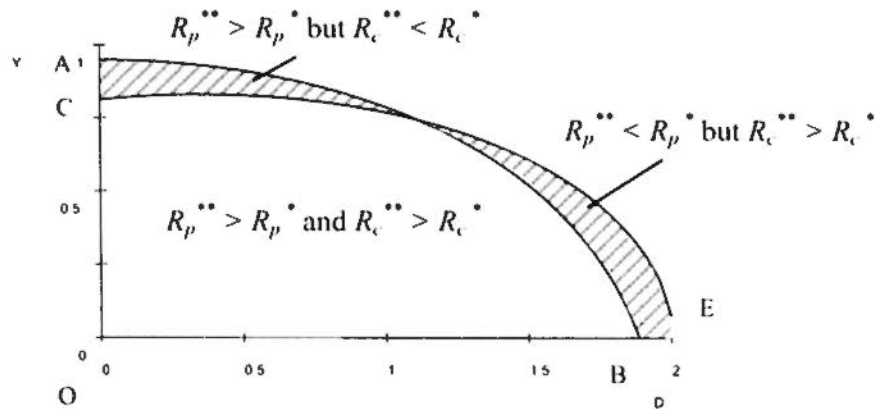
While the above analysis does not preclude the possibility that the interests of all the stakeholders may converge, such a chance is probably small given the vastness of China with widely disparate social, economic and geographic conditions across jurisdictions. Insofar as the different stakeholders have divergent interests, it is natural to ask how their differences are resolved for jurisdictional reforms to proceed. Since participatory politics is still in its infancy in China, the interests of the different tiers of governments are likely to be critical in shaping jurisdictional changes. But so far, the political decision mechanism is a black box. In theory, under China's top-down administrative hierarchy, jurisdictional changes have to be approved by the central government. But anecdotes suggest intense lobbying and behind-the-scene maneuvering by local governments in the choice of different jurisdictional systems. The uneven pace of jurisdictional reforms which often drag on for many years is perhaps a vindication of such hidden political dynamics.

3.5 Concluding Remarks

The recent flood of interest in the PGC system of Zhejiang has brought to the forefront the question whether China has too many tiers of governments and whether the prefecture level is really necessary. The wind of change from the central government in backing the PGC regime has set off a scramble to learn from and emulate Zhejiang's *de facto* PGC system. Despite the center's blessing, whether the PGC system is really "better" suited to the Chinese reality has yet to command a

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consensus. With the help of our model, this chapter is a preliminary attempt to shed light on this issue and it provides an angle to interpret the pattern of jurisdictional changes in the last few decades. In what follows, we shall return to the questions raised in the introductory section.

An important message from our analysis is that there is no simple answer to the question whether the system with or without the prefecture level is *always* "better". One size does not fit all. For one thing, the tradeoffs may change *over time*. At the dawn of the reform era when the visible hand of the local states was all pervasive and local barriers all but insurmountable, a province-prefecture-county setup might be a sensible choice in that the effect of releasing the market from the jurisdictional straightjacket might be substantial. Indeed, as our results above suggest, if the initial market segmentation is serious at the dawn of the reform era, the PPC system is likely to benefit households and governments. But with the deepening of market reform and the gradual retreat of the local states over time, the balance may tip in favor of the PGC system. This is incidentally consistent with the growing dissatisfaction with the CGC system in recent years.

The tradeoffs also change *across space*. This may explain the uneven advance of the CGC system. Indeed, most of the central and western provinces only embraced the CGC in the late 1990s and early years of the new millennium. For one thing, geography matters. For large provinces with rugged terrains and poor transport networks, the costs engendered by preference heterogeneity associated with different accesses to the centralized supply of public services might be inordinately high. Geography aside, there are other reasons why the tradeoffs may vary from one place to another. At any point in time, the pace of economic reform and the governance tradition of local governments may vary. A good illustration is to contrast Jiangsu with Zhejiang. Although both of them are coastal provinces, Jiangsu embraced the CGC system in the 1980s while Zhejiang has effectively adhered to the PGC system. The insights of our model provide some hints to such a puzzle. Economic reforms were more likely to hit the invisible walls set up by sub-provincial jurisdictions in Jiangsu where the local states traditionally maintained a tighter grip over the

economy. On the other hand, Zhejiang's local cadres seem to have a pro-market and liberal-minded tradition (see Huang, 2008). As suggested by the logic of our model, the need for a prefecture level to foster market integration might be much less pressing in free-wheeling Zhejiang than in Jiangsu.

The above analyses call for prudence in the choice of the PGC system. Whether or not this system may be really better is far from determinate. To better understand this, we have a look at the ongoing experiments with the PGC system in a number of provinces during the past several years. These provinces include Hebei, Shanxi, Liaoning, Anhui, Jiangsu and Fujian, to name a few. With various policy details in different provinces, the reform in general involves granting more powers to county-level jurisdictions and placing counties directly under the province in the fiscal institutions (Yang, 2006). Although these experiments are reported to generate such benefits as releasing fiscal burdens and granting counties with increased autonomy to better look after their own interests (see Wang, Ma and Wu, 2008; Xu, 2008), observers have pointed out various problems. Both the provincial and county governments are saddled with heavier administrative burdens. A case in point is Feng County in North Jiangsu. Being around 400 kilometers from the provincial capital Nanjing, the county officials have complained about spending an excessive amount of time and money in communicating with provincial agencies. At the same time, provincial agencies are hard-pressed to make effective and timely decisions on the affairs of this distant county (Duan, Li and Liu, 2008). In addition, with a lack of effective coordination, the rivalry between neighboring jurisdictions for projects and investments intensified, sounding an alarm that local protectionism may become aggravated (Xu, 2008; Zhu, 2009). In particular, prefecture-level cities have become more reluctant to assist the development of subordinate counties by the means of, say, preventing their industries from transferring to counties. In a nutshell, the on-going PGC experiments do not spur overwhelming benefits as its supporters have argued. The proposal of immediately implementing this new regime across the whole nation has thus gained less support then before. More scholars have begun to argue that the PGC regime may not be an appropriate system for all regions with different local

conditions (see Yang, 2006; Dong and Huang, 2008; Xu, 2008; Li and He, 2009), lending support to our model conclusions.

Another issue related to the choice of PGC is whether or not the plan of resizing provinces and counties could be put in place. Such plans have been repetitively proposed in history, and they gained currency in recent years as a measure resolving the difficulties with PGC. To make conditions more suitable for introducing PGC, some scholars suggest re-partitioning China into more provinces (say, 50 provinces as suggested by Dai), thereby reducing the size of provinces. At the same time, some suggest merging neighboring counties to create fewer but larger county-level jurisdictions (Wang, 2008). If these plans were put into practice, it may be easier to employ a PGC system in many regions. However, rescaling provinces and counties is not an easy task. As pointed by Wang (2008), majority of present provinces have been gradually shaped throughout history, having existed for hundreds of years. As the most stable jurisdictional level, majority of counties have even maintained their present size for thousands of years. Reshaping them may spur unexpected difficulties and cause serious political consequences. It is thus not surprising that the central government has repeatedly denied plans of resizing the provinces and counties, increasing the difficulties for pushing the PGC system nationwide.

3.6 Appendix

3.6.1 Model Derivations for Provinces Governing Counties

The problem for household

The production function is:

$$y_i(e_i, g_i) = [A + (n-1)\gamma A]e_i^{\alpha} g_i^{\beta}.$$

The household problem is

$$\max_{e_i} u_i = (1 - t_{ci} - t_p)y(e_i, g_i) - e_i$$
$$= (1 - t_{ci} - t_p)[A + (n-1)\gamma A]e_i^{\alpha} g_i^{\beta} - e_i$$

Solving the first order condition:

$$c_i^*(t_{ci}, t_p, g_i) = \left(1 - t_{ci} - t_p\right)^{\frac{1}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} g_i^{\frac{1}{1-\alpha}}.$$

If follows that:

$$y_i^*(t_{ci}, t_p, g_i) = \left[A + (n-1)\gamma A\right] e_i^{\alpha} g_i^{\beta}$$

$$= \left(1 - t_{ci} - t_p\right)^{\frac{\alpha}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} g_i^{\frac{1}{1-\alpha}}$$

The problem for county governments

$$\max_{t_{ci}, g_i} R_{ci} = t_{ci} y_i^*(t_{ci}, t_p, g_i) - C(g_i)$$

$$= t_{ci} \left(1 - t_{ci} - t_p\right)^{\frac{\alpha}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} g_i^{\frac{1}{1-\alpha}} - \left(F + cg_i\right)$$

The first order conditions are:

$$\frac{\partial R_{ci}}{\partial t_{ci}} = 0 \Rightarrow \left(1 - t_{ci} - t_p\right)^{\frac{\alpha}{1-\alpha}} = \frac{\alpha}{1-\alpha} t_{ci} \left(1 - t_{ci} - t_p\right)^{\frac{\alpha}{1-\alpha} - 1}$$

$$t_{ci}^*(t_p) = (1-\alpha)(1 - t_p)$$

$$\frac{\partial R_{ci}}{\partial g_i} = 0 \Rightarrow t_{ci}^* \left(1 - t_{ci}^* - t_p\right)^{\frac{\alpha}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \frac{\beta}{1-\alpha} g_i^{\frac{\alpha+\beta-1}{1-\alpha}} = c$$

$$g_i^*(t_p) = \left(1 - t_p\right)^{\frac{1}{1-\alpha-\beta}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{\alpha}{1-\alpha-\beta}} \left(\frac{\beta}{c}\right)^{\frac{1-\alpha}{1-\alpha-\beta}}$$

Output as a reaction function:

$$y_i^*(t_p) = \left(1 - t_{ci}^* - t_p\right)^{\frac{\alpha}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} g_i^{*\frac{1}{1-\alpha}}$$

$$= \left(1 - t_p\right)^{\frac{\alpha+\beta}{1-\alpha-\beta}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha-\beta}} \alpha^{\frac{\alpha}{1-\alpha-\beta}} \left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha-\beta}}$$

The administrative costs for the provincial government

The provincial government is assumed to be located at the midpoint of the province, i.e., $nD/2$. The distance from the provincial government to county j is $|(n+1)/2 - j|D$. The total administrative costs are $\sum \sigma |(n+1)/2 - j|D$.

Provincial government

County 1   County 2   County n-1   County n

0   D   2D   (n-2)D   (n-1)D   nD

If n is even, the distance from the provincial government to county 1 is $nD/2 - D/2$, to county 2 is $nD/2 - 3D/2$, to county 3 is $nD/2 - 5D/2$, until to county $n/2$, $D/2$. The sum of administrative costs for these $n/2$ counties is an arithmetic progression. It

is easily $\sigma n^2 D/8$, so the cost for the whole county is $\sigma n^2 D/4$.

If n is odd, the distance from the provincial government to county 1 is $nD/2 - D/2$, to county 2 is $nD/2 - 3D/2$, to county 3 is $nD/2 - 5D/2$, until to county $(n + 1)/2$, 0. The sum of administrative costs for these $(n + 1)/2$ counties is an arithmetic progression. It is easily $\sigma(n^2 - 1)D/8$, so the cost for the whole county is $\sigma(n^2 - 1)D/4$.

As a result, the total administrative cost of the provincial government is:

$$V_p = \sum_{i=1}^{n} \sigma \left| \frac{n+1}{2} - j \right| D = \begin{cases} \dfrac{\sigma n^2 D}{4}, & \text{if } n \text{ is even,} \\ \dfrac{\sigma \left(n^2 - 1\right) D}{4}, & \text{if } n \text{ is odd.} \end{cases}$$

The provincial government problem

$$\max_{t_p} R_p = t_p \cdot \sum_{i=1}^{n} y_i^{*}\left(t_p\right) - V_p$$

$$= n t_p \left(1 - t_p\right)^{\frac{1}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha}} - V_p$$

The first order condition is:

$$\frac{\partial R_p}{\partial t_p} = 0 \Rightarrow \left(1 - t_p\right)^{\frac{1}{1-\alpha}} = \frac{\alpha + \beta}{1 - \alpha - \beta} t_p \left(1 - t_p\right)^{\frac{\alpha}{1-\alpha}-1}$$

$$t_p^{*} = 1 - \alpha - \beta$$

$$t_c^{*} = (1 - \alpha)\left(1 - t_p^{*}\right) = (1 - \alpha)(\alpha + \beta)$$

$$T^{*} = t_c^{*} + t_p^{*} = 1 - \alpha(\alpha + \beta)$$

It follows that the equilibrium supply of public good is:

$$g_i^{*} = (\alpha + \beta)^{\frac{1}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha}}$$

Equilibrium configuration

The equilibrium labor input is:

$$c_i^{*} = \left(1 - t_c^{*} - t_p^{*}\right)^{\frac{1}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} g_i^{\frac{1}{1-\alpha}}$$

$$= (\alpha + \beta)^{\frac{1}{1-\alpha}} \left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{1}{1-\alpha}}$$

The equilibrium production output is:

$$y_j^* = \left(1 - t_p^*\right)^{\frac{\alpha+t}{1-\alpha-t}}\left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha-t}}\alpha^{\frac{\alpha\alpha}{1-\alpha-t}}\left(\frac{\beta}{c}\right)^{\frac{t}{1-\alpha-t}}$$

$$= (\alpha + \beta)^{\frac{\alpha+t}{1-\alpha-t}}\left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha-t}}\alpha^{\frac{\alpha\alpha}{1-\alpha-t}}\left(\frac{\beta}{c}\right)^{\frac{t}{1-\alpha-t}}$$

The equilibrium household utility is:

$$u_j^* = (1 - T^*)y_j^* - e_j^*$$

$$= (\alpha + \beta)^{\frac{1}{1-\alpha-t}}\left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha-t}}\left(\frac{\beta}{c}\right)^{\frac{t}{1-\alpha-t}}\alpha^{\frac{1-\alpha-t}{1-\alpha-t}}(1-\alpha)$$

The equilibrium county fiscal rent is:

$$R_{cj}^* = t_{cj}^* y_j^* - \left(F + cg_j^*\right)$$

$$= (\alpha + \beta)^{\frac{1}{1-\alpha-t}}\left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha-t}}\alpha^{\frac{\alpha\alpha}{1-\alpha-t}}\left(\frac{\beta}{c}\right)^{\frac{t}{1-\alpha-t}}(1-\alpha-\beta) - F$$

The equilibrium provincial government rent:

$$R_p^* = t_p^* \cdot \sum_{j=1}^{n} y_j^* - V_p$$

$$= n\left[A + (n-1)\gamma A\right]^{\frac{1}{1-\alpha-t}}\alpha^{\frac{\alpha\alpha}{1-\alpha-t}}(1-\alpha-\beta)(\alpha+\beta)^{\frac{\alpha+t}{1-\alpha-t}}\left(\frac{\beta}{c}\right)^{\frac{t}{1-\alpha-t}}$$

$$- \begin{cases} \dfrac{\sigma n^2 D}{4}, & \text{if } n \text{ is even,} \\[2mm] \dfrac{\sigma\left(n^2 - 1\right)D}{4}, & \text{if } n \text{ is odd.} \end{cases}$$

3.6.2 Model Derivation for the Province-Prefecture-County Regime

The production function in county j of the prefecture 1 is:

$$y_j\left(e_j, G, x\right) = \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]e_j^{\alpha}\left[G\Phi_j\left(\sigma;x\right)\right]^{t}.$$

The household problem

$$\max_{e_j} u_j = (1 - t_p - t_d - t_{cj})y_j(e_j, G, x) - e_j$$

$$= (1 - t_p - t_d - t_{cj})\left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]e_j^{\alpha}\left[G\Phi_j\left(\sigma;x\right)\right]^{t} - e_j$$

The first order condition is:

$$\frac{\partial u_i}{\partial c_i} = 0 \Rightarrow (1 - t_p - t_d - t_i)\left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]\alpha c_i^{\alpha - 1}\left[G\Phi_i(\sigma_i x)\right]' = 1$$

$$c_i^{**}(t_p, t_d, t_i, G, x) = (1 - t_p - t_d - t_i)^{\frac{1}{\alpha}}\left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{\alpha}}\alpha^{\frac{1}{\alpha}}\left[G\Phi_i(\sigma_i x)\right]^{\frac{1}{\alpha}}$$

$$y^{**}(t_p, t_d, t_i, G, x) = \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]c_i^{**\alpha}\left[G\Phi_i(x)\right]'$$

$$\quad\quad = (1 - t_p - t_d - t_i)^{\frac{1}{\alpha}}\left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{\alpha}}\alpha^{\frac{1}{\alpha}}\left[G\Phi_i(\sigma_i x)\right]^{\frac{1}{\alpha}}$$

The county government problem

The county governments first separately set the tax rate:

$$\max R_{ii} = t_{ii}y_{ii}^{**}(t_p, t_d, t_i, G, x) - S_i C(G)$$

$$\quad = t_{ii}(1 - t_p - t_d - t_i)^{\frac{1}{\alpha}}\left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{\alpha}}\alpha^{\frac{1}{\alpha}}\left[\Phi_i(\sigma_i x)G\right]^{\frac{1}{\alpha}} - S_i C(G)$$

The first order condition is:

$$\frac{\partial R_{ii}}{\partial t_{ii}} = 0 \Rightarrow (1 - t_p - t_d - t_i)^{\frac{1}{\alpha}} = \frac{\alpha}{1 - \alpha}t_{ii}(1 - t_p - t_d - t_i)^{\frac{1}{\alpha} - 1}$$

$$t_{ii}^{**}(t_p, t_d) = (1 - \alpha)\left(1 - t_p - t_d\right)$$

Substitute into R^{**}, we have

$$R_{ii}^{**}(t_p, t_d, G, x, S_i) = t_{ii}^{**}(1 - t_p - t_d - t_{ii}^{**})^{\frac{1}{\alpha}}\left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{\alpha}}\alpha^{\frac{1}{\alpha}}\left[G\Phi_i(\sigma_i x)\right]^{\frac{1}{\alpha}}$$

$$\quad\quad - S_i(F + cG)$$

$$\quad = (1 - \alpha)\left(1 - t_p - t_d\right)^{\frac{1}{\alpha}}\left[\frac{n}{m}A + \left(n - \frac{\tilde{n}}{m}\right)\gamma A\right]^{\frac{1}{\alpha}}\alpha^{\frac{1}{\alpha}}\left[G\Phi_i(\sigma_i x)\right]^{\frac{1}{\alpha}}$$

$$\quad\quad - S_i(F + cG)$$

The n/m counties decide G and S_i through a Nash bargaining process:

$$\max_{G, S_i} \prod_{i=1}^{n/m} R_{ii}^{**}\left(t_d, t_p, G, x, S_i\right)$$

$$\text{s.t. } \sum_{i=1}^{n/m} S_i = 1$$

We construct the following function:

$$L = \prod_{i=1}^{n/m} R_{ii}^{**}\left(t_d, t_p, G, x, S_i\right) + \lambda\left(\sum_{i=1}^{n/m} S_i - 1\right)$$

We have:

$$\frac{\partial L}{\partial G} = \sum_{i=1}^{n \cdot m} \left\{ \frac{\partial R_{i}^{*}\left(t_{d}, t_{p}, G, x, S_{i}\right)}{\partial G} \cdot \prod_{k \neq i} R_{i}^{*}\left(t_{d}, t_{p}, G, x, S_{k}\right) \right\} = 0$$

$$\Rightarrow \sum_{i=1}^{n \cdot m} \left\{ \left[\Lambda \left[\Phi_{i}(\sigma;x) \right] \cdot G^{\cdots} - S_{i}c \right] \cdot \prod_{k \neq i} R_{i}^{*}\left(t_{d}, t_{p}, G, x, S_{k}\right) \right\} = 0 \qquad (1)$$

$$\frac{\partial L}{\partial S_{i}} = \frac{\partial R_{i}^{*}\left(t_{d}, t_{p}, G, x, S_{i}\right)}{\partial S_{i}} \cdot \prod_{k \neq i} R_{i}^{*}\left(t_{d}, t_{p}, G, x, S_{k}\right) = 0$$

$$\Rightarrow (F + cG) \prod_{k \neq i} R_{i}^{*}\left(t_{d}, t_{p}, G, x, S_{i}\right) = \lambda$$

$$\Rightarrow \prod_{k \neq i} R_{i}^{*}\left(t_{d}, t_{p}, G, x, S_{i}\right) = \lambda / (F + cG) \qquad (2)$$

$$\frac{\partial L}{\partial \lambda} = 0 \Rightarrow \sum_{i=1}^{n \cdot m} S_{i} = 1 \qquad (3)$$

where $\Lambda = \beta \left(1 - t_{p} - t_{d}\right)^{\frac{1}{\cdots}} \left[\frac{n}{m} A + \left(n - \frac{n}{m}\right) \gamma A \right]^{\cdots} \alpha^{\cdots}$ for simplicity.

Substituting (2) into (1), we have

$$\sum_{i=1}^{n \cdot m} \left[\Lambda \left[\Phi_{i}(\sigma;x) \right]^{\frac{1}{\cdots}} G^{\cdots} - S_{i}c \right] = 0$$

$$\Lambda G^{\cdots} \sum_{i=1}^{n \cdot m} \Phi_{i}(\sigma;x)^{\frac{1}{\cdots}} = c \cdot \sum_{i=1}^{n \cdot m} S_{i}$$

$$\frac{\beta}{c}\left(1 - t_{p} - t_{d}\right)^{\frac{1}{\cdots}} \left[\frac{n}{m} A + \left(n - \frac{n}{m}\right) \gamma A \right]^{\cdots} \alpha^{\cdots} \sum_{i=1}^{n \cdot m} \Phi_{i}(\sigma;x)^{\frac{1}{\cdots}} = G^{\cdots}$$

The equilibrium supply of public good is:

$$G^{**}\left(t_{p}, t_{d}, x\right) = \left(1 - t_{p} - t_{d}\right)^{\frac{1}{\cdots}} \left[\frac{n}{m} A + \left(n - \frac{n}{m}\right) \gamma A \right]^{\frac{1}{\cdots}}$$

$$\alpha^{\cdots} \left(\frac{\beta}{c}\right)^{\frac{1}{\cdots}} \left[\sum_{i=1}^{n \cdot m} \Phi_{i}(\sigma;x)^{\frac{1}{\cdots}} \right]^{\frac{1}{\cdots}}$$

$$s_{i}^{**}\left(t_{p}, t_{d}, x\right) = \frac{m}{n} + \Lambda \left[G^{*} \Phi_{i}(\sigma;x)^{\frac{1}{\cdots}} - \frac{m}{n} \sum_{k=1}^{n \cdot m} G^{*} \Phi_{k}(\sigma;x)^{\frac{1}{\cdots}} \right]$$

where $\Lambda = (1 - \alpha) \big/ C(G^{*})$.

