LOCAL GOVERNMENT TAX EFFORT IN CHINA: AN ANALYSIS OF PROVINCIAL TAX PERFORMANCE

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Abstract *- This paper aims to enhance the understanding of provincial tax performance in China, paying special attention to the recent fiscal reforms in the 1980s and in 1994. Using provincial panel data for the period 1986-2004, our analysis consists of two steps. First, a combined fixed time effects and random provincial effects model is used to analyze the statistical relationship between the tax share in GDP and economic and demographic variables. Results indicate that the decentralized fiscal system over the period 1986–1993 has had a positive impact on the tax share in GDP, whereas the recentralized fiscal system in the period 1994-2004 has had a negative impact. Second, provincial tax effort indices are calculated to estimate potential room for additional taxation. The findings from the analysis have important policy implications on the redistribution of fiscal resources as well as on the effectiveness of the tax administration.*

Keywords : TAX EFFORT, TAX CAPACITY, FISCAL REFORMS, FISCAL DECENTRALIZATION,

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INTRODUCTION

Taxation is a major source of government revenue that finances essential public services such as education, health, infrastructure and environmental protection. In developing countries in particular, greater investment in public services is required to raise the standard of living and increase the pace of economic development. However, countries or localities that need tax revenues the most face more difficulty in raising tax revenues. Some studies in this area suggest that the root of the problem lies in the governments' inadequate efforts to collect tax revenues based on their tax bases. For example, Tanzi (1992) found that tax efforts in developing countries tend to be lower than in industrialized countries.

China has undergone several fiscal reforms with various forms of fiscal contracting systems (1978-1993) and later a tax sharing system (1994-present). This leads to the inevitable question: How have these fiscal reforms affected the tax performance of provincial governments? The objective of this paper is to answer this question using a detailed analysis of patterns in provincial finance. This paper predicts tax capacity and calculates tax effort indices using provincial data over the period 1986-2004.

This study contributes to the field of public finance in three important ways. First, the research findings contribute to a better understanding of the tax performance of provincial governments in China. Second, the study provides insights into how the major fiscal reforms in1986 and 1994 have affected the tax performance of provincial governments. Third, the research has important policy implications for governments at different levels. For example, for the purpose of redistribution, the Chinese central government must know not only the provinces' capacity to raise tax revenues, but also to what extent they have exploited their tax capacity. Provincial governments with high tax effort should be rewarded for their performance. Otherwise, the risk exists that the central government might spoil those provinces with low tax effort by subsidizing their deficits that are supposed to be financed through provincial tax base. Finally, from the administrative perspective, since provincial governments do not have the right to change tax rates or decide what kind of tax they can levy, they have to focus on minimizing administrative costs. Therefore, this study provides the central government with a better understanding of the effectiveness of the current administrative reform that aims to reduce costs and improve administrative efficiency. The paper proceeds as follows. Section one discusses previous research and different methodologies that have been used to measure tax capacity and tax effort. Section two reviews tax reforms in China. Section three discusses the methodology this study employs and describes the data. Section four discusses the model selection and empirical results. Section five computes tax capacity and tax effort indices. Section six discusses policy implications.

1. TAX PERFORMANCE: WHAT IS KNOWN ?

Tax performance consists of two distinct measurements. One is tax capacity, the measurement of a government's hypothetical ability to raise revenue. The other is tax effort, which measures the extent to which a certain level of government actually has explored its available tax bases and utilized its tax capacity. Together, these two measurements of tax performance of a specific locality provide a picture of potential room for additional taxation for that place (Bahl, 1971; Bahl, 1972; Chelliah, 1971; Mertens, 2003; Tanzi, 1987; Tanzi, 1992). The literature defines tax effort by dividing the actual collected tax by the tax capacity. This section discusses two major methods the literature has used to link tax capacity and tax effort.

The first method is employed by the Advisory Commission on Intergovernmental Relations (ACIR, 1981, 1982, 1987, 1990 and 1993) in the U.S. ACIR uses the representative tax system (RTS) and representative revenue system (RRS) to measure the tax capacity and tax effort of all U.S. states. Although each state has different taxes, the RTS assumes a representative tax rate for every single tax across states, which is calculated by dividing the total actual revenues for a tax source from all states by the total estimated RTS/RRS base. Therefore, this methodology measures tax capacity by different taxes. For each revenue source, the tax capacity for every state is estimated by multiplying the RTS/RRS tax base by the representative tax rate. Correspondingly, a state's tax effort is calculated by dividing the actual tax collections by its capacity to collect taxes.

The other method in the literature to connect tax capacity and tax effort, which is widely used in OECD countries, uses a regression approach. Most of the OECD working papers regress tax capacity on explanatory variables that might affect a country's ability to raise tax revenues. In this literature, most studies employ the ratio of actually collected tax over GDP as a measurement of tax capacity (Tanzi, 1992). Ratios to GDP are used for the reason that "GDP includes income earned locally that accrues to non-residents and excludes income received from abroad by residents. Since local income accruing to non-residents typically is taxed while remittances from abroad are not, GDP produces a more accurate measure of taxable capacity" (Teera and Hudson, 2004). Therefore, the estimated tax share of GDP from such a regression is regarded as a measure of taxable capacity. Following this approach, tax effort is the ratio of actual tax share of GDP over estimated tax share of GDP (Mertens, 2003).

Since tax capacity is based on hypothetical calculations, different researchers focus on different sets of factors to capture such capacity. On the one hand, some studies emphasize economic and demographic variables, which are called "tax handles" (Musgrave, 1969), such as GDP per capita, population, and trade share of GDP (Ansari, 1982; Mertens, 2003; Sagbas, 2001; Teera and Hudson, 2004; Stotsky and Woldemariam, 1997). On the other hand, some studies focus on social and institutional factors, such as the administrative and political constraints on the fiscal system, attitudes toward the government, and

other government institutions (Eltony 2002; Teera and Hudson, 2004; Warner, 2001).

Tax capacity analysis has traditionally focused on economic and demographic characteristics. The literature suggests that a higher level of economic development reflects an increased demand for public expenditure and a greater taxable capacity to meet such demands, therefore a higher per capita income indicates a greater tax capacity (Teera and Hudson, 2004). Industry's share of GDP plays a positive role in generating tax revenue, as it is usually easier to collect tax from the industrial sector than from the agricultural sector given their relatively accurate accounting records of taxable resources (Bahl, 1971; Bahl, 1972; Chelliah, 1971; Mertens, 2003; Tanzi, 1968; Tanzi 1987; Tanzi, 1992). Moreover, there exist more public services and activities in urban areas than in rural areas. Therefore, the higher the agricultural share of GDP, the less public services are needed, and the less tax revenue needs to be generated. Tax capacity also depends on the volume of international trade, which measures the degree of openness. Stotsky and Woldemariam (1997) argue that the tax share is positively related to the degree of openness of the economy.

