

Transfers-based Decentralization, Local Endowment and Public Employment

—A theoretical inquiry and empirical evidence from China

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Abstract: Based on the theoretical literature of fiscal decentralization, we discuss the political economy of inter-governmental fiscal arrangements in China and examine how a transfer-based decentralization impacts on local public employment. A theoretical model is built to show that compared to their counterparts in better-endowed localities, local governments in worse-endowed localities that are more heavily dependent on upper level fiscal transfers to finance their spending have higher incentives to increase public employment to build local political support rather than invest in growth-promoting public goods. Using a county-level panel data set from 1994 to 2003, we empirically identify the causality from higher transfer dependency to the expansion of public employment with an instrumental variable approach. It is argued that under a governance regime in which local governments are more accountable to the upper level than to local constituency, transfer-based decentralization, either through general-purpose transfer or through earmarked transfer, would both lead to serious problems. The policy implication is that expenditure decentralization needs to be accompanied by both revenue and political decentralization to achieve better local governance outcomes.

Key words: Local endowment, transfers-based decentralization, public employment expansion

JEL Classification:

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1 Introduction

As the role of government has expanded dramatically in countries across the globe, explaining the growth of public sector employment and accounting for the huge differences emerging across and within individual countries have become key challenges for the students of political economy. In the early 1990s civilian government employment ranged from less than 2 percent of the labor force in Senegal to almost 35 percent in Sweden. Levels of public employment also vary across the regions or municipalities that make up a given country. In Italy's South, public employees made up almost one quarter of the work force in 1995, compared to about 12 percent in the country's North.

A number of theories have emerged to explain the significant variations both across and within countries. The most common argument is what is commonly known as the Wagner's law, i.e., economic development engenders demands for new types of government services, and thus usually larger public sectors, measured in terms of either government spending or manpower. Wagner's law works decently well in explaining public employment levels across countries, but not always so well within them. For example, in Argentina, Italy, and various other less developed countries such as China, the poorer regions tend to have higher levels of public employment (Saxena, 2001, Gimpelson and Treisman, 2005).

A second perspective in the literature of political economy views government spending as inherently "excessive" and officials might abuse the natural information asymmetry between the ruler and the ruled, leading to a larger public sector than citizens would prefer (Buchanan 1977, Rodden, 2003). For example, Alesina et al (1999) view public employment as a means by which politicians conceal redistribution in favor of specific groups, or in another word,

public employment is a means to disguise flows of patronage. In a similar vein, Gimpelson and Treisman (2005) propose a theory that poorly structured institutions, i.e., democracies with weak legal and administrative systems, create incentives for local actors to increase staff and delay paying wages. This is because subnational politicians can deliberately run up some level of wage arrears that would erode political support and shifted the responsibilities in part onto the central government, who would then be under pressure to bail out the delinquent local government by giving transfers. Local government would then extracts larger fiscal transfers, part of which it uses to pay off wage arrears, but part of which goes toward hiring yet more public employees. Over time, such pressures would lead to sustained growth of the subnational public sector, alongside tightening fiscal constraints on the central government.

Another long-standing literature on fiscal federalism, public choice, and a more recent body of work on “market-preserving federalism” links public sector size to intergovernmental arrangements by extolling the virtues of decentralized fiscal and political decision making. It is argued that at least under the “Leviathan hypothesis” in which governments seek to maximize revenues by exploiting its monopoly power over the tax base, decentralized competition imposes constraints on the fiscal appetite of governments and "total government intrusion into the economy should be smaller, ceteris paribus, the greater the extent to which taxes and expenditures are decentralized" (Brennan and Buchanan, 1980).¹ However, as Rodden(2003) has argued, there is a caveat that decentralization may be dangerous if it allows

¹ Indeed, there has also been an international movement towards both institutional and fiscal decentralization over the last 25 years. Fiscally, the role of regional governments has expanded, in the sense that the share of state/provincial and local governments in total government consumption has risen.(Rodden, 2002)

subnational government to expand their expenditures while externalizing their costs to others. For example, if expenditure decentralization is not accompanied by revenue centralization, but rather is financed by central transfers, local government size may well be excessive since local governments can attempt to externalize their fiscal burdens onto one another when the ultimate locus of fiscal sovereignty is unclear. Empirically, there are also findings that the relationship between decentralization and government size depends upon the balance between local taxation and intergovernmental grants. For example, Stein(1999) found that decentralization in Latin America tends to produce larger governments, but this effect is particularly important in cases where vertical imbalance is high, transfers are discretionary and the degree of borrowing autonomy of subnational governments is large. There are also other cross-country studies that shows expenditure decentralization (the share of subnational governments in total government spending) will promote per capita delivery of different forms of infrastructure and reduce corruption, however, this effect was stronger when there was greater revenue decentralization (measured by dependence of subnational governments on self-generated revenues rather than fiscal transfers) (Grossman, 1989, De Mello et al, 2000, Estache and Sinha, 1995, Fisman and Gatti, 2002).

However, while the existing theories helps to account for public sector and employment growth across countries and in some democracies with weak legal and administrative systems, the existing theories may need to be extended to account for regional variations in public employment within country as well as the public employment expansion that is witnessed in non-democratic systems such as China. For example, China's public employment has been widely regarded as being excessive and growing too fast compared to the country's economic

development and the public services that have been provided (World Bank 2002). Overstaffing and an excessive number of government agencies and organizations appear to be pervasive in local governments and becomes a major constraint to improving the efficiency of expenditures. At the local level, on average over 70 percent or more of total expenditures is absorbed by personnel costs. (Chen et al, 2003). Moreover, there is also a need to explain why it is usually in the poorer regions of many countries where we see higher public employment levels. Still in the case of China, the public employment as a share of local population is significantly higher in the relative poor inland region than that in the more developed coastal region.

In this paper, a theoretical framework is proposed that helps to understand the patterns of and the relationships between fiscal transfers and public employment at the local level in a transfer-based decentralized economy like China. On the basis of recent analytic developments in the literature of decentralization and local governance, we argue that heterogeneous endowments across localities, combined with the central government's preference for interregional redistribution, would shape local incentives in investing in effective public goods versus creating patronage-type public employment. Simplistic as it might appear to be, our analysis is more or less regime –neutral in the sense that it can be applied to both non-democratic systems like China as well as democracies with relatively weak legal and administrative systems.

The rest of the paper proceeds as follows. In Part 2, we describe the evolution of China's fiscal system and public employment since the 1990s and explore the political economy behind such changes. Drawing on recent literature on decentralized governance, in Part 3 we

provide a two- stage game-theoretical model between the local and the central government that formalizes our analytic logic with testable hypothesis. On the basis of county level data from China between 1994 and 2003, Part 4 uses multivariate regressions to show that the pattern of regional public employment pattern fits the predictions of our theory: An instrument variable approach is employed in our empirical analysis to identify the following causality: other things controlled, the higher the share of a regions' expenditure is financed by upper level transfers, the higher its public employment level would be. Part 5 concludes with policy implications.

2 The Political Economy of Transfers-based Decentralization and Public Employment in China

2.1 The evolution of China's inter-governmental fiscal system since 1994.

China is a unitary state with its government being broadly composed of five layers of state administration: the center, 31 provinces, 331 prefectures, 2109 counties, and 44741 townships (World Bank 2002). In the 1980s and early 1990s, Along with other important reforms in the agricultural and the state-owned industrial sectors which promote work incentives, fiscal and administrative decentralization was pushed forward since the reform measures could not have been implemented without close coordination by local governments. In this period, local governments began assuming primary responsibility for local development while at the same time they enjoy significant revenue autonomy (Qian and

Weingast, 1997)²

A major fiscal reform undertaken in 1994 and further changes afterwards largely reshaped the intergovernmental fiscal relations in China. The main purpose of these reforms was to ensure both higher revenue collection as a ratio to GDP and a larger share of the central government in total budget revenue. This system replaced the revenue sharing arrangements established by a 1980 reform, which had favored local governments and had led to a sharp decline of the center's share in total revenue from about 40 percent in 1985 to less than 25 percent in 1993(World Bank, 2002).³

The fiscal and tax reforms undertaken in 1994 and afterwards significantly re-centralized the control over revenues by changing the revenue-sharing rules and increasing the role of transfers, but without modifying the largely decentralized expenditure responsibilities. (Martinez-Vazquez & Zhang, 2002). As a matter of fact, the expenditure responsibilities of sub-national levels (province, prefecture, county, and township) after 1994 became even heavier due to heavier responsibilities for maintaining the social safety at the local level. This was related to the transfer of SOE ownership from the central to local governments before the middle 1990s and the ensuing large-scale restructuring of China's state owned sectors in the late 1990s. Many of the social service and social security responsibilities that had been

² In the 1980s, a fiscal contracting system characterized by "dividing revenue and expenditure with each level of government responsible for balancing its own budget" was introduced to ensure that there would be incentives for local governments. At the same time, control over expenditures were further decentralized and local governments assumed primary responsibilities for providing education, health, housing, local infrastructure, and so forth(Wong, 2000).

³ The centerpiece of the package was introduction of the Tax Sharing System under which taxes were assigned either to the central or local governments. Central taxes include customs duties, the consumption tax, VAT revenues collected by customs, income taxes from central enterprises, banks and non-bank financial intermediaries et al while local taxes consist of business taxes, income taxes and profit remittances of local enterprises, urban land use taxes, personal income taxes, the fixed asset investment orientation tax, urban construction and maintenance tax, real estate taxes, vehicle utilization tax, the stamp tax. The main shared tax was to be the VAT, at the fixed rate of 75 percent for the Central Government, and 25 percent for local governments(World Bank, 2002).

shouldered by the state owned enterprises were now passed to local governments without corresponding resources being set aside to meet them(Wong, 2000).