It follows that:

$$y_j^{**}(t_p, t_d, x) = (1 - t_p - t_d - t_i^{**})^{\frac{1}{\cdots}} \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\cdots} \alpha^{\cdots} \left[G^{**}(t_p, t_d, x) \Phi_i(x) \right]^{\cdots}$$

$$= (1 - t_p - t_d)^{\cdots} \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\cdots} \alpha^{\cdots} \left(\frac{\beta}{c} \right)^{\cdots}$$

$$\Phi_i(x)^{\cdots} \left[\sum_{i=1}^{n/m} \Phi_i(\sigma; x)^{\cdots} \right]^{\cdots}$$

The prefecture government problem:

Following the similar approach used above, we have the administrative costs of the prefecture government:

$$V_d = \sum_{i=1}^{n/m} \sigma \left| j - \frac{1}{2} - \frac{n}{2m} \right| D = \begin{cases} \dfrac{\sigma n^2 D}{4m^2}, & \text{if } \dfrac{n}{m} \text{ is even.} \\[2ex] \dfrac{\sigma(n^2 - m^2) D}{4m^2}, & \text{if } \dfrac{n}{m} \text{ is odd.} \end{cases}$$

Its problem is:

$$\max_{t_d} R_d = t_d \cdot \sum_{i=1}^{n/m} y_j^{**}(t_p, t_d, x) - V_d$$

$$= t_d (1 - t_p - t_d)^{\cdots} \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\cdots} \alpha^{\cdots} \left(\frac{\beta}{c} \right)^{\cdots} \left[\sum_{i=1}^{n/m} \Phi_i(\sigma; x)^{\cdots} \right]^{\cdots} - V_d$$

The first order conditions are:

$$\frac{\partial R_d}{\partial t_d} = 0 \Rightarrow (1 - t_p - t_d)^{\cdots} = \frac{\alpha + \beta}{1 - \alpha - \beta} t_d (1 - t_p - t_d)^{\cdots - 1}$$

$$t_d^{**}(t_p) = (1 - \alpha - \beta)(1 - t_p)$$

$$t_i^{**}(t_p) = (1 - \alpha)\left(1 - t_p - t_d^{**}(t_p)\right) = (1 - \alpha)(\alpha + \beta)(1 - t_p)$$

$$\frac{\partial R_d}{\partial t_d} = \frac{\partial}{\partial x} \sum_{i=1}^{n/m} \Phi_i(\sigma; x)^{\cdots} = 0$$

$$\sum_{i=1}^{n/m} F'(x) = 0$$

$$\sum_{i=1}^{j} F'(x) = \sum_{i=j}^{n/m} F'(x)$$

$$x^{**} = \frac{n}{2m}$$

where $F_i(x) = \Phi_i(x)$

Output as a reaction function:

$$y_i^{**}(t_p) = (1 - t_p)^{\frac{\cdots}{\cdots}} (\alpha + \beta)^{\cdots} \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\cdots} \alpha^{\cdots} \left(\frac{\beta}{c} \right)^{\cdots}$$

$$\Phi \left(\left| j - \frac{n}{2m} \right| \right)^{\cdots} \left[\sum_{j=1}^{n,\,m} \Phi \left(\sigma: \left| j - \frac{1}{2} - \frac{n}{2m} \right| \right) \right]^{\cdots}$$

The provincial government problem:

Following the similar approach used above, we have the administrative costs of the provincial government:

$$V_p = \sum_{j=1}^{m} \sigma \left| j + \frac{n}{2m} - \frac{ni}{m} \right| D = \begin{cases} \dfrac{\sigma mnD}{4}, & \text{if } m \text{ is even.} \\[2ex] \dfrac{\sigma n(m^2 - 1)D}{4m}, & \text{if } m \text{ is odd.} \end{cases}$$

Its maximum problem is

$$\max_{t_p} R_p = t_p \cdot m \sum_{j=1}^{m} y_i^{**}(t_p) - V_p$$

$$= mt_p (1 - t_p)^{\frac{\cdots}{\cdots}} (\alpha + \beta)^{\cdots} \left[\frac{n}{m} A + \left(n - \frac{n}{m} \right) \gamma A \right]^{\cdots} \alpha^{\cdots} \left(\frac{\beta}{c} \right)^{\cdots}$$

$$\cdot \left[\sum_{j=1}^{n,\,m} \Phi \left(\sigma: \left| j - \frac{1}{2} - \frac{n}{2m} \right| \right)^{\cdots} \right]^{\cdots} - V_p$$

The optimal provincial tax rate:

$$\frac{\partial R_p}{\partial t_p} = 0 \Rightarrow (1 - t_p)^{\cdots} = \frac{\alpha + \beta}{1 - \alpha - \beta} t_p (1 - t_p)^{\frac{\cdots}{\cdots} - 1}$$

$$t_p^{**} = 1 - \alpha - \beta$$

It follows that

$$t_d^{**} = (1 - \alpha - \beta)(1 - t_p^{**})$$
$$= (1 - \alpha - \beta)(\alpha + \beta)$$
$$t_i^{**} = (1 - \alpha)(\alpha + \beta)(1 - t_p^{**})$$
$$= (1 - \alpha)(\alpha + \beta)^2$$
$$T^{**} = t_p^{**} + t_i^{**} + t_d^{**}$$
$$= 1 - \alpha(\alpha + \beta)^2$$

The equilibrium supply of public good is:

$$G^{**} = \left(1 - t_p^{**} - t_d^{**}\right)^{-1} \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{1}{1-\alpha}} \left[\sum_{i=1}^{n,m} \Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)\right]^{\frac{1}{1-\alpha}} \right]^{\frac{1-\alpha}{\alpha}}$$

$$= (\alpha + \beta)^{-1} \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{1}{1-\alpha}} \left[\sum_{i=1}^{n,m} \Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)\right]^{\frac{1}{1-\alpha}} \right]^{\frac{1-\alpha}{\alpha}}$$

The equilibrium labor input is:

$$c_{ti}^{**} = \left(1 - t_p^{**} - t_d^{**} - t_{ti}^{**}\right)^{-1} \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} \left[G^{**}\Phi_t(\sigma; x^{**})\right]^{\frac{1}{1-\alpha}}$$

$$= \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha}} (\alpha + \beta)^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{1}{1-\alpha}}$$

$$\Phi\left(\left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)^{\frac{1}{1-\alpha}} \left[\sum_{k=1}^{n,m} \Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)^{\frac{1}{\alpha}}\right]^{\frac{1}{1-\alpha}}$$

The equilibrium output is:

$$y_{ti}^{**} = \left(1 - t_p^{**}\right)^{\frac{\alpha+\beta}{1-\alpha}} (\alpha + \beta)^{\frac{\alpha+\beta}{1-\alpha}} \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha}}$$

$$\Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)^{\frac{1}{1-\alpha}} \left[\sum_{k=1}^{n,m} \Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)^{\frac{1}{1-\alpha}}\right]^{\frac{1}{1-\alpha}}$$

$$= (\alpha + \beta)^{\frac{\alpha+\beta}{1-\alpha}} \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha}}$$

$$\Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)^{\frac{1}{1-\alpha}} \left[\sum_{k=1}^{n,m} \Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)^{\frac{1}{1-\alpha}}\right]^{\frac{1}{1-\alpha}}$$

The equilibrium utility is:

$$u_i^{**} = \left(1 - T^{**}\right)y_{ti}^{**} + 1 - c_{ti}^{**}$$

$$= \left[\frac{n}{m}A + \left(n - \frac{n}{m}\right)\gamma A\right]^{\frac{1}{1-\alpha}} (\alpha + \beta)^{\frac{1}{1-\alpha}} \left(\frac{\beta}{c}\right)^{\frac{1}{1-\alpha}}$$

$$\Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)^{\frac{1}{1-\alpha}} \left[\sum_{k=1}^{n,m} \Phi\left(\sigma; \left|j - \frac{1}{2} - \frac{n}{2m}\right|\right)^{\frac{1}{1-\alpha}}\right]^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} (1 - \alpha)$$

Chapter 4 Cities Governing Counties: Rural-Urban Divide to Integration?

Widely adopted since the early 1980s, the city-governing-county (CGC) system is said to have been introduced to tackle the problems caused by the rural-urban divide, a legacy of the socialist planning system. Let us recall that prefectures representing the provincial authority are replaced by prefecture-level cities equipped with the administrative and fiscal powers of a formal tier of jurisdictions. The prefecture-level city is expected to assume the role of an industrial hub that generates spillovers in technology and know-how to foster economic development in neighboring backward rural regions. Whether the CGC system has achieved these goals or whether it has created predatory city governments exploiting the rural counties is a subject of much heated debate. Given this situation, this chapter examines the pros and cons of the CGC system by using a modified version of the models and line of reasoning developed in the previous chapter.

In what follows, Section 4.1 provides a background on the CGC system with particular reference to its alleged pros and cons. In Section 4.2, we first develop a model of merging prefectures and cities by setting up two heterogeneous county-level jurisdictions pertaining respectively to the urban district and the rural county. Then we investigate a model that focuses on the conversion of a prefecture into a prefecture-level city, another widely used mode for creating the CGC since the 1990s. The two models put into focus the issue of rural-urban divide and the resulting disparities and explore whether the CGC system actually aggravates or alleviates the problems of rural-urban divide. In particular, urban-biased policies are shown to be the endogenous choice of the rent-maximizing city government. The findings explain the oft-cited conflicts between the prefecture-level cities and their

subordinate counties and the phenomenon of "cities exploiting counties". Section 4.4 concludes the chapter by summarizing the salient findings.

4.1 Background and Issues

This section briefly reviews the evolution and spread of CGC which was believed to have been introduced during the reform era to address the problem of rural-urban divide. Next, we review the debate whether the CGC system has actually brought more benefits such as rural-urban integration and accelerated economic development, or whether the prefecture-level cities pursue urban-biased policies that exploit rather than help their subordinate rural counties.

The modern history of prefecture-level cities in the administrative hierarchy is well documented in Dai's book (2000) on China's peculiar urban system. Historically, the city under the leadership of the county emerged as a new type of jurisdiction in the early 1900s. It then gradually moved up the hierarchy of jurisdictions in tandem with industrialization and urbanization. When the Japanese army took Shanghai by force, they put several adjacent counties under the municipal authority to consolidate the occupation. Incidentally, the Chinese government also adopted this regime in the capital Nanjing for military security reasons (Li, 2000; Quan, 2002). However, these are only exceptions. Throughout the pre-reform era after the communist takeover, the sub-provincial government system had been largely organized under the principle of *chengxiang fenzhi*, that is, a separate administration for rural and urban sectors. The urban system consisted of (prefecture-level) cities and their subordinate (county-level) urban districts while the rural system included prefectures and counties (Dai, 2000), with the former focusing on the promotion of industrial development and the latter on agriculture. During the Great Leap Forward (*dayuejin*, 1958-1960), many cities incorporated rural counties under their control to ensure the supply of agricultural products or raw materials in order to support the rush to industrialization, which promoted the CGC system effectively (Wang, 2000). Subsequently ratified by the

central government,[57] however, the shift toward the CGC regime did not become popular after the Great Leap Forward. At the dawn of the reform era, only 99 out of 340 prefecture-level jurisdictions were prefecture-level cities.

At the dawn of the reform era, the rural-urban divide as a legacy of the socialist planning system was criticized as the cause of such negative effects as large rural-urban disparities. With the rapid transition from plan to market in the reform era, rural-urban segmentation increasingly impeded the development, not least because the existing rural-urban fault line blocked the free flow of factors, commodities, and technology spillovers. Solving such a problem was apparently behind the central government's push for the CGC regime in the early 1980s. As shown in Table 4-2, a set of documents in the 1980s and 1990s were endorsed by the central government gradually relaxing the standards for setting up the CGC. Initially, only existing prefecture-level cities could lead counties and developed county-level cities could be promoted to become prefecture-level cities. However, a 1993 document removed this restriction so that all county-level jurisdictions could be promoted if they met a set of standards, including a non-agricultural population over 250,000, a GDP over 2.5 billion yuan, the tertiary industry accounting for over 35 percent of GDP, and a local budgetary revenue over 0.2 billion yuan. These standards were further lessened in 1999 so that county-level jurisdictions with a non-agricultural population over 150,000, a tertiary industry accounting for over 30 percent of GDP, and a local budgetary revenue exceeding 0.15 billion yuan were eligible. As Table 1-2 shows, the result has been a surge in the number of prefecture-level cities since the 1990s.

Ideally, the CGC system is supposed to unify the separate urban and rural administrations, foster market integration, and facilitate urban-to-rural spillovers in technology and knowledge, thereby promoting local economic development (see Yu, 2002; Zhu, 2003; Wang, 2004; Xiao, 2004). Implicit in this hope is the assumption that productivity is higher in the urban sector because of its supposedly better

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[57] The CGC regime was ratified by the National Congress in 1959. But after the Great Leap Forward, it was abolished in many regions in the early 1960s. It was then accepted as a formal regime of governments in the 1978 Constitution.

development and more sophisticated industries. Therefore, the CGC system can help facilitate urban-to-rural spillovers in know-how and technology if the city government clears the administrative roadblocks by bridging the rural-urban administrative fault line.

The CGC system is however not without its critics (see Liu, 1996; Dai, 2000; Wu, 2003; Li, 2003). Policies of the city government are often criticized as being biased in favor of the urban district. Urban-biased policies include the location of public goods closer to urban areas (see Zhou and Hu, 1992; Sun and Wu, 2004 for other examples of urban-biased policies), investing disproportionately in urban projects at the expense of the rural counties (e.g., Fu, 2003; Lu, 2004; Ma and Fang, 2005; Jiang, 2006; Li, 2006), or centralizing county fiscal resources to support urban projects (e.g., Sun and Wu, 2004). Critics see this as a result of a bias for urban counties; this bias is ingrained in China's political system with the quest for industrialization being one of its chief goals. The political logic of the city government is thus to pour resources into industry rather than agriculture. In addition, with its political seat physically in the urban district—which is often less autonomous—the city government can better control the fiscal resources of its urban districts in fostering industrial development.

Whether or not CGC is more suitable to developed regions is also an issue of contention (e.g., Dai, 2000; Wang, 2000). As was previously said, there are two ways of creating a prefecture-level city, merging prefectures and cities and converting prefectures into cities. More prevalent at the beginning of the reform era in more developed regions (e.g., Jiangsu and Guangdong) are mergers of the city government with the prefecture government whose subordinate counties were then put under the leadership of the city government. From 1983 to 1993, there were a total of 98 such cases. Since urban centers in advanced regions often have an economic structure more productive than their neighboring rural counties, they are expected to bring about significant spillover effects to neighboring rural counties. However, this can only happen if rural-urban integration removes local barriers to the movement of goods, factors and ideas, thereby clearing the roadblock to rapid economic reform

and marketization. Frequently cited are the experiences of alleged successful cases such as Changzhou which is discussed in Chapter 1.

Nevertheless, critics question whether the same is true when CGC is introduced into backward regions not least because of the way often used to create prefecture-level cities in these regions. Often lacking in highly developed urban hubs, which can assume the pivotal role in generating significant spillovers in technology and know-how, a new prefecture-level city was often arbitrarily created to take the place of the original prefecture. In this setup, one or more subordinate county-level jurisdictions became the urban district although it was not very different from the other rural counties and one could scarcely expect it to generate significant urban-to-rural spillovers. A good example is the case of Yancheng as discussed in Chapter 1, with its eponymous and backward county being converted into an urban district. Table 4-1 illustrates the large disparity between the urban economy of Changzhou and that of Yancheng in 1983 when these two regions both adopted the CGC system, as suggested by a set of socio-economic indicators. The critics doubt that such an urban hub as the one in Yancheng can actually bring about the benefits as promised by CGC.

Critics also point out that the geographical conditions characterizing China's less developed regions have a negative implication for the CGC system. Vast underdeveloped regions often have very few cities, each of which has to administer many counties, resulting in the oft-cited problem of "a small horse pulling a heavy cart". For example, Changzhou as a developed city covers an area of 4375 km^2 and governs three counties, while Yancheng, which is relatively backward, covers an area of 14,984 km^2 and governs eight counties. These are not exceptions in Jiangsu. On the average, a prefecture-level city governs two or three counties in South Jiangsu but seven or eight counties in the far less developed North Jiangsu (Quan, 2002). What makes things worse is that transport conditions are less developed in backward regions which often have rugged and hostile terrain, reducing the effectiveness of urban-rural spillovers and inter-regional coordination in public affairs.

Table 4-1 Socio-Economic Index in Urban Districts of Changzhou and Yancheng, 1983

Index	Changzhou	Yancheng
Non-agricultural population (10,000)	40.98	13.87
Degree of urbanization (%)	81.21	36.39
GDP (100 million yuan)	13.32	2.91
GDP per capita (yuan)	2,667	770
Industrial product value (100 million yuan)	61.47	7.26
Number of middle and above-sized enterprises	46	2
Fiscal revenues (100 million yuan)	5.41	0.55

Source: Data of Yancheng are from *Yancheng Statistical Yearbook, 2003*. Data of Changzhou are from *Changzhou Statistical Yearbook, 2002*.

The rest of this chapter attempts to provide a better understanding of the previously discussed issues through two models. As the previous chapter points out, an analysis of the CGC system cannot be divorced from a set of tradeoffs. From the background discussion above, the relevant issues to be incorporated into our models include rural-urban disparities, rural-urban integration, urban-biased policies, and geography. Our model shows that spatial and temporal variations in these tradeoffs may account for the controversy over the desirability of the CGC system and explains why the interests of developed regions may diverge from those of their underdeveloped counterparts over the issue of CGC.

Table 4-2 Official Documents and Notices Relevant to the CGC Regime

Issuing Date	No. of Documents	Title of Document and Notice	Contexts Relevant to CGC
09/12/1982	Central [1982] no. 51	Notice on Administrative Reform of Province, City and Autonomous Region (Zhonggong Zhongyang Guowuyuan guanyu sheng, shi, zizhiqu dangzheng jiguan jigou gaige ruogan wenti de tongzhi)	• Encourage merging prefectures and prefecture-level cities.
15/02/1983	Central [1983] no. 6	Notice on Problems in the Administrative Reform of Prefectures and Cities (guanyu di shi zhou dangzheng jiguan jigou gaige ruogan wenti de tongzhi)	• Promote the CGC regime with developed cities as the centre and rural areas as the base. • Merge prefectures and prefecture-level cities. • Expand extant large cities to lead more counties. • Promote developed industrial county towns to prefecture-level cities.
14/06/1983	Central Office [1983] no. 44	Notice on Crucial Issues in the Administrative Reform of Prefectures and Cities (guanyu di shi xingzheng tizhi gaige ruogan zhongyao wenti de tongzhi)	• Permit to promote county-level cities to prefecture-level cities if it has industrial product value over 0.4 billion and non-agricultural population over 150,000.
16/06/1983	Notice [1983] no. 98	Notice on Decisions Made by the Central Meetings	• Only permit to promote developed county-level cities to

Date	Document No.	Document	Content
		(guanyu zhongyang huiyi ruogan jueding de tongzhi)	prefecture-level cities.
19/04/1986	State [1986] no. 46	Notice of Approving and Transmitting the Report of Adjusting the Standards in Setting Cities and the Conditions in Employing the City-Governing-County Regime Submitted by the Ministry of Civil Affairs (guowuyuan pizhuan minzhengbu guanyu tiaozheng sheshi biaozhun he shi lingdao xian tiaojian baogao de tongzhi)	• Permit cities to lead counties if it has non-agricultural population over 250,000 and local GDP over 1 billion.
17/05/1993	State [1993] no. 38	Notice of Approving and Transmitting the Report of Adjusting the Standards in Setting Cities Submitted by the Ministry of Civil Affairs (guowuyuan pizhuan minzhengbu guanyu tiaozheng sheshi biaozhun baogao de tongzhi)	Permit to promote a county or county-level city to prefecture-level city if it satisfies the condition as follows • Non-agricultural population over 250,000 in the urban district; • Total product of primary and second industries over 3 billion, 30% of are from the second industry; • GDP over 2.5 billion; product of tertiary industry higher than that of primary industry and accounting over 35% of GDP; • Local budgetary revenue over 0.2 billion.
05/01/1999	Central [1999] no. 2	Instructions on the Administrative Reform of Local	• Merge co-existing prefectures and prefecture-level cities.

12/11/1999	Ministry of Civil Affairs [1999] no. 105	Governments (*Zhonggong Zhongyang Guowuyuan guanyu defang zhengfu jigou gaige de yijian*) Notice on Adjusting Administrative Divisions of Prefecture-Level Jurisdictions (*min=henghu guanyu tiao=heng diqu jian=hi youguan wenti de tong=hi*)	• Remove prefectures and promote qualified counties or county-level cities to prefecture-level cities. • Permit city to lead county-level city. Relax the standards for promoting a county to city if it has: • Non-agricultural population over 150,000 in the urban district; • GDP over 2.5 billion; product of tertiary industry higher than that of primary industry and accounting over 30% of GDP; • Local budgetary revenue over 0.15 billion.

Source: The notices and documented are collected and sorted by the author.

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4.2 Models

This section, using two different models, analyzes the two different modes used to create the CGC system. To help the readers understand these models better, we first highlight how these models differ from those discussed in the previous chapter. Since our focus here is on the issues of rural-urban divide *versus* rural-urban integration as well as urban-biased policies, we are introducing asymmetries with respect to the two county-level jurisdictions. With regard to the merger of a prefecture with a city as described in Subsection 4.2.1 below, the urban district is assumed to be more productive. Furthermore, the urban district is assumed to remit a share of its tax revenues to the city government to reflect the stylized fact that they are less autonomous. In the second model on the conversion of a prefecture into a prefecture-level city, we do not assume any productivity gap; nevertheless, we continue to assume that the district government remits a share of its tax revenue. The different specifications for the two models are supposed to capture the different degrees of spillover effects when CGC is introduced in developed as opposed to underdeveloped regions.

Issues such as overtaxation which are concerned with the number of tiers of governments not vital to our discussion here are left out. The tax rates are therefore assumed to be fixed exogenously so as to simplify our analysis and stress the issues of rural-urban integration and urban-biased policies.

4.2.1 Merging Prefectures with Prefecture-Level Cities

This section examines the CGC system created by merging a prefecture and prefecture-level city using a model which captures the tradeoffs of this system change. Leaving the details to subsequent analysis, we first outline the basic setup of the model. The last section points out that at the core of the CGC system is the tradeoff between rural-urban integration and urban-biased policies. To capture these

issues, the model we are proposing has a rural county and an urban district. Unlike the models in the previous chapters, the two county-level jurisdictions are *not* identical. The urban sector is assumed to be more productive, thereby generating rural-urban disparity. Our point of origin is a system, in which the urban district and rural county are governed separately by a city and a prefecture government (see A in Figure 4-1). This setup is patterned from the system prevalent at the start of the reform era. Rural-urban segmentation is assumed to exist and hence there are no spillover effects. Without horizontal coordination to exploit the economies of scale, the two county-level jurisdictions are assumed to supply their own public goods. The role of different governments is limited to tax collection and provision of public goods. With the introduction of the CGC system, the prefecture-level city governs the two county-level jurisdictions (see B in Figure 4-1). As was discussed in the previous chapter, with a unified rural-urban governance structure, the change is assumed to boost technological spillovers from the urban to the rural sector and the prefecture-level city is assumed to take on the role of coordinating horizontally the two subordinate jurisdictions. The setup of the model is summarized in Table 4-3.

Figure 4-1 Merging the Prefecture and the City

A. Rural-urban Segmentation   B. Rural-urban Integration
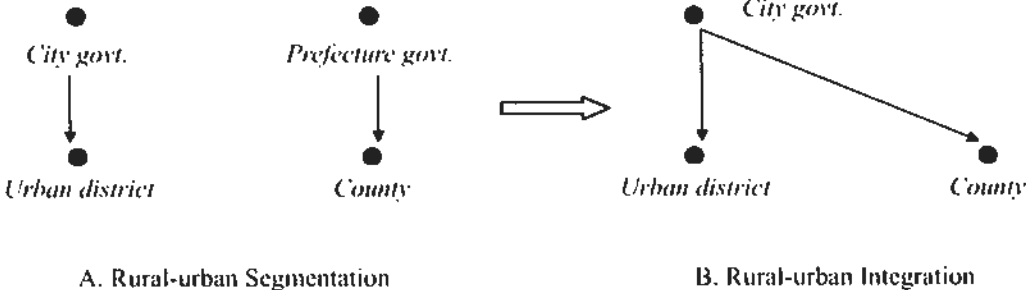
Table 4-3 The Distribution of Duties and Power among Different Agents

Agents	Before the Regime Change	After the Regime Change
The prefecture-level	Collect prefecture-level taxes t_d	Collect prefecture-level tax t_d and

city government		share π of the tax collected by the urban district; decide the location of the pooled public good.
The county/district government	Collect county-level tax, decide the supply of public good and produce the public good.	Collect county-level tax and produce the public good.
The resident	Use labor input and public good to produce and turn in taxes.	Use labor input and public good to produce and turn in taxes.

Distilled from the discussion in the previous section is a set of benefits and costs induced by merging prefectures and cities. For facility of understanding, we summarize them in Table 4-4 plus a brief introduction on how these tradeoffs will be modeled. Some tradeoffs such as market integration and accessibility problem are similar to those discussed in the last chapter; the rationale behind them will not be rehearsed here. But it may be useful to highlight here that, without identical jurisdictions, there are additional tradeoffs pertaining to rural-urban disparities and urban-biased policies. By urban-biased policies, we mean that the newly created prefecture-level city government now decides the location of a shared public good. Furthermore, it is assumed that the urban district, being less autonomous, has to remit a share π of its tax revenue to the city government. In conjunction with the fact that the urban production is more productive, the city government has the incentive to put the public good closer to the urban district.