Other than the aforementioned variables, that are traditionally used to measure the tax capacity, more tax handle variables have been proposed to capture the determinants of tax capacity more precisely. Ansari (1982) argues that a high population density is assumed to be a negative indicator of tax capacity, because a high degree of congestion is considered to cause more problems of tax exemptions. However, Teera and Hudson (2004) argue that the tax collection cost will be reduced in a densely populated area, which is expected to encourage governments to collect tax revenues. In addition, Sagbas' results show that there is a strong positive relationship between tax capacity and expenditure trends (Sagbas, 2001).

Even though the literature emphasizes that the success of governments in exploiting tax potential and in attaining a taxation target depends to a large extent on their tax handles, the role of institutional factors has been widely discussed as well. Recent research suggests that institutional factors could also be significant predictors of tax performance. Teera and Hudson (2004) state that variables such as levels of literacy, the administrative and political constraints on the fiscal system, and social-political values, should also be taken into account to measure the overall willingness and ability of the government to raise taxes. In addition, Warner proposes that tax capacity is positively related to spatial effects, and it is negatively related to poverty and tax substitutes (e.g. state aid or federal aid) (Warner, 2001). Furthermore, Eltony (2002) argues that country-specific factors appear to be important determinants of tax share, e.g., the political system and other institutions of the government, and attitudes toward the government.

In China, uniform national tax laws are set by the central government, whereas provincial governments are responsible for tax administration and may give tax concessions to State Owned Enterprises (hereafter called SOEs). Therefore, it is important to analyze each province's hypothetical tax base and

the extent to which each provincial government exploits its tax base because this information will allow the central government to gain tighter control over the central and provincial tax systems. For example, the central government needs to inspire the revenue-raising incentives of provincial governments. In addition, it is better for the central government to have an overall picture of provincial tax collection, in case provincial governments offer their SOEs more tax concessions or tax holidays than necessary. However, few if any empirical studies have analyzed the tax performance of provincial governments in China. In their 1992 study, Bahl and Wallich used only two variables—per capita gross value of industrial output and the percentage of population living in urban areas—to estimate the tax capacity of provincial governments in China in one single year (1986). In this context, this present study employs the economic and demographic variables mentioned above to analyze the tax capacity and tax effort of provincial governments in China during 1986–2004. The reason why we chose this period is that there were two main fiscal reforms during the period. The first, the "Contracting System," was introduced in 1986. The other, the "Tax Sharing System," began in 1994. This paper will compare the different effects of the two fiscal reforms on tax collection.

2. FISCAL DECENTRALIZATION REFORM

Fiscal decentralization is widely recognized as an essential component in China's transition to a market economy, and advocated by many for its contribution to the country's remarkable economic performance over the last 25 years. The country has made substantial efforts to break down its highly centralized fiscal management system with various forms of fiscal contracting systems (1978-1993) and later a tax sharing system (1994-present) (Shen, 2008).

A fiscal revenue sharing system replaced the highly centralized system in 1980. From then on, the central and provincial governments each began to 'eat in separate kitchens', which provided sub-national governments with an incentive to collect revenues. Under this system, central-provincial sharing rules were established by the central government; provincial-municipal relations were governed by the province; and this principle extended to lower levels. There were three basic types of revenues under the reformed system: central-fixed revenues, local-fixed revenues, and shared revenues. During the period 1980–84, about 80 percent of the shared revenues were remitted to the central government and 20 percent were retained by local governments. The bases and rates of all the taxes, whether shared or fixed, were determined by the central government. Enterprises were supposed to pay taxes to the level of government they were subordinate to. Almost all revenues, except a few minor central-fixed revenues, were collected by local finance bureaus (Shen, 2008).

The uniform-sharing formula during the period 1980-1984 created undesired surpluses in affluent provinces and deficits in poor provinces, although the reform boosted more revenue collection in many localities. In 1985, the State Council redesigned revenue-sharing arrangements by varying schedules based on localities' budget balances in the previous years. The

financially weak provinces were allowed to retain more revenues, but the wealthier regions, like Shanghai, Beijing, Tianjin, Liaoning, Jiangsu, and Zhejiang, were penalized by remitting more revenues to the center. As a consequence, the revenues from these regions generally grew more slowly than the national average since the high level of remittance curbed local enthusiasm for expanding their tax bases (Shen, 2008).

In the period 1988-1993, the "fiscal contracting system" was implemented. This system requires each level of government to contract with its subordinate level to meet certain revenue and expenditure targets. The central government signed contracts on a case-by-case basis with the provincial governments, specifying their remittance based on the profit of their enterprises. Six types of central-provincial revenue-sharing methods were adopted and each applied to some provinces[1]. Consequently, all revenues were divided into two parts: the central fixed revenues and the local retained revenues. The provincial governments relied on their local retained revenues for their public expenditure requirements. In this case, to some extent, the provincial governments were self-financed. In other words, the responsibility for meeting the expenditure needs of provincial governments was decentralized (Bahl and Wallich, 1992).

Under this reform, the proportion of central revenue declined dramatically, causing a huge deficit at the central government level. In particular, certain categories of local revenues went to the "extra-budgetary fund" of the provincial government, which was not subject to sharing with the central government. Provincial governments tended to maximize their "extra-budgetary fund." Consequently, two ratios (revenue/GDP and central/total revenue) eroded (see Figure 1), and the central government faced a huge deficit (Zhang and Zou, 1998). Therefore, in order to raise the ratio of central revenue over the total revenue, the central government introduced a new reform, the "Tax Sharing System," in 1994.

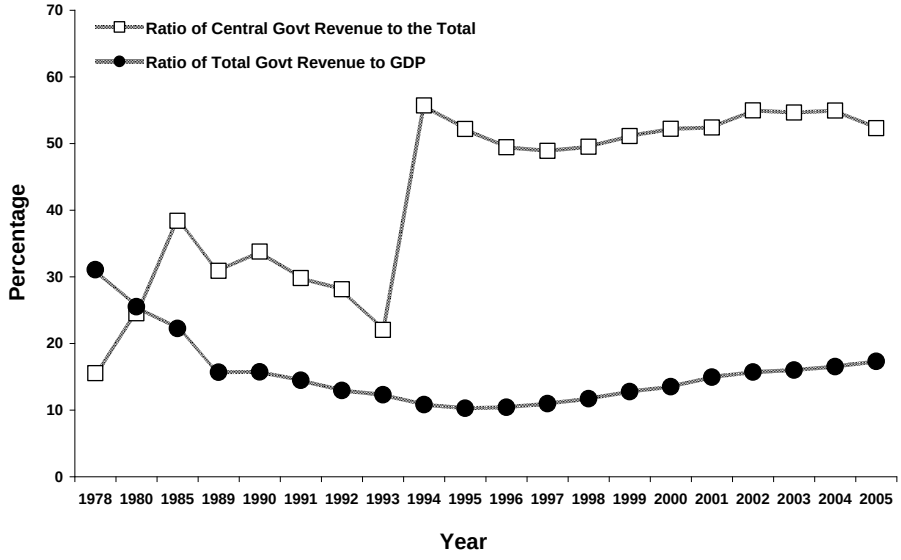
The 1994 fiscal reform was designed to base the fiscal relations between governments on the tax code: central, local, and shared taxes. Value-added tax, business tax, and several excise taxes were introduced both at the central governmental and the provincial level. The biggest tax is value-added tax, which is a shared tax. From value-added tax, the central government takes 75%, which accounts for a major portion of its fiscal revenue, and provincial governments retain only 25%. According to most scholars (Bahl and Wallich, 1992; Lin, Tao and Liu, 2003; Wong, 1998), the overall system reforms in China focused on the decentralization of economic management, which allowed the development of a greater autonomy for provinces and non-state sectors, but