At the sub-national level, there was also significant revenue centralization following the center's revenue centralization move since 1994. One important problem in China's intergovernmental fiscal system is that there is a serious lack of clear responsibility assignment among different levels of governments below the province (World Bank, 2002). Such ambiguity leads to a high degree of concurrent and overlapping expenditures among the sub-national levels and may easily lead to revenue concentration and delegation of expenditure responsibilities to lower level governments due to the weak bargaining position of lower level governments. This has been most obvious since the 1994 fiscal reform. The responses of provincial governments were to squeeze even larger shares of revenues from lower level governments and at the same time assign more responsibilities for expenditure to them (World Bank 2002).⁴

By the early 2000s, the center already collected over one-half of all fiscal income, while it only spent one-third of total government expenditure. In contrast, local governments at the county and the township level shared less than 20% of total government collection, but were burdened with more than 30% of the total expenditure needs (Su 2003). According to the World Bank (2002), China is one of the most decentralized countries in the world in terms of subnational government expenditure shares. In the 1990s, the ratio of sub-national to total

⁴ More recent years China has witnessed a trend toward further centralization of fiscal powers. The center began to claim 50% of the personal and enterprise income taxes that used to belong exclusively to localities in 2002 and this share was raised further to 60% in 2003. Starting from 2002, the central government also initiated a rural tax reform that aims to remove all local fee charges and replace them fiscal transfers from upper-level governments. (Martinez-Vazquez and Qiao, 2006). Responding to protests by farmers about the inadequacy of the compensation in land requisition, Chinese government is currently in the process of centralizing land requisition power to the provincial and central level by establishing a vertically controlled land management system with tighter land supply quotas and stronger supervision. The center is also planning to shift the local extra-budget revenue from land leases into budget and there are initiatives to share these revenues with local governments. Overall speaking, the center is now asserting a firmer control in terms of fiscal as well as administrative power.

government spending averaged 32 percent in OECD countries, 26 percent in transition economies, and 14 percent in developing countries. With its 70 plus percent ratio of subnational to total spending, of which more than 55 percent is at sub-provincial levels, China is clearly an outlier.

The revenue centralization since 1994 without corresponding spending changes has created large vertical imbalance that needs to be offset by a sufficient quantity of transfers. To compensate local governments for the losses after 1994, the central government devised a complicated subsidies system to the provinces and the latter also adopted this complex subsidies system and applied it to lower levels of government. Before the 1994 tax reform, subsidies to the county government broke down into fixed subsidies and earmarked subsidies.

⁵ The 1994 tax reform saw the introduction of a host of new subsidies category. These transfers mainly include the tax return subsidies, original systems subsidies and general purpose transfer. The tax return is a transfer that a higher level of government gives to the lower level after taxes have been successfully collected by the higher level of government. The original system subsidies was created to ensure that local governments still received the same amounts of subsidies as they had under the previous fiscal system (State Council 2003).⁶ . The government also introduced the so-called “general purpose” transfer aiming at redistributing tax capabilities across regions and redress regional imbalance by implementing an objective formula for redistribution ((Budgetary Division of the Ministry of Finance 2002, Lou 2002). In addition to the above three types of transfers that local governments have freedom in how to spend, there are also hundreds of different earmarked grants allocated by the center on an ad-hoc negotiated basis. These earmarked subsidies was less than 20% of all transfers in the middle 1990s but increased to over 30% in the early 2000s while the general

⁵ Fixed subsidies were more or less equalizing transfers whereby both central and provincial governments transferred money to poor and minority counties (Ahmad 1998; Park et al. 1996). Earmarked subsidies, were designated for specific purposes, which ranged from construction, education, flood-prevention to administration and even public security (Ministry of Finance 2001).

⁶ However, because the tax return was designed to compensate local government and not to redistribute, tax return would only grow at 0.3 times the growth rate of VAT and consumption tax collection (State Council 2003).. The original system subsidy thus subsumes fixed subsidies and some items of earmarked subsidies (Lou 2002)

purpose was about 6-8% in the middle 1990s and gradually rose to around 20% in early 2000s. (Fedelino and Ter-Minassian, 2006).

By the end of 1990s, around 40% of the spending at the subnational level is financed by the central transfers. The same held for governments below provincial level: in 1999, 40% of the county level spending is financed by their upper level governments while that for the nationally designated poor counties reached as high as 61% (Chen et al, 2002) .

2.2 The political economy of revenue centralization under political centralization

Unlike many other developing countries have been going through significant processes of both political and fiscal decentralization as these countries democratized, China's administrative and fiscal decentralization in the 1980s and the early 1990s occurred in a context of continued political centralization. The Central Committee of the Chinese Communist Party (CCP) acts as the headquarters of local governments at all levels, which ultimately controls the mobility of government officials within the system. This highly centralized structure of personnel control remains intact even to this day (Li and Zhou 2005). Therefore, the concept of "constitutional decentralization" or "political decentralization" that are prevalent in the experiences of many other decentralizing systems does not apply to the case of China (Bardhan, 2002). Neither does local government in China hold any institutionalized rights to participate in central decision-making procedures; nor are there any widely accepted free elections at any level of government that stretch upward from the townships to Beijing.⁷ Therefore, overall speaking there is no effective electoral mechanism to ensure the responsiveness of sub-national governments to their constituencies.

Under the current political regime in China, the political legitimacy of the Chinese

⁷ Although grass-roots (village-level) elections have been taking place quite extensively across the country since the late 1980s, the elected village committees are conceived of as community organizations, rather than as units of state administration. These grass-roots leadership selections do not qualify, therefore, as elections to local-state governmental offices.

government largely builds on its ability to deliver economic growth and employment. This is why the Chinese government started its marketization reform in the late 1970s and early 1980s after the chaos of the Cultural Revolution. Under the strategy of “*fa zhan shi ying dao li*” (which means ‘development is what really counts’), which the Communist Party of China has been advocating for the objective of catching up with developed countries, GDP maximization has been included in the central government’s policy agenda for years.

However, as the economy became more marketized and decentralized in the 1980s, the ability of the center to politically control local governments also gradually eroded. The center felt its authority threatened in the process of economic liberalization and decentralization since the traditional administrative tools such as planning and regulation become less accessible to the center and a firmer control over fiscal revenue became necessary. Therefore, the revenue recentralization since the middle 1990s can be viewed a natural response for the center that hoped to continue its firm political control in an increasingly marketized economic system. After all, controls over fiscal transfers could then be used as carrots and sticks to induce local policy coordination.

The logic above may also help to explain why the center, with more resources in hand after the 1994 fiscal reform, has not increased the general purpose (or the more equalizing) transfers but has instead significantly raised the earmarked transfers. In deed, much of the increase in central transfers came from hundreds of types of earmarked grants allocated in an ad hoc, nontransparent fashion rather than from the general-purpose equalizing transfers. For example, in 1999 the earmarked transfers was as high as RMB 147 billion, over one third of the total transfers while in 2001 this reached RMB 256 billion, 50% of the total transfers(Wong, 2000, Tsui, 2005, World Bank 2002). Since under China’s political system local officials are not elected popularly and thus they are not held accountable to local populations, giving money through the general-purpose transfer may easily lead to abusive

use of these funds into local bureaucracy expansion or even out-right rent-seeking while earmarking transfer will at least give the center a sense of control over the local governments. The center knows that in lacking accountability to their people, local governments may easily divert general-purpose transfers to bureaucratic expansion and staff wages rather than to public goods and services that reach to the local constituency. Under such a circumstance, earmarking the transfer and directing its use to designated purposes seems to be the only sensible alternative. After all, tax receipts accrue to the center allow the center to withhold funds if local governments fail to comply with the central policies. Earmarking transfers, compared to general-purpose transfers, is a more effective way of exerting control since earmarked transfer is a relatively discretionary portion in transfers.⁸ Thus, the new transfer system after 1994 likely serves more effectively as a tool for political control than a redistributive mechanism (Shih and Zhang, 2006).

However, once funds are allocated from above and local government performance is evaluated by certain “core” indicators that are relatively easy to monitor, these transfers inevitably entail distortion in local incentives. Usually decisions on these transfers, especially on earmarked transfers are made in very arbitrary way that has led to tactics of extensive negotiation, unhealthy competition, political performance that caters to higher level, and further rent seeking by local authorities (Martinez-Vazquez & Zhang, 2002). Local governments competing for upper level transfers also have strong incentives to showcase in fiscal spending and investment that usually does not bring even short-term benefits to local population that need services. In the end, these transfers usually degenerate into poorly targeted patronage-type programs that provide grants too small and dispersed to meet basic

⁸ As the World Bank observes(2002), after the 1994 fiscal reform the Chinese Central Government has gained a great deal of allocative control even though a large share of central revenues are returned to the localities. First, tax receipts accrue to the center before rebates are made that the center controls the purse confers power over local governments. It allows MOF to withhold funds if local governments fail to comply with central policies. Second, the center’s allocative flexibility increases over time as the share of tax rebates has fallen in total transfers increasing the discretionary portion and reducing the formula-driven portion.

needs in poorer regions and help the poor people effectively (Park et al, 2002).

Overall speaking, the recentralization in China's intergovernmental fiscal system since the middle 1990s reflects a tension between China's still centralized political system and its increasingly liberalized and decentralized economic system. To ensure the upper level policy targets met, upper level governments need some instruments to control local officials. Though political appointment still serves as an effective instrument, it is a blunt instrument that can only be used as a last resort (for example, when the officials commit crimes) while fiscal transfer is a much more flexible tool for the center to exert political control in an increasingly market economy.