Table 4-4 Tradeoffs Related to the CGC Regime and Corresponding Model Strategy

	Tradeoffs	Relevant Variables or Parameters
Benefits	Market integration and urban spillovers	The initial degree of market integration γ
	Horizontal cooperation	The fixed cost F
	Expansion of the tax base controlled by the	n. a.

	city government	
Costs	The accessibility problem caused by	Distance D and transport condition σ
	horizontal cooperation	
	Urban-bias policy	Location of public good x
	Increase in administrative cost of the city	Distance D and transport condition σ
	government	

The Scenario without the CGC Regime

We start with rural-urban segmentation due to the coexistence of the prefecture and city governments. There are only *two* heterogeneous county-level jurisdictions, with jurisdiction 1 corresponding to the urban district and jurisdiction 2 the county. We assume that productivity of the urban sector is higher,[58] that is, $A_1 > A_2$. As in the previous chapter, we assume that the degree of knowledge/technological spillovers depends on the degree of market integration. Given an initial degree of economic integration γ, TFP in jurisdiction i is $(A_i + \gamma A_{-i})$, where γA_{-i} is the spillover effect received by jurisdiction i from the other jurisdiction $-i$. The production function is the same as in the previous chapter with two subordinate counties:

$$y_i(e_i, g_i) = (A_i + \gamma A_{-i})e_i^\alpha g_i^\beta, \quad i \in \{1,2\}, \tag{4.1}$$

where e_i is the labor input by the household and g_i is the public good supplied by the government in jurisdiction i.

Since the specification of the model and how the results are derived turn out to be very similar to those presented in the last chapter, we proceed directly to the interpretation of the results (for details see the appendix at the end of this chapter). As before, the household-producer chooses an optimal labor supply to maximize utility:

$$\max_{e_i} u_i = (1 - t_i - t_d)y_i(e_i, g_i) - e_i. \tag{4.2}$$

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[58] Many empirical studies have shown that the urban and rural sectors have different productivities as a result of their distinct industrial structures. In comparison with the urban area, the rural area is still mainly agricultural with small-backward industries resulting in a huge productivity gap between the urban and rural sectors (Yang and Zhou, 1999; Zhao, 2000, 2003; Chen, 2006). Dense population in the urban area generates the economies of scale, scope and agglomerations favoring the emergence of modern industries and specialization as well as the provision of large-scale public infrastructure (Eldridge, 1956; Wang and He, 2005; Zhao, 2005).

where t_c and t_d are respectively the tax rates of the county-level and prefecture-level governments, respectively. It must be noted that they are now assumed to be exogenous because overtaxation as a tradeoff is not our focus here.

As for the county governments, the public good is separately provided by the urban district and the county government, with each maximizing its fiscal rent:

$$\max_q R_{cc} = t_c y_c^*(g_c) - C(g_c). \qquad (4.3)$$

Solving this problem yields the optimal amount of public good supplied by the two county-level governments. Once g is chosen, the rents of the county-level and prefecture-level governments are determined (recall that the tax rates are exogenous in the present context). It follows that the fiscal rents of the city government and district governments are higher than those of the prefecture and county government ($R_{c1}^* > R_{c2}^*$ and $R_{d1}^* > R_{d2}^*$) because productivity is higher in the urban district, i.e., $A_1 > A_2$. As before, in the absence of horizontal cooperation, each of the two county-level governments pays the total fixed cost F in public production, hence they cannot exploit the economies of scale.

An important departure from the previous models is that the difference in productivity results in inter-regional disparity.[59] It is helpful to use the ratio of the utilities in the two jurisdictions $I = u_1^* / u_2^*$ to better understand the factors driving rural-urban disparities:

$$I^* = \left(\frac{A_1 + \gamma A_2}{A_2 + \gamma A_1} \right)^{\frac{1}{1+\gamma}} = \left(\frac{\mu + \gamma}{1 + \gamma\mu} \right)^{\frac{1}{1+\gamma}}, \qquad (4.4)$$

where $\mu = A_1 / A_2 > 1$. As can be seen, rural-urban disparity increases with the rural-urban difference in productivity since $\partial I^* / \partial \mu > 0$. The opposite is true with respect to market integration because $\partial I^* / \partial \gamma < 0$. Therefore, merging the prefecture and the city could reduce rural-urban disparities insofar as the merger promotes market integration. However, as shown below, the merger may also generate

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[59] The difference in productivity has long been conceived as decisive in shaping rural-urban disparity in China (e.g., Yang and Zhou, 1999; Zhao, 2003). Rural-urban disparity is usually a significant characteristic in undeveloped countries (Sundrum, 1983). It is in particular serious in a dual economy like China. Much research has investigated why rural-urban disparity emerged. Besides financial depression and discrimination (e.g., Tian, 2001; Zhang, Liu and Chen, 2006), a lack of public services, in particular infrastructural facilities, is thought to be another key reason for rural poverty and rural-urban disparity (e.g., Fu, 2003; Li, 2004; Lu, 2004; Ma and Fang, 2005; Wang, 2005; Jiang, 2006).

urban-biased policies when the prefecture-level city government decides where to place the pooled public goods.

The Scenario after Introducing the CGC Regime

In this part, we explore how the merger of prefectures and cities changes the equilibrium configuration. Rural-urban integration removes the prefecture government and puts both the urban district and the rural county under the city government. Compared with the model presented in Chapter 3, there are similarities and differences in the distribution of administrative and fiscal powers between the city and the county governments. The city government is still expected to decide where the public input should be located and to bring the two subordinate jurisdictions to the bargaining table to hammer out the amount of the public good produced and the cost-sharing formula. As regards the differences, the tax rates are now exogenously given and the urban district, not the county, should remit part of its tax revenue to the city government. With such an institutional arrangement, the resulting tradeoffs are summarized in Table 4-4 above.

Horizontal coordination by the city is supposed to promote rural-urban market integration. For simplicity we assume that the degree of market integration increases from γ to γ' so that the level of TFP for jurisdiction i is $A_i + \gamma'A_{-i}$. It must be noted that in the case of full market integration ($\gamma' = 1$), TFP in the two regions will be identical. But if $\gamma' < 1$, then the difference in productivity still persists in the urban and rural areas. As we will show later, this is one of the factors that cause the urban-biased policies.

With unified administration, the two regions together produce and supply the public good. We assume that the distance between the two county-level governments is D and the pooled public good is located at a place x miles away from the urban district (i.e., jurisdiction 1). Again, as in the previous models, we assume that the consumption of the public good G by households in the ith jurisdiction dissipates with distance, that is, $G \cdot \Phi_i(\sigma; x)$, where $\Phi_1(\sigma; x) = \Phi(\sigma; x)$ and $\Phi_2(\sigma; x) = \Phi(\sigma; D - x)$. For household in jurisdiction i, the production function is thus:

$$y_i = \left(A_i + \gamma'A_j\right)c_i^{-1}\left[G\Phi_i(\sigma;x)\right]^{\beta}, \quad i \in \{1,2\}. \tag{4.5}$$

The households choose their labor input to maximize utilities, given the government policies. We skip the details because the derivation is similar to what has been presented in the previous chapter. The two county-level governments jointly choose the supply of public good G and the sharing ratio s_i of the costs, where $s_1 = s$ for the urban district and $s_2 = 1 - s$ for the county. They are again assumed to tackle this problem through a Nash bargaining process.[60] The problem is to maximize the Nash product:

$$\max_{G,s} \prod_{i=1}^{2} R_i^{**}(G,x). \tag{4.6}$$

The optimal amount of public good agreed by both parties is:

$$G^{**}(x) = t_c^{\frac{1}{1-\alpha}}\left(1 - t_d - t_c\right)^{\frac{\alpha}{1-\alpha}}\alpha^{\frac{\alpha}{1-\alpha}} \tag{4.7}$$

$$\left[\frac{\beta}{(1-\alpha)c}\sum_{i=1}^{2}\left(A_i + \gamma'A_j\right)^{\frac{1}{1-\alpha}}\Phi_i(\sigma;x)^{\frac{1}{1-\alpha}}\right]^{\frac{1-\alpha}{1-\alpha}}.$$

With respect to cost sharing, the bargaining result is that the jurisdiction closer to the location of public goods should pay more. The urban share is:

$$s^{**}(x) = \frac{1}{2} + \frac{\Lambda G^{**}(x)^{\frac{1}{1-\alpha}}}{2C(G^{**}(x))}\left[\left(A_1 + \gamma'A_2\right)^{\frac{1}{1-\alpha}}\Phi(\sigma;x)^{\frac{1}{1-\alpha}}\right. \tag{4.8}$$

$$\left. - \left(A_2 + \gamma'A_1\right)^{\frac{1}{1-\alpha}}\Phi(\sigma;D - x)^{\frac{1}{1-\alpha}}\right],$$

where $\Lambda = t_c\left(1 - t_d - t_c\right)^{\frac{\alpha}{1-\alpha}}\alpha^{\frac{\alpha}{1-\alpha}}$.

To consider urban-based policies which figure prominently in the debates about the CGC system, a number of new assumptions in the form of asymmetries with respect to the two county-level jurisdictions are introduced. However, unlike the county-level government in Chapter 3, we assume that the less autonomous urban district government (but not the county) has to remit a proportion π of its tax revenue

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[60] An urban district is to some degrees different from a county in that it is an integral part of the prefecture-level city so that its government is often subject to tighter control by the city authority. However, it has been granted more and more autonomy since the reform and today it has an independent budget. This motivates us to assume that the district government can independently interact with a county government.

to the city government.[61] The rationale is that, as the seat of the city government, the urban district is tied more closely to the city with fiscal resources often under tighter control of the city government. Examples abound in this regard,. For instance, after Shunde was converted into a district of Foshan, it had to submit around one-fifth of its revenues to the city authority. As shown below, such an assumption is critical in generating urban-biased policies. Another asymmetry is that the city government incurs a distance-induced administrative cost for governing the county, which is σD. No such cost arises in managing the urban district where the city government is located.

Putting all the above together, the city government maximizes its fiscal rent:

$$\max_r R_d = (t_d + \pi t_c)y_1^{**} + t_d y_2^{**} - \sigma D. \tag{4.9}$$

The first order condition with respect to x suggests that the location of the pooled public good is derived using the following condition:

$$\left(\frac{\beta}{1-\alpha-\beta} + \Theta\tau\right)F'(x) = \left(\frac{\beta}{1-\alpha-\beta} + \Theta\right)F'(D-x), \tag{4.10}$$

where

$$\tau = \frac{(t_d + \pi t_c)}{t_d} \cdot \frac{\left(A_1 + \gamma'A_2\right)^{\frac{1}{1-\alpha}}}{\left(A_2 + \gamma'A_1\right)^{\frac{1}{1-\alpha}}} > 1, \tag{4.11}$$

$F(\cdot) = \Phi(\cdot)^{\beta/1-\alpha}$ is a concave and decreasing function. Condition (4.10) shows that the city government will locate the public good at a place where the marginal fiscal rent from the county should be equal to that of the urban district. It can easily be shown that the location of the public goods defined by condition (4.10) is biased in favor of the urban district:

$$x^{**} < \frac{D}{2} \text{ for } \tau > 1. \tag{4.12}$$

Such an urban-biased policy hinges critically on τ, which depends on the share π of the tax remitted by the urban district government to the city and the productivity difference between the two jurisdictions. The bigger the rural-urban difference in productivity or the larger π is, the closer the public good is to the urban district.

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[61] The proportion π can be alternatively assumed to be endogenously chosen by the city government. But this may complicates the analysis without shedding more light on the key issues related to the urban-biased policies.

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Where to locate the public input G affects private production in the two jurisdictions through A_i and thus the tax revenues collected by the city government. The city government has the incentive to boost urban production by locating the public good closer to the urban district which can make more effective use of the public input because $A_1 + \gamma'A_2 > A_2 + \gamma'A_1$ for $A_1 > A_2$ and $\gamma' < 1$, an incentive further reinforced by the tax remittance by the urban district to the city's coffer.

The Gainers and Losers under CGC Regime

Given the tradeoffs above, there are gainers and losers resulting from this regime change. First, we explore how the welfare of the households in the two regions is affected. For the urban district, the condition $u_1^{**} > u_1^{*}$ implies:

$$\Phi(\sigma; x^{**})^{\frac{(1-\alpha)-\beta}{1-\alpha}}\left[\Phi(\sigma; x^{**})^{\frac{1}{1-\alpha}} + \left(\frac{1 + \mu\gamma'}{\mu + \gamma'}\right)^{\frac{1}{1-\alpha}}\Phi(\sigma; D - x^{**})^{\frac{1}{1-\alpha}}\right]^{\beta} > \frac{\mu + \gamma}{\mu + \gamma'}, \quad (4.13)$$

where $\mu = A_1/A_2$, the rural-urban difference in productivity. The expression above captures the tradeoff between rural-urban integration and the cost in accessing the public good supplied jointly. To see this, it is helpful to show how the above inequality depends on the various parameters. First, the left hand side decreases when D and σ increase. The urban household is less likely to benefit because the cost is large in accessing the centralized public goods. Condition (4.13) holds for sufficiently large γ', in which case market integration and technology spillovers are especially significant to make the household in the urban district better off. The right-hand side expression $(\mu + \gamma)/(\mu + \gamma')$ increases with μ, while $(1 + \mu\gamma')/(\mu + \gamma')$ on the left-hand side decreases with μ. This implies that the welfare of the urban district may not improve in case of a large rural-urban difference in productivity. Insofar as one benefit of market integration is inter-jurisdictional technological spillovers, the urban district may gain very little if rural productivity is very low.

For the rural county, the condition $u_2^{**} > u_2^{*}$ implies:

$$\Phi(\sigma; D - x^{**})^{\frac{(1-\alpha)-\beta}{1-\alpha}}\left[\left(\frac{\mu + \gamma'}{1 + \mu\gamma'}\right)^{\frac{1}{1-\alpha}}\Phi(\sigma; x^{**})^{\frac{1}{1-\alpha}} + \Phi(\sigma; D - x^{**})^{\frac{1}{1-\alpha}}\right]^{\beta} \quad (4.14)$$
$$> \frac{1 + \gamma\mu}{1 + \gamma'\mu}.$$

The analysis with respect to distance D, transport conditions σ and the initial degree of market integration γ is the same as before, but it is different for the rural-urban productivity difference μ. With an increase in μ, the right-hand side of (4.14) decreases, while the term $(\mu + \gamma')/(1 + \mu\gamma')$ on the left-hand side increases, so that (4.14) is more likely to hold. The household in the rural county is more likely to benefit from market integration because of the large urban-to-rural spillover effect when the rural-urban difference in productivity is large.

Next, we examine how the fiscal rent of the two county-level governments is affected by the CGC. For the condition $R_{ci}^{**} > R_{ci}^{*}$ to hold:

$$F > \Delta \left\{ 2 \left(\frac{A_i + \gamma A_{-i}}{A_1 + \gamma' A_2} \right)^{\frac{1}{1-\alpha}} - \left[\sum_{i=1}^{2} \Phi_i (\sigma; x^{**})^{\frac{i}{1-\alpha}} \right]^{\frac{1-\alpha}{1-\alpha}} \right\}, \tag{4.15}$$

where $\Delta = t_i^{\frac{1-\alpha}{1-\alpha}} [\alpha(1 - t_i - t_d)]^{\frac{\alpha}{1-\alpha}} [(1 - \alpha - \beta)/(1 - \alpha)][\beta/c(1 - \alpha)]^{\frac{1}{1-\alpha}}$. As in previous analyses, the county-level governments are more likely to prosper when they are not far apart (a small value of D), when they have good transport networks (a small value of σ), and when they are plagued initially by a high degree of market segmentation (a small value of γ). The same is true if the fixed cost F in public production is so large that the benefit of cost sharing is significant. Nevertheless, condition (4.15) differs for the two governments with respect to μ. The term $(A_i + \gamma A_{-i})/(A_i + \gamma' A_{-i})$ on the right-hand side of (4.15) is reduced to $(\mu + \gamma)/(\mu + \gamma')$ for the urban district government, which increases with μ. However, this term is reduced to $(1 + \gamma\mu)/(1 + \gamma'\mu)$ for the county government, which decreases with μ. The urban district receives a smaller spillover effect from dismantling rural-urban barriers if rural productivity is low such that μ is large; but the opposite is true for the rural county.

Finally, we examine how the CGC regime impinges on the prefecture-level city government. For condition $R_d^{**} > R_{d1}^{*}$ to hold:

$$D < \frac{\Delta}{\sigma} \left\{ \left[\sum_{i=1}^{2} \Phi_i (\sigma; x^{**})^{\frac{i}{1-\alpha}} \right]^{\frac{1-\alpha}{1-\alpha}} - \left(\frac{\mu + \gamma}{\mu + \gamma'} \right)^{\frac{1}{1-\alpha}} \right\}, \tag{4.16}$$

where $\Delta = t_d t_i^{\frac{1}{1-\alpha}} [\alpha(1 - t_i - t_d)]^{\frac{\alpha}{1-\alpha}} (A_1 + A_2)^{\frac{\alpha}{1-\alpha}} [\beta/c(1 - \alpha)]^{\frac{1}{1-\alpha}}$. The city

government is likely to be better off if market integration leads to significant technological spillovers (i.e., γ is small and γ' is large). The longer distance and poorer transport conditions not only aggravate the accessibility problem as before but also increase the distance-related administrative cost σD; in effect, this offsets the benefits of the CGC system. What is worth mentioning is that the city government is also less likely to be better off in case of a large rural-urban difference in productivity when the rural county is backward. To see this, $(\mu + \gamma)/(\gamma' + \mu)$ increases with μ so that the right hand side of (4.16) decreases with μ. Putting a very backward rural county under the city's administration generates very little tax revenue to the city government. Like the urban district government, the city government prefers to govern a county that is not very backward.

Divergent Interests of Stakeholders: Lessons from the Above Analysis

Based on the above discussion, Table 4-5 summarizes who gain and who lose under different circumstances. Studying this table helps explain why there is so much controversy as well as conflict among the stakeholders whose interests may be divergent.

Table 4-5 The Conditions Necessary for Different Agents to Be Better Off under the CGC Regime

Conditions	Urban District		County		City Govt.
	Residents	Govt.	Residents	Govt.	
Initial degree of market integration (γ)	Low	Low	Low	Low	Low
Difference in productivity (μ)	Small	Small	Large	Large	Small
Distance (D)	Short	Short	Short	Short	Short
Transport conditions (σ)	Good	Good	Good	Good	Good

As Table 4-5 suggests, all the stakeholders find the CGC regime desirable if (1) markets are seriously segmented, (2) inter-regional distance D is short, and (3)

transport conditions σ are good. However, their interests differ in terms of the relative urban-rural productivity gap μ. This finding captures an important reason behind many of the conflicts, controversies and mutual recriminations involving local governments on the question of jurisdictional changes. When the productivity gap between the city and a rural county is huge, the city government together with its urban district may find an underdeveloped rural county a burden. It is thus in the interest of the city government to pursue urban-biased policies by allocating more resources to the urban district, offsetting whatever gains poor rural county may get from urban-to-rural spillovers. The scenario is different when it comes to developed counties, which often strive to move up the administrative ladder by gaining prefecture-level city status so as to free themselves from the control of the city. A case in point is Dongguan in Guangdong Province which was successfully promoted to be a prefecture-level city. On the other hand, prefecture-level cities endeavor to retain developed counties under its control and even incorporate them as urban districts. Examples include the incorporation of Wujin, Shunde, and Xiaoshan as urban districts into Changzhou, Foshan and Hangzhou. These real-world observations are nicely predicted by our model when the productivity gap is small.

4.2.2 Converting Prefectures into Prefecture-level Cities

This subsection examines the second mode of creating the CGC regime which was more widely used in underdeveloped regions in the 1990s. In Yancheng's case, the prefecture was replaced by a newly created prefecture-level city. On the surface, this mode seems to involve big changes of dissolving the prefecture and promoting a county or county-level city to become a prefecture-level city. In reality, however, the change may be far less significant because the original prefecture government often directly becomes the city government whose officials retain their positions. A county or county-level city in which the defunct prefecture government is located is renamed as the urban district.

Furthermore, there is no substantial change in the function of the prefecture-level

government. The new city government may be a little more powerful than the defunct prefecture government, but the differences are of degree and not of substance. Although prefectures were only agents representing the provincial governments in the early years, they were gradually granted more powers since the late 1950s. Given *de facto* administrative powers, prefectures played an *effective* role in coordinating subordinate counties (see Li, 2005). In Yangcheng's case, for instance, the prefecture government coordinated economic affairs among the counties, ranging from the facilitation of commodity trade to the joint construction of irrigation facilities. The benefits resulting from coordination may thus be far fewer in the case of converting prefectures into cities than in the case of merging them.

However, the conversion of prefectures into prefecture-level cities reshapes the superior-subordinate relationship. A prefecture government usually treats all its subordinate counties on an equal basis as it is a representative of the provincial government administering these counties. After the regime change, however, the prefecture-level city becomes a formal jurisdiction with the urban district being an integral part of the city itself. Districts are thus politically and fiscally closer to the city government than other counties. As was introduced in the last subsection, this is again an important reason behind the urban-biased policies of the city government.

In what follows, we incorporate the above discussion into a model based on a two-region setting. As shown in Figure 4-2, there are two counties under the prefecture government, which plays a coordinating role before the regime change. After converting the prefecture to a city, an urban district, labeled jurisdiction 1 below, is created. The remaining county is referred to as jurisdiction 2. Before proceeding to examine what effects such a change has on the different stakeholders, it is essential that we explain how the present model differs from the previous one. Insofar as the original prefecture is underdeveloped with all the counties more or less at the same level of development, technological spillovers as a benefit do not figure prominently in this mode of change. Indeed, the urban district created is not very different from other rural counties in terms of economic structure and productivity. A case in point is Yancheng as previously discussed. Therefore, our model excludes the

issue of rural-urban integration and corresponding spillover effects. Specifically, the parameter γ measuring the degree of market integration no longer appears in the model below. Furthermore, the two county-level jurisdictions are assumed to have the same level of productivity, so we drop the parameter A for TFP. These changes help simplify our analysis.

Figure 4-2 Converting Prefectures into Cities

A. Before the Regime Change B. After the Regime Change
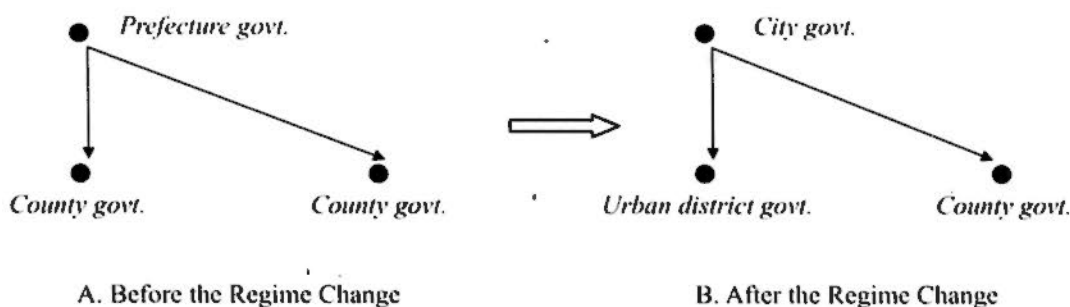
The Scenario before Converting Prefectures into Cities

With the above assumptions, the production function for the two jurisdictions becomes:

$$y_i(e_i, g_i) = e_i^a \left[G\Phi_i(\sigma; x) \right]^t, \quad i = 1, 2. \tag{4.17}$$

The analysis for the household and the county-level governments are similar to what was presented in the previous subsection, hence we skip the details and move directly to the problem facing the prefecture government. The prefecture government collects taxes from the two counties at an exogenously fixed tax rate t_d. Assuming that the prefecture government is located in jurisdiction 1, it incurs a cost σD for administering the counties. We assume that the prefecture government horizontally coordinates the counties and chooses a location of public good to maximize its fiscal rent:

$$\max_x R_d = t_d \left[y_1^*(x) + y_2^*(x) \right] - \sigma D. \tag{4.18}$$

Solving this problem gives the optimal location of public good:

$$x' = \frac{D}{2} . \tag{4.19}$$

Intuitively, the prefecture treats the two counties equally. As the two counties are assumed to be identical, the public good will be located at their midpoint. As explained in the previous chapter, such a choice maximizes local output and thus its fiscal revenues.