[1] For example, one formula was "contracted sharing rate with fixed yearly growth rate of revenue", which means the central-local revenue sharing rate and the yearly growth rate of local revenues were based on the revenue performance of the province over recent years and negotiated by the central and provincial governments. If the real growth rate was greater than the contracted rate, the province could keep all the surpluses. If the real growth rate was lower than the contracted rate, then the province had to make up the gap.

the 1994 fiscal reform actually recentralized the Chinese fiscal system. On the one hand, revenue is centralized under the tax sharing system because the central government takes a considerable amount of revenue.

On the other hand, since provinces keep only a small proportion of the total revenue, they need subsidies from the central government to meet their expenditure. In this respect, expenditure is also centralized.

Figure n°1 : The Two Ratios, 1978-2005



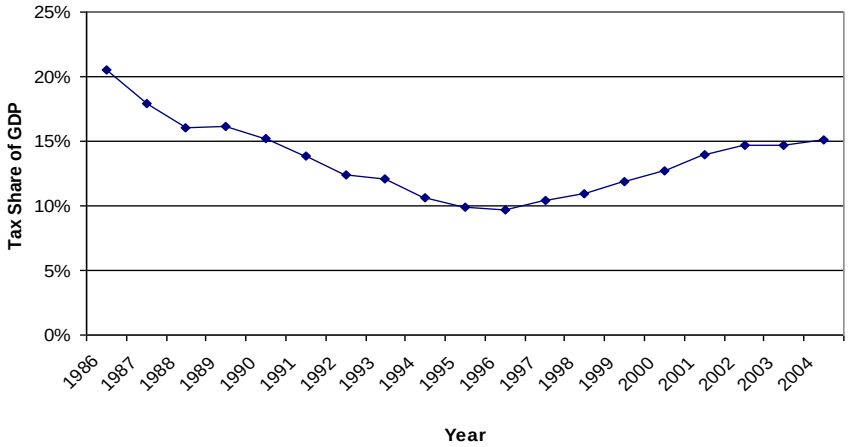
Source : Shen, 2008.

In terms of the outcome of these fiscal reforms, the 1980s fiscal reform led to a decreased overall tax share of GDP, while the 1994 fiscal reform resulted in a contrary outcome. As shown in Figure 1 below, the general trend over time is an increase in the tax share of GDP from 10% to 15% since 1996 (see Figure 2).

Such a trend suggests that China has enjoyed increases in tax shares, and hence, better overall tax-collection efforts in the past decade.

Theoretically, both the decentralization in 1980s and the recentralization in 1994 have had a significant impact on tax capacity and tax effort of provincial governments in China. In this study, we use panel data analysis to capture the policy reactions of local governments to the central government tax reforms.

Figure n°2 : The Ratio of Total Tax Revenue Share of GDP (% GDP)



Source: China Statistical Yearbooks (1986–2004).

3. METHODOLOGY

This study attempts to examine the effect of the tax base on the tax capacity of provincial governments in China, and therefore the dependent variable is the tax share of GDP actually collected and the independent variables are the agricultural share of GDP, industry's share of GDP, the trade share of GDP, and the population density. The relationship between the dependent and independent variables can be summarized by the equation below :

$$Taxshare = f(GDPpc, Ind, Agri, Trade, PopDensi)$$

Where :

Taxshare = Tax to GDP ratio (% of GDP)
GDPpc = GDP per capita, in thousand yuan
Ind = the ratio of industry to GDP (% of GDP)
Agri = the ratio of agriculture to GDP (% of GDP)
Trade = the ratio of import and export to GDP (% of GDP)
PopDensi = population density (People per Sq.Km)

3.1. Tax share of GDP

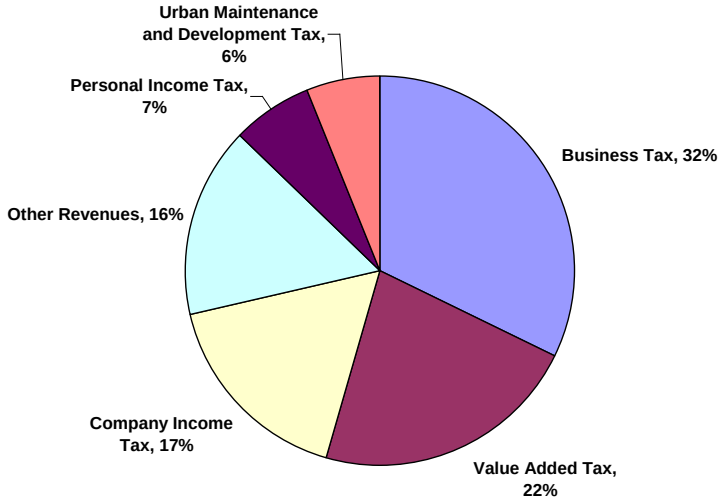
In this part, we will analyze the tax system of provincial governments before and after 1994, calculate the tax share of GDP as well as the tax growth rate, and discuss the tax buoyancy for each province.

In the pre-1994 fiscal system, the most important tax is "profits tax," accompanied by value added tax, business tax, agricultural tax and so on. The central government stipulated a lump-sum tax obligation from provincial governments, based on their SOEs' profit for the current year. The tax

obligation will increase annually by an agreed rate if there are additional profits accruing to their SOEs. Usually, it is a fixed tax obligation for several years, but sometimes with an annual increment (Bahl and Wallich, 1992). Therefore, Wong (1992) argues that, under the fixed tax obligation, increased profits of SOEs will lead to a decreased representative tax rate.

In 1994, the tax sharing system consisted of central taxes, local taxes and shared taxes. Consumption taxes, tariffs and vehicle purchase taxes are all central taxes, while value added taxes, business income taxes, corporate income taxes and personal income taxes are shared taxes levied both at the central level and the local level. At the provincial level, China has introduced local taxes on very limited tax bases, including resource taxes, urban land use taxes, agriculture and related taxes, and taxes on contracts. Figure 3 uses 2005 data to demonstrate that value added tax and business tax usually comprise the largest share of taxes at the provincial level.