2.3 Local Spending Financing and Public Employment Growth

Though across China local governments have neither much power to set rates for local taxes nor much autonomy in the definition of their tax bases, this does not mean governments in different localities have access to the same level of locally generated revenue and have the same capacity in self-financing their local expenditure. This is because in China local tax revenues derive mainly from the shared value added tax, business tax, as well as enterprise income tax. Since the bases of these taxes typically cover manufacturing and service sectors, localities in which the shares of the secondary and tertiary sectors in GDP (mainly in coastal provinces) are relatively high fare much better average in terms of local revenue collections. In contrast, the central and western provinces, which are predominantly agriculture-based, fare poorly. The same holds for the distribution of the personal income tax (PIT) that becomes more important in recent years, whose yield is higher the larger the average household income,

thus the richer coastal provinces are favored (Fedelino and Ter-Minassian, 2006).⁵

As a result, the share of local spending financed by locally generated fiscal revenue diverges significantly across regions. Apparently, local governments in more industrialized regions have access to higher levels of locally generated fiscal resources than their counterparts in less developed regions. On the contrary, governments in less developed localities with smaller local tax base are more dependent on upper level transfers for their spending. Once revenues come mostly from the upper level, local governments tend to have less fiscal incentives to serve local constituency by providing public services to local population but instead tend to engage more in cultivating local patronage and political support, or even engage in rent-seeking. Tentatively, the implications are twofold: first, localities with higher dependence on the upper level transfers would have larger governments in terms of local public employment, everything else controlled. Furthermore, as China's intergovernmental fiscal system become more centralized and all localities become more dependent on upper level transfers, their incentive to provide growth-promoting public goods would decline while their incentives to engage in political patronage and rent-seeking would be stronger and a larger government would follow.

Figure 1 presents the dynamics of local transfer dependence and public employment from 1994 to 2003 at and below the county level in China.⁹ Our county-level panel data set

⁵ Moreover, the relatively developed regions can also draw on additional high budget revenue as well as extra-budget revenue from the development and lease of rights of local land while less developed regions with lower land values have less access to such resources.

⁹ In China, the county-level administrative units include counties, county-level cities, and urban districts. The choice of county level data is because the county and township levels have very heavy expenditure responsibilities and are providing most of the public employment in China. These two levels combine to provide the bulk of vital public services, including 70 percent of budgetary expenditures for education, and 55-60 percent of those for health. In addition, the county, along with the city level government, account for 100 percent of expenditures for unemployment insurance and social security and welfare. The county and township level together provide around 70% of public employment in China and the growth of public employment has been concentrating on these two levels. For example the province of Hebei, public employment grew from 1.57 million to 2.19 million and 80% of

has information for county aggregate (i.e., the county and the township level) variables such as public employment, fiscal expenditure, transfers as well as other economic and demographic information to be used in empirical analysis in Part 4 (available from the newly available *Statistical Material for Prefectures, Cities, and Counties Nationwide (various years)* published by the Ministry of Finance. The original data covers over 2800 county-level administrative regions. However, due to lack of information for some counties in some years, we opt to use a balanced panel that covers 1527 county level administrations between 1994 and 2003 to facilitate effective comparison (In our econometric analysis in Part 4, we will use both the balanced data set and the unbalanced data set to test the robustness of our theoretical hypotheses).

Our local transfer dependence variable, the local transfer share, is defined as the share of local spending financed by the upper level transfers. Our public employment variable, the public employment share, is defined as the number of public employees per 10,000 population. Here public employment represents employment in government administrations as well as public service providing sectors such as education, health care and sport, social protection, culture, art, science. These public providing sectors are overwhelmingly financed from government budgets in China. Our public employment definition is consistent with the World Bank definition that treats it as employment in government administration, public health and education and other public service units.

the growth was at the county and township level (Zhao, 2002) .

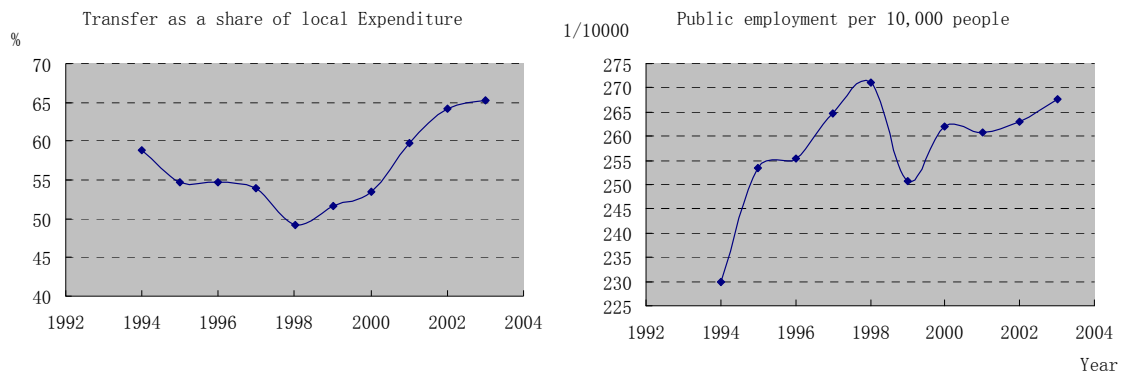


Figure 1: National trends in local transfer share and public employment 1994-2003

Surprisingly, local fiscal transfer share first decreased from 1994 after the revenue centralization reform and then began to rise fast since 1998. This is because local governments after 1994 tax sharing reform exerted much greater efforts in collecting taxes that are wholly local, such as the local business tax and income tax while in the same period the central transfers did not follow up as fast. For example, the business tax, a local tax has risen from 12.6 to 16.2 percent of total tax revenues, while the personal income tax, an insignificant tax in 1994 but accounted for more than 6 percent of local taxes in 1998 (World Bank, 2002). Due to the higher income elasticity of local taxes, the central share of revenues fell during the mid-1990s, and only recovered afterwards along with higher transfers to local governments. Therefore, only after 1998 when the center's tax revenue began to rise faster and when the center began to channel more grants to local governments, local transfer dependence share began to rise steadily.

The local public employment ratio also saw an overall growth between 1994 and 2003. However, between 1998 and 1999 a large scale state-owned enterprise restructuring led to a lot of laid-off workers and a significant drop of local public employment. A quick growth of the public employment ratio started from 1999 and by 2003 almost all the losses due to SOE restructuring in the late 1990s were made up. On average the growth of public employment in

China is still as high as 1 million per year and such growth mainly occurred at local level, especially the municipal and county level. At the county level, between 1994 and 1999 the county-level dependents grew by an average of 4.5%. (Wang 2002),

Figure 2 divides China into three large regions: the Eastern, the Middle and the Western region. Roughly speaking, the eastern coastal region boasts the best endowment and the highest development level among all while the western region is the poorest. As shown in the figure, the western counties have the highest dependence on upper level among during the whole period. The middle region's transfer dependence was lower than that of the east before 1998 because right after the 1994 fiscal reform the east obtained a lot of tax returns to compensate their fiscal loss. However, after 1998 the middle's transfer dependence rose steadily and become much higher than that of the east. Overall speaking, there was an increasing trend of transfer dependence for all regions during the whole period and the rise was particularly sharp after 1998.

With regard to the public employment share, Figure 2 also indicates that the least developed west had the highest public employment ratio among all, followed by the middle and the east. Between 1998 and 1999, the west was most heavily affected by the SOE restructuring followed by the east. Though there was also large laid-off in the middle regions, it seems that its loss of SOE workers was more than compensated by public employment growth in non-SOE public sectors, therefore this region witnessed a steady growth of public employment ratio during the whole period. Overall speaking, Figure 2 indicates that the lower the level of economic development, the higher the public employment ratio.

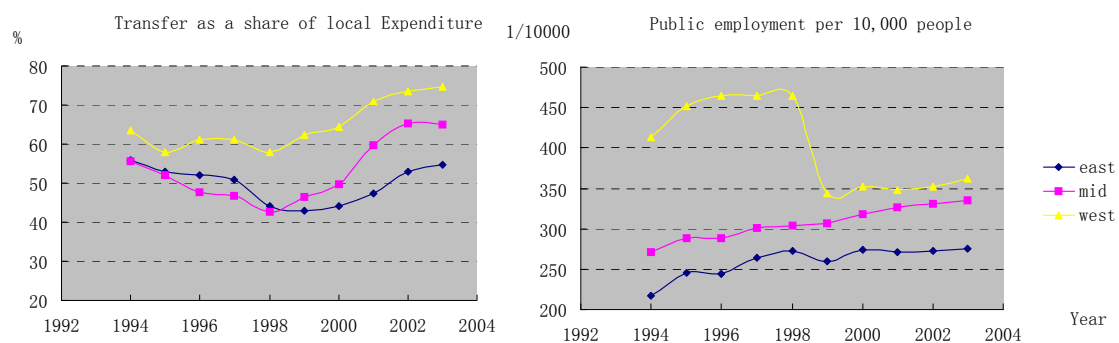


Figure 2: Regional Trends in Local transfer share and public employment 1994-2003

The question to ask is whether regional variations in public employment share can be attributed to their local spending financing. Though all local governments in China operate within one political system, significant regional variations indeed exist in local governance practices. As shown by many scholars, in the more developed coastal regions, local governments have, to a large extent, limited their predatory and regulatory roles and have been much quicker in readjusting their local policies. Many coastal provinces such as Zhejiang and Jiangsu, county and township governments have significantly changed their roles, lately emphasizing their provision of public goods and services to promote economic development. Meanwhile, in many less developed regions, local governments tend to remain firmly engaged in competing for upper level transfers, charging farmers' fees while at the same time use most of their revenue for salaries to personnel that is unable to provide much effective service. Both western and Chinese scholars point out that the ballooning of local fiscal personnel has rapidly increased local fiscal demand and in many less developed regions local budget became "easting budget", i.e., local revenue is barely enough for basic salaries of public employees, not to mention the operating costs for effective public services. (Fan 1998; Park et al. 1996, Chen et al, 2003). In next section, we will provide a theoretical framework to link public employment growth to higher transfer dependence in local spending.