The Scenario after Converting Prefectures to Cities

After converting the prefecture to a city, jurisdiction 1 becomes an urban district and jurisdiction 2 remains a county. We only report the main results here because how they are derived is similar to those presented in the previous subsection. Again, we assume that the urban district government should remit a share π of its tax revenues to the city government, which thus has an incentive to locate the pooled public good closer to the urban district resulting in an urban-biased policy:

$$x'' < \frac{D}{2} , \tag{4.20}$$

where x'' is derived from an expression as follows:

$$\left[\frac{\beta}{1-\alpha-\beta} + \Theta\tau' \right] F'(x) = \left[\frac{\beta}{1-\alpha-\beta} + \Theta \right] F'(D-x), \tag{4.21}$$

where

$$\tau' = \frac{(t_d + \pi t_c)}{t_d} > 1. \tag{4.22}$$

The forces driving the urban-biased policy here is somewhat different from those in the model presented in the last section (Recall (4.11)). The urban-biased policy is no longer induced by different productivity levels and is solely the result of the share of tax revenues π remitted by the urban district to the city government. It must be noted that this policy causes a decline in the supply of public good. To understand this, recall that locating the public good at the midpoint brings about the maximum supply of public good when the two jurisdictions are homogenous. Otherwise, the supply of public good and thus total output may be reduced. This conclusion also applies to the present context in which the two county-level jurisdictions are assumed to be identical. However, the urban district contributes more to the city's fiscal pool

by remitting a part of its revenue to the city, thereby prompting the city government to locate the public good closer to it. This policy may be optimal from the perspective of the city government by maximizing the *effective* fiscal revenues under its control, but it causes a decline in the supply of public good.

The Welfare Results

As before, we compare the equilibria before and after the jurisdictional change to find out the gainers and losers. Since the urban district is more closely tied to the city, the city government no longer treats all subordinate jurisdictions equally; instead, it has an incentive to favor the urban district. Such a policy then produces two effects on the consumption and provision of the public good. On the one hand, the pooled public goods are located closer to the urban district so that urban residents can make better use of them. On the other hand, the urban-biased policy leads to a decrease in the supply of the public good.

Considering these two effects, the welfares of different players are differently affected by the regime change. Hence, we compare the welfare of the households. Before the change, the equilibrium utility of the household in region i is

$$u_i^* = t_c^{\frac{d}{1-a-d}} \left(1 - t_d - t_c\right)^{\frac{1-d}{1-a-d}} \alpha^{\frac{a}{1-a-d}} (1-\alpha) \tag{4.23}$$

$$\Phi_i\left(\sigma; \frac{D}{2}\right)^{\frac{d}{1-a}} \left[\frac{\beta}{(1-\alpha)c} \sum_{k=1}^{2} \Phi_k\left(\sigma; \frac{D}{2}\right)^{\frac{d}{1-a}}\right]^{\frac{d}{1-a-d}}$$

After the change, it becomes:

$$u_i^{**} = t_c^{\frac{d}{1-a-d}} \left(1 - t_d - t_c\right)^{\frac{1-d}{1-a-d}} \alpha^{\frac{a}{1-a-d}} (1-\alpha) \tag{4.24}$$

$$\Phi_i\left(\sigma; x^{**}\right)^{\frac{d}{1-a}} \left[\frac{\beta}{(1-\alpha)c} \sum_{k=1}^{2} \Phi_k\left(\sigma; x^{**}\right)^{\frac{d}{1-a}}\right]^{\frac{d}{1-a-d}}.$$

Although urban residents benefit from being located more closely to the pooled public goods, their welfare is curtailed by the decrease in the supply of public goods. Therefore, the result depends on swapping these two opposite effects. Using (4.23) and (4.24), the urban household is better off ($u_1^{**} > u_1^*$) whenever

$$\Phi(\sigma; x^{**})^{\frac{d}{1-a}} \left[\sum_{i=1}^{2} \Phi_i(\sigma; x^{**})^{\frac{d}{1-a}}\right]^{\frac{d}{1-a-d}} > \Phi(\sigma; x^*)^{\frac{d}{1-a}} \left[\sum_{i=1}^{2} \Phi_i(\sigma; x^*)^{\frac{d}{1-a}}\right]^{\frac{d}{1-a-d}}. \tag{4.25}$$

This condition does not always hold. The public good is closer to the urban household ($\Phi(x^{**}) > \Phi(x^*)$ for $x^{**} < x^* = D/2$), but at the same time, the amount of public goods decreases ($\sum\Phi_i(x^{**}) < \sum\Phi_i(x^*)$), therefore capturing the loss caused by the urban-biased policy. The result may depend on comparing these two opposite effects.

The story is different for the county. Similarly, the household in the county is better off ($u_2^{**} > u_2^*$) whenever

$$\Phi(\sigma; D - x^{**})^{\frac{1}{1-\eta}}\left[\sum_{i=1}^{2}\Phi_i(\sigma; x^{**})^{\frac{1}{\eta}}\right]^{\frac{1}{1-\eta}\eta} \tag{4.26}$$

$$> \Phi(\sigma; D - x^*)^{\frac{1}{1-\eta}}\left[\sum_{i=1}^{2}\Phi_i(\sigma; x^*)^{\frac{1}{\eta}}\right]^{\frac{1}{1-\eta}\eta}.$$

Since $\Phi(D - x^{**}) < \Phi(D - x^*)$ for $x^{**} < x^*$, and $\sum\Phi_i(x^{**}) < \sum\Phi_i(x^*)$, (4.26) above never holds. The county household surely suffers a loss in welfare due to the urban-biased policy. After the regime change, not only is there a smaller supply of the public good, but also it is located farther away from the county.

The switch to CGC is thus not a Pareto-improvement. But is society as a whole better off? To answer this question, we measure social welfare by a utilitarian social welfare function so that social welfare levels with and without CGC are $U^* = \sum u_i^*$ and $U^{**} = \sum u_i^{**}$ respectively. Using (4.23) and (4.24), condition $U^{**} > U^*$ reduces to:

$$\sum_{i=1}^{2}\Phi_i(\sigma; x^{**})^{\frac{1}{1-\eta}} > \sum_{i=1}^{2}\Phi_i(\sigma; x^*)^{\frac{1}{1-\eta}}. \tag{4.27}$$

This condition never holds as $x^{**} < x^* = D/2$, implying that social welfare suffers a loss by converting the prefecture into a city.

Given all these points, we derive several important conclusions from above analysis. First of all, the counties that are redesigned as the urban districts *may* be better off, so it is not surprising that they often desire such a change. On the contrary, the counties other than the urban districts are definitely worse off, explaining why there is a growing opposition by the counties against the CGC system. Second, inter-jurisdictional disparity in welfare levels is created by locating the pooled public goods closer to the urban districts, although the districts and counties are often very

similar in terms of economic development levels. This policy is evidently unfair from the viewpoint of common counties, thereby arousing their discontents with the CGC system. Finally, what makes things worse is that social welfare is worse off by converting prefectures to prefecture-level cities. The establishment of CGC with this mode thus fails to bring about expected benefits such as city assisting counties; instead, it even causes an efficiency loss from the view of social welfare, providing strong evidence for the proposals of removing the CGC system.

4.3 Performance of CGC across Space and Time

Whether or not CGC is a better system ultimately depends on the tradeoffs as the findings above suggest. As pointed out in the introductory section, one concern of the critics is that CGC is not suitable to all regions and at all time in China. Below, we summarize how our line of reasoning above helps explain why the desirability of CGC varies across regions and over time.

As alluded to in the introductory section, one common argument about the CGC system is that CGC benefits the developed regions more but inflicts more harm than good on backward areas. Our models interpret the above view in terms of the different tradeoffs varying across regions. For ease of reference, the different conditions characterizing the developed and underdeveloped regions are summarized in Table 4-6. As indicated in the table, the CGC system was more often created by merging prefectures and cities in the developed regions where there are more developed large cities. However, when this regime spread to backward regions with the promotion of the central government, the conversion of prefectures to cities became the dominant mode of creating the CGC system. As explained above, this way of introducing CGC more often than not bring more harm than benefit to the counties. For a typical developed region, the cities are more productive compared with their neighboring rural counties. With large rural-urban productivity gaps, rural-urban integration generates significant spillover effects, all the more so when the initial degree of integration γ is often lower due to the juxtaposition of prefectures

and prefecture-level cities. Furthermore, as there are more cities in advanced regions, each often governs a smaller area with fewer counties, i.e., smaller D, so the administrative cost turns out to be less onerous. The same is not true for underdeveloped regions where a small city often has to lead more counties, resulting in the oft-cited problem of "a small horse pulling a heavy cart" as previously mentioned.

Table 4-6 Different Conditions in the Developed and Underdeveloped Regions

Conditions	Developed Regions	Underdeveloped Regions
Common mode in creating CGC	Merging prefectures and cities	Converting prefectures to cities
Initial degree of rural-urban integration (γ)	Lower	Higher
Rural-urban difference in productivity (μ)	Larger	Smaller
Distance (D)	Shorter	Longer
Transport conditions (σ)	Good	Poor

The CGC encountered far less opposition from subordinate counties in the 1980s and early 1990s perhaps because its introduction did promote the development of both the urban and rural areas in the early years of the reform era (see e.g., Dai, 2000; Wang, 2004). This observation suggests that the desirability of CGC not only varies across regions but also over time due to the changing conditions which affect the tradeoffs. We summarize changing conditions before and after the mid 1990s in Table 4-7. As indicated in the table, at the beginning the CGC system was more often created by merging prefectures and cities, but more by converting prefectures into cities in the 1990s when this regime spread to backward regions. From 1999 to 2004, 52 out of the total 55 cases of employing the CGC were by converting prefectures into cities. Besides, rural-urban segmentation has become less serious especially since the mid 1990s as economic reform progresses. Local states have gradually retreated from the economy in tandem with market-oriented reforms. Although local

protectionism persists, the mobility of factors and commodities is increasingly driven by the incentives of private enterprises. [62] The coordinating role of the prefecture-level city government in breaking down rural-urban barriers seems to have diminished in importance over time. Last but not least, in many advanced regions, the rural-urban productivity gap has significantly narrowed after two decades of economic growth. For instance, GDP per capita of the urban district in Changzhou was nearly four times high than that of Wujin in 1983, but this ratio was narrowed to 1.16:1 in 2001. In some cases, subordinate counties are even more prosperous than the urban district of the city, with examples being Shunde in Foshan, Kunshan in Suzhou, and Xiaoshan in Hangzhou. With these developed counties no longer receiving attractive benefits from their superior city, the city-county relationship often turns sour when they compete head on for economic and fiscal resources.

Table 4-7 Different Conditions from the 1980s to the Present

Conditions	1980s and early 1990s	Since the mid-1990s
Common mode in creating CGC	Merging prefectures and cities	Converting prefectures to cities
Initial degree of market integration (γ)	Lower	Higher
Rural-urban difference in productivity (μ)	Larger	Smaller
Transport conditions (σ)	Worse	Better

4.4 Concluding Remarks

This chapter examines the reasons behind the introduction of the CGC regime, with focus on issues related to bridging the rural-urban divide. The chapter also examines whether the CGC system really brings about its expected benefits. In a simplified

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[62] Several studies offer evidence that the degree of market integration has increased in recently years (see Li, Hou and Chen, 2003; Li, Hou, Liu and Chen, 2003; Naughton, 2003; Bai, Du, Tao and Tong, 2004).

two-region setting, we investigate the two modes of creating the CGC regime. Our models highlight the different tradeoffs involved in these two forms of CGC as well as their different distributional effects. Special attention is paid to the urban-biased policies and city-county conflicts induced by the CGC system. By highlighting how economic and geographic conditions vary across space and over time, we explore how the CGC differently affect the welfare of different stakeholders.

Our findings shed light on the heated debates whether the CGC system should be replaced by, say, the PGC system. There seems to be a growing consensus supported by the central government to switch to the PGC system. But if our models are any guide, the choice between the CGC and PGC system boils down to the tradeoffs which vary over time and across space. Our findings thus call for prudence in abolishing the CGC system. Whether this regime should be reformed, removed, or retained depends on a range of factors which vary across regions and there is no one-size-fit-all formula for all regions. In general, developed regions may be more suitable for CGC because a large number of central cities can generate effective spillovers to surrounding rural areas. In recent years, the theme of development in these regions is furthering inter-jurisdictional integration. A growing trend among prefecture-level cities in developed regions is expanding themselves by converting neighboring counties into their urban districts. This change may help correct the bias caused by policies favoring urban districts without loosing the benefits of rural-urban integration. We relegate the discussion of this new type of jurisdictional change to the next chapter.

In contrast to developed regions, the CGC system may not bring about expected benefits to underdeveloped regions either because the city is itself too small and backward to generate positive spillover effects, or because vast distance and poor transport conditions thwart the potential benefits. Not only are the counties exploited by the city as a result of urban-biased policies, but the city is also burdened by the administrative cost in governing poor subordinates spread out over vast distances. For instance, some cities of western provinces have GDPs even less those of a town in the developed regions, but these cities have to govern many counties covering an

area hundreds or even thousands of square kilometers in size. In this case, bringing back the system of rural-urban separate administration may temporarily be a better choice for all the stakeholders.

For those regions that used to be backward but have been developing rapidly (e.g., some areas in the central provinces), the policy choice may be more difficult. Even though the CGC regime often created by the conversion of counties into cities did not work well in the past, some cities managed, partly through their urban-biased policies, to develop rapidly. They have turned around and are ready for generating significant spillovers benefiting surrounding rural areas. For instance, Ma'anshan City in Anhui Province used to be small town, but it has developed to a relatively large city with recorded GDP and GDP per capita six and three times respectively more than those of its subordinate counties in 2006 (*Anhui Statistical Yearbook*, 2007). In addition, transport conditions have also greatly improved as a result of massive investments in public infrastructure since the 1990s, partly thanks to the fiscal resources centralized by the city government. Just as the conditions needed for the CGC regime to work well have begun to emerge, replacing such a jurisdictional setup may only rob the counties of potential externalities from the rapidly developing urban hub after years of sacrifice they went through in support of urban development.

At the end of this chapter, we call for attention to an ongoing reform that may be related to the present debate whether or not to retain rural-urban unified administration. As previously mentioned, one reason for removing the CGC system is to restore separate administration for rural and urban areas. This type of administration is perceived as a general principle for organizing government systems across the world, allowing different types of governments to better support the different interests of rural and urban areas (see Liu, 2002). However, as introduced before, China's strategy of rural-urban separate administration from 1949 to the early 1980s had resulted in gaping disparities between the rural and urban areas, and the arrested development in the past three decades even has exacerbated the troubling gap. In response to the challenge of increasing rural-urban gap and the resulting

social conflicts, the central government has announced a reform to promote rural-urban coordination (*chengxiang tongchou*), with the goal of fostering the development of backward rural areas and narrowing rural-urban disparities. Based on experiments in Chengdu and Chongqing, the two regions selected for this experiment, the reform has key points to reinforce rural-urban economic integration and introduce advanced technology and fiscal resources from the urban to rural areas (National Development and Reform Commission, 2005). The focus is in particular on how to put under one roof planning, administration, infrastructure construction, public services and industrial development between the rural and urban sectors (*The 21st Century Economic Report*, June 9, 2009). This is a similar rationale used to underlie the spread of the CGC system in the 1980s and the 1990s.

Evidently, the reform of rural-urban coordination is at odds with the proposal of removing the CGC system. Which should we support, the CGC system or the reform of rural-urban coordination, although both are backed by the central government? Our answer is the same as before: it depends on the different conditions. In developed and some rapidly developing regions with large central cities, it may be time to foster rural-urban economic connections to introduce urban spillovers into rural areas; otherwise, the counties may be the first to suffer. Indeed, some counties under the recent PGC experiments have reported that they receive fewer aids from superior prefecture-level cities (Xu, 2008). For example, after Feng County is selected for the PGC experiment in Jiangsu, its superior, Xuzhou City, no longer supports this county in paying back government loans. The city likewise refuses to offer matching grants for earmarked fiscal transfers from the central and provincial governments (Duan, Li and Liu, 2008). Of course, such evidence can not support retaining CGC in those vast and underdeveloped regions, where binding the rural and urban areas together may fail the goal of rural-urban effective coordination. Instead, placing distant counties directly under the province and ensuring sufficient and timely fiscal transfers and subsidies are important to finance their basic expenditures for infrastructural construction and social security.

4.5 Appendix

4.5.1 Model Derivations for Merging Prefectures and Cities

Before Merging Prefectures and Cities

For household in jurisdiction i, $i = 1, 2$, the production is

$$y_i = (A_i + \gamma A_{-i})e_i^{1-\alpha}g_i^{\beta}$$

The household problem is:

$$\max_{e_i} u_i = (1 - t_c - t_d)(A_i + \gamma A_{-i})e_i^{1-\alpha}g_i^{\beta} - e_i$$

Solving this problem gives:

$$e_i^*(g_i) = (1 - t_c - t_d)^{\frac{1}{\alpha}}(A_i + \gamma A_{-i})^{\frac{1}{\alpha}}\alpha^{\frac{1}{\alpha}}g_i^{\frac{\beta}{\alpha}}$$

It follows that

$$y_i^*(g_i) = (A_i + \gamma A_{-i})e_i^{*1-\alpha}g_i^{\beta}$$

$$= (1 - t_c - t_d)^{\frac{\alpha}{1-\alpha}}(A_i + \gamma A_{-i})^{\frac{1}{1-\alpha}}\alpha^{\frac{\alpha}{1-\alpha}}g_i^{\frac{\beta}{1-\alpha}}$$

The problem for the county-level government i:

$$\max_{g_i} R_i = t_c y_i^*(g_i) - C(g_i)$$

$$= t_{ci}(1 - t_c - t_d)^{\frac{\alpha}{1-\alpha}}(A_i + \gamma A_{-i})^{\frac{1}{1-\alpha}}\alpha^{\frac{\alpha}{1-\alpha}}g_i^{\frac{\beta}{1-\alpha}} - F - cg_i$$

The first order condition is:

$$\frac{\partial R_{ci}}{\partial g_i} = 0 \Rightarrow$$

$$g_i^* = t_c^{\frac{1-\alpha}{1-\alpha-\beta}}(1 - t_c - t_d)^{\frac{\alpha}{1-\alpha-\beta}}(A_i + \gamma A_{-i})^{\frac{1}{1-\alpha-\beta}}\alpha^{\frac{\alpha}{1-\alpha-\beta}}\left[\frac{\beta}{(1-\alpha)c}\right]^{\frac{1-\alpha}{1-\alpha-\beta}}$$

The output is:

$$y_i^* = (1 - t_c - t_d)^{\frac{\alpha}{1-\alpha}}(A_i + \gamma A_{-i})^{\frac{1}{1-\alpha}}\alpha^{\frac{\alpha}{1-\alpha}}g_i^{*\frac{\beta}{1-\alpha}}$$

$$= t_c^{\frac{\beta}{1-\alpha-\beta}}(1 - t_c - t_d)^{\frac{\alpha}{1-\alpha-\beta}}(A_i + \gamma A_{-i})^{\frac{1}{1-\alpha-\beta}}\alpha^{\frac{\alpha}{1-\alpha-\beta}}\left[\frac{\beta}{(1-\alpha)c}\right]^{\frac{\beta}{1-\alpha-\beta}}$$

The equilibrium labor input is:

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$$c_i^* = (1 - t_i - t_d)^{\frac{1}{1-\alpha}} (A_i + \gamma A_{-i})^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} y_i^{\frac{1}{1-\alpha}}$$

$$= t_i^{\frac{1}{1-\alpha}} (1 - t_i - t_d)^{\frac{1}{1-\alpha}} (A_i + \gamma A_{-i})^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} \left[\frac{\beta}{(1-\alpha)c} \right]^{\frac{1}{1-\alpha}}$$

The equilibrium household utility is:

$$u_i^* = (1 - t_i - t_d) y_i^* - c_i^*$$

$$= t_i^{\frac{1}{1-\alpha}} (1 - t_i - t_d)^{\frac{1}{1-\alpha}} (A_i + \gamma A_{-i})^{\frac{1}{1-\alpha}} \left[\frac{\beta}{(1-\alpha)c} \right]^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} (1 - \alpha)$$

The equilibrium county-level government rent:

$$R_{ci}^* = t_i y_i^* - (F + cg_i^*)$$

$$= t_i^{\frac{1}{1-\alpha}} (1 - t_i - t_d)^{\frac{\alpha}{1-\alpha}} (A_i + \gamma A_{-i})^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left[\frac{\beta}{(1-\alpha)c} \right]^{\frac{1}{1-\alpha}} \frac{1 - \alpha - \beta}{1 - \alpha} - F$$

Equilibrium prefecture-level government rent:

$$R_{di}^* = t_d \cdot y_i^*$$

$$= t_d t_i^{\frac{1}{1-\alpha}} (1 - t_i - t_d)^{\frac{\alpha}{1-\alpha}} (A_i + \gamma A_{-i})^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left[\frac{\beta}{(1-\alpha)c} \right]^{\frac{1}{1-\alpha}}$$

After Merging Prefectures and Cities

After merging the prefecture and city, two county-level jurisdictions cooperate in the public good supply. The private production for household j in county i is

$$y_i = (A_i + \gamma' A_{-i}) e_{ij}^\alpha [G\Phi_i(\sigma; x)]^t, \quad i \in \{1, 2\}.$$

The household problem:

$$\max_{e_i} u_i = (1 - t_d - t_i) y_i(e_i, G, x) - e_i$$

$$= (1 - t_d - t_i)(A_i + \gamma' A_{-i}) e_i^\alpha [\Phi_i(\sigma; x)G]^t - e_i$$

f. o. c:

$$\frac{\partial u_i}{\partial e_i} = 0 \Rightarrow (1 - t_d - t_i)(A_i + \gamma' A_{-i}) \alpha e_i^{\alpha-1} [\Phi_i(\sigma; x)G]^t = 1$$

$$e_i^{**}(G, x) = (1 - t_d - t_i)^{\frac{1}{1-\alpha}} (A_i + \gamma' A_{-i})^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} [\Phi_i(\sigma; x)G]^{\frac{t}{1-\alpha}}$$

$$y_i^{**}(G, x) = (A_i + \gamma' A_{-i}) e_i^{**\alpha} [\Phi_i(\sigma; x)G]^t$$

$$= (1 - t_d - t_i)^{\frac{\alpha}{1-\alpha}} (A_i + \gamma' A_{-i})^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} [\Phi_i(\sigma; x)G]^{\frac{t}{1-\alpha}}$$

It follows that

$$R_1^{**}(G,x) = t_{ci}(1 - t_d - t_{ci})^{\frac{1}{1-\alpha}}(A_i + \gamma'A_j)^{\frac{1}{1-\alpha}}\alpha^{\frac{\alpha}{1-\alpha}}[\Phi_i(\sigma;x)G]^{\frac{1}{1-\alpha}} - S_i(F + cG)$$

Two governments then jointly determine the public good G and the ratio of sharing the public cost s through a Nash bargaining process:

$$\max_{G,s} R_1^{**}(G,x)R_2^{**}(G,x)$$

$$= \left\{\Lambda(A_1 + \gamma'A_2)^{\frac{1}{1-\alpha}}[\Phi(\sigma;x)G]^{\frac{1}{1-\alpha}} - sC(G)\right\}$$

$$\left\{\Lambda(A_2 + \gamma'A_1)^{\frac{1}{1-\alpha}}[\Phi(\sigma;D-x)G]^{\frac{1}{1-\alpha}} - (1-s)C(G)\right\}$$

where $\Lambda = t_c(1 - t_d - t_c)^{\frac{1}{1-\alpha}}\alpha^{\frac{\alpha}{1-\alpha}}$.