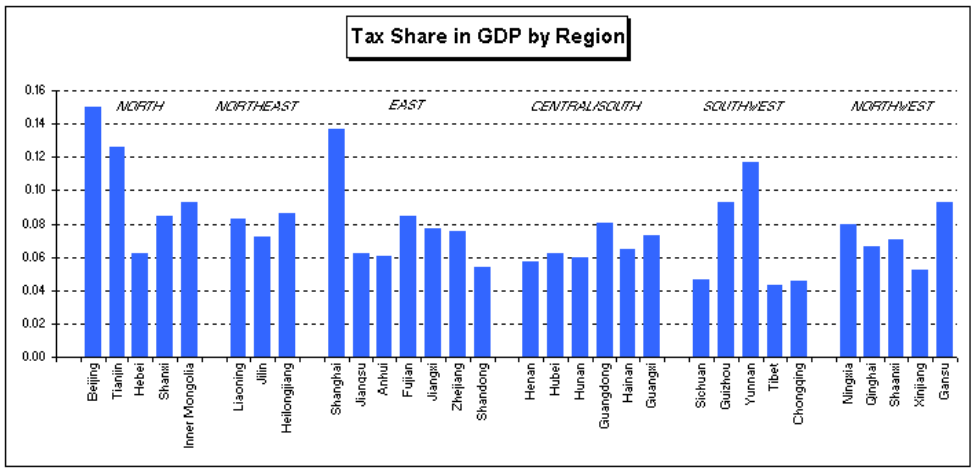
Figure n°3 : Main Tax Items of Provincial Governments in 2005



Source : Shen, 2008.

With respect to the average tax share of GDP for each province, as shown in Figure 4, Tibet has the lowest tax share of GDP (4.29%) followed by Chongqing, a new municipality entitled in 1996, and Sichuan, a province in the West region. Next comes Xinjiang, a minority province in the West region. Beijing has the highest share of GDP (14.97%), followed by the two municipalities of Shanghai and Tianjin. Surprisingly Shandong, which has a high GDP per capita and is located on the east coast, has the fifth lowest tax share of GDP, while, Yunnan, a minority province in the Southwest region, has the fourth highest tax share of GDP.

Figure n°4 : The Average Tax Share of GDP over the period of 1986–2004



Source : China Data Online (1986–2004).

3.2. GDP per capita

In Table 1 (see appendix), the provinces are ranked by average per capita GDP during the 1986–2004 period. The poorest provinces, which have the lowest average per capita GDP, are mostly inland provinces. On the contrary, the prosperous provinces with high per capita GDP are located in the coastal region.

Figure 5 in the appendix shows that Shanghai, the largest metropolitan city, had the highest average GDP per capita over the period 1986–2004. Beijing, the nation's capital, ranked number two in GDP per capita, followed by Tianjin, the third municipality after Shanghai and Beijing. Following the three municipalities rank the three coastal provinces of Zhejiang, Jiangsu and Guangdong. Guangdong is a coastal province favored by central government policies and was among the first to undertake economic reforms in 1978. Liaoning, one of China's heavy industrial centers, ranked number seven in per capita GDP. And Fujian ranks next, which has several special economic zones enjoying a special policy for the purpose of promoting economic development in that area. This can be accounted for by a special "open door" policy implemented in Guangdong and Fujian in 1978. Under this policy, four special economic zones in Guangdong and Fujian were established in 1980. In addition, 14 coastal cities were established as "coastal open cities" in 1984, which all work in favor of the coastal provinces, especially in the Southeast region. Due to the special "open door" policy, the coastal provinces were given not only special opportunity to develop their economy, but also special institutional environments and policies that grant them additional rights over

local economic activities beyond those of other provinces (Lin, Tao and Liu, 2003).

At the other extreme, Guizhou, a mountainous minority province in the Southwest, is the poorest province, followed by Gansu in the West region. Tibet, the minority province in the Southwest region, has very low per capita GDP. Sichuan, one of the most populous provinces in the West region, ranks the fourth poorest area, although its GDP is not among the lowest group. The Yunnan and Guangxi minority areas in the Southwest have very low per capita GDP.

Overall, most coastal provinces in the East region are rich provinces. While on the contrary, the minority provincial areas of the Southwest and the Northwest are among the poorer provinces.

3.3. Industry's share of GDP

"China's fiscal structure depends overwhelmingly on industry for the generation of revenues" (Wong, 1992). As Lin, Tao and Liu (2003) argue, since the first decentralization reform in 1957, the ownership of SOEs has been shifted from central government to provincial government. The tax revenue collection of provincial governments naturally fell on the shoulders of SOEs, since the provincial governments put their effort in revenue collection on the profits of SOEs. As Shen, Jin and Zou state in their report, provincial governments' revenue heavily rely upon their SOEs. Especially under the fiscal contracting system, the interests of the provincial governments are tightly linked with those of SOEs (Shen, Jin and Zou, 2006). SOEs and provincial governments have a strong connection not only because of the revenue collection, but also because SOEs provide their employees with basic services, which are otherwise supposed to be provided by provincial governments, such as education, health care, and pension services (Lin, Tao and Liu, 2003).

In the 1980s, over 80% of total local governmental revenues came from industry. The tax system remained narrowly focused on SOEs. However, Wong argues that this share has fallen with the Chinese fiscal reform, which has introduced a competitive market and declining profits of SOEs (Wong, 1992).

In the last decades, industry's share of GDP has grown in most of the provinces. Xinjiang (a minority province in the West region) has the highest growth rate of industry, followed by Hebei, an inland province in the North region. There are several exceptions, such as Tibet and Jianxi, where industry's share of GDP has decreased by respectively 2.77% and 1.37% (see Table 1 in appendix).

The average share of industry of GDP during the period 1986 to 2004 is as low as 7.59% in Tibet, and as high as 51.94% in Shanghai (see Figure 6 in appendix). Shanghai is well known as a leading municipality in industrial and economic development. As provinces that strongly rely on heavy industry, Heilongjiang and Liaoning, in the Northeast region, have relatively high industry share of GDP. In most of the literature, industry's share of GDP

positively affects tax capacity, since urban areas need more public services than rural areas and in addition, there is a lower tax administrative cost in the industrial sector than in the agricultural sector (Bahl, 1971; Bahl, 1972; Chelliah, 1971; Mertens, 2003; Tanzi 1987; Tanzi, 1992). Therefore, we predict that industry's share of GDP is positively related to the tax share.

3.4. Agriculture's share of GDP

The values of the average agricultural share of GDP range from 2.63% in Shanghai to 39.27% in Tibet. Hainan, the island in the south of China, Guizhou, Guangxi and Jiangxi, in less developed, mostly inland areas — all of these provinces' revenues mainly stem from agricultural sources. By contrast, Shanghai, Beijing, Tianjin, Shanxi, Liaoning and Heilongjiang rely less on agriculture in their economy (See Figure 7 in appendix).