3. Transfer-based Decentralization, Local Endowment and Public Employment: A theoretical framework

A lot of efforts have been made in the literature to model the relationship between decentralization and government size, though the measure of government size may differ from government expenditure as a share of GDP to government staffing level. Careaga and Weingast (2002) present a simple model in which governments that raise their own revenue have incentives to provide market-enhancing public goods, while governments that rely heavily on revenue-sharing from the central government are more likely to use resources for patronage and rent-seeking. An important reason to choose public goods is that they will ultimately foster growth and push out the budget constraint, but this incentive is lost when these additional revenues flow to the common national pool rather than the local government.

¹⁰ If we consider hiring public employees is one way that local leaders to cultivate patronage and build political support, a plausible hypothesis is that as the fiscal system become less decentralized, due to lower local revenue share and/or higher share of local expenditure being financed by upper level transfer, local governments may have incentive to hire more public employees.

Since local officials in China are appointed from above and thus are not held accountable to local constituency as those in democracies with popular election, under such a regime there is a reason to believe that a transfer-based decentralization would tend to induce more local

¹⁰. As a matter of fact, such argument has been applied to a variety of countries. Some contend that the high—and increasingly secure—share of revenues retained by subnational governments in China helps to explain why that country grew rapidly in the 1980s and 1990s (Jin, Qian, and Weingast 1999). By contrast, a low ex post share of revenue locally retained is seen as a reason why Russia has stagnated (Zhuravskaya 2000; Blanchard and Shleifer 2000). Similar arguments are often made about other developing countries such as Kisubi (1999, p. 123) for Uganda, Shah(1998, p.141) for Pakistan.

patronage and rent-seeking rather than promote local incentives to provide effective public goods. Theoretically, the revenue-centralization fiscal reforms since 1994 would make local officials have lower stake in locally generated revenues. Local government will then care less about expanding the tax base, but rather use grants to reward political supporters and set up local political network, or even extract bribes and divert or embezzle budget funds if such misbehavior is not well monitored. As a matter of fact, rent-seeking can be also realized through hiring public employees if jobs in public sectors are attractive. Government officials can make money by selling positions to people who want to get a job in government agencies.¹¹ Therefore, the key here is that the upper level transfers will discourage local resource mobilization and give perverse signals of a “soft budget constraint” to local governments. A transfer-based decentralization would only weaken the agency relationship between local citizens and government agencies. By severing the link between taxes and benefits, mere expenditure decentralization might turn the public sector’s resources to uses of little relevance to local needs.

However, the hypothesis for more fiscal decentralization by granting local government higher share of tax revenue can only be tested using cross-country analysis since within one country the tax sharing rule is almost always the same for different regions. One exception is China during the 1980s and early 1990s when different provinces had different tax sharing formulas with the center through a so-called “fiscal contracting system”. Nevertheless, as

¹¹ This has indeed happened in China, especially in many less developed regions where job opportunities in the private sector are limited and the wage premiums in government sectors are high. The authors’ field work in many places in western provinces in China such as Gansu and Shannxi in recent years found that there was significant increase of both teaching and administrative staffs at local public schools after the upper level governments required a timely and full delivery of school salaries and the bribes of getting jobs could be as high as two or three years of the salaries these jobs pay . There are also a lot of reports on cases in which local government pay wages to people who are on the public sector pay list but are not really working at all. In recent investigations, the western province of Sichuan found that there are 370,000 such people while in the middle province of Henan over 20,000 people were found on the public payroll but never work in the public sector.

shown in Part 2, different fiscal spending patterns are still observed even among different regions within the same country even though these regions have exactly the same tax sharing rule with their upper level governments. Though the Wagner's Law holds that as economy grows, local public employment tends to grow, it has been observed that local governments in the relatively poor regions of many developing countries usually have higher incentives to provide public employment rather than to spend in effective public investment though the latter is more productive in generate growth and revenue in the future().... This is also true in China. A natural question to follow is why this has happened.

Our perspective is that local endowment (or local investment climate), by affecting the marginal productivity of government investment in local public goods and services, shapes local incentives to invest in public goods versus public employment. Along with central preference for regional equalization, the interregional endowment difference helps to account for spending patterns across regions and local incentive to create public employment.

In our theoretical setup, we assume there are two levels of government, i.e., the central government and the local government. Assume there are N regions within the country. These regions differ from each other in terms of local endowments. Local endowment $\rho_i, i = 1, 2, \dots, N$ can be broadly understood as local investment environment. Therefore, it could be "hardware" endowment such as local infrastructure, transportation and even geographical conditions or "software" endowment such as local law and order, or local regulatory policies, although clearly many other interpretations are possible. A higher ρ here can be regarded as a better endowment or investment environment. If some units start out better endowed than others with characteristics that make them attractive to investors (e.g.,

natural resources, geographical advantages, inherited human capital), it can usually be associated with a higher initial level of development.¹²

Local government's utility function has two parts. On the one hand, it values local (economic) production, which is an increasing function of local provision of productive public goods (and services); on the other hand, it also draws utility from hiring public employees to cultivate local political support. Here we are assuming that local governments as *partially self-interested* actors, which may care about both social welfare and their own salaries.

Therefore, local government's utility can be written as $f(I, \rho) + \eta \cdot \psi(C)$, where $f(I, \rho)$ is local production function, I is local government investment in productive public goods. $f(I, \rho)$ is also an increasing function of local endowment ρ , I and ρ are complementary in $f(I, \rho)$. C is the number of local public employees and $\eta \cdot \psi(C)$ is local government's utility from hiring them. In another word, our model assumes that building more infrastructure and spending tax revenues prudently by providing effective public goods are not the only ways that sub-national governments can spend their money. In a political system where there are insufficient checks and balances against (local) governments, local expenditure is also a conduit for patronage where local officials can expand their local political base or establish political support network by hiring public employees. Though in practice

¹² Heterogeneous endowment is also assumed in the most recent literature of decentralization. For example, In a model of tax competition, Cai and Triesmand (2005) argued that if differences in endowments are sufficiently large, the worse-endowed units will actually have *less* business-friendly policies in equilibrium under capital mobility than if they had effective capital controls. Rather than being disciplined, officials of such units will spend a larger share of the budget on non-productive public goods or on their own consumption than when capital is immobile. By contrast, better-endowed units will invest more in business services and will suck capital out of their poorly-endowed counterparts. Their model is a model of tax competition that abstracts from central-local transfers while in our model we abstract from the tax competition effect but focus on transfer-based decentralization in a central-local context.

hiring public employees may also contribute to providing effective public goods, for tractability here we set up the model as though provide public services, on the one hand, and consume patronage on the other, but this is merely a convenient stylization which should not affect our results.

Assume there are N regions, each with a different endowment. For simplicity, the center's utility function is to maximize a weighted-sum of the social welfare of all regions, with the poor-endowed regions having higher weights in the center's utility function. Therefore the center's utility function can be written as $\sum_i \lambda(\rho_i) \cdot f_i(I_i(B_i, \rho_i), \rho_i)$, where $\lambda(\rho_i)$ is an decreasing function of local endowment. This is a reasonable assumption if we consider that regional equalization is an explicit target for central governments in almost all countries.

The above setup of local and central utility is consistent with the current literature on decentralization that usually assumes that local governments, as compared to central governments, are usually more vulnerable to "capture" by local interests groups even in many non-full-fledged democracies (Bardhan and Mookherjee, 2001). In the case of China, it is at least no less, if not more, reasonable to assume such a local government utility function since local public employees is generally considered as the most significant interest groups that support the Chinese Communist Party at the local level. (...

Further assume that the government tax rate is t and that the tax sharing rule between the central and the local is that the latter retains a share of α from the total revenue while the center has a share of $(1 - \alpha)$. Local government's expenditure is jointly financed by its share of locally retained revenue $\alpha \cdot t \cdot f(I, \rho)$ and the central transfer B .

The center's utility maximization problems can be written

$$\sum_i \lambda(\rho_i) \cdot f_i(I_i(B_i, \rho_i), \rho_i) \quad i = 1, 2 \dots m$$

Its budget constraint is

$$\sum B_i = (1 - \alpha)t \sum_i f(I_i, \rho_i) \quad i = 1, 2 \dots m$$

The maximization problem of Local government in region i is

$$\max_{I, C} f(I, \rho) + \eta \cdot \psi(C)$$

Local budget constraint is

$$I + w \cdot C = B + \alpha \cdot t \cdot f(I, \rho) \quad i = 1, 2 \dots m$$

Where B_i is the center's transfer to region i; $f_i(I_i, \rho_i)$ is region i's production function; I_i denotes local government's productive public investment in region i, ρ_i is region i's endowment; t is tax rate and α is local tax share; w is the average wage rate of local public employees; $\lambda(\rho_i)$ is the weight attached by the center to region i, which we assume is a function of local endowment.