The first order conditions are:

$$\left[\Lambda(A_1 + \gamma'A_2)^{\frac{1}{1-\alpha}}\Phi(\sigma;x)^{\frac{1}{1-\alpha}}\frac{\beta}{1-\alpha}G^{\frac{\alpha+\beta-1}{1-\alpha}} - sc\right]$$

$$\left\{\Lambda(A_2 + \gamma'A_1)^{\frac{1}{1-\alpha}}[G\Phi(\sigma;D-x)]^{\frac{1}{1-\alpha}} - (1-s)(F + cG)\right\}$$

$$+ \left\{\Lambda(A_1 + \gamma'A_2)^{\frac{1}{1-\alpha}}[G\Phi(\sigma;x)]^{\frac{1}{1-\alpha}} - s(F + cG)\right\}$$

$$\left[\Lambda(A_2 + \gamma'A_1)^{\frac{1}{1-\alpha}}\Phi(\sigma;D-x)^{\frac{1}{1-\alpha}}\frac{\beta}{1-\alpha}G^{\frac{\alpha+\beta-1}{1-\alpha}} - (1-s)c\right] = 0$$

$$-(F + cG)\left\{\Lambda(A_1 + \gamma'A_2)^{\frac{1}{1-\alpha}}[G\Phi(D-x)]^{\frac{1}{1-\alpha}} - (1-s)(F + cG)\right\}$$

$$+ \left\{\Lambda(A_2 + \gamma'A_1)^{\frac{1}{1-\alpha}}[G\Phi(x)]^{\frac{1}{1-\alpha}} - s(F + cG)\right\}(F + cG) = 0$$

$$\Rightarrow \left\{\Lambda(A_1 + \gamma'A_2)^{\frac{1}{1-\alpha}}[G\Phi(D-x)]^{\frac{1}{1-\alpha}} - (1-s)(F + cG)\right\}$$

$$= \left\{\Lambda(A_2 + \gamma'A_1)^{\frac{1}{1-\alpha}}[G\Phi(x)]^{\frac{1}{1-\alpha}} - s(F + cG)\right\}$$

Substitute the result of the second condition into the first condition, we have

$$\left[\Lambda(A_1 + \gamma'A_2)^{\frac{1}{1-\alpha}}\Phi(\sigma;x)^{\frac{1}{1-\alpha}}\frac{\beta}{1-\alpha}G^{\frac{\alpha+\beta-1}{1-\alpha}} - sc\right]$$

$$+ \left[\Lambda(A_2 + \gamma'A_1)^{\frac{1}{1-\alpha}}\Phi(\sigma;D-x)^{\frac{1}{1-\alpha}}\frac{\beta}{1-\alpha}G^{\frac{\alpha+\beta-1}{1-\alpha}} - (1-s)c\right] = 0$$

$$\Lambda\frac{\beta}{1-\alpha}\left[(A_1 + \gamma'A_2)^{\frac{1}{1-\alpha}}\Phi(\sigma;x)^{\frac{1}{1-\alpha}} + (A_2 + \gamma'A_1)^{\frac{1}{1-\alpha}}\Phi(\sigma;D-x)^{\frac{1}{1-\alpha}}\right]G^{\frac{\alpha+\beta-1}{1-\alpha}} = c$$

$$G^{**}(x) = t_c^{\frac{1-\alpha}{1-\alpha-\beta}}(1 - t_d - t_c)^{\frac{1}{1-\alpha-\beta}}\alpha^{\frac{\alpha}{1-\alpha-\beta}}\left(\frac{\beta}{(1-\alpha)c}\right)^{\frac{1-\alpha}{1-\alpha-\beta}}\left[\sum_{i=1}^{2}(A_i + \gamma'A_j)^{\frac{1}{1-\alpha}}\Phi_i(\sigma;x)^{\frac{1}{1-\alpha}}\right]^{\frac{1-\alpha}{1-\alpha-\beta}}$$

Substitute this expression into the condition with respect to s, we have

$$2s(F + cG) = \Lambda G^{\frac{t}{1-\alpha}}\left[\Phi(\sigma;x)^{\frac{t}{1-\alpha}} - \Phi(\sigma;D-x)^{\frac{t}{1-\alpha}}\right] + (F + cG)$$

$$s = \frac{1}{2} + \frac{\Lambda G^{\frac{t}{1-\alpha}}\left[(A_1 + \gamma'A_2)^{\frac{t}{1-\alpha}}\Phi(\sigma;x)^{\frac{t}{1-\alpha}} - (A_2 + \gamma'A_1)^{\frac{t}{1-\alpha}}\Phi(\sigma;D-x)^{\frac{t}{1-\alpha}}\right]}{2(F + cG)}$$

The output is:

$$y_1^{\cdot\cdot}(x) = (1 - t_d - t_c)^{\frac{t}{1-\alpha}}\left(A_1 + \gamma'A_1\right)^{\frac{t}{1-\alpha}}\alpha^{\frac{t}{1-\alpha}}\left[\Phi_1(\sigma;x)G^{\cdot\cdot}\right]^{\frac{t}{1-\alpha}}$$

$$= t_c^{\frac{t}{1-\alpha-t}}(1 - t_d - t_c)^{\frac{\alpha}{1-\alpha-t}}\alpha^{\frac{t}{1-\alpha-t}}\left(\frac{\beta}{(1-\alpha)c}\right)^{\frac{t}{1-\alpha-t}}$$

$$\left(A_1 + \gamma'A_1\right)^{\frac{1}{1-\alpha}}\Phi_1(\sigma;x)^{\frac{t}{1-\alpha}}\left[\sum_{k=1}^{2}(A_k + \gamma'A_k)^{\frac{1}{1-\alpha}}\Phi_k(\sigma;x)^{\frac{t}{1-\alpha}}\right]^{\frac{t}{1-\alpha-t}}$$

The prefecture-level city government then chooses the optimal location of public good. It holds closer control over the fiscal revenues of the urban district, so the problem is

$$\max_s R_d = (t_d + \pi t_c)y_1^{\cdot\cdot} + t_d y_2^{\cdot\cdot} - \sigma D$$

$$= t_c^{\frac{t}{1-\alpha-t}}(1 - t_d - t_c)^{\frac{\alpha}{1-\alpha-t}}\alpha^{\frac{t}{1-\alpha-t}}\left(\frac{\beta}{(1-\alpha)c}\right)^{\frac{t}{1-\alpha-t}}\left[\sum_{i=1}^{2}(A_i + \gamma'A_i)^{\frac{1}{1-\alpha}}\Phi_i(\sigma;x)^{\frac{t}{1-\alpha}}\right]^{\frac{t}{1-\alpha-t}}$$

$$\left\{(t_d + \pi t_c)(A_1 + \gamma'A_2)^{\frac{1}{1-\alpha}}\Phi(\sigma;x)^{\frac{t}{1-\alpha}} + t_d(A_2 + \gamma'A_1)^{\frac{1}{1-\alpha}}\Phi(\sigma;D-x)^{\frac{t}{1-\alpha}}\right\} - \sigma D$$

The first order condition is:

$$\frac{\beta}{1-\alpha-\beta}\left[F(x) + F(D-x)\right]^{\frac{t}{1-\alpha-t}-1}\left[F'(x) - F'(D-x)\right]\left[\tau F(x) + F(D-x)\right]$$

$$+\left[F(x) + F(D-x)\right]^{\frac{t}{1-\alpha-t}}\left[\tau F'(x) - F'(D-x)\right] = 0$$

$$\frac{\beta}{1-\alpha-\beta}\left[F'(x) - F'(D-x)\right]\left[\tau F(x) + F(D-x)\right]$$

$$+\left[F(x) + F(D-x)\right]\left[\tau F'(x) - F'(D-x)\right] = 0$$

where $F(\cdot) = \Phi(\cdot)^{m/1-\alpha}$ and

$$\tau = \left[(t_d + \pi t_c)(A_1 + \gamma'A_2)^{1/1-\alpha}\right]\bigg/\left[t_d(A_2 + \gamma'A_1)^{1/1-\alpha}\right] > 1. \text{ Let}$$

$$\Theta = \frac{F(x) + F(D-x)}{\tau F(x) + F(D-x)}, \text{ the above condition reduces to:}$$

$$\frac{\beta}{1-\alpha-\beta}\left[F'(x)-F'(D-x)\right]+\Theta\left[\tau F'(x)-F'(D-x)\right]=0$$

$$\left(\frac{\beta}{1-\alpha-\beta}+\Theta\tau\right)F'(x)=\left(\frac{\beta}{1-\alpha-\beta}+\Theta\right)F'(D-x)$$

For any $\tau>1$, we have

$$x^{**}<\frac{D}{2}.$$

Proof: Let $\Delta=\left(\frac{\beta}{1-\alpha-\beta}+\tau\Theta\right)\Big/\left(\frac{\beta}{1-\alpha-\beta}+\Theta\right)>1$ for any $\tau>1$. Note

that $F'(\bullet)<0$, we have

$$F'(x^{**})>\Delta F'(x^{**})=F'(D-x^{**}).$$

Since $F''(\bullet)<0$, we get $x^{**}<D-x^{**}$, i.e., $x^{**}<D/2$.

The equilibrium public good supply is:

$$G^{**}=t_c^{\frac{1-\alpha}{1-\alpha-\beta}}\left(1-t_d-t_c\right)^{\frac{\alpha}{1-\alpha-\beta}}\alpha^{\frac{\alpha}{1-\alpha-\beta}}\left(\frac{\beta}{(1-\alpha)c}\right)^{\frac{1-\alpha}{1-\alpha-\beta}}\left[\sum_{i=1}^{2}\left(A_i+\gamma'A_{-i}\right)^{\frac{1}{1-\alpha}}\Phi_i(\sigma;x^{**})^{\frac{1}{1-\alpha}}\right]^{\frac{1-\alpha}{1-\alpha-\beta}}$$

The equilibrium output for household:

$$y_i^{**}=t_c^{\frac{\beta}{1-\alpha-\beta}}\left(1-t_d-t_c\right)^{\frac{\alpha}{1-\alpha-\beta}}\alpha^{\frac{\alpha}{1-\alpha-\beta}}\left(\frac{\beta}{(1-\alpha)c}\right)^{\frac{\beta}{1-\alpha-\beta}}\left(A_i+\gamma'A_{-i}\right)^{\frac{1}{1-\alpha}}$$

$$\Phi_i(\sigma;x^{**})^{\frac{\beta}{1-\alpha}}\left[\sum_{k=1}^{2}\left(A_k+\gamma'A_{-k}\right)^{\frac{1}{1-\alpha}}\Phi_k(\sigma;x^{**})^{\frac{1}{1-\alpha}}\right]^{\frac{\beta}{1-\alpha-\beta}}$$

The equilibrium labor input:

$$e_i^{**}=\left(1-t_d-t_{ci}\right)^{\frac{1}{1-\alpha}}\left(A_i+\gamma'A_{-i}\right)^{\frac{1}{1-\alpha}}\alpha^{\frac{1}{1-\alpha}}\left[\Phi_i(\sigma;x)G^{**}\right]^{\frac{\beta}{1-\alpha}}$$

$$=t_c^{\frac{\beta}{1-\alpha-\beta}}\left(1-t_d-t_{ci}\right)^{\frac{1-\beta}{1-\alpha-\beta}}\alpha^{\frac{1-\beta}{1-\alpha-\beta}}\left(\frac{\beta}{(1-\alpha)c}\right)^{\frac{\beta}{1-\alpha-\beta}}$$

$$\left(A_i+\gamma'A_{-i}\right)^{\frac{1}{1-\alpha}}\Phi_i(\sigma;x^{**})^{\frac{\beta}{1-\alpha}}\left[\sum_{k=1}^{2}\left(A_k+\gamma'A_{-k}\right)^{\frac{1}{1-\alpha}}\Phi_k(\sigma;x)^{\frac{1}{1-\alpha}}\right]^{\frac{\beta}{1-\alpha-\beta}}$$

The equilibrium utility is:

$$u_i^{**} = \left(1 - t_d - t_r\right) y_i^{**} - c_i^{**}$$

$$= t_r^{\frac{r}{1-\alpha-r}} \left(1 - t_d - t_r\right)^{\frac{1-\alpha}{1-\alpha-r}} \alpha^{\frac{\alpha}{1-\alpha-r}} \left(1 - \alpha\right) \left[\frac{\beta}{(1-\alpha)c}\right]^{\frac{r}{1-\alpha-r}}$$

$$\left(A_i + \gamma' A_i\right)^{\frac{1}{1-\alpha}} \Phi_i(\sigma; x^{**})^{\frac{r}{1-\alpha}} \left[\sum_{k=1}^{2} \left(A_k + \gamma' A_k\right)^{\frac{1}{1-\alpha}} \Phi_k(\sigma; x)^{\frac{r}{1-\alpha}}\right]^{\frac{r}{1-\alpha-r}}$$

4.5.2 The Model of Converting Prefectures to Cities

The derivations are similar to those presented above, so we omit them for simplicity.

Chapter 5 Converting County-Level Jurisdictions into Urban Districts and Land Requisition

While the debate on the CGC regime continued to rage, the conversion of county-level jurisdictions into urban districts has picked up pace since the late 1990s.[63] Insofar as this regime change further reinforces the political and economic strength of prefecture-level cities in the local jurisdictional systems, it is ironic that there are growing voices to replace the CGC. It is interesting to find out what motivates this regime change. The purpose of this regime change is allegedly twofold (recall the discussion on the case of Changzhou and Yancheng in Chapter 1). One of them is to centralize administrative powers to the prefecture-level city governments by placing the counties and county-level cities under their tighter control, thereby furthering city-county integration and solving growing city-county conflicts induced by the CGC system. The other is to facilitate the requisition of rural land in support of speedy local industrialization and urbanization by transforming rural jurisdictions into urban ones. As the analysis for the tradeoffs related to administrative centralization is quite similar to that in the previous chapters, this chapter focuses only on developing a new model to explore the issues of land requisition.

The conversion of county-level jurisdictions into urban districts has its share of pros and cons. Although actively driven by prefecture-level city governments, the regime change has often faced opposition from the governments of county-level jurisdictions that are to be converted into districts. In what follows, we will look into the motivations behind of this regime change and its distributional effects. Section 5.1 provides a background for this regime change and examines the two motivations

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[63] The number of districts increased very slowly prior to the reform (from 349 in 1949 to 418 in 1977), but the reform period since the late 1970s has witnessed a sharp increase in the number of districts. From 1977 to 2006, its number is doubled from 418 to 856. From 1985 through 2005, a total of 87 counties/cities were converted into district, among which 67 cases occurred after 1996.

mentioned above with a particular focus on the issues of land requisition. In Section 5.2, with land introduced as a productive factor, we develop a new model in which rural land is requisitioned and utilized by the city government for both industrial and real estate development. The model will highlight the distributional effects of this regime change on the welfare of different stakeholders. Section 5.3 concludes this chapter.

5.1 Background and Issues

The conversion of county-level jurisdictions into urban districts is not new. It dates back to the early 1980s as a byproduct of the introduction of the CGC regime. As mentioned before, some counties or county-level cities are redesigned as urban districts when prefecture-level cities are created. There is a surge in this type of jurisdictional changes in tandem with the rapid spread of CGC during the 1980s through the 1990s. For instance, in a total of 181 cases of converting county-level jurisdictions into districts from 1985 to 2000, nearly two-thirds are the results of the CGC (see Table 5-1). The related tradeoffs were fully examined and their analyses were presented in the previous chapter.

In recent years, however, this type of regime change was increasingly driven by existing prefecture-level cities' quest for expansion and development. A number of county-level jurisdictions were incorporated into the existing prefecture-level cities. As the central government since 2003 has imposed restrictions on this type of regime reform with the intention of protecting arable land, a second way was increasingly used by converting parts of a county-level jurisdiction (e.g., several towns or even villages) into districts.[64] As Table 5-1 shows, these two types of the regime change accounted for the majority of the cases (79.1 percent of the total 115 cases) between 2001 and 2005.

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[64] For instance, Quanzhou City in Fujian Province took four towns away from Hui'an County and set up Quangang District in 2000.

Table 5-1 The Number of Cases Converting County-Level Jurisdictions into Districts

Year	Total Cases	A result of creating prefecture-level cities for employing CGC	Converting the whole jurisdiction into districts of existing cities	Converting a part of jurisdiction to districts of existing cities
1985	19	15	1	3
1986	4	3	1	0
1987	9	3	3	3
1988	14	11	2	1
1989	2	1	1	0
1990	0	0	0	0
1991	2	2	0	0
1992	12	5	6	1
1993	6	6	0	0
1994	21	16	3	2
1995	10	5	3	2
1996	12	8	1	3
1997	14	7	5	2
1998	10	5	5	0
1999	11	9	2	0
2000	35	23	11	1
2001	34	6	15	13
2002	30	10	16	4
2003	21	7	7	7
2004	16	1	5	10
2005	14	0	0	14

Source: Prepared by the author based on data from *China Administrative Jurisdiction Net* (*Zhongguo Xingzheng Quhua Wang*).

Prefecture-level city governments have actively promoted the conversion of

county-level jurisdictions into districts since the late 1990s (see Chung and Lam, 2004). This regime change is mainly intended to resolve the growing city-county conflicts induced by the existing CGC regime and to cater to the growing demand for rural land. When threatened by *developed* but unruly subordinate counties or county-level cities, prefecture-level cities tend to convert them into districts in order to centralize administrative powers. However, if an *undeveloped* rural county is involved, it is more likely that the city has an eye on the county's abundant land resources.

We first briefly introduce how the conversion of county-level jurisdictions into districts facilitates centralizing administrative powers and the effects of this change on different stakeholders. A county or county-level city formally belongs in the same tier of administrative hierarchy as an urban district, but it is relatively more autonomous, often possessing greater decision-making powers in local affairs (Wei and Liu, 2004). Instead, being an integral part of prefecture-level cities, an urban district is under tighter control and coordination from above (see Tang, 2004; Xu, 2004; Shi, 2005).[65] Converting a county or county-level city into a district therefore aids the city government in maintaining a tighter grip on this subordinate jurisdiction with several effects. First, local economies are further integrated as a result of enhanced coordination.[66] An example is Foshan City which removed all residual toll stations between subordinate jurisdictions after four subordinate county-level cities were converted into districts in 2002. Second, the bias towards urban areas in policy making caused by the CGC regime is commonly alleviated as the converted county or county-level city is no longer discriminated against by the city government. For

[65] Urban districts have been granted much more autonomy than before (see Liu, Zhang, and Ma, 2002). Prior to the reform, the district government was a representative agent of the city authority, with a duty mainly resting on fulfilling mandates from above. From the late 1970s to 1988, more power was devolved to district governments, but only to a very limited degree. Since 1988, the city's administrative system has been more decentralized and urban district governments have been granted more autonomy and power. Nowadays, the role and position of the urban district government vary from city to city as there are no general laws or regulations defining its power and duties. In some cities, the district even acquires such important power as urban construction, economic planning, independent financing and land use, etc. For example, district governments in Shanghai usually hold much more power than their counterparts in Tianjin. District governments in Shanghai are authorized to approve FDI projects below US$ 30 million, and this level is only US$ 5 million in Tianjin.

[66] For instance, after converting some of county-level cities like Shunde and Nanhai into districts, the Foshan City Government eliminated residual inter-regional toll stations and built a ring-road connecting its districts, improving the transportation networks between them.

example, Guangzhou began to devote its fiscal resources to develop the port and subway transportation after Panyu was converted into a district. Third, the political and fiscal ties between the city and counties are consolidated and the city-county conflicts frequently witnessed under the CGC are reconciled. For instance, Wujin sought independence throughout the entire 1990s, but it abandoned such attempts after being converted into a district of Changzhou in 2003.

Administrative centralization produces different effects on various stakeholders. Prefecture-level city governments may gain the most. Long-lasting city-county conflicts are resolved after disgruntled subordinates and potential rivals are transformed into integral parts of the prefecture-level city.[67] Not only is the city enlarged in size,[68] but it is strengthened in terms of economic and fiscal capacity as well. In contrast, county-level governments usually oppose this regime change because their autonomy in managing local affairs is compromised and their fiscal resources are likely to be under the tighter control of the city governments (Dai, 2003).[69] For instance, Shunde has been submitting one billon yuan worth of land transfer fees and 10 percent of its fiscal revenues each year to Foshan's fiscal coffers since 2008 (*Southern Metro Daily*, Jan. 9, 2009). However, the residents of county-level jurisdictions may not always oppose the regime change. Enhanced economic integration and the removal of urban-biased policies may be beneficial to the local economy, thereby benefiting the residents. For instance, after Xiaoshan and Yuhang were converted into the districts of Hangzhou in 2002, their residents have received better transportation services. They likewise gained by more equally sharing educational services supplied by the city authority.

In addition to centralizing administrative powers, the conversion of county-level jurisdictions into urban districts helps requisition rural land for industrial and urban

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[67] In some cases it also reduces the number of subordinate governments and saves administrative costs by annexing a county/city into existing districts (Dai, 2003). For example in Nanjing City, Pukou District and Jiangpu County were consolidated into one district, and so did Dachang District and Liuhe County.

[68] For instance, after converting Wujin into a district, the urban area of Changzhou was greatly enlarged from 280 km² to 1864 km², becoming the second largest in South Jiangsu.

[69] For an extreme case in 2005, many officials in Daye, a county-level city of Hubei Province, even organized street demonstration in opposition to transforming Daye into a district of Huangshi City (*Sohu Net*, Feb. 25, 2006).

development, especially when a rural county to be incorporated as a district has an abundant supply of land. As pointed out by Chung and Lam (2004), the accelerated pace of this regime change since the 1990s has been largely driven by the growing demand for land, all the more so after the central government imposed more stringent control over land requisition from the mid-1990s onward (see Deng, 2005; Wang, 2005)[70].

This regime change facilitates land requisition with the help of China's specific land systems. By law,[71] land in China is categorized into urban state-owned land and rural collective land. For a city to acquire extra land in support of urbanization and industrialization, it must transform rural collective land into urban state-owned land through land requisition (Luo, Yan and Chen, 2004).[72] Converting rural counties into districts facilitates land requisition in several ways. First, being an urban jurisdiction, a district is permitted to set aside more land for industrial and urban development. Transforming a county into a district thus offers an opportunity to revise the land use plan.[73] Second, the regime change transforms rural population into urban population, generating more quotas for requisitioning rural land. For example, if 50,000 rural residents become urban residents, a city is permitted to requisition 300 to 600 hectares of rural land for urban construction.[74] Third, rural collective land automatically becomes state-owned urban land if the city grants the rural residents non-agricultural *hukou*.[75]

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[70] Due to the large benefits in land requisition, rural land was excessively requisitioned in the 1980s and 1990s, resulting in a sharp decrease in the area of arable land and serious conflicts between local residents and governments (Fang and Sun, 2003; Luo, Yan and Chen, 2004). To reconcile such conflicts and protect arable land for food security, the central government began to restrict land requisition. Measures to protect arable land include a mandatory plan in "balancing requisition and replenishment" (*zhanbu pingheng*), setting aside the so-called "basic arable land" which is off limit to nonagricultural uses, establishing a highly centralized land use planning and approval system (*tudi shiyong guihua shenpi zhidu*). These measures produced an immediate and significant effect. For example, in 2004's macro-economic adjustment, seventy percent of planned industrial parks and 64.5 percent of planned area were abolished (Wang, 2005), thereby increasing cropping area by 2.2 million hectares (Deng, 2005).

[71] "Land in the cities is owned by the state" and "land in the rural and suburban areas is owned by collectives." See Article 10 in *Constitution of The People's Republic of China*, the English version, compiled by the Bureau of Legislative Affairs of the State Council of the People's Republic of China.

[72] In some southern provinces like Guangdong, rural collectives often directly rent land. But it is in fact illegal by law and the concerning contracts are usually declared invalid (Luo, Yan and Chen, 2004).

[73] According to the *Land Management Code*, all levels of governments should compose an master plan for land (*tudi liyong zongti guihua*) (Article 17). Those at the county level should further specify detailed use (Article 20).

[74] According to relevant regulations, each additional urban resident corresponds to a construction land quota of 60~120 m². See the *Classification of Urban Land Use and Standards for Construction Land Planning* (*chengshi yongdi fenlei yu guihua jiansheyongdi biaozhun*), issued by the National Department of Construction in 1990.

[75] See Item 5 of Article 2, *Provisional Regulations for Land Management Code*.

For local governments, land requisition plays a strategic role in supporting local economic development and public finances. Inexpensive land through requisition is critical in attracting outside investments to boost industrial development, especially if land in the central urban area has been exhausted (Bian, Wu and Liu, 2005). For instance, after Yandu County was converted into a district of Yancheng City, approximately 21.6 km^2 of land was allotted for the establishment of the Western Industrial Park, attracting hundreds of enterprises for several years (*Yanfu People Daily*, August 15, 2006). Governments may not directly receive sizable revenues in this case because they are forced to reduce land prices in intense inter-jurisdictional competition for footloose investment (see Guo, 2002). [76] However, if local governments successfully attract investments, land devoted to industrial development often ends up enriching their fiscal coffers through taxation and creating employment.