During the period 1986 to 2004, most of the provinces experienced a decrease in the agricultural sector, as a great amount of agricultural land was converted to industrial constructions for the purpose of urban development. Correspondingly, as shown in Table 1, agriculture's share of GDP has been diminishing. For example, Shanghai, Beijing and other eastern coastal provinces all decreased their agricultural share by more than 5%. However, agriculture's share of the GDP growth rate is 33.98% in Chongqing, 29.70% in Tibet, and 21.51% in Shanxi, where the largest number of coal mines are located (see Table 1 in appendix).

Agriculture is supposed to have a higher tax administrative cost than other sections, and rural areas enjoy fewer public services, which all make agriculture a negative factor that affects the tax capacity of a jurisdiction. However, some scholars (Lin, Tao and Liu, 2003) argue that in China, rural taxes and land requisition are charged excessively and abusively. Under this circumstance, one could expect agriculture to have a positive impact on the provincial governments' revenue.

3.5. Population Density

Tax capacity also depends on the population density. In China, the most populous area is Shanghai where the average population density over period 1986–2004 amounts to 2,100 inhabitants per Sq.Km, followed by the other two municipalities, Beijing and Tianjin. The least densely populated area is Tibet with only 2 inhabitants per Sq.Km, followed by Qinghai, Xinjiang and Inner Mongolia, all of which are minority areas (see Figure 8 in appendix). In China, the effect of the population density on tax capacity could lead to two diverging outcomes. On the one hand, a more populous area could result in a negative impact on tax capacity because of a high level of tax concession. On the other hand, a high density population area could play a positive role on the collection of tax revenue because of the reduced administrative cost.

3.6. Trade's share of GDP

Trade's share of GDP is used to measure the degree of openness, which is calculated by dividing the sum of imports and exports by GDP. The more open and the more developed the economies, the greater the tax bases. Figure 9 in the appendix shows that the most open area is Guangdong, which is also the first province that established a special economic zone and opened its door to the whole world. After this first open province rank Shanghai and Tianjin, the two coastal municipalities. Most of the coastal provinces, such as Fujian, Hainan and Jiangsu are very open too. The least open area is an inland province in the center, Henan, which is "a political and economic center of ancient China" (Zhang and Zou, 1998). Guizhou, Qinghai, Sichuan and Chongqing, in the Western inland area, rank second to fifth as the least open areas.

The effects of the share of industry, agriculture and trade, as well as the impact of the population density on provincial governments' tax revenue will be tested in the next section.

4. MODEL SELECTION AND EMPIRICAL RESULTS

This study uses panel data in order to allow for time and province heterogeneity. Without controlling the unobservable effects, the coefficients may be biased and inconsistent due to an omitted variable bias. For example, one such unobservable factor is the central policy. Both fixed effects and random effects can capture heterogeneity along both time and province dimensions. Specifically, three models are used:

Pooled regression : $y_{it} = X'_{it}\beta + \alpha + \varepsilon_{it}$ (1)

Fixed effects : $y_{it} = X'_{it}\beta + \alpha_i + \varepsilon_{it}$ (2)

Random effects : $y_{it} = X'_{it}\beta + \alpha + \mu_i + \varepsilon_{it}$ (3)

In equations (1), (2) and (3), i is the index for individual provinces and t denotes time or year. If there are no unobserved effects, equation (1), OLS is suitable to provide unbiased, consistent and efficient estimates. In equation (2), the fixed effects, α_i, capture the fixed individual effects. In equation (3), the province specific component in the error terms, μ_i is a group specific random element, which allows these unobservable effects to be randomly distributed across cross-sectional units.

When choosing between a fixed effects model and a random effects model for the time variable, we have chosen to use a fixed effects model. The reason is that we can only examine the effects of central fiscal on the tax share through the use of a fixed effects model. If a random effects model is used, the time variable, whose coefficient represents the effect of the central fiscal policy, would not enter the regression as an explanatory variable (it enters as one component of the error term).

For provincial effects, two tests are conducted to help choose a desirable model among pooled regression techniques, random effects and fixed effects. The first test is the Breusch and Pagan Lagrangian Multiplier test for random effects against pooled OLS. The LM test statistic is 1290.59 ($p<0.01$). Hence we reject the null hypothesis that there are no such group-specific random elements. Then, we go on to use the Hausman test for a fixed effects model versus a random effects model. The Hausman test statistic is 23.63 ($p=0.37$); on this basis, the null hypothesis cannot be rejected. In this case, the random effects model is consistent and efficient, but the fixed effects model is not efficient although still consistent. The reason is that there is no correlation between the included independent variables and the random effect (Greene, 2003). As a result, a provincial random effects model has been implemented. In this paper, we use fixed time effects and random provincial effects at the same time, denoted by:

$$y_{it} = X'_{it}\beta + \alpha_t + \mu_i + \varepsilon_{it} \tag{4}$$

μ_i is the unobservable province specific effect while α_t represents the fixed time effects that capture the impact of policy changes that affect all provinces each year. Estimations are carried out using the STATA statistical software package.

The tax capacity of a province is measured as a function of its GDP per head, the share of agriculture, trade and industry of GDP, and the population density. The model performs generally well with most of the variables significant at the .01 level. The signs of the coefficients are generally consistent with expectations. The results show that tax capacity is negatively, though not significantly, related to the level of per capita GDP. Also consistent with previous findings, industry's share plays a positive role in determining tax capacity. In other words, the higher the level of industrialization, the greater the capacity to raise taxes. Agriculture's and trade's share of GDP play a negative role in generating tax revenue. In addition, the importance of the population density as a major determinant of the level of tax capacity is not reliable, since it is not significant.

When comparing the effects of decentralization and centralization, the results of my panel analysis show that they have opposite effects on the level of the tax share. Decentralization had a positive and significant impact on the level of the tax share, while recentralization has had a negative impact. In the regression, the constant is dropped so that all of the time dummies can be included. The time effects are all significant except 1987. According to the Chow tests, the coefficients of the years after 1994 are significantly different from those before 1994. The results can be seen clearly in Figure 10. We plot the coefficients of the time dummies. There was clearly a slump in 1994.

Theoretically, there are two major views that can be used to explain the effect of decentralization on provincial tax capacity, i.e. Brennan and Buchanan's "Leviathan" model and Oates' model (Bird, Martinez-Vazquez and Benno, 2004).