We assume $\frac{\partial f}{\partial I} > 0$; $\frac{\partial f}{\partial \rho} > 0$; $\frac{\partial^2 f}{\partial I^2} < 0$; $\frac{\partial \psi}{\partial C} > 0$; $\frac{\partial^2 \psi}{\partial C^2} < 0$; $\frac{\partial^2 f}{\partial \rho \partial I} > 0$; $\frac{\partial \lambda}{\partial \rho} < 0$; The first

five assumptions are easy to understand and have been used in the decentralization literature

(Cai and Treisman, 2002). $\frac{\partial^2 f}{\partial \rho \partial I} > 0$ is to assume the complementarities between local

endowment and local productive public investment. $\frac{\partial \lambda}{\partial \rho} < 0$ is to assume the center has an

explicit target of "regional equalization", which means that the center values production of different regions differently and attaches a higher value for the less-well-endowed regions.

This setup of the center's maximization problem means that it is facing a tradeoff between transfers to the better-endowed regions that could raise national production more effectively

and transfers to the less-well-endowed regions to realize its target of regional equalization. The optimal choice for the center is to choose B_i so as to maximize its utility.

What we want to know from this model is that how local governments in the worse-endowed localities spend differently from those in better-endowed ones in terms of hiring public employees versus providing productive public investment. More importantly, we want to understand how such difference is related to the differences in their dependence on upper level transfers and how a transfer-based decentralization will affect the regional variation in public employment.

The model is a two-stage game-theoretical model. In the first stage, the center chooses its transfers B_i to different regions, in the second stage, local governments decides its spending on productive public investment versus public employments. We use backward induction to solve the model. In the second stage, local government, on the basis of its transfer and endowment, decides its spending on productive public investment versus public employments., i.e., $I_i^*(B_i, \rho_i)$ and $C^*(B_i, \rho_i)$

For any region i , from the Kuhn-Tucker condition we have:

$$F \equiv f_I + \eta\psi_C(\alpha t \cdot f_I - 1) = 0 ;$$

Here f_I, f_{II} are the first order, second order f with respect to local effective public goods provisioning I respectively, $f_{I\rho}$ is partial derivative of f_I with respect to ρ .

and, $\alpha t \cdot f_I - 1 < 0$

For F , take partial derivative of I , we have

$$\eta\psi_{CC}(\alpha t \cdot f_I - 1)^2 + (1 + \alpha t\eta\psi_C) \cdot f_{II} < 0 ,$$

therefore, I^* and C^* is the global optimal, or $I = I^*(B, \rho); B = B^*(B, I^*(B, \rho), \rho)$

From the Implicit Function Theorem, we have :

$$\begin{aligned}\frac{\partial I}{\partial \rho} &= -\frac{(1+\eta\alpha t \cdot \psi_c)f_{I\rho} + \eta\alpha t(\alpha t f_I - 1)f_\rho \cdot \psi_{cc}}{(1+\eta\alpha t \cdot \psi_c)f_{II} + \eta(\alpha t f_I - 1)^2 \cdot \psi_{cc}}; \\ \frac{\partial I}{\partial B} &= -\frac{\eta(\alpha t f_I - 1) \cdot \psi_{cc}}{(1+\eta\alpha t \cdot \psi_c)f_{II} + \eta(\alpha t f_I - 1)^2 \cdot \psi_{cc}}; \\ \frac{\partial C}{\partial \rho} &= \frac{1}{w} \cdot [\alpha t f_\rho + (\alpha t f_I - 1) \cdot \frac{\partial I}{\partial \rho}]; \\ \frac{\partial C}{\partial B} &= \frac{1}{w} \cdot [1 + (\alpha t f_I - 1) \cdot \frac{\partial I}{\partial B}]\end{aligned}$$

Therefore,

$$\frac{\partial I}{\partial \rho} > 0 \quad ; \quad \frac{\partial I}{\partial B} > 0$$

(1)

$$\frac{\partial C}{\partial B} = \frac{1}{w} \cdot \frac{(1+\eta\alpha t \cdot \psi_c) \cdot f_{II}}{(1+\eta\alpha t \cdot \psi_c)f_{II} + \eta(\alpha t f_I - 1)^2 \cdot \psi_{cc}} > 0 \quad (2)$$

$$\frac{\partial C}{\partial \rho} = \frac{1}{w} \cdot \frac{(1+\eta\alpha t \cdot \psi_c) \cdot [\alpha t \cdot f_\rho - (\alpha t f_I - 1) \cdot f_{I\rho}]}{(1+\eta\alpha t \cdot \psi_c)f_{II} + \eta(\alpha t f_I - 1)^2 \cdot \psi_{cc}} < 0 \quad (3)$$

Without loss of generality, we assume there are only two regions within the country. In

the first stage, we have ¹³

$$G = \begin{cases} \lambda(\rho_1)f_{I_1}I_{B_1} - \gamma(1-(1-\alpha)t \cdot f_{I_1}I_{B_1}) = 0 \\ \lambda(\rho_2)f_{I_2}I_{B_2} - \gamma(1-(1-\alpha)t \cdot f_{I_2}I_{B_2}) = 0 \\ B_1 + B_2 = (1-\alpha)t \cdot [f_1(I_1, \rho_1) + f_2(I_2, \rho_2)] \end{cases} \quad , \quad \gamma \text{ is Lagrangian 's multiplier}$$

From the first , we have $B_i = B_i^*(\rho_i)$, $i=1, 2$;

Similarly, we have B_i^* as the central optimal

For the central government:

$$I_i = I_i^*(B_i^*(\rho_i), \rho_i); B_i = B_i^*(B_i^*(\rho_i), I_i^*(B_i^*(\rho_i), \rho_i), \rho_i)$$

Taking full derivative with respect to G we have:

¹³ Similar results can be obtained with a set-up of m regions.

$$\begin{pmatrix} dB_1 \\ dB_2 \end{pmatrix} = \frac{A^*}{|A|} \begin{pmatrix} M \cdot d\rho_1 + N \cdot d\rho_2 \\ O \cdot d\rho_1 + P \cdot d\rho_2 \end{pmatrix},$$

let $\beta = (1 - \alpha)t$

$$\text{where, } A = \begin{pmatrix} 1 - \beta f_{I_1} I_{B_1} & 1 - \beta f_{I_2} I_{B_2} \\ -(\lambda_2 + \beta \lambda_1)(f_{I_1 I_1} I_{B_1}^2 + f_{I_1} I_{B_1 B_1}) & (\lambda_1 + \beta \lambda_2)(f_{I_2 I_2} I_{B_2}^2 + f_{I_2} I_{B_2 B_2}) \end{pmatrix},$$

A^* is the adjoint matrix, where $|A| < 0$ is a negative definite matrix.

$$M = f_{I_1} I_{\rho_1} + f_{\rho_1}; N = f_{I_2} I_{\rho_2} + f_{\rho_2}$$

$$O = \lambda_{\rho_1} (f_{I_2} I_{B_2} - \beta f_{I_1} I_{B_1}) - (\lambda_2 + \beta \lambda_1) [(f_{I_1 I_1} I_{\rho_1} + f_{I_1 \rho_1}) I_{B_1} + f_{I_1} I_{B_1 \rho_1}]$$

$$P = \lambda_{\rho_2} (\beta f_{I_2} I_{B_2} - f_{I_1} I_{B_1}) + (\lambda_1 + \beta \lambda_2) [(f_{I_2 I_2} I_{\rho_2} + f_{I_2 \rho_2}) I_{B_2} + f_{I_2} I_{B_2 \rho_2}]$$

In the case of region 1 ($i = 1$),

We can solve

$$\frac{\partial B_1}{\partial \rho_1} = \frac{H + J}{|A|}$$

$$H = \beta (\lambda_1 + \beta \lambda_2) (f_{I_1} I_{\rho_1} + f_{\rho_1}) (f_{I_2 I_2} I_{B_2}^2 + f_{I_2} I_{B_2 B_2}) < 0$$

$$J = \{ \lambda_{\rho_1} (f_{I_2} I_{B_2} - \beta f_{I_1} I_{B_1}) - (\lambda_2 + \beta \lambda_1) [(f_{I_1 I_1} I_{\rho_1} + f_{I_1 \rho_1}) I_{B_1} + f_{I_1} I_{B_1 \rho_1}] \} (\beta f_{I_2} I_{B_2} - 1) > 0$$

Therefore, if λ_{ρ_1} is small enough, i.e., the weight attached by the center to poorly-endowed region is high enough, we have $|J| > |H|$, and $\frac{\partial B_1}{\partial \rho_1} < 0$. Here the tradeoff the center faces is obvious: on the one hand, if the center gives more transfer to the region with good endowment, its rate of return will be higher as compared to the case in which the poorly endowed region gets the transfer. However, this gain must be balanced with the utility costs due to worse outcome in production for the poorly-endowed region.

$$(\lambda_{\rho_1} < 0)$$

Therefore, we have:

$$\frac{dC}{dB} = \frac{\partial C}{\partial B} + \frac{\partial C}{\partial \rho} \frac{\partial B}{\partial \rho} > 0 \quad (4)$$

$$\frac{dC}{d\left(\frac{B}{B + \alpha t f(I, \rho)}\right)} = \frac{dC}{\frac{\alpha t [B_{\rho} f(I, \rho) - B(f_{\rho} + f_I I_{\rho})]}{(B + \alpha t f(I, \rho))^2} d\rho} > \frac{dC}{\frac{\alpha t}{(B + \alpha t f(I, \rho))^2} dB} > 0 \quad (5)$$

Under our theoretical setup, it can be proposed that compared to that in less well-endowed regions, a larger share of local public expenditure in the relatively well-endowed regions is financed by locally generated revenue rather than upper level transfers. Since productive public investment in these regions is more effective in promoting local production (due to better local endowment or investment climate), local governments in these regions have higher incentive to make such investment. In contrast, local governments in less well-endowed regions are more dependent on upper level transfers and have higher incentives to spend money in hiring local public employees that are of little use to promote local production but help to cultivate local political network and support. If we assume that economy-wide there are further revenue-centralization and responsibility-decentralization, which is exactly the case of China after 1994, this would have two effects: first, it would imply that with more resources transferred out of the better-endowed regions and into the worse-endowed regions that have higher incentives in raising public employment for political support, the net effects would be the worse-endowed regions increase its public employment more than the better-endowed ones reduce theirs since marginally the worse-endowed regions have higher propensity to hire public employees and their public employment would be even higher than the better-endowed regions. And since the worse-endowed regions have higher dependence on the upper level transfer, these more transfers-based regions would have higher public employment everything else controlled. Second, such transfer-based decentralization would render all regions' spending more dependent on upper level transfers, thus all regions

will have lower incentive to spend on productive public investment but more incentive to hire public employees to strengthen local political network.