Land requisition likewise boosts local public finances through the sales of land slated for real estate development. The government not only directly receives a large amount of revenues from land transfer but collects a significant amount of taxes and fees from land-related industries as well (e.g., taxes on real estate and construction industry, see Table 5-2 for a summary of land-related revenues). These taxes play an increasingly crucial role in local public finance in particular since the central government carts off a larger share of taxes through the 1994 tax reform. They even account for more than 40 percent of budgetary revenues in some cities (*21st Century Economic Report*). For example, in Shaoxing of Zhejiang Province, taxes from the construction and real estate industry (including business tax and company income tax) were pegged at roughly 0.27 billion yuan, accounting for nearly one-fifth of local fiscal revenues (Liu and Jiang, 2005). In addition, land-related fees have become the chief source of extra-budgetary revenues since the late 1990s. In several cities, these even accounted for over half of total local extra-budgetary revenues (Liu and Jiang, 2005). In recent years, with the establishment of the land reserve system (*tudi chubei*

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[76] For instance, land prices in the industrial parks of Suzhou in Jiangsu Province are usually one third to one tenth of market values.

zhidu), requisitioned land has also been added to land banks and then employed as collaterals by local governments for securing bank loans in financing rapid urban development.[77] For instance, in Jinhua City of Zhejiang Province, 17 billion yuan out of 23.3 billion yuan worth of urban construction expenditures from 1999 to 2003 were from bank loans supported by mortgaged land (Liu and Jiang, 2005).

Table 5-2 Some Land-Related Taxes and Fees

Budgetary Revenues	Direct taxes	Urban land using tax (*Chengzhen Tudi shiyong shui*)
		Tax on contracts (*Qi shui*)
		Tax on the use of arable land (*Gengdi zhanyong shui*)
		VAT on land (*Tudi zengzhi shui*)
	Taxes on related industries	Taxes on real estate and construction industry
Extra-budgetary Revenues	Direct revenues	Land transfer fee (*Tudi churang jin*)
		Land renting fee (*Tudi zulin shouru*)
	Related fees	Arable land farming fee (*Gengdi kaiken fei*)
		Land re-farming fee (*Gengdi fuken fei*)
		New construction land using fee (*Xinzeng jianshe yongdi youchang shiyong fei*)
		land compensations fee (*Tudi shiyong buchang fei*)

Source: Prepared by the author according to relevant tax codes and regulations.

The local government often benefits from land requisition at the expense of rural

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[77] In 1997, Hangzhou City, the capital of Zhejiang Province, took the lead in setting up the land reserve center (*tudi chubei zhongxin*) with the intention of buying back urban land used by moribund state-owned enterprises. By doing so, enterprises got enough money to pay off debts and laid-off workers while the government obtained land for urban development. In July 1998, the National Department of Land Resources introduced Hangzhou's experience to local governments in an internal bulletin. In May 2001, the State Council issued *A Notice on Strengthening Management of State-owned Land Property* (guanyu jiaqiang guoyou tudi zichan guanli de tongzhi, State [2001] no. 15), requiring local governments to set up land reserve systems if possible and pushing local banks to provide financial supports for such an endeavour. Local governments responded actively to set up land reserve systems. However, there are two perverse effects, .Rather than buying back urban land, rural land has been unscrupously requisitioned especially since 2001 not least because rural land is much cheaper. For example, the center of Shaoxing county has reserved 324.89 hectares from 1999-2003, 74.2 per cent of which were rural collective land (Liu and Jiang, 2005).

residents. Using "public interest" by the government as an excuse to requisition land, rural residents are not paid the market value of their land but receive compensation for the loss of output derived from their land; this is usually far less than the market value.[78] A survey by Ni (2005) demonstrates that the compensation level varies from 3,000 to 30,000 yuan per *mu* whereas the average land transfer price is over 180,000 yuan per mu.[79] Even worse, only 5 to 10 percent of compensation finally reaches the peasants who have lost their land (Liu and Ge, 2002).[80]

In the following section, we develop a model to capture the above discussions on the motivations and tradeoffs induced by the conversion of county-level jurisdictions into urban districts. As mentioned at the beginning of this chapter, the model and tradeoffs corresponding to the motivation of administrative centralization are fairly similar to those presented in the previous chapters, so below we only develop a model focusing on land requisition.

5.2 The Model of Land Requisition

The model to be presented in this section attempts to capture the driving forces behind the recent scramble to transform county-level jurisdictions into districts. Given our focus on the strategic role of land in local industrial development and public finance, the model differs from those in previous chapters in a number of ways. Land replaces the public good as a factor of production.[81] Shifting our focus away from the strategic interactions between different levels of governments, we

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[78] The compensation is merely 6~10 times of the average annual product value in the previous three years. See Article 47 of the *Land Management Code*. The resettlement aid is 4~6 times, and the attachment and crop aid is decided by province-level governments. In a free market, the value of rural land near the urban area not only comes from rents of arable land, but also includes discounted value of expected land rents for possible urban use (Ding, 2002). Across the world, compensation for land requisition usually includes market price of land, requisition loss, resettlement cost and move cost, etc (see Chen, 2004).

[79] The calculation is based on data from *China Land Resources Yearbook 2004*. An even more astounding number is that the average transfer price is eighteen times as much as the requisition cost, as disclosed by a survey in more than thirty cities (*Liaowang News Weekly*, Sept. 12, 2005, p26).

[80] It is estimated that 60~70 percent of the compensation are held back by the governments of each level, 25~30 percent allocated to the village collectives. Default or cut-down in paying compensation and unfairness in allocating compensation fund are pervasive. In a survey on 34 freeway construction projects, the National Audit Office found that a total amount of 1.639 billion yuan land-requisition compensations were siphoned off (*Xinhua Net*, June 29, 2006).

[81] We can alternatively assume both a public good and land in production, but this may largely complicates model derivation without shedding more light on our analysis.

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emphasize the important role of the local government as monopolizing in the supply of urban land, requisitioning and then allocating collective land to different usesages to advance their self-interests.

We begin with rural residents using their land for agricultural production. Then a city government requisitions some land and allocates it for developing industry and real estate. Comparing results under the two scenarios highlights the tradeoffs induced by this regime change as well as its distributional effects on the different stakeholders. After land requisition, the rural resident who lost his land will abandon agricultural production and receive compensation. The land requisitioned may then be utilized as input for industrial production or consumed by a representative urban household as housing. The urban household may be perceived as an investor and industrial worker attracted by the favorable policies offered by local governments. As a monopolistic supplier of urban land, the city government decides the amount of land to be utilized for industrial production and urban housing consumption. As indicated above, industrial land is commonly offered at low prices to attract investment. On the other hand, land for residential purpose is sold to developers at prevailing market prices. To render our model tractable, we do not explicitly model a real estate sector equipped with developers bidding for urban land. Instead, the urban household is assumed to buy land directly from the city government. Being the only supplier of land, the city government behaves like a monopoly restricting the supply of land for residential use so as to maximize its "profit".

5.2.1 The Scenario before Land Requisition

We try to keep our modeling of the rural sector as simple as possible, so we assume that there is a rural sector in the county with land endowment $\bar{H}$ prior to the regime change. The reprehensive rural household uses land endowment for agricultural production. For simplicity, we assume that the output is easily $y(\bar{H})$, which is subject to taxation by the county government with a rate t. The fiscal revenue for the government is thus $R_r^* = t \cdot y(\bar{H})$, and the income left for the consumption of the

rural resident is $u_r^* = (1 - t) \cdot y(\bar{H})$.[82] With these results in mind, we proceed to examine what will happen when the city government requisitions and utilizes this rural land.

5.2.2 The Scenario after Land Requisition

After the county in question is converted into an urban district, the city government can requisition a part of the land. Land requisitioned is either for industrial or residential use, so interactions between the household and the government assume two forms. For industrial production, the city government selects a policy combination of tax rate and land supply (t_u, h_1), while the urban household chooses its labor input e_u. For real estate development, the city government, which controls the residential land supply, chooses the residential land price p, to maximize revenues, and the urban household determines the amount of land purchased for residence.[83] The game is summarized in Table 5-3.

Table 5-3 The Game and Choice Variables of Different Stakeholders in Land Requisition

Game Stage	Agent	Choice Variables
1	The city government	Choose tax rate t_u, supply land h_1 to industrial production and set the price of land for real estate p
2	The producer-household	Supply labor input e and choose the demand for real estate

We assume that the urban household consumes an industrial good as well as

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[82] We can alternatively allow the tax rate and the output endogenously chosen by the stakeholders following the approach used in previous chapters. But this may not shed additional light on the present model which focuses on the interactions between the city government and the urban sector with respect to the allocation of requisitioned land.

[83] It makes no difference whether the city government chooses the residential land supply or the residential land price; for a given demand function for residential housing, the residential land supply is determined once the price is fixed and vice versa.

housing.[84] Its utility is as follows:

$$u_u = C_u + V_u(h_0) - e_u, \tag{5.1}$$

where C_u is the consumption of industrial good, V_u is utility from house consumption h_0, and $-e_u$ is disutility caused by labor input.

The industrial good is produced by the household using labor input e_u and land input h_1 supplied by the city government. To simplify our analysis, we assume that land for industrial use is allocated to producers free of charge. This assumption approximates the Chinese context where local governments commonly set extremely low and even "zero" land prices to attract footloose investments. We assume the production function has a log-linear form and is strictly concave:

$$y_u(e_u, h_1) = e_u^\alpha h_1^\beta, \tag{5.2}$$

where parameter α and β capture the productivity of labor and land in industrial production, respectively. The household pays tax at a rate t_u set by the city government, retaining $(1 - t_u) \cdot y_u(e_u, h_1)$ as its income.

Utility from house consumption assumes the following functional specification:

$$V(h_0) = h_0^\delta, \tag{5.3}$$

We assume $0 < \delta < 1$ so that $V' > 0$ and $V'' < 0$. The household is a price taker and chooses the amount of housing at the price p. Its consumption is thus equal to its income net of the payment for housing consumption:

$$C_u = (1 - t_u) \cdot y_u(e_u, h_1) - p \cdot h_0. \tag{5.4}$$

With the above components taken collectively, the household chooses e_u and h_0 to maximize utility. Solving this problem yields the two reaction functions of the government policies as follows:

$$e_u^{**}(t_u, h_1) = (1 - t_u)^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} h_1^{\frac{\beta}{1-\alpha}}, \tag{5.5}$$

$$h_0^{**}(p) = \left(\frac{\delta}{p}\right)^{\frac{1}{1-\delta}}.$$

It is clearly from (5.5) that the household's labor effort negatively depends on the tax

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[84] In the real world, the government sells land to real estate enterprises, and these enterprises develop real estate and sell to consumers.

rate, capturing the disincentive effect of government's taxation. On the other hand, a greater amount of industrial land h_1 induces an increased input of labor, boosting output and thus tax revenues. Local governments therefore have the incentive to supply cheap industrial land to attract investments. As for housing consumption, $h_0^{**}(p_0)$ is the demand curve for housing and $\eta = 1/(1 - \delta)$ is the corresponding price elasticity of demand.

Substituting (5.5) into (5.2), we obtain the industrial output as a function of government policies t_u and h_1. Tax revenue for the city government is thus $t_u \cdot y_u^{**}(e_u, h_1)$. The government likewise generates revenues $p \cdot h_0^{**}(p)$ from land sales. Naturally, the government pays compensation for land requisition. As mentioned above, compensation is not determined according to the market value of land, but is based on legal standards. We assume that this cost is c for each unit of requisitioned land, in which case the government pays $c \cdot (h_1 + h_0)$. The city government chooses t_u, h_1 and p to maximize its fiscal rent, defined as the total revenues net of land requisition cost. Solving this problem arrives at:

$$t_u^{**} = 1 - \alpha, \tag{5.6}$$

$$h_1^{**} = \alpha^{\frac{2\alpha}{1-\alpha-\beta}} \left(\frac{\beta}{c} \right)^{\frac{1-\alpha}{1-\alpha-\beta}},$$

$$p^{**} = \frac{c}{\delta}.$$

Since $\delta = 1-(1/\eta)$, p^{**} is high if the demand for residential housing is inelastic. This is in fact the pricing strategy of a monopolist. The equilibrium demand for housing is:

$$h_0^{**} = \left(\frac{\delta^2}{c} \right)^{\frac{1}{1-\delta}}. \tag{5.7}$$

With regard to the supply of land for industrial use, the city government needs to strike a balance between the cost of land requisition and the revenues derived from industrial output on the one hand and the revenues from land sales on the other. Clearly, the government has more incentives to supply requisitioned land for industrial production if the productivity of labor or land (i.e., α and β) and thus the marginal tax revenue is high. This is to be set against the marginal cost of land acquisition c. In choosing h_0, the city government similarly considers the marginal

cost of land requisition c and the elasticity of housing demand because $\delta = 1-(1/\eta)$. While a high c may induce the city government to requisition a lesser amount of land, low demand elasticity for housing (corresponding to a large value of δ) prompts the city government to supply less land for residential use in order to boost the housing price.

Using (5.6) and (5.7), we derive the equilibrium utility for the urban household:

$$ u_u^{**} = (1-\alpha)\alpha^{\frac{1-\alpha-\beta}{1-\alpha-\beta}}\left(\frac{\beta}{c}\right)^{\frac{1}{1-\alpha-\beta}} + (1-\delta)\left(\frac{\delta^2}{c}\right)^{\frac{\delta}{1-\delta}}. \tag{5.8} $$

The equilibrium fiscal rent for the city government is:

$$ R_u^{**} = (1-\alpha-\beta)\alpha^{\frac{\beta}{1-\alpha-\beta}}\left(\frac{\beta}{c}\right)^{\frac{1}{1-\alpha-\beta}} + \left(\frac{c}{\delta}-c\right)\left(\frac{\delta^2}{c}\right)^{\frac{1}{1-\delta}}. \tag{5.9} $$

It is worth noting that both the equilibrium household utility and the city government rent are decreasing in the land requisition cost c, implying that they receive more benefits if land is requisitioned at a lower price. Evidently, high compensation for the land requisitioned increases the income of the peasants losing their land. Therefore, the interests of the city government and urban households are totally at odds with those of the rural residents, which may help explain the fierce conflicts between them when land requisition is in question.

For the rural resident, if all of his land is requisitioned and used by the city government, the peasants only receive compensation $c\cdot(h_0^{**} + h_1^{**}) = c\bar{H}$. Otherwise, if $\bar{H} > h_0^{**} + h_1^{**}$, the rural resident still uses the rest of land for agricultural production. His utility $u_r^{**} = c\cdot(h_0^{**} + h_1^{**}) + (1-t)\cdot y(\bar{H} - h_0^{**} - h_1^{**})$. In this case, if we assume that the county government cannot share the fiscal revenues derived from land requisition, it collects a tax on the remaining agricultural output, $R_r^{**} = t\cdot y(\bar{H} - h_0^{**} - h_1^{**})$.

5.2.3 The Distributional Consequences

This subsection is intended to highlight the effects of the regime change on the interests of concerned stakeholders. In essence, land requisition effectively leads to a

redistribution of land-related incomes between the different stakeholders. In the urban sector, the city government gains with a larger land supply which may be used to boost industrialization and fiscal revenue. The land at subsidized prices (free in the present context) boosts industrial production, thereby benefiting urban enterprises and residents (the urban household in our model). In Yancheng's case, using requisitioned land in Yandu County, the city developed its chemical and automobile industry and offered better and inexpensive housing to its growing urban population. At the same time, the city government collects a large amount of revenues from industrial taxes and sales of land for developing real estate. These benefits for urban residents and the government are increasingly significant when the compensation standard for land requisition is artificially suppressed.

In contrast, rural residents are generally the losers in land requisition. Deprived of their land, they quit their main source of livelihood and thus suffer income losses from the lack of agricultural production. If they receive low monetary compensation for the land requisitioned, they may be worse off. By deriving $u_r^{**} - u_r^* = c \cdot (h_0^{**} + h_1^{**}) + (1 - t) \cdot [y(\bar{H} - h_0^{**} - h_1^{**}) - y(\bar{H})]$, we demonstrate that the peasants' resulting welfare depends on whether or not the output loss can be sufficiently offset by the compensation which, in turn, hinges on c. In our model, the outcry against land grabs in recent years revolves around the question of whether c is exceedingly low. In some developed provinces such as Zhejiang, Jiangsu and Guangdong, some rural residents close to urban centers may be well compensated when their land is requisitioned for developing high value-added business and residential real estate. However, Chinese local governments are inclined to set low compensation standards for the land requisitioned, especially industrial land far from urban centers. The poorly paid rural residents are thus often unlikely to benefit from the arrangement, resorting to organized demonstrations that oppose land requisition. These have become rampant in many developing areas across China in recent years. In a number of cases, demonstrations have even evolved into violent conflicts between residents and the local governments, an example of which is the Taishi Village of Panyu District in Guangzhou.

Interestingly, the county government like the peasants may also be the loser. Our model assumes that the county government is unable to share the fiscal revenues derived from land requisition, as it is left to tax a shrinking agricultural tax base. As a result, its revenues decrease, $R_r^{**} < R_r^{*}$. This may be true in many cases. For example, city governments in various regions utilize the requisitioned land to construct industrial parks which are under their direct control, and fiscal revenues collected in these parks are usually funneled into the city's, instead of the county's, fiscal coffers. Additionally, city governments often largely centralize the revenues of land transfer for real estate. Of course, in an effort to reduce the county governments' strong oppositions to the regime change and gain their assistance in land requisition, the city government may alternatively allow some county governments to share a number of benefits stemming from the development of requisitioned land. For example, county governments may be allowed to retain a part of revenues from land transfer. In this case, the county governments may be partly compensated for their loss.

5.3 Concluding Remarks

This chapter explored the regime change of converting county-level jurisdictions into urban districts largely driven by the motivations of centralizing administrative powers and requisitioning rural land. Whichever motivation is involved, the city government generally has the upper hand, whereas the county governments and rural residents are likely to suffer. Such divergent distributional effects on the different stakeholders shed light on the reason behind the conflicts induced by this type of regime change. In particular, we addressed the issues related to land requisition, which is made possible by China's specific land ownership and transfer system. As our model shows, being a monopolistic buyer of rural land and a monopolistic supplier of urban land, local governments exploit a large amount of benefits from land requisition, thereby motivating them to excessively seize rural land to boost industrialization and urbanization and finance their rapidly growing expenditures.

However, reality is more complicated than what has been depicted by our models. There may be motivations other than administrative centralization and land requisition driving prefecture-level cities to convert county-level jurisdictions into their districts. For example, certain cities may primarily seek to expand their geographic and population size to arbitrarily create "large" cities in order to spawn political rewards. A case in point is Foshan City which began to pursue the title of "relatively large city" (*jiaoda de shi*) with the intention of acquiring increased local legislative powers.[85] On occasion, the arbitrary creation of large cities likewise serves the purpose of safeguarding a city's status in inter-jurisdictional competition. For example, Hangzhou became the second largest city in the Yangtze River Delta by merging Xiaoshan and Yuhang, thereby acquiring unchallengeable advantages over Ningbo City. Similarly, Guangzhou strengthened itself in its competition with Shenzhen by merging Panyu and Huadu in 2000.

Our model demonstrates that the county-level governments may oppose being converted into districts for fear of compromising their autonomy. In reality, however, this regime change may be desirable for certain governments. At times, converting a backward county into a district of a developed city may induce a sizeable amount of fiscal aid. For example, Gaoling County in Shaanxi Province has attempted for several years to be converted into a district of Xi'an City, expecting subsidies to compensate for its fiscal shortfall (*Huashang Daily*, June 10, 2004). Converting county-level jurisdictions into districts may likewise earn political benefits for involved officials. We again look into the case of Gaoling. As Xi'an is a deputy-provincial-level city,[86] its districts are at a deputy-prefecture level but its counties are still at a county level in administrative hierarchy. The conversion of a county into a district may therefore allow its officials to rise through the ranks (*Huashang Daily*, June 10, 2004).

The outcome of land requisition is likewise less determinate as our model suggests. Utilizing land for industrial production theoretically increases land

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[85] In China, if a city obtains the title of "relatively large city", it is granted more local legislative power.

[86] In China, many provincial capital cities and some large central cities are of a deputy-provincial hierarchical rank, higher than general prefecture-level cities.

productivity and improves the welfare of the city government and its urban residents. In practice, however, local governments engaged in fierce competition for footloose capital have developed an excessive number of industrial parks, many of which fail to attract enough investments. As a result, large tracts of requisitioned land are left unused. For instance, a survey conducted by the central government disclosed that a total of 4,735 local industrial parks failed to receive investment (*Chinese Supervision Daily*, Junly 14, 2004). In this case, wasted land benefits none and surely causes an efficiency loss.

What is worth mentioning is a forthcoming reform on the land transfer system which may affect land requisition. In 2008, the central government announced a plan of reforming the present rural land transfer system.[87] Although the details have yet to be finalized, this new initiative's thrust is to grant the peasants with increased autonomy in transferring their rural land. New policies may, among other things, allow rural residents to directly use their land in cooperation with enterprises for industrial development (Zhang, 2009). Although it may be too early to predict the resulting effects of this reform, our analysis on land requisition suggests that the new policy may better protect the interests of rural residents. Meanwhile, local governments may have less incentive to convert too many rural areas into their districts with an eye on the abundant land resources.

5.4 Appendix

The utility for urban household is:

$$u_u = C_u + V_u(h_u) - c_u.$$

The industrial production function is:

$$y_u(c_u, h_1) = c_u^\alpha h_1^\beta$$

where $\alpha < 1$, $\beta < 1$, and $\alpha + \beta < 1$.

[87] See *Decisions on Some Important Problems of Promoting Rural Reform and Development (guanyu tuijin nongcun gaige fazhan ruogan zhongda wenti de jueding)*.

The household demands a mount of land h_0 for residence, but he must pay for purchasing the real state. We assume that p is the land price set by the government, so he pays ph_0. His consumption is thus his income net of the payment for real estate:

$$C_u = (1 - t_u)y_u(c_u, h_1) - p \cdot h_0$$

The utility from residence is assumed to be:

$$V(h_0) = h_0^\delta,$$

where $\delta < 1$ so that $V' > 0$ and $V'' < 0$.