Table n°2 : Estimation Results for the Determinants of Tax Share using a Fixed Time Effects and Random Provincial Effects Model

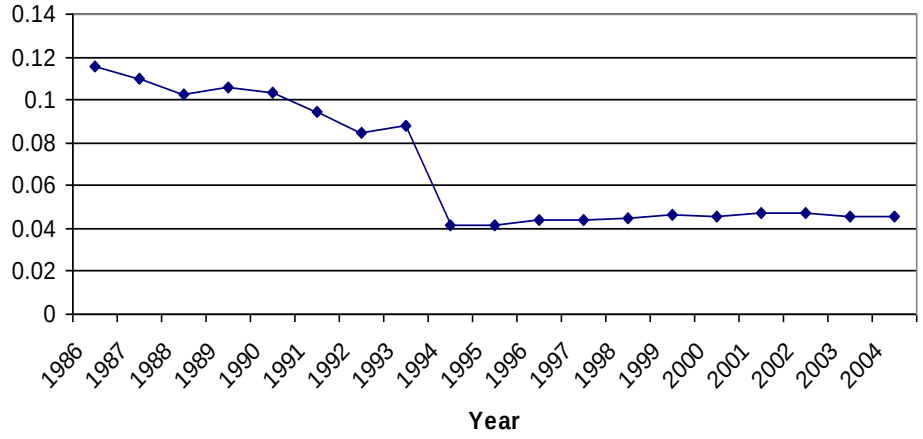
Independent Variable	Coefficients	Z Statistics
GDPpc	-0.0004	-1.42
Agrishare	-0.0950***	-3.41
Indushare	0.0811***	3.16
Trade	0.0110***	2.69
Popdensi	0.0279	0.29
year_1986	0.1152***	6.99
year_1987	0.1099	-1.22
year_1988	0.1025***	-2.92
year_1989	0.1061**	-2.07
year_1990	0.1031***	-2.76
year_1991	0.0948***	-4.55
year_1992	0.0845***	-6.58
year_1993	0.0877***	-5.70
year_1994	0.0417***	-15.43
year_1995	0.0414***	-15.22
year_1996	0.0441***	-14.47
year_1997	0.0438***	-13.88
year_1998	0.0451***	-13.08
year_1999	0.0465***	-12.04
year_2000	0.0458***	-11.67
year_2001	0.0475***	-10.96
year_2002	0.0476***	-10.64
year_2003	0.0454***	-10.59
year_2004	0.0456***	-9.51
R^2 (Within)	0.7483	
R^2 (Between)	0.3848	
R^2 (Overall)	0.5760	
LM	1290.59	
H	23.63	

*Notes : N=527. ** p<0.05, ***p<0.01. LM is the Breusch and Pagan Lagrangian multiplier test for random effects against pooled OLS. H is the Hausman test for Fixed versus random effects.*

In Brennan and Buchanan's view, governments act as a Leviathan and seek to maximize their tax revenues through exploiting their tax base. Just like the private sector's desire to maximize profit, governments' rational behavior leads to increasing tax burdens and growing government size. They argue that the Leviathan behavior of governments can only be constrained by the

constitution that limits their access to tax and other fiscal instruments that encourage decentralization or federalism (Brennan and Buchanan, 1980). Based on this premise, Nelson (1986 and 1987) finds that decentralization divides a monolithic power into a number of relatively homogenous governmental units, and in turn this may result in competition among local governments in lowering taxes lest taxpayers vote with their feet or investments move to jurisdictions with lower tax rates. As a result, decentralization may serve as a constitutional constraint in limiting the revenue generating power of local governments. Marlow (1988) adds, "if greater decentralization in government increases competition in the public sector, then greater decentralization may lead to relatively low tax burdens." Furthermore, Marlow's study concludes that a decreasing federal share of total government could strengthen the importance of local governments in overall governmental activity. As a result, competition among local governments will cause them to lower tax shares. An alternate perspective offered by Oates contradicts these theories. Oates (1972 and 1985) argues that in a more decentralized system of government, local governments tend to increase public spending and the level of tax shares to meet their voters' demands for government effectiveness and efficiency.

Figure n°10 : Coefficients of the Fixed Time Effects



The result reported above gainsays Brennan and Buchanan's theory. This divergence can be explained by the lack of interjurisdictional mobility of people in China and the absence of explicit fiscal constraints on the taxing power of provincial governments. Consistent with Oates' theory, under a decentralized system, provincial governments tend to increase tax revenues as a result of fiscal decentralization in order to meet their residents' demands for public services. Therefore, the contract system can in theory provide incentives for provincial governments to collect revenue. In contrast, under the tax-sharing system, the high sharing rate with the central government may discourage tax collection at the provincial government level. As Bahl and Wallich (1992) state, if provinces are only able to keep a small proportion of what they collect, they

may not have the incentive to increase tax share. Therefore, under the recentralization of the tax system, provincial governments' tax collection performance is expected to decline.

5. TAX CAPACITY AND TAX EFFORT OF THE PROVINCIAL GOVERNMENT

In this section we will report the predicted tax capacity based on the data and model presented in earlier sections, discuss the provincial tax authority, and calculate tax effort indices for each province.

5.1. Tax Capacity

One can predict the tax share, or tax capacity, based on the level of per capita GDP, agriculture's and industry's share of GDP, and population density, using the coefficients generated in the earlier model. In this case the fixed time effects are not included in the tax capacity values because we do not want the provinces' tax capacities to be influenced by the national policies.

Figure n°11 : Average Tax Capacity over the period 1986–2004

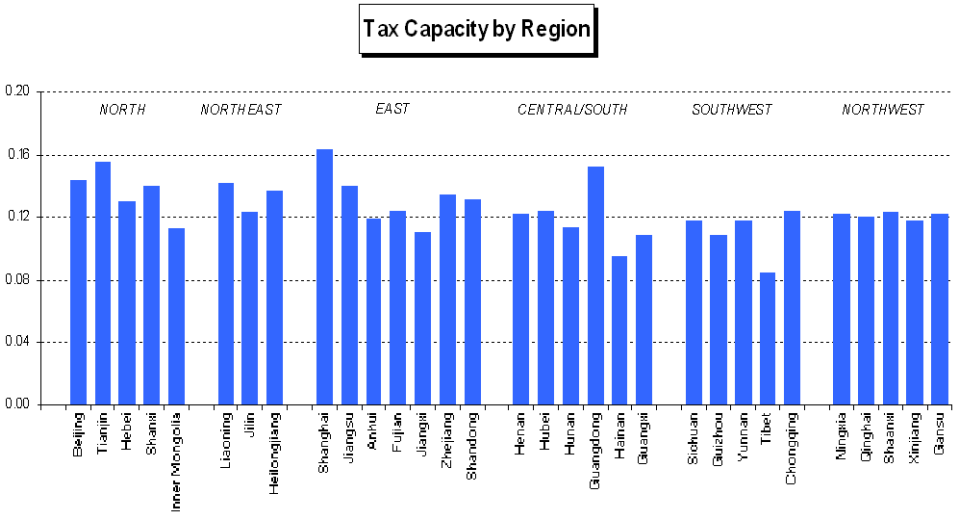


Figure 11 shows the average tax capacity of each province. Shanghai has the highest tax capacity and Tibet has the lowest tax capacity. Not surprisingly, the least developed provinces, such as Hainan, Guangxi, Guizhou, Jiangxi, have comparatively low abilities to raise taxes, while the most developed provinces have the highest abilities to levy taxes, including Tianjin, Guangdong, and Beijing. Liaoning, one of the heavy industrial centers in the northeast, ranks fifth in the level of tax capacity. Most of the top ten provinces are located in the east coast or northeast regions, except Hebei in the northern region. Facing their hypothetical capability to raise tax revenue, do provincial governments have the incentive or authority to control the extent to which they exploit their tax bases? The answer is yes.