Therefore, the key hypothesis drawn from our theoretical framework can be stated as the following: everything else equal, in a panel data setting observations that are more dependent on the upper level transfers in financing their spending will tend to hire more public employees. Of course, this hypothesis is based on a plausible assumption that local grow-promoting public investment is less productive in the worse-endowed regions. Under the center's regional-equalization objective and transfer-based decentralization, it is local governments in these worse-endowed regions that are more heavily dependent on upper level transfers in their spending and thus have higher incentives to hire public employees. .

4. Empirical Evidence

Our theoretical analysis indicates that everything else controlled, local transfer dependence would lead to higher local public employment. In this part we will test this hypothesis and identify the causality using an instrument variable approach. As indicated in Part 2.3, our data is a county-level panel data in China from 1994 to 2003. In our econometric analysis, we will mainly use a balanced panel data set that includes 1527 counties across China, though for the purpose of robustness we will also use an unbalanced panel data that includes information for all county units in China.

4.1 Transfer dependence and public employment: some initial descriptive analysis

To better see the correlation between local public employment and transfer dependence,

we divide our 15270(1527 county* 10 years) observations and divide them into 10 groups of equal number of units with their transfer dependence in an ascending order. Table 1 gives the transfer dependence share, public employment share, per capita transfer as well as the per capita GDP for these 10 groups. As shown in Table 1, significant positive correlations exist between the public employment share and both of the fiscal transfer indicators, while it is the observations with lower per capita GDP that obtained more transfer per capita and have higher dependence on upper level transfers. .

Table 1 Transfer dependence and public employment

	Transfer as a share of	Public employment		
	local spending	share	Per capita transfer	
	(%)	(1/10,000)	(RMB Yuan)	
			Per capita GDP	
			(RMB Yuan)	
Group 1	25.6	256.	132.6	8781.4
Group 2	35.7	263	167.8	7694.7
Group 3	41.9	261	165.5	6309.2
Group 4	47.6	271	179.1	5854.2
Group 5	52.8	276	193.8	5309.8
Group 6	58.1	300	229.0	4864.5
Group 7	63.5	321	255.6	4242.6
Group 8	70.0	362	324.4	3917.2
Group 9	78.4	417	437.5	3286.9
Group 10	91.9	548	673.4	2536.2

Data source: authors' calculation based on a balanced panel of 1527 counties from 1994 to 2003.

Figure 3 plots the county per capita GDP against local transfer dependence by averaging ten-year data for each county. The figure shows there is a clearly negative relationship between local development level and its transfer dependence. Under China's current fiscal system, it is the poorer (and usually the worse-endowed) regions that are more heavily

dependent on the upper level transfers to finance their local expenditure. This implies that on average, the center indeed have a tendency of regional equalization and the current fiscal system is channeling resources from the richer regions to the poorer regions.¹⁴

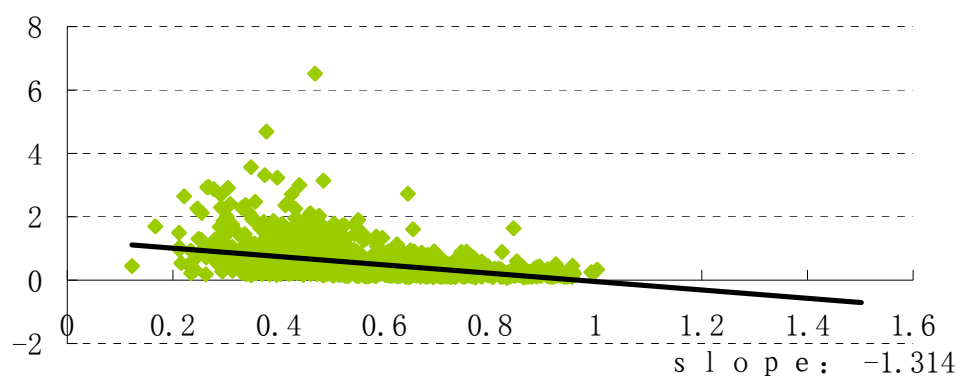


Figure 3: Local economic development and transfer dependence: cross-sectional facts

Our theoretical model predicts that such heavier local transfer dependence would translate into higher local public employment. To see if this is true, Figure 4 further scatter plots local public employment share against local transfer dependence share. Since the panel data has both time series (within group) and cross-sectional (between group) information, scatter plots are presented for the pooled data relationship, the within group relationship as well as the between group relationship. The between-group data is obtained by averaging the two variables across years for all 1527 cross-sectional units while the within-group data is calculated by deducting the original variables by the group (county)-averages. As indicated in Figure 4, a positive correlation between the public employment share and transfer dependence variable is clear for both the between-group and the pooled data but not for within group data. Such correlations (or lack of it) may be superficial since in such analysis other factors have not

¹⁴ Assume the center returns an equal amount of revenue to the regions that contribute such revenue, the local transfer shares should be equal for all the regions. The fact that the less developed regions have higher local transfer shares implies that the upper level government, using the transfer system, is channeling some resources to the less developed regions from the more developed one.

been fully controlled and more rigorous regression-based analysis is warranted .

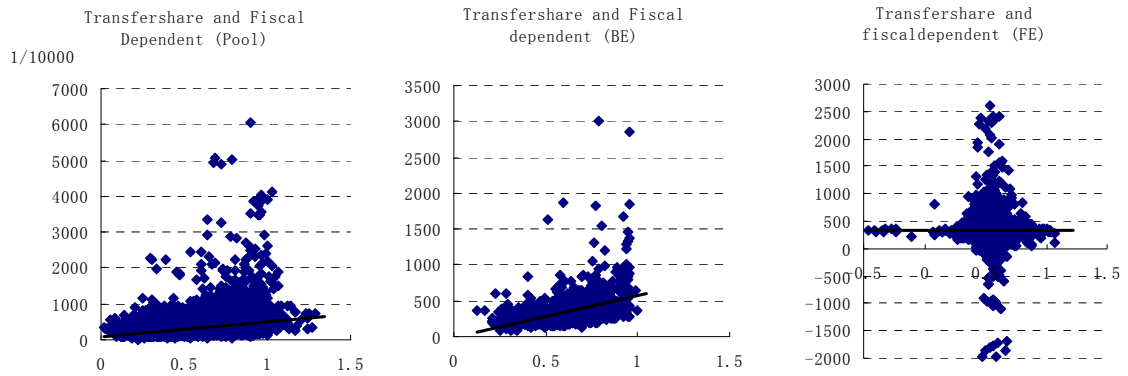


Figure 4: public employment and transfer dependence: pooled , between-group and within-group effects

4.2 Regression-based analysis

To test our theoretical hypotheses more rigorously and identify the causality from the transfer dependence to public employment, we set up our econometric specification as the following:

$$Y_{it} = \alpha + \sum_{j=1}^k \beta_j Z_{it} + \gamma W_{it} + \mu_i + v_t + \varepsilon_{it} \quad (1)$$

Where i is the county, t is year. Our key dependent variable Y is the local public employment share. Our key explanatory variable W is the transfer dependence share as defined in Part 2. The key hypothesis proposed in Part 3 holds that the coefficient of W is positive. Z is a vector of control variables including local urbanization rate(urban population as a share of total population, local GDP per capita, local GDP per capita square, local population size. which are factors that may affect local public employment share. The Wagner’s law suggests that demand for public services would be higher in more developed or urbanized regions. Local population size is also included to control the potential economy of

scale in public employment. We also controlled county dummies and year dummies to control the unobserved locality-specific and year-specific impacts. For example, the year-specific dummies may help to control the massive state enterprise restructuring in the late 1990s. In estimating the unobserved effects panel data, either the Fixed-effect model or the Random-effects model can be used based on different assumptions about the unobserved effects. If the unobserved effects u is assume to have some correlation with the regressors, the random effects model would be inconsistent while the Fixed-effects model is consistent. If the unobserved effects are assumed to have no correlation with the regressors, both models would be consistent though the Random-effects estimation would be more efficient since both the within-group (time series) information and the Between-group (cross-sectional) information will be utilized while the Fixed-effects estimation only incorporates the within-group information. If we control both the fixed-effects (county dummies in our case) and the year dummies in our model, our estimators would be a weighted estimators of the between estimator and the within-group estimator.