The household problem is:

$$\max_{c, h} u = (1 - t_u)c_u^\alpha h_1^\beta - c_u + h_0^\delta - ph_0.$$

The first order conditions are:

$$\frac{\partial u_u}{\partial c_u} : (1 - t_u)\alpha c_u^{\alpha-1}h_1^\beta - 1 = 0$$

$$c_u^*(t_u, h_1) - (1 - t_u)^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} h_1$$

$$\frac{\partial u_u}{\partial h_0} : \delta h_0^{\delta-1} - p = 0$$

$$h_0^*(p) = \left(\frac{\delta}{p}\right)^{\frac{1}{1-\delta}}$$

The output as a reaction function:

$$y_u^*(t_u, h_1) = (1 - t_u)^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} h_1^{\alpha} \cdot h_1$$

$$= (1 - t_u)^{\frac{\alpha}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} h_1^{\frac{1}{1-\alpha}}$$

The city government pays a cost for requisitioning land, $c(h_0 + h_1)$. Its problem is:

$$\max_{t_u, h_1, p} R_u = t_u \cdot y_u^*(t_u, h_1) + ph_0 - c(h_0 + h_1)$$

$$- t_u \cdot (1 - t_u)^{\frac{\alpha}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} h_1^{\frac{1}{1-\alpha}} - ch_1 + (p - c)\left(\frac{\delta}{p}\right)^{\frac{1}{1-\delta}}$$

The first order conditions:

$$\frac{\partial R_u}{\partial t_u} = (1 - t_u)^{\frac{\alpha}{1-\alpha}} - t_u \cdot \frac{\alpha}{1-\alpha}(1 - t_u)^{\frac{\alpha}{1-\alpha}-1} = 0$$

$$t_u^{**} = 1 - \alpha$$

$$\frac{\partial R_u}{\partial h_1} = \frac{\beta}{1-\alpha}(1-\alpha)\alpha^{\frac{\alpha}{1-\alpha}}h_1^{\frac{\beta}{1-\alpha}-1} - c = 0$$

$$h_1^{**} = \alpha^{\frac{\alpha}{1-\alpha-\beta}}\left(\frac{\beta}{c}\right)^{\frac{1}{1-\alpha-\beta}}$$

$$\frac{\partial R_u}{\partial p} = 0 \Rightarrow \left(\frac{\delta}{p}\right)^{\frac{1}{1-\delta}} = (p-c)\frac{1}{1-\delta}\left(\frac{\delta}{p}\right)^{\frac{1}{1-\delta}-1}\left(\frac{\delta}{p^2}\right)$$

$$p^{**} = \frac{c}{\delta}$$

It follows that

$$h_0^{**} = \left(\frac{\delta}{p^{**}}\right)^{\frac{1}{1-\delta}} = \left(\frac{\delta^2}{c}\right)^{\frac{1}{1-\delta}}$$

The equilibrium labor input is:

$$e_u^{**} = (1 - t_u^{**})^{\frac{1}{1-\alpha}}\alpha^{\frac{1}{1-\alpha}}h_1^{\frac{\beta}{1-\alpha}}$$

$$= \alpha^{\frac{\alpha-\beta}{1-\alpha-\beta}}\left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha-\beta}}$$

The equilibrium output is:

$$y_u^{**} = (1 - t_u^{**})^{\frac{\alpha}{1-\alpha}}\alpha^{\frac{\alpha}{1-\alpha}}h_1^{\frac{\beta}{1-\alpha}}$$

$$= \alpha^{\frac{\alpha}{1-\alpha-\beta}}\left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha-\beta}}$$

The equilibrium utility is:

$$u_u^{**} = (1 - t_u^{**})y_u^{**} - e_u^{**} + h_0^{***} - p^{**}h_0^{**}$$

$$= (1-\alpha)\alpha^{\frac{1+\alpha-\beta}{1-\alpha-\beta}}\left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha-\beta}} + (1-\delta)\left(\frac{\delta^2}{c}\right)^{\frac{\delta}{1-\delta}}$$

The city government rent is:

$$R_u^{**} = t_u^{**} \cdot y^{**} + p^{**}h_0^{**} - c(h_0^{**} + h_1^{**})$$

$$= (1-\alpha-\beta)\alpha^{\frac{\alpha}{1-\alpha-\beta}}\left(\frac{\beta}{c}\right)^{\frac{\beta}{1-\alpha-\beta}} + \left(\frac{c}{\delta}-c\right)\left(\frac{\delta^2}{c}\right)^{\frac{1}{1-\delta}} .$$

Chapter 6 Conclusions and Policy Implications

In conclusion, this chapter summarizes the salient findings derived from the models presented in the previous chapters. By relating our model findings to the Chinese contexts, we outline the factors crucial for the design of future government systems. The contribution and limitations of this thesis are briefly discussed at the end of this chapter.

6.1 A Summary of the Thesis

This thesis attempts to interpret the important changes in local jurisdictional systems across China during the reform era and to revisit the heated debate on the choice of an appropriate system. The thesis is focused on the province-prefecture-county setup in this overlapping system. The reform era has witnessed the spread and consolidation of such a hierarchical configuration thanks to the blessing of the central government, with the prefecture level playing the role in fostering rural-urban integration. Since the mid 1990s, converting county-level jurisdictions to urban districts has been gaining currency, further bolstering the economic and political strength of the prefecture-level cities in the administrative hierarchy.

At the beginning of the new millennium just when the entire nation has embraced the CGC system, there has been a growing dissatisfaction with the province-prefecture-county setup, with calls for introducing a system with provinces governing counties. At the forefront of the controversy are two critical questions: Should there be an intermediate prefecture level between the provinces and counties? Is the reversion to separate administration of cities and counties the best solution to the problems engendered by the CGC system? These questions motivate us to

develop a theoretical framework to sort out and collate the benefits and costs engendered by the different jurisdictional systems proposed. Gathered together below are the major lessons emerging from our theoretical analyses:

- *At the heart of choosing a system of jurisdictions are different tradeoffs.* The introduction of a prefecture level may bring about a range of benefits: saving administrative costs, promoting market integration and facilitating horizontal cooperation. Against these benefits are the cost of heavier tax burdens induced by a more overlapping government system and the cost spawned by heterogeneity of preferences. Unified administration in rural and urban regions likewise results in the benefit of rural-urban spillovers but the cost of urban-biased policies. The on-going debate on jurisdictional changes largely boils down on how one weighs the different tradeoffs.

- *The tradeoffs impinge differently on the stakeholders.* A clear message from our analyses is that jurisdictional changes are seldom Pareto-improving. From this perspective, it is not difficult to understand why we frequently observe bitter conflicts between cities and counties under CGC or riots and protests stemming from land requisition when a county is converted into an urban district. Jurisdictional changes may not necessarily benefit the people if it is unilaterally initiated and engineered by self-interested governments.

- *One size does not fit all.* Insofar as the tradeoffs vary over time and across space, there does not seem to be one best system of jurisdictions for all the regions in China, all the more so with China's gaping regional disparities. Indeed, in the real world, we do observe that the system of jurisdictions adapts to the local conditions. For example, Zhejiang has long embraced the PGC system while its neighboring Jiangsu has adhered to the CGC system.

6.2 Policy Implications for Future Jurisdictional Systems

By relating our model findings to Chinese specific contexts, this section proceeds to the policy debate on the choice of future jurisdictional systems. In what direction will China's future jurisdictional system be heading? Should there be one uniform system of jurisdictions such as the PGC system adopted nationwide? Should there be fewer layers of governments such as the three-tiered architecture of the US proposed by some scholars? Will the CGC lose the raison *d'être* for its existence with the retreat of the local states? If the findings in this thesis are any guide, these questions do not have simple answers which ultimately depend on the geographic and political landscape of China and how they may change across space and over time. In what follows, we first highlight how the geographic and political landscape may impinge on the different suggestions on how China's future system of jurisdictions should be. Then, we speculate on the possible trajectories for China's system of jurisdictions.

Our findings suggest that geography matters. Being a unitary state, there is always a centripetal tendency to impose a uniform system of jurisdictions nationwide. But there are likely to be centrifugal forces for different systems to emerge in response to local geographic conditions. A case in point is whether the prefecture level should be removed, an issue which can scarcely be divorced from geography. Insofar as some Chinese provinces are too large in size, prefectures as an intermediate level between provinces and counties may serve the useful purpose of lowering administrative costs and facilitating necessary horizontal coordination. Unless and until there is a repartitioning of the Chinese provinces to make them smaller, any top-down policy to have it removed may not be sustainable in the long run because, as show in our models, the stakeholders may be hurt by the policy. Indeed, many a time in history, the prefecture level reappeared after its abolition.

China' existing *top-down* political system also limits the range of jurisdictional architectures which China may borrow from other countries not least because of its

effect on the cost in administering large country and on local protection. In support of the PGC system, there are frequent suggestions that China should adopt a US-like system, which has fewer tiers of governments (e.g., Liu, 2002). Advocates of the US system contend that a US state manages to govern hundreds of counties and towns without an intermediate tier of government. But China may be ill-advised to follow such an example because this advice overlooks the political reality that China has a top-down rather than a decentralized administrative system. Superior governments have to deal with a much wider range of issues than their foreign counterparts. Any proposal to compress China's administrative hierarchy raises immediately the question whether China should modify its top-down political system by opting for a more decentralized system with clearly delineated responsibilities between different levels of governments and granting local governments with greater autonomy.

Local protectionism figures prominently in debates on China's jurisdictional changes. Removing market barriers and fostering cooperation in public affairs are the rationale behind the introduction of the CGC system as explained in our study. But as market reforms progress and the state retreat, will local protectionism still be a problem in the future? As pointed out before, local protectionism is driven by fiscal decentralization and inter-jurisdictional competition. It is aggravated by competition among local cadres for scarce promotion opportunities under top-own administrative hierarchy. As long as these institutions persist, local officials may have strong incentives to erect barriers along their jurisdictional borders if coordination from above is absent.

Returning to the question on the future of China's system of jurisdictions, we thus have to keep the above discussion in mind: any speculation or policy recommendations cannot be divorced from China's specific geographic and political conditions and how they evolve over time, taking into account the motivations and outcomes of different reform experiments and proposals. Rather than converging towards a uniform system of jurisdictions, a number of scenarios are conceivable in view of the spatial variation in local geographic, economic, and political conditions:

- There is much talk about replacing the CGC system by its PGC counterpart.

But given China's widely varying geographic and political conditions, one size probably does not fit all. In the backward regions which are large in size, with poor transport networks and a lack of large industrial cities, the present CGC system often does not generate the expected benefits. Instead it results in such problems as "city exploiting county" and "a small horse pulling a heavy cart", etc. We may expect that the PGC system may garner more support in the backward regions. Direct fiscal subsidies from the provincial government to the counties may support them in filling in fiscal shortfalls and financing basic developmental and welfare expenditures.

- In the developed provinces, the emphasis is more on promoting integration. For instance, jurisdictions in the Pearl River Delta and Yangtze River Delta are exploring how they can better integrate among themselves to exploit the economies of scale from an enlarged market and fiscal capacity. Jurisdictional reforms which create more inter-jurisdictional barriers and reinstate the rural-urban fault line may be a step backward. It may be better to strengthen the present central cities by allowing them to expand merging neighboring county-level jurisdictions.

- As pointed out above, China's top-down political system limits the choice of the different jurisdictional systems. In the long term, in what direction China's system of jurisdictions will be heading thus hinges on whether a more market-oriented, decentralized, and democratic system will emerge in China. If China's local states continue to retreat with the progress of market-oriented reforms, there is less need for coordination from above to break down inter-jurisdictional barriers induced by local protectionism. A more bottom-up political system will drive local governments to be more accountable and focus on serving the wellbeing of the people. With a government system comprised of more autonomous jurisdictions, administration will be drastically simplified and a province directly governing many counties may be possible.

In the past, there was a tendency under the top-down political system to forge a

uniform system of jurisdictions throughout the country as in the case of the CGC system in the 1980s and the 1990s. In recent years, the central government seems to be more willing to take into account the divergent conditions in different regions when mapping out future jurisdictional reforms. For example, it encourages but does not mandate the provinces to adopt the PGC system. Meanwhile, it lifted the ban on the conversion of county-level jurisdictions into urban districts early this year, paving the way for the creation of larger central cities. Following this approach, China may expect a range of jurisdictional architectures to be designed and adjusted by considering various local geographic and economic conditions.

6.3 Contributions and Limitations

Our study may be the first attempt to incorporate discussions on the different designs of Chinese jurisdictional systems into a theoretical framework. In this framework, the benefits and costs derived from jurisdictional changes can be traded off, thereby highlighting the forces driving jurisdictional changes as well as their distributional consequences. Further, our research contributes to the New Political Economy literature by developing hierarchical game-theoretical models to capture the interactions between self-interested stakeholders. The models shed light on the way the local residents and different levels of governments with divergent interests interact strategically with each other in choosing jurisdictional systems. Finally, our study treats jurisdictions as endogenous outcomes of different stakeholders weighing their benefits and costs instead of assuming exogenously given jurisdictions.

However, our theoretical models are not without limitations. While our analysis draws attention to the political economy behind the different paces of jurisdictional changes observed in reality, much work remains to be done unraveling how the political system shapes jurisdictional changes. We have shown that the interests of the stakeholders may be divergent, raising the question how jurisdictional reforms advance or retreat when navigating the political waters. Though our model predicts winners and losers in jurisdictional reforms, what is lacking is a political mechanism

which breaks the impasse posed by diverging interests of the stakeholders. This is obviously one direction for future research. Another limitation of the thesis is that the findings derived from our models are theoretical. While the models provide a useful organizing framework to study China's system of jurisdictions and they seem to be consistent with some stylized facts, whether our models are good approximations to reality remains to be empirically tested.

The dissertation has also left out a number of interesting issues related to jurisdictional changes. One such issue pertains to the central government's recent decision to promote PGC nationwide. Though we have touched upon this issue before, there is room for deeper analyses to find out how such a reform may impinge on the economy and social welfare. Our model also does not look into jurisdictional reforms at the township level which involve the abolition of towns and incorporating them into townships (*che xiang bing zhen*). How would the change in this grassroots level of governments affect the jurisdictional restructuring of higher levels of governments? This and other questions deserve more scrutiny in the future.

Bibliography

Alesina, Alberto and Enrico Spolaore (1995), "International Conflict, Defense Spending and the Size of Countries," Mimeo, Harvard University.

Alesina, Alberto and Enrico Spolaore (1997), "On the Number and Size of Nations," *Quarterly Journal of Economics*, Vol. 112, pp. 1027 1056.

Alesina, Alberto and Enrico Spolaore (2003), *The Size of Nations*, Cambridge, Mass.: MIT Press.

Allen, Thomas J. (1977), *Managing the Flow of Technology*, Cambridge, MA: MIT Press.

Arrow Kenneth J. and Mordecai Kurz (1970), *Pulic Investmen, the Rate of Return, and Optimal Fiscal Policy*, Baltimore: The John Hopkins Press.

Bahl, Roy W. (1999), *Fiscal Policy in China: Taxation and Intergovernmental Fiscal Relations*, South San Francisco, California: 1990 Institute.

Bai, Chong-En, Yingjuan Du, Zhigang Tao and Sarah Y. Tong (2004), "Local Protectionism and Regional Specialization: Evidence from China's Industries," *Journal of International Economics*, Vol. 63, pp. 397 417.

Baligh, Helmy H. and Leon E. Richartz (1967), *Vertical Market Structures*, Boston, Mass.: Allyn and Bacon, Inc.

Barro, Robert. J. (1990), "Government Spending in a Simple Model of Endogenous Growth," *Journal of Political Economy*, Vol. 98, No. 5, Oct., pp. 103-105.

Barro, Robert. J. (1991), "Small is Beautiful," *The Wall Street Journal*, October 11.

Barro, Robert. J. and Xavier Sala-I-Martin (1992), "Public Finance in Models of Economic Growth," *The Review of Economic Studies*, Vol. 59, No. 4, Oct., pp. 645-661.

Bergstrom, Theodore C. and Robert P. Goodman (1973), "Private Demands for Public Goods," *American Economic Review*, Vol. 63, No. 3, Jun., pp. 280-296.

Besley, Timothy and Stephen Coates (2003), "Centralized versus Decentralized Provision of Local Public Goods: A Political Economy Approach," *Journal of Public Economics*, Vol. 87, No.12, pp. 2611-2637.

Binmore, Ken, Ariel Rubinstein and Asher Wolinsky (1986), "The Nash Bargaining Solution in Economic Modeling," *RAND Journal of Economics*, Vol. 17, No. 2, pp. 176-188.

Boadway, Robin and Michael Keen (1996), "Efficiency and the Optimal Direction of Federal-State Transfers," *International Tax and Public Finance*, Vol. 3, No. 2, May, pp. 137 155.

Boadway, Robin, Maurice Marchand and Marianne Vigneault (1998), "The Consequences of Overlapping Tax Bases for Redistribution and Public Spending in a Federation," *Journal of Public Economics*, Vol. 68, pp. 453–478.

Bolton, Patrick and Gérard Roland (1997), "The Breakup of Nations: A Political Economy Analysis," *The Quarterly Journal of Economics*, Vol. 112, No. 4, Nov., pp. 1057-1090.

Bolton, Patrick, Gérard Roland and Enrico Spolaore (1996), "Economic Theories of the Break-Up and Integration of Nations," *European Economic Review*, Vol. 40, pp. 697-705.

Borcherding, Thomas E. and Robert T. Deacon (1972), "The Demand for the Services of

Non-Federal Governments," *American Economic Review*, Vol. 62, No. 5, Dec., pp. 891-901.

Brennan, Geoffrey and James M. Buchanan (1980), *The Power to Tax: Analytical Foundations of a Fiscal Constitution*, Cambridge: Cambridge University Press.

Casella, Alessandra and Jonathan Feinstein (1990), "Public Goods in Trade: On the Formation of Markets and Political Jurisdictions," NBER Working Paper No.3554, Dec.

Cassing, James H. and Ayre L. Hillman (1982), "State-Federal Resource Tax Rivalry: The Queensland Railway and the Federal Export Tax," *Economic Record*, Sept., pp. 235-241.

Chakraborty, Kalyan, Basudeb Biswas and W. Cris Lewis (2000), "Economies of Scale in Public Education: An Econometric Analysis," *Contemporary Economic Policy*, Vol. 18, No. 2, April, pp. 238-247.

Chung, Jae Ho and Tao-chiu Lam (2004), "China's 'City System' in Flux- Explaining Post-Mao Administrative Changes," *The China Quarterly*, Vol. 180, pp.945-964

Conner, Kathleen R. (1991), "A Historical Comparison of Resource-Based Theory and Five Schools of Thought within Industrial Organization Economics: Do We Have a New Theory of the Firm?" *Journal of Management*, Vol. 17, No. 1, pp. 121-154.

Craig, Steven G. (1987), "The Impact of Congestion on Local Pubic Good Production," *Journal of Public Economics*, Vol. 32, pp. 331-353.

Dahlby, Bev (1994), "The Distortionary Effect of Rising Taxes," In R. Robson and W. Scarth (eds.), *Deficit Reduction: What Pain; What Gain*, Toronto: The C.D. Howe Institute.

Donnithorne, Audrey (1972), "China's Cellular Economy: Some Economic Trends since the Cultural Revolution," *The China Quarterly*, No. 52, pp. 605-619.

Edin, Maria (2000), *Market Forces and Communist Power: Local Political Institutions and Economic Development in China*, Uppsala: Uppsala University.

Edwards, John H. Y. (1990), "Congestion Function Specification and the Publicness of Local Goods," *Journal of Urban Economics*, Vol. 27, No. 1, Jan., pp. 80-96.

Eldridge, Hope T. (1956), "The Process of Urbanization," in Joseph J. Spengler and Otis D. Duncan (eds.), *Demographic Analysis: Selected Readings*, Glencoe, Ill.: Free Press.

Fisher, Ronald C. (1996), *State and Local Public Finance*, Chicago: Irwin.

Flowers, Marilyn R. (1988), "Shared Tax Sources in a Leviathan Model of Federalism," *Public Finance Quarterly*, Vol. 16, pp. 67-77.

Freidman, David (1977), "A Theory of the Size and Shape of Nations," *Journal of Political Economy*, Vol. 85, No. 1, Feb., pp. 59-77.

Galbraith, Jay R. (1973), *Designing Complex Organizations: An Executive Guide to Strategy, Structure, and Process*, Beading, Massachusetts: Addison-Wesley.

Galbraith, Jay R. (1977), *Organization Design*, Beading, Massachusetts: Addison-Wesley.

Geneveive, Boyreau-Debray and Shang-jin Wei, (2004), "Can China Grow Faster? A Diagnosis of the Fragmentation of Its Domestic Capital Market," IMF Working Paper, May.

Grinter, Rebecca E., James D. Herbsleb and Dewayne E. Perry (1999), "The Geography of Coordination: Dealing with Distance in R&D Work," Proceedings of the international ACM SIGGROUP conference on supporting group work, pp. 306-315, November 14-17, Phoenix, AZ: ACM Press.

Hennart, Jean F. (1993), "Explaining the Swollen Middle: Why Most Transactions Are a Mix of Market and Hierarchy," *Organization Science*, Vol. 4, pp. 529-547.

Huang, Yasheng (1995), "Administrative Monitoring in China," *The China Quarterly*, Vol. 143,

Sept., pp. 828-843.

Huang, Yasheng (2003), *Selling China: Foreign Direct Investment during the Reform Era*, Cambridge University Press.

Huang, Yasheng (2008), *Capitalism with Chinese Characteristics: Entrepreneurship and the State*, Cambridge University Press.

Keen, Michael (1998), "Vertical Tax Externalities in the Theory of Fiscal Federalism," *International Monetary Fund Staff Papers*, No. 451998, pp. 454-484.

Keen, Michael and Christos Kotsogiannis (1996), "Federalism and Tax Competition," Mimeo.

Leite-Monteiroa, Manuel and Motohiro Sato (2003), "Economic Integration and Fiscal Devolution," *Journal of Public Economics*, Vol. 87, pp. 2507-2525.

Li, Hongbin and Li-an Zhou (2005), "Political Turnover and Economic Performance: The Disciplinary Role of Personnel Control in China," *Journal of Public Economics*, Vol. 89, pp. 1743-1762.

Lockwood, Ben (2002), "Distributive Politics and the Costs of Centralization", *The Review of Economic Studies*, Vol. 69, No. 2, pp. 313-337.

Lucas, Robert E. Jr. (1988), "On the Mechanics of Economic Development," *Journal of Monetary Economics*, Vol. 22, No. 1, pp. 3-42.

Madhok, Anoop (1996), "The Organization of Economic Activity: Transaction Costs, Firm Capabilities, and the Nature of Governance," *Organization Science*, Vol. 7, No. 5, pp. 577-590.

Malone, Thomas W. (1987), "Modeling Coordination in Organizations and Markets," *Management Science*, Vol. 33, No. 10, Oct., pp. 1317-1332.

Masten, Scott E., James W. Meehan and Jr. Edward A. Snyder (1991), "The Costs of Organization," *Journal of Law, Economics, & Organization*, Vol. 7, No. 1, Spring, pp. 1-25.

Means, Tom S. and Stephen L. Mehay (1995), "Estimating the Publicness of Local Government Services: Alternative Congestion Function Specification," *Southern Economic Journal*, Vol. 61, No. 3, pp. 614-627.

Nash, John F. (1953), "Two-Person Cooperative Games," *Econometrica*, Vol. 21, No.1, April, pp. 128-140.

Naughton, Barry (2003), "How Much Can Regional Integration Do to Unify China's Markets?", in Nicholas Hope, Dennis Yang and Muyang Li (eds.), *How Far Across the River? Chinese Policy Reform at the Millennium*, Stanford: Stanford University Press, pp. 204-232.

Nelson, Michael A. (1986), "An Empirical Analysis of State and Local Tax Structure in the Context of the Leviathan Model of Government," *Public Choice*, Vol. 49, No. 3, June, pp. 283-294.

Niskanen, William A. Jr. (1971), *Bureaucracy and Representative Government*, Chicago: Aldine-Atherton.

Oates, Wallace E. (1972), *Fiscal Federalism*, New York: Harcourt Brace Jovanovich.

Oates, Wallace E. (1988), "On the Measurement of Congestion in the Provision of Local Public Goods," *Journal of Urban Economics*, Vol. 54, July, pp. 85-94.

Oates, Wallace E. (2005), "Toward a Second-Generation Theory of Fiscal Federalism", *International Tax and Public Finance*, Vol. 12, pp. 349-374.

Ostrom, Vincent, Charles M. Tiebout and Robert Warren (1961), "The Organization of

Government in Metropolitan Areas: A Theoretical Inquiry," *The American Political Science Review*, Vol. 55, No. 4, Dec., pp. 831-842.

Park, Albert, Scott Rozelle, Christine Wong and Changqing Ren (1996), "Distributional Consequences of Reforming Local Public Finance in China," *The China Quarterly*, Vol. 147, Sept., pp. 751-778.

Persson, Torsten and Guido Tabellini (2000), *Political Economics: Explaining Economic Policy*, Cambridge, Mass.: MIT Press.

Poncet, Sandra (2003), "Measuring Chinese Domestic and International Integration," *China Economic Review*, Vol. 14, pp. 1-21.

Poncet, Sandra (2005), "A Fragmented China: Measure and Determinants of Chinese Domestic Market Disintegration," *Review of International Economics*, Vol. 13, No. 3, pp. 409-430.

Qian, Yingyi and Gérard Roland (1998), "Federalism and the Soft Budget Constraint," *American Economic Review*, Vol. 88, No. 5, Dec., pp. 1143-1162.

Romer, Paul M. (1986), "Increasing Returns and Long Run Growth," *Journal of Political Economics*, Vol.94, pp. 1002-1037.

Rumelt, Richard P. (1984), "Towards a Strategic Theory of the Firm," in Richard B. Lamb (Ed.), *Competitive Strategic Management*, pp. 556-570, Englewood Cliffs, NJ: Prentice Hall.

Samuelson, Paul A. (1954), "The Transfer Problem and Transport Costs, II: Analysis of Effects of Trade Impediments," *The Economic Journal*, Vol. 64, No. 254, Jun., pp. 264-289.