5.2. Provincial Tax Authority

It is well known that China has a uniform tax system, under which tax rates and tax bases are determined by the central government. However, as Wong (1997) states, the Chinese tax system is ad hoc and negotiable, and provincial governments, to some extent, are entitled to change the de facto rate by offering special policies to their SOEs. Due to provincial protectionism, provincial governments are incited to award tax breaks to enterprises within their jurisdiction, which are called tax expenditures. Similarly, if provincial governments can get compensation from the central government through alternative sources, such as grants and subsidies, for inadequate local tax revenue, they have little incentive to collect the full tax from their tax base. To control the provincial governments' tax expenditures, and for redistributive purposes, the central government needs to know to what extent provincial governments are utilizing their tax capacity.

Tax expenditure

Even though tax rates are nominally set centrally, provincial governments still have an important impact on the amount of tax revenues raised within their jurisdictions. Provincial governments play the role of administering and collecting taxes and have a substantial degree of freedom to affect the level and composition of collected taxes, which determines the effective tax rate for their region. As Bahl and Wallich argue, "provincial governments have a surprising amount of discretion in granting tax relief," which is referred to as the policy of "stimulating enterprises through tax expenditures." Provincial governments, in most cases, award their SOEs tax concessions, which can substantially alter the effective tax rates paid by SOEs. Especially with the economic reform, or "open door" policy, markets in China tend to be increasingly competitive. Provincial governments are eager to attract additional investment from all over the world by offering special tax breaks, tax concessions and tax holidays (Bahl and Wallich, 1992). Nonetheless, this autonomy of provincial governments can result in serious problems if the tax concessions they offer are in conflict with the central governments' policy and can be detrimental to the fiscal environment as a whole.

Alternative Sources

Provincial governments have other revenue sources beyond their own tax revenue, including shared taxes with the central government, extrabudgetary funds, non-tax fees, tax rebates, earmarked grants, capital grants, and international aid (Bahl and Wallich, 1992; Zhang and Zou, 1998). These alternative sources have a significant impact on the tax effort, since provincial governments expect the central government to transfer grants so as to offset their deficit.

In addition, provincial governments can utilize "extra-budgetary revenues" to meet their expenditure needs, which includes "user charges of living infrastructure, various quasi-fiscal fees levied on provincial enterprises or

direct illegitimate fee charges on farmers by provincial governments who have almost all the autonomy of levying and spending the fees" (Wong, 1998). However, this extra-budget revenue falls outside the control of the central government. This lack of accountability may hurt the transparency of the fiscal system (Lin, Tao and Liu, 2003). Also, this provides opportunities for corruption.

In order to improve the transparency and accountability of provincial governments' tax administration, it is necessary for the central government to have a clear idea of the extent to which provincial governments collect tax revenues from their own tax bases. With mandatory accounting practices, the tax effort could be better measured by the ratio of the actual tax share to the estimated tax share.

5.3. Tax Effort Indices

In this section, we employ the OECD method to calculate tax effort indices for each province by dividing the actual tax shares by the predicted tax shares. Tax effort indices suggest the willingness of provinces to use the available tax capacity to finance public expenditures. The higher a tax effort index, the greater the extent to which the province has exhausted its capacity for further taxation. This increases the likelihood that the province will have to explore other fiscal resources, such as central government subsidies and international aid. The national average of tax effort indices during the period 1986 to 2004 is 1.05, close to one, which suggests that the overall extent to which provinces utilize their tax capacity is close to the ideal one. It is noteworthy that the tax effort index of each province varies over time and the trends differ from each other.