In our analysis, we choose to use the Foxed-effects model for two reasons: first, the Hausman tests tells us that there are systematic differences between the Fixed-effects estimators and the Random-effects estimators, thus the latter would yield inconsistent coefficients; second, our sample includes most of county-level units in China and in such a empirical setting the Fixed-effects model would be more appropriate. As our descriptive analysis in Part 4.1 indicates, the relationships between the key explanatory variable (W) and the independent variable(Y) are different for the within-group analysis and for the between-group analysis, we not only estimate the two-way Fixed-effects model that controls

both the county dummies and the year dummies, but also estimate the within-group model that reflects the changes across years as well as the between-group model that reflect the changes across cross-sectional units.

Though our Fixed-effects specifications help to partly address the potential endogeneity by controlling the locality-specific unobserved effects, the issue is still not fully addressed since some unobserved effects that are both time and locality-varying may still exist, or there might be a reverse causality from higher public employment to higher upper level transfers.¹⁵ To effectively address this issue, an Instrumental variable approach is adopted to obtain consistent estimators.

Our IV for our key explanatory variable, i.e., the transfer dependence variable, is the product of nationally designated poverty county dummy (P) and a time variable(S). P takes the value of 1 if the county is a nationally designated county, otherwise P =0.¹⁶ S =0 if the observation is between year 1994 and year 2000, otherwise S=1 if otherwise. The choice of

¹⁵ For example, according to Chinese accounts, wage issues are driving the increases in government subsidies for several reasons. First, the central government has raised wage standards for government employees, including teachers, several times since the 1993 (Wang 2002). To compensate local governments for the increased expenses, the center allocated subsidies for the increased wage bill (Finance Department of Anhui Province 2000a). Second, with more and more functional bureaus being vertically managed by either the province or the central government, county-level bureaus, including tax bureaus, the administration for industry and commerce, and various product supervision bureaus, needed more specialized personnel and received grants from higher level departments in the same functional system to fulfill these hiring demands (He 2003; Mertha 2003). Finally, county governments might simply be blackmailing higher levels with the possibility of rampant wage arrears and social stability. Given this perverse incentive, county governments would blindly expand local fiscal dependents in the hopes of attracting more central or provincial wage subsidies. However, increasing subsidies might also be driving the growth of fiscal dependents. First, the increase in subsidies might allow local officials to hire more cadres to fill the ranks. With higher number of employees, local officials can then ask central and provincial governments for more wage subsidies in subsequent years. Moreover, the increase in earmarked grants might also lead to higher numbers of fiscal dependents since earmarked grants at times demand specialized personnel, which forces the county to hire more people to administer the programs funded by these earmarked grants (Wang 2002).

¹⁶ The nationally designated poverty county is an essential part of China's poverty reduction strategy since the Seventh Five Year Plan (1986-90). The emphasis of this strategy is on regional development programs in the poor areas. In year 1993, the Chinese government redefined its nationally designated poor counties when the "Eight-Seven Poverty Reduction Plan" was initiated. The State Statistical Bureau (SSB) was asked to calculate a poverty line and all counties with annual rural net income below CNY 400 (current year) would enter the national poor county list. With this criteria, 592 nationally designated poor counties were defined between 1993 and 1994, and these counties mainly locate in the very poor western and central provinces in China. (Wang et al, 2004). These poor counties would be targeted with various poverty alleviation programs including various government budgetary grants, public works program (food for work) as well as subsidized loans.

this IV needs more explanation. In China, the poor counties would be targeted with various poverty alleviation programs including various government budgetary grants, public works program (food for work) as well as subsidized loans (Park et al 2002). Therefore, presumably the nationally designated poor counties would receive higher upper level transfers and their dependence on transfers would be higher.

However, P alone could not serve as an effective IV for the time-varying local transfer dependence variable W since the latter is time-invariant. Therefore, we use the $P*S$ as the IV for W_{it} where S is thus defined that it is equal to 0 for observations before 2000 and it is equal to 1 for all observation after 2001. This is because 1994-2000 is the implementation period for China's "Eight-Seven Poverty Alleviation Plan" Period, which is an ambitious National Plan for Poverty Reduction set up in 1993 to lift the remaining 80 million poor out of poverty within 7 years. After 2001 when the "Eight-Seven Plan" was completed, China started a new "New Poverty Alleviation Plan Program (2001-2010)" that aimed to further alleviate the remaining poverty with more anti-poverty grants as well as better targeting efficiency (Wang et al 2004). Since before and after 2000 China's poverty alleviation strategy changed significantly, we define S as a period dummy.

Our choice of the $P*S$ as the IV for transfer dependence share can be justified for two reasons : First, compared to other county level administrations, the nationally designated poverty counties are invariably localities with relatively poor endowments and thus are much more dependent on upper level transfer for local spending. Second, China designated the national poor counties in 1993-1994 and our data covers the period between 1994 and 2003, also the period of 1994-2000 and the period after 2000 represents a macro-policy changes of

the national poverty alleviation strategy, thus our IV(P*S) can be viewed as largely exogenous to W.

Table 2 presents our estimation results with a balanced panel of 1527 counties for 10 years. For the purpose of robustness check, in Table 3 we also give the estimation results with an unbalanced panel of 2736 counties. In both tables, we give the two-way fixed effects estimations, the between-group estimations as well as the within-group estimations. Again, the between-group models mainly use the cross-sectional variation in estimation and the within-group model uses the time series changes in estimation. Considering that our models cover thousands of cross-sectional units but have only 10 years, the between-group variation is naturally much more significant than the within-group variation.

The estimation results indicate that our key explanatory variable, the local transfer share, has consistent and positive impacts on public employment share under all model setting, supporting our key theoretical hypothesis. As table 2 shows, both the within-group estimators and the between-group estimators are positive and statistically significant. The between-group estimators largely represent the impacts of cross-sectional changes (changes of local endowment) on local public employment share. The positive and significant coefficients mean that the worse-endowed regions indeed have higher dependence on the upper level transfer, and such more transfers-based regions would have higher public employment everything else controlled. The within-group estimators largely represent the impacts of the changes of local fiscal dependence over time on local public employment, thus it reflects the impacts of the revenue centralization (changes in α in our theoretical model). The positive and significant within-group estimators indicates that such transfer-based decentralization would render all

regions' spending more dependent on upper level transfers, thus all regions will have lower incentive to spend on productive public investment but more incentive to hire public employees to strengthen local political network.

Overall speaking, urbanization, economic development and local population have significant impacts on public employment in all IV estimations. Higher local population leads to lower public employment, indicating some economy of scale in public employment. Consistent with the Wagner's law, higher per capita GDP leads to higher public employment. The coefficients of the per capita GDP square are positive except in the between-group estimations. The differences between the between-group estimations and the within-group estimations in both the OLS and IV setting may come from the fact that the between-group variation is much higher than the within-group variation. For example, the within-group standard variance for urbanization variable is only 0.03 while that for the between-group is 0.23. The within-group standard variance for the per capita GDP is only 0.30 while that for the between-group is 0.79.

Table 2 Impacts of fiscal dependence share on local public employment (balanced panel of 1527 counties)

	Public employment share (person/10,000 person)					
	OLS			IV		
	Two-way Fixed-effects	Within group	Between Group	Two-way Fixed-effects	Within group	Between Group
Fiscal dependence share	30.5	21.7	196.5	334.2	126.0	564.4
(%)	(4.69)***	(3.58)***	(8.13)***	(2.33)**	(3.32)***	(2.61)***
Urbanization rate	46.7	86.7	38.8	96.8	107.0	24.6
(%)	(2.14)**	(3.94)***	(2.24)**	(2.90)***	(4.57)***	(0.6)
Log GDP per capita	17.1	45.1	2.0	54.0	45.5	26.2
(RMB)	(3.57)***	(11.7)***	(0.27)	(2.97)***	(11.65)***	(1.61)

Log GDP per capita square	18.0	18.1	-14.5	29.3	20.3	-22.0
	(12.6)***	(12.7)***	(3.87)***	(5.29)***	(12.29)***	(3.7)***
LogPopulation	-502.5	-396.6	-115.7	-508.0	-428.8	-81.7
(10,000)	(23.41)***	(20.3)***	(31.05)***	(21.9)***	(18.74)***	(4.04)***
Observations	15223	15223	15223	15223	15223	15223
Number of groups	1527	1527	1527	1527	1527	1527

Note : 1. Robust t statistics or F statistics in parentheses.

2. County and/or year dummies controlled

3. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3 presents the OLS and IV estimation results using the unbalanced panel of 2738 county level administrations. We still use the same IVs as in estimating the balanced panel. These results are similar to those using the balanced panel and our fiscal dependence share variable have positive coefficients in all cases and significant except in IV between-group estimations.

Table 3 Impacts of fiscal dependence share on local public employment(unbalanced panel of 2738 counties)

		Public employment share (person/10,000 person)					
		OLS			IV		
		Two-way	Within group	Between	Two-way	Within group	Between
		Fixed- effects		Group	Fixed- effects		Group
Fiscal	dependence	29.421	26.901	239.403	662.108	488.240	156.050
share	(%)	(3.84)***	(3.88)***	(10.26)***	(4.75)***	(7.32)***	(1.25)
Urbanization rate	(%)	11.162	65.485	-135.273	91.592	99.643	-152.014
		(0.48)	(2.80)***	(9.63)***	(2.83)***	(3.80)***	(5.34)***
Log GDP per capita	(RMB)	-1.459	30.505	28.667	53.618	20.330	20.187
		(0.31)	(7.84)***	(5.55)***	(4.05)***	(4.49)***	(1.49)
Log GDP per capita	square	19.293	18.752	-3.262	35.615	25.827	-3.961

	(13.25)***	(12.91)***	(1.72)*	(8.99)***	(13.62)***	(1.83)*
LogPopulation	-489.642	-385.440	-117.343	-478.431	-480.829	-124.530
(10,000)	(25.49)***	(21.57)***	(31.17)***	(21.47)***	(20.05)***	(11.05)***
Observations	23439	23439	23439	23439	23439	23439
Number of groups	2738	2738	2738	2738	2738	2738

Note : 1. Robust t statistics or F statistics in parentheses.