Sundrum, R. M. (1983), *Development Economics: A Framework for Analysis and Policy*, New York: John Wiley & Sons.

Tian, Quanjian (2001), "China's New Urban-Rural Divide and Pitfalls for the Chinese Economy," *Canadian Journal of Development Studies*, Vol. 22, No. 1, pp. 165-190.

Tong, James (1989), "Fiscal Reform, Elite Turnover and Central-Provincial Relations in Post-Mao China," *The Australian Journal of Chinese Affairs*, No. 22, July, pp. 1-28.

Tsui, Kai-yuen (2003), "Local Tax System, Intergovernmental Transfers and China's Sub-Prefecture Fiscal Disparities," Working paper, The Dept. of Economics, The Chinese University of Hong Kong.

Tsui, Kai-yuen and Youqiang Wang (2002), "Decentralization with Political Trump: Vertical Control, Local Accountability and Regional Polarization," working paper, Dept. of Economics, The Chinese University of Hong Kong.

Tsui, Kai-yuen and Youqiang Wang (2004), "Between Separate Stoves and a Single Menu: Fiscal Decentralization, China Style," *The China Quarterly*, Vol. 177, Mar., pp. 71-90.

Walder, Andrew G. (1995), "Local Governments as Industrial Firms: An Organization Analysis of China's Transitional Economy," *The American Journal of Sociology*, Vol. 101, No. 2, Sept., pp. 263 – 301.

West, Loraine and Christine P. W. Wong (1995), "Fiscal Decentralization and Growing Regional Disparities in Rural China: Some Evidence in the Provision of Social Service," Working paper, Asian Development Bank, Manila.

Williams, Alan (1966), "The Optimal Provision of Public Goods in a System of Local Government," *The Journal of Political Economy*, Vol. 74, No. 1, Feb., pp. 18-33.

Williamson, Oliver E. (1981), "The Economics of Organization: The Transaction Cost Approach," *The American Journal of Sociology*, Vol. 87, No. 3., Nov., pp. 548-577.

Williamson, Oliver E. (1985), *The Economic Institutions of Capitalism*, New York: Free Press.

Wilson, John D. (2006), "Tax Competition in a Federal Setting," in G. Brosio and E. Ahmad (eds.), *Handbook on Fiscal Federalism*, Edward Elgar Publishing Limited.

Wong, Christine P. W. (1991), "Central-Local Relations in an Era of Fiscal Decline: The Paradox of Fiscal Decentralization in Post-Mao China," *The China Quarterly*, No. 128, Dec., pp. 691-715.

Wong, Christine P. W. (1997), "Overview of Issues in Local Public Finance in the PRC," In *Financing Local Government in the People's Republic of China*, Hong Kong: Oxford University Press.

Wong, Christine P. W. (1998), "Municipal Finance in China: The Development of Extra-Budgetary Revenues," Paper presented at International Municipal Finance Forum, Washington: The World Bank, April.

World Bank (2002), "China National Development and Sub-National Finance: A Review of Provincial Expenditures," Report No. 22951-CHA, April 9.

Wrede, Matthias (1999), "Tragedy of the Fiscal Common? Fiscal Stock Externalities in A Leviathan Model of Federalism," *Public Choice*, Vol. 101, pp. 177-193.

Wrede, Matthias (2000), "Shared Tax Sources and Public Expenditures," *International Tax and Public Finance*, Vol. 7, pp. 163-175.

Yang, Dennis Tao and Hao Zhou (1999), "Rural-Urban Disparity and Sectoral Labor Allocation in China," *Journal of Development Studies*, Vol. 35, No. 3, pp. 105-133.

Zhao, Zhong (2003), "Rural-Urban Migration in China: What Do We Know and What Do We Need to Know?" China Center for Economic Research Working Paper, Peking University.

Bian Xuefang, Wu Qun and Liu Weina (2005), "Chengshihua yu zhongguo chengshi tudi liyong jiegou de xiangguan fenxi" (The analysis of association between urbanization and the structure of land use), *Ziyuan Kexue*, 3, 73-78.

Chen Hewu (2004), "Tudi zhengyong buchang zhidu de guoji bijiao ji dui woguo de jiejian" (The international comparison of the institutions of land requisition and compensation), *Diaoyan Shijie*, 6, 35-37.

Chen Yongqing (2006), "Zhongguo chengxiang jumin shouru chaju yanbian de lujing ji yuanyin fenxi" (The analysis of the transformation path and cause of the income disparity between Chinese city and rural residents), *Jingji Pinglun*, 4, 49-53.

Dai Junliang (2000), *Zhongguo shizhi* (The city system in China), Beijing: Zhongguo ditu chubanshe.

Dai Junliang (2001), "Xingzheng quhua gaige ying shixing shengxian erjizhi --- guanyu zhubu gaige shi lingdao xian tizhi de sikao" (Administrative and jurisdictional reform should employ a province-city system: thoughts on the gradual reform of the CGC system), *Zhongguo Gaige*, 9, 38-39.

Dai Yang, Yang Long and Wu Xiaowen (2005), "Zhengfu chengben wenti yanjiu shulun" (Survey of government cost study), *Sichuan Shifan Daxue Xuebao* (shehui kexue ban), 32(5), 35-39.

Deng Tao (2005), "Chengshi kuozhang zhong de toujixing zhanyong gengdi wenti" (The issue of speculative use of land in the city expansion), *Nongcun Jingji*, 6, 4-46.

Ding Chengri (2002), "Tudi jiazhi yu chengshi zengzhang" (The value of land and the city growth), *Chengshi Fazhan Yanjiu*, 6, 48-53.

Dong Zaiping and Huang Xiaohong (2008), "Guanyu Guangxi shengguanxi caizheng tizhi gaige

moshi de tantao" (Investigations on the modes of PGC reform in Guangxi), *Guangxi Shehui Kexue*, 10, 21-25.

Duan Yulan, Li Jianxin and Liu Zhi (2008), "Jiangsu sheng zhiguan xian caizheng guanli tizhi gaige qianxi" (A preliminary analysis on the fiscal reform of PGC in Jiangsu Province), *Nongcun caizhen yu caiwu*, 3, 11-14.

Fang Jian and Sun Lijuan (2003), "Lun nongcun tudi liuzhuan zhidu" (The study of the transfer system of rural land), *Ningxia Nonglin Keji*, 6, 1-93.

Feng Ling (2001), "Shilun fenshuizhi dui difang jingji de fumian yingxiang yu wanshan silu" (The adverse effects of tax-sharing system on the local economy and the enhancement methods), *Hunan Jingji*, 1, 43-45.

Fu Qintai (2003), "Woguo chengxiang bupingdeng de zhidu genyuan ji duice yanjiu" (The causes of rural-urban disparity and the study on the countermeasures), *Lilun Qianyan*, 22, 39-40.

Gong Kezhen (2006), *Chuyi shengguanxian tizhi gaige* (The review on the reform of city governing county system), *Zhongguo Zingzheng Quhua Wang*, http://www.xzqh.org.cn.

He Tao (2000), "Boyi lilun yu fen shuizhi zhidu de wanshan -- zhongyang shuishou yu difang shuishou zhijian guanxi de boyi fenxi" (The game theory and the enhancement of tax sharing system — a game-theoretical analysis on the central and local taxation), *Gongye Jishu Jingji*, 19 (5), 54-58.

He Xiangzhou and He Xinyu (2004), "Xingzheng chengben jiqi zhili " (The administrative costs and the reduction methods), *Zhengzhixue Yanjiu*, 4, 86-94.

He Xianming (2004), "Shiguanxian tizhi jixiao jiqi biange lujing xuanze de zhidu fenxi -- jian lun 'fuhe xingzheng' gainian" (The institutional analysis of CGC performance and the choice of transformation paths—the review of the concept of complex administration), *Zhongguo Xingzheng Guanli*, 7, 70-74.

He Xinyu and Lijie (2005), "Lun zhengfu guanli banjing" (On the radius of governmental administration), *Hubei Shehui Kexue*, 2, 30-31.

Huang Xianjin, Pu Lijie and Shang Guihua (2001), "Gengdi zongliang dongtai pingheng zhengce cunzai wenti ji gaige jianyi" (The problems of the policy on the dynamic balance of arable land and the reform suggestions), *Zhongguo Tudi Kexue*, 15 (4), 2-6.

Jia Kang and Bai Jingming (2002), "Xianxiang caizheng jiekun yu caizheng tizhi chuangxin" (The solving of county and township fiscal shortfalls and the innovation of financial system), *Caishui yu Kuaiji*, 5, 9-13.

Jia Kang and Bai Jingming (2005), "Guanyu zhongguo fenshui fenji caizheng tizhi anpai de jiben silu" (Basic thoughts on the fiscal institution of sharing taxes in different government levels in China), *Jingjixue Dongtai*, 2.

Jiang Changyun (2006), "Woguo chengxiang fazhan de buxietiao jiqi shenceng yuanyin" (The rural-urban unbalanced development in China and its driving factors), *Jinji Yanjiu Cankao*, 9, 34-44.

Li Changjiang (2004), "Chengxiang chaju de xianzhuang, genyuan ji jiejue duice," (The urban-rural disparity: the situation, the causes, and the countermeasures), Lilun Tansuo, 3, 46-47.

Li Chuanyong (2000), "Shilun woguo de xingzheng quhua"(On administrative division in China), *Sichuan Shifan Xueyuan Xuebao* (zhexue whchui kexue ban), 4, 27-31.

Li Guangbin and Gu Renxu (2005), "Zhengfu jingzheng--xingzhengqu jingji yunxing zhong de

difang zhengfu xingwei fenxi" (Governmental competition the behavioral analysis of local governments in the jurisdictional economy), *Chengshi Wenti*, 6, 70-75.

Li Jinlong (2003), "Shiguanxian tizhi — zhongguo tese de difang xingzheng zhidu" (The CGC system a local administrative institution with Chinese characteristics), *Hu'nan Shehui Kexue*, 3, 39-41.

Li Jinxia and He Jun (2009), "Guanyu shengguanxian caizheng tizhi gaige de wudian sikao" (Five opinions on the reform of PGC), *Jingji yu Guanli*, 23 (1), 66-69.

Li Qingfang (2005), *Shixian guanxi de falü yanjiu* (The legislation analysis of the city-county relations), Zhongguo zhengfa daxue shuoshi lunwen.

Li Shantong, Hou Yongzhi and Chen Bo (2003), "Zhongguo guonei difang baohu de diaocha baogao fei qiye chouyang diaocha jieguo de chubu fenxi" (A report on the local protectionism in China: a preliminary analysis of non-enterprises surveys), *Guowuyuan fazhan yanjiu zhongxin diaocha yanjiu baogao*, No. 2042.

Li Shantong, Hou Yongzhi, Liu Yunzhong and Chen Bo (2003), "Zhongguo guonei difang baohu de diaocha baogao — jiyu qiye chouyang diaocha de fenxi" (A report on the local protectionism in China: The analysis of enterprises surveys), *Guowuyuan fazhan yanjiu zhongxin diaocha yanjiu baogao*, Zhuan kan No. 65.

Li Tongbin (2006), "Tongchou chengxiang gonggongpin gongji, goujian hexie chengxiang guanxi," (Coordinating the supply of urban-rural public goods and constructing harmonious urban-rural relations), *Nongye Jingji*, 1, 8-9.

Liu Hao and Ge Jiqi (2002), "Chengshihuazhong de tudi zhengyong wen ti" (The issues of land requisition in the urbanization), *Guotu Jingji*, 9, 32-34.

Liu Junde (1996), Zhongguo xingzheng quhua de lilun yu shijian (Theory and practice on Chinese jurisdictional divisions), Shanghai: Huadong shifan daxue chubanshe.

Liu Junde (2000), "Changjiang sanjiaozhou diqu kongjian jingji de zhiduxing maodun yu zhenghe yanjiu--zhongguo 'xingzhengqu jingji' de anli fenxi" (The study of the institutional contradiction and integration of space economy in the Yangtze River Delta: a case study on Chinese jurisdictional economy), *Hangzhou Shifan Xueyuan Xuebao*, 10, 15-19.

Liu Junde (2002), *Zhongwai xingzheng quhua bijiao yanjiu* (The comparative analysis of Chinese and international administrative divisiond), Beijing: Zhongguo shehui kexue chubanshe.

Liu Junde and Shu Qing (1993), "Lun xingzheng quhua, xingzheng guanli tizhi yu quyu jingji fazhan zhanlue" (The study of administrative division, the administrative management system, and the development strategy of local economy), *Jingji Dili*, 1, 1-5.

Liu Junde, Zhang Junfang, and Ma Zuqi (2002), "Dachengshi zhengfu zhineng zhuanbian zhong de quji zhengqu gongneng dingwei yanjiu" (Research on the functional orientation of duburban sdministrative srea in the functional transformation of metropolitan government), *Hangzhou Shifan Xueyuan Xuebao* (shehui kexue ban), 5, 34-40.

Liu Lifeng (2004), "Woguo zhengfujian touzi zhize huafen" (The division of investment dutyies among Chinese governments), *Zhongguo Touzi*, 9, 52-53.

Liu Shouying and Jiang Shengsan (2005), "Tudi rongzi yu caizheng he jinrong fengxian" (The land financing and the fiscal and financial risks), *Zhongguo Tudi Kexue*, 5, 3-9.

Lu Hongyou (2004), "Yipin liangzhi de jingji fenxi -- jianlun gonggongpin chengben fentan yu shouyi fenxiang de shehui gongping" (An economic analysis on one good and two systems: on the social equality of sharing the benefits and costs of public good), *Caijing Wenti Yanjiu*,

10, 50-54.

Luo Dan, Yan Ruizhen and Chen Hao (2004), "Butong nongcun tudi feinonghua moshi de liyi fenpei jizhi bijiao yanjiu"(The comparative analysis of profit distribution systems between different non-farm utilizing types of rural land), *Guanli Shijie*, 9, 87-96.

Ma Xiaohe and Fang Songhai (2005), "Woguo nongcun gonggongpin de gongji xianzhuang, wenti yu duice" (The supply of Chinese rural public goods: situations, problems, and countermeasures), *Nongye Jingji Wenti*, 4, 22-29.

Ni Xiongfei (2005), "Woguo nongcun tudi zhengyong buchang xin biaozhun pingxi" (The analysis of Chinese new criteria of rural land requisition), *Jituan Jingji Yanjiu*, 6, 45-46.

Pu Shanxin, Chen Deyu and Zhou Yi (1995), *Zhongguo xingzheng quhua gailun* (A brief summary of Chinese administrative divisions), Beijing: Zhishi chubanshe.

Quan Wei (2002), "Shi guan xian (shi) tizhi fenxi yanjiu" (The study of CGC system), *Lilun yu Gaige*, 6, 41-43.

Ren yan ling (2006), "Zhengfu zhineng yuewei yu quewei de caizheng zhichu fenxi" (An analysis in fiscal expenditure of the offside and absence of governments function), *Xi'an Youdian Xueyuan Xuebao*, 11 (4), 79-82.

Shen Liren and Dai Yuanchen (1990), "Woguo 'zhuhou jingji' de xingcheng jiqi biduan he genyuan" (Chinese vassal economy: the formation, the drawbacks, and the origins), *Jingji Yanjiu*, 3, 12-19.

Shi Lei (2005), "Zhongguo zhongxin chengshi shixiaqu quhua gaige yanjiu" (The study on reforming urban districts of central cities in China), *Qingdao Xingzheng Xueyuan Xuebao*, 5, 37-40.

Shu Qing (1995), *Zhongguo xingzhengqu jingji yu xingzheng quhua yanjiu* (The study of Chinese jurisdictional economy and the administrative divisions), Beijing: Zhongguo huanjing kexue chubanshe.

Shu Qing and Zhou Keyu (2003), *Cong fengbi dao kaifang: zhongguo xingzhengqu jingji yanjiu* (From close-up to opening: on jurisdictional economy in China), Shanghai: Huadong shifan daxue chubanshe.

Song Li (2004), "Shizheng shouyi zhaiquan: jiejue difang zhengfu zhaiwu wenti de zhongyao tujing" (Municipal income bonds: a crucial way of solving the problems of local government debt), *Guanli Shijie*, 2, 27-34.

Sun Xueyu and Wu Kaichang (2004), "Dangdai zhongguo xingzheng jiegou bianping hua de zhanlue gouxiang-- yi shiguanxian tizhi weili" (The strategic conception of a flattened structure of administration in China— the CGC system as an example), *Zhongguo Xingzheng Guanli*, 3, 79-87.

Tang Ning (2004), "Dui shi ji shixiaqu tizhi guanxi de ruogan sikao" (Some thoughts on the institutional relations between the city and the urban districts), *Lingdao Kexue*, 2, 20-22.

Tao Ran, Liu Mingxing and Zhang Qi (2003), "Nongmin fudan, zhengfu guanzhi yu caizheng tizhi gaige" (Farmers' fiscal burden, the governmental governance and the reform of fiscal system), *Jingji Yanjiu*, 4, 3-12.

Wang Chunxia (2000), "Shiguanxian tizhi – bianqian, kunjing he chuangxin" (The CGC system — the transformation, dilemma and innovation), *Chengxiang Jianshe*, 12, 12-13.

Wang Dewen and He Yupeng (2005), "Chengxiang chaju de benzhi, duomianxing yu zhengce hanyi" (The nature, dimension and policy implications of rural-urban disparity in China),

Zhongguo Nongcun Guancha, 3, 25-37.

Wang Dianli (2004), "Shiguanxian shijian de fansi - 'fuhe xingzheng' de shijiao" (The rethinking of CGC practice the perspective of complex administration), *Beijing Xingzheng Xueyuan Xuebao*, 4, 19-23.

Wang Fuquan, Ma Chunfeng and Wu Hangkai (2008), "Guanyu woguo shixing shengguanxian caizheng tizhi de sikao" (Thoughts on the employment of a PGC system in China), *Difang Caizheng Yanjiu*, 9, 10-12.

Wang Jiping (2008), "Shiguanxi tizhi gaige quxiang tanxi" (On the reform orientations of CGC), *Shaanxi Ligong Xueyuan Xuebao* (shehui kexue ban), 26 (4), 29-33.

Wang Jun (2005), "Tudi caizheng de dongli jiegou" (The motivation structures of land finance), *Liaowang*, 9, 34.

Wang Sirui (2004), "Zhongguo xingzheng quhua de zhongxin: sheng haishi Fuzhou" (The focal level of administrative jurisdictions: province or prefecture?), http://www.bjsjs.net/news /news.php? intNewsId=1680.

Wang Yuming (2000), "Zhongguo shiguan xian (shi) tizhi de quyu jiegou guanxi ji fazhan qushi" (The regional structure and the development trend of Chinese CGC system), *Jingji Dili*, 3, 18-21.

Wei Xinghe and Liu Tangshan (2004), "Chuli zhongyang yu difang guanxi de guanjian: caiquan yu shiquan de heli huafen" (The key to reforming central-local relationships: proper divisions of revenues and expenditure responsibilities), *Jiangxi Xingzheng Xueyuan Xuebao*, 2, 15-18.

Wu Ang and Zhang Jianxi (1994), *Zhongguo difang jingji fazhan fenxi* (The analysis of the development of local economy). Beijing: zhongguo jingji chubanshe.

Wu Junpei (2003), "Guanyu hubei xianyu jingji fazhan de jige wenti" (Several issues on the development of county economy in Hubei Province), *Hubei Caishui*, 4, 2-4 .

Wu Li cai (2003), "Sannong shiyexia de shiguanxian tizhi -- jianyi ' shixian fenzhi '" (The CGC system in the perspective of farmers, rural areas, agriculture production—a proposal of separate governance between city and county), *Juece Zixun*, 10, 48-49.

Xiao Jincheng (2004), "Dijishi diweilun -- jian yu chedi qiangxianlun shangque" (The position of prefecture-level cities: discussion with the proposal of removing prefectures and reinforcing counties), *Xueshujie*, 2, 107-120.

Xie Baofu and Wu Yang (2004), "Dangdai zhongguo xingzheng quhua ruogan wenti fenxi" (The analysis of several issues on administrative division in China), *Anqing Shifan Xueyuan Xuebao* (shehui kexueban), 1, 13-17.

Xu Fei (2004), *Shixiaqu zhili fenxi -- zongxiang zhengfu jingzheng jichushang de yizhong zhidu anpai* (The analysis of the governance of urban districts—an institutional arrangement based on vertical governmental competition), Zhejiang daxue shuoshi xuewei lunwen.

Xu Rui'e (2008), "Shengguanxian caizheng guanli tizhi gaige yanjiu zongshu" (A survey of research on the PGC reform), Jingji Yanjiu Cankao, 60, 32-36.

Xu Xuelin (1991), *Zhongguo lidai xingzheng quhua* (China's administrative divisions in the past dynasties). Hefei: Anhui jiaoyu chubanshe.

Yan Kun and Wang Jinjie (2000), "Cong caizheng fenquan lilun kan woguode shuishou fenge" (China's segmentation of tax revenue from the perspective of fiscal decentralization theory), *Caijing Kexue*, 5, 78-82.

Yang Wenbin (2006), "Zhongguo shixing shengguanxi tizhi de zuli jizhi fenxi" (An analysis on the hinders to the PGC system), Xingzheng Luntan, 5, 28-30.

Yu Mingchao (2002), "Xiandai guojia zhiduxia de zhongguo xianzhi gaige" (The reform of China's county system in the modern state institution), *Zhanlue yu Guanli*, 1, 87-98.

Yuan Wenyi and Huang Anxin (2002), "Xingzheng chengben ji xiangguan lilun chanshi" (The administrative costs and the interpretation of relevant theories), *Ezhou Daxue Xuebao*, 9 (2), 5-7.

Zang Qi, Lu Mingxing and Vincent Yiupor Chen (2006), "Zhongguo de jinrong zhongjie zeng zhang yu chengxiang shouru chaju" (The growth of financial agencies in China and the urban-rural income gap), in Cai fang and Wan Guang hua (eds.) *Zhongguo zhuangui shiqi shouru chaju yu pinkun* (The income disparity in transitional China and the poverty), Beijing: Shehui kexue wenxian chubanshe.

Zhang Chungen (1999), *Xianyu Lun* (On couties), Beijing: Zhongguo wenlian chubanshe.

Zhang Lunjun and Wang Meiying (2003), "Zhongyang yu difang shuishou fencheng wenti de boyi fenxi" (A game-theoretic analysis on the central-local tax sharing), *Shuliang Jingji Jishu Jingji Yanjiu*, 12, 75-78.

Zhang Zhichang (1999), "Shixiaqu jidai guifan yu tiaozheng" (Urban districts: crying out for regulation and readjustment), *Suzhou Daxue Xuebao* (Zhexue shehui kexueban), 2, 4-47.

Zhao Anshun (2005), "Chengshi gainian de jieding yu chengshihua duliang fangshi" (The definition of the concept of city and the measurement of urbanization), *Chengshi Wenti*, 5, 24-27.

Zhao Liange (2000), "Yingxiang nongcun gongye juji de yinsu ji shizheng fenxi," (Effect factors of Chinese rural industry agglomeration and positive analysis), *Nongye Xiandaihua Yanjiu*, 21 (1), 48-52.

Zhao Yaping (2000), "Dui jiejue woguo difang baohu zhuyi wenti de tantao" (The exploration of the resolutions of local protectionism in China), *Hongguan Jingji Guanli*, 11, 42-43.

Zheng Yusheng and Li Chonggao (2003), "Zhongguo difang fenge de xiaolü sunshi" (The efficiency loss caused by Chinese intrt-regional division), *Zhongguo shehui kexue*, 1, 64-72.

Zhou Yixing and Hu Dapeng (1992), "Shidaixian tizhi dui xian jingji yingxiang de wenjuan diaocha fenxi"(The survey on the effect of CGC system on the county economy), *Jingji Dili*, 12 (1), 8-14.

Zhu Xianglin (2003), "Shengguanxian tizhixia shiji caizheng wenti yanjiu" (The study of prefecture-level public finance in the system of PGC), *Shehui Kexue Luntan*, 12, 82-84.

Zhu Xiangmin (2009), "Shengguanxian gaige yao jingti shichang fenge he xianyu jingzheng" (Attentions to market segmentation and inter-county rivalry in the reform of PGC), *Xin Changzheng*, 3, 15.