Figure n°12 : Tax Effort Indices in the Northern Region

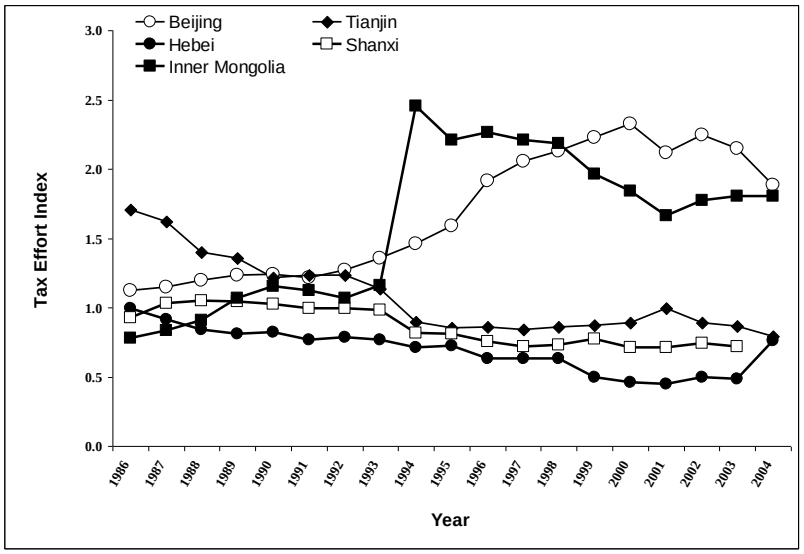


Figure n°13 : Tax Effort Indices in the Northeast Region

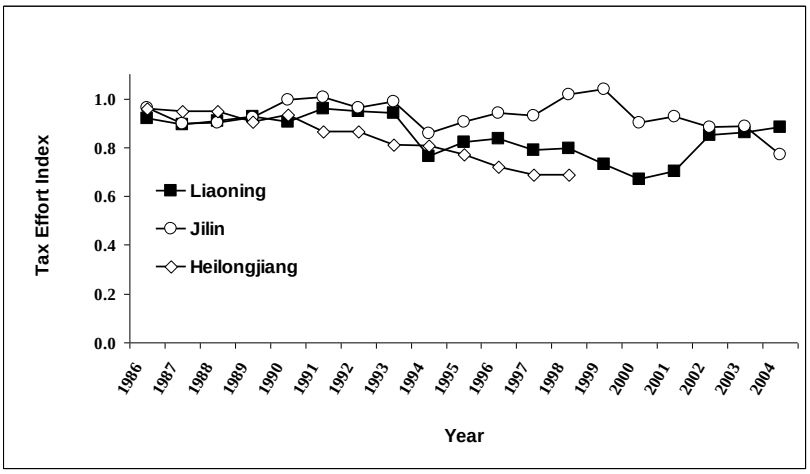
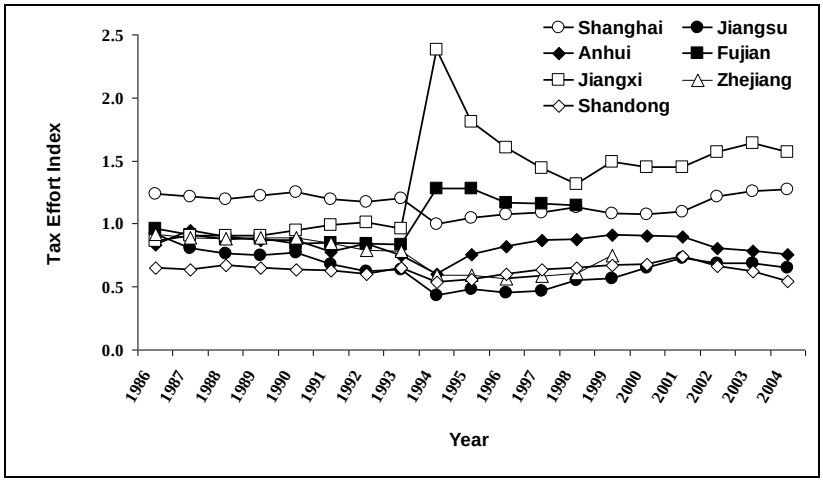


Figure n°14 : Tax Effort Indices in the Eastern Region

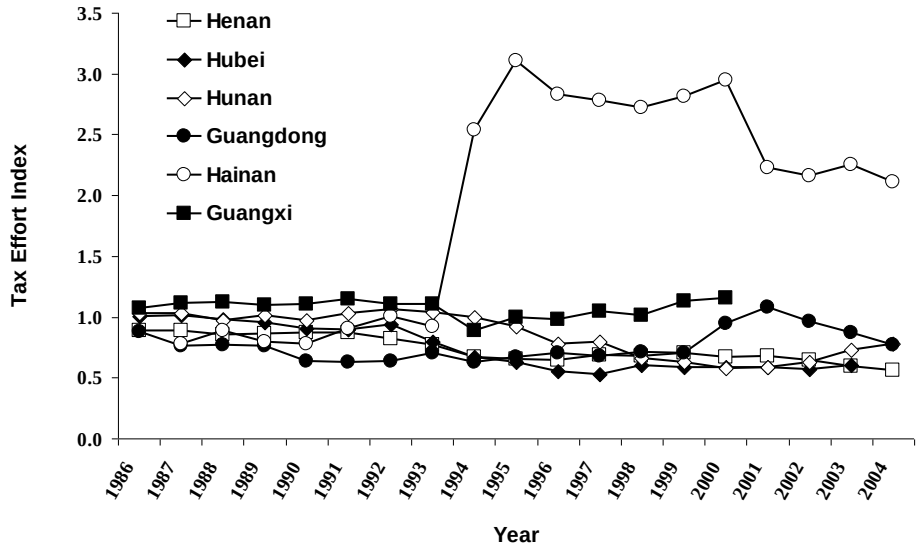


In the Northeastern region, the three provinces, Liaoning, Jilin and Heilongjiang all have low tax effort indices. The trends are gradually decreasing with an average tax effort of approximately 0.8, which is below one. Since the three provinces are heavy industrial centers, the provincial governments are likely to offer tax breaks or tax holidays to their SOEs to help them in periods of hardship and promote their development. This would explain their low effective tax rates.

In the Eastern region, Anhui, Jiangsu, Zhejiang and Shandong are stable with mostly low tax effort indices, but all of them have a slump in 1994, which indicates the process of tax effort erosion accelerated under the economic reform. These provinces end up with indices averaging 0.75 in 2004. Jiangxi was stable before 1994, around one, but jumped to 2.38 in 1994 and then fell to 1.50 sharply in 1997. Shanghai's tax effort indices stay slightly above one.

In the Central South, most of the provinces' tax effort indices stay between 1 and 0.5, except Hainan. Hainan, an island in the South of China, which experiences a dramatic development in real estate and tourism after the open door policy. Hainan's tax effort indices soared sharply to 2.54 in 1994 and 3.11 in 1995, and fell slightly to 2.78 in 1997, but still maintain a high tax effort around 2.11 in 2004. This is partly because Hainan has taken advantage of the tax reform in 1994, which motivated efforts to raise tax revenue on commerce and services.

Figure n°15 : Tax Effort Indices in the Central/Southern Region



The tax effort indices of provinces in the Northwest were close to each other before the 1994 reform, but afterwards a divergent trend appears. Ningxia, Xinjiang and Gansu have average tax effort indices above one. In addition, Gansu's tax effort indices fell sharply after the 1994 reform from above 1.2 to around one.

In the Southwest, Guizhou and Yunnan (on the southwest border) have average tax efforts above one. Sichuan and Chongqing (located inside Sichuan) have average tax efforts close to one. Tibet witnessed a dramatic change from

1.00 in 1993 to 3.96 in 1994 and 4.68 in 1995, and then dropped to 1.13 in 2004.

Figure 16: Tax Effort Indices in the Northwestern Region

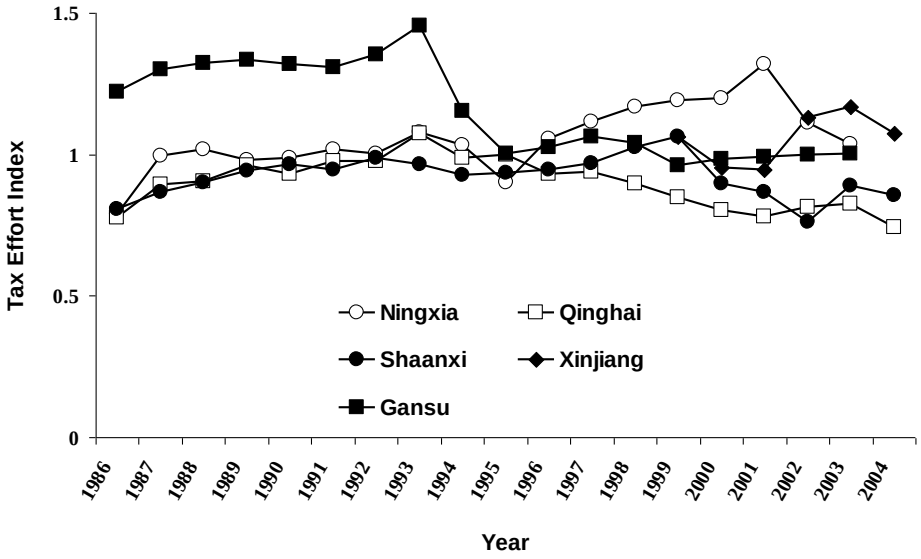


Figure n°17 : Tax Effort Indices in the Southwestern Region