2. County and/or year dummies controlled

3. * significant at 10%; ** significant at 5%; *** significant at 1%

We further evaluate the impacts of the upper level transfers per capita on local public employment share with an unobserved effect panel data model. The purpose is to compare the impacts of per capita locally generated (and retained) revenue versus the impacts of per capita upper level transfer on public employment share. We also estimate the impacts of per capita high-freedom transfer per capita versus the impacts of per capita low-freedom upper level transfer on public employment share.

$$Y_{it} = \alpha + \sum_{j=1}^k \beta_j Z_{it} + \gamma X_{it} + \mu_i + v_t + \varepsilon_{it} \quad (2)$$

Where Y , Z , u , v are defined as in model (1). If X is defined as the per capita locally generated (and retained) revenue and the per capita upper level transfer respectively, then a natural hypothesis following our discussion is that compared to the locally generated and retained revenue, the upper level transfers will lead to more public employees, or in another word, the coefficients for the per capita locally generated revenue shall be smaller than those of the per capita upper level transfers

Given that local governments may have varied freedom in using the upper transfers and such differences may affect local governments' leeway in hiring public employees, we can also define X as either the per capita high-freedom transfer or the per capita low-freedom

upper level transfer. By high-freedom transfer we mean are the transfers that local governments have more discretion in spending. In China's transfer system, these would include the tax returns, the original-system subsidies as well as the general-purpose transfers that the upper level government does not stipulate the specific use of the funds. The low freedom transfers would include various earmarked transfers that the upper level government specifies the usage of the funds. In a regime that local governments are generally unaccountable to local consistency, we can expect that compared to the transfers that local governments have lower freedom in fiscal spending, the upper level transfers that local governments have higher spending freedom will lead to more public employment. Of course, this does not mean that the earmarked transfers will not lead to higher public employment since local governments may well use or even divert some of these funds to hire public employees that could strengthen local political support.¹⁷ However, the hypothesis is that the coefficients of the per capita low-freedom upper level transfer shall be lower than those of the per capita high-freedom transfers

Due to space constraint, we report only the regression results that control both the county dummies and the year dummies. The issue of endogeneity arises again here and our instrument variable for all per capita transfer variables is $P * F$, which is the product of Poverty county dummy and the per capita national transfers for poverty alleviation (calculated as the national poverty alleviation funds divided by total population under national poverty lines for each year). Again, the impacts of the instruments on the instrumented variables can be

¹⁷The existing literature and the authors' fieldwork in middle and west China shows that even earmarked funds can be diverted for personnel and administrative costs. For example, Murdoch (2000) and Park et al (2002) found that in China's anti-poverty alleviation programs, diversion of funds by county and township level governments are pervasive. The authors' recent fieldwork in a nationally poor county in the western province of Gansu also finds that in early 1990s 20-30% of the upper level poverty alleviation funds is diverted for personnel and administrative costs while in the latter 1990s this ratio has risen to 70%-80% per cent.

regarded as the exogenous shocks due to the national poverty alleviation policies. Within the analytic framework of this research, both P and the per capita national poverty funds can be viewed as exogenous. Everything else controlled, if a county is a nationally designated poverty county, its per capita transfers should be higher, and the higher the per capita national poverty alleviation funds, the higher the per capita transfer for this nationally designated poverty county. For the per capita locally generated and retained revenue, we choose its one period lagged value as its instruments.

Table 5 Impacts of different transfers and locally generated revenue on public employment

		Public employment share (person/10,000 person)							
		OLS				IV results			
		fixed effects with county and year dummies				fixed effects with county and year dummies con			
Log transfer per capita		42.6				61.0			
	(RMB/person)	(13.4)***				(3.1)***			
Log locally generated revenue per capita		-6.9				-27.4			
	(RMB/person)	(2.4)**				(5.2)***			
Log high-freedom transfer per capita					25.0			64.5	
	(RMB/person)				(9.6)***			(3.5)***	
Log low-freedom transfer per capita					5.8			74.7	
	(RMB/person))				(3.1)***			(2.33)**	
Urbanization		48.6	45.4	38.5	45.4	51.5	48.5	36.2	71.4
	(%)	(2.2)**	(2.1)**	(1.77)*	(2.1)**	(2.4)**	(2.1)**	(1.65)*	(2.8)***
Log GDP per capita		21.1	16.0	19.9	11.4	24.4	23.3	27.8	18.6
	(RMB)	(4.5)***	(3.3)***	(4.12)***	(2.5)***	(4.1)***	(4.4)***	(4.6)***	(3.16)***
Log GDP per capita		20.4	17.4	19.5	16.3	21.9	19.8	22.6	20.8

square								
	(14.3)***	(12.2)***	(13.4)***	(11.7)***	(10.1)***	(12.9)***	(11.0)***	(8.13)**
Log Population	-475.7	-506.9	-480.6	-509.1	-464.3	-542.3	-446.5	-490.0
(10,000)	(22.2)***	(23.5)***	(22.4)***	(24.1)***	(18.8)***	(23.5)***	(16.7)***	(20.6)***
Observations	15223	15223	15223	15223	15223	13703	15218	15218
Number of groups	1527	1527	1527	1527	1527	1527	1527	1527

Note : 1. Robust t statistics or F statistics in parentheses.

2. both county and year dummies controlled

3. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5 reports the estimation results. Overall speaking, our models fit well and the Hausman endogeneity tests are in favor of the IV estimations. From Table 5, we can see that the per capita total transfers indeed significantly raised the local public employment share while the per capita locally generated revenue reduces it. Table 5 also shows the impacts of the high-freedom transfers and the low-freedom transfers on public employment are positively significant. Calculating the specific impacts on the basis of the coefficients, on average per RMB 10,000 increase of high-freedom transfers per capita would lead to an increase of 0.75 public employees while that of low-freedom transfers per capita would only lead to an increase of 0.58 public employees. Marginally, the impacts of high-freedom transfers are higher than those of the low-freedom transfers.

Due to lack of data, we cannot divide our public employment into employment in administrative agencies and public service units (such as those in public schools and hospitals). Technically speaking, there is almost no way to technologically distinguish among all the public employees who are redundant and who are providing effective public services. What can be argued is that in our regression-based analysis, we are controlling other factors that may affect public employment who are providing effective public services. These factors include the per capita GDP, the per capita GDP square and urbanization rate. Indeed they are

positively correlated with the independent variable. These results are not only consistent with the findings in the literature that higher level of economic development implies higher demand for public services (and ensuing public employment), but also help to control the part of public employment that may provide useful public services. Therefore, it can still be argued that our empirical results supports our hypothesis that higher dependence on upper level transfers may lead to higher local incentives to hire public employees for political support but lower incentives for effective public services.

5. Conclusion

Since the middle 1990s there has been a trend of revenue centralization and expenditure decentralization in China's intergovernmental fiscal system. This has led to an increasingly transfer-based (expenditure) decentralization in the country. Local governments, especially those in less-developed regions, are becoming more dependent on upper level transfers.¹⁸ At the same time, local public employment, especially those in less-developed regions where locally fiscal resources are much more limited, has also grown significantly in the same period. In China's western and middle region, most of the fiscal resources are spent on salaries for public employees and various administrative costs while the provisioning of public services is seriously undermined. In response to fast growing salary pressures and insufficient public service provisioning, the Chinese central government has in recent years begun to push forward reforms by streamlining local administrative agencies and public service sectors. At the same time, In 2005, under a holistic policy framework of constructing "the New Socialist Countryside", the central government announced a series of new development initiatives in

¹⁸ Under fiscal pressure followed by revenue centralization, local governments in all regions have also responded by raising extra-budget revenue by either charging illegal fees on farmers(in less developed regions) or abusively requisitioning farmers' land at below-market prices.

the new decade by increasing transfers to help build rural basic infrastructure, strengthen agricultural technology extension, scrap tuition fees and textbook charges for children from poor rural families, and fund the newly set-up rural cooperative medical insurance scheme. However, whether these policies would reach their targets of bureaucracy downsizing and better service provisioning depends on whether such reforms can provide effective incentives to local governments to do so. Local governments, deprived of local informal tax autonomy and hungry for revenue, may well have incentive to use the upper level transfers to feed the public employees instead of providing the needed public services.

The fact that much of the China's upper level transfers is in the forms of earmarked transfers that the center has more discretionary power while the use of these funds are specified to local governments is not a surprise since such transfers give the center a sense of control over the local governments that are not accountable to the local people under a politically centralized regime. In recent years, various problems with regard to earmarking transfers, such as unhealthy competition for transfers, showcasing projects that are of little use to local livelihood, have emerged in recent years. In response, the center in recent years has begun to increase the more rule-based general-purpose transfers. This is also a policy recommendation from many international organizations such as the World Bank. For example, it has been suggested that regional disparities in service delivery will only diminish if equalizing grants scheme in China is substantially expanded and earmarked grants have higher targeting efficiency (World Bank, 2002). However, as our analysis indicates, transfer-based decentralization itself may lead to higher public employment that serves more to build local political network or patronage support rather than to provide service to people.

Under a regime in which local governments are not accountable due to lack of popular elections, transfer-based decentralization may further lower local government incentive to provide effective public services. Over time, higher local tax autonomy matched with increased popular participation is perhaps the single best guarantee for well-managed local expenditures in a large country like China.

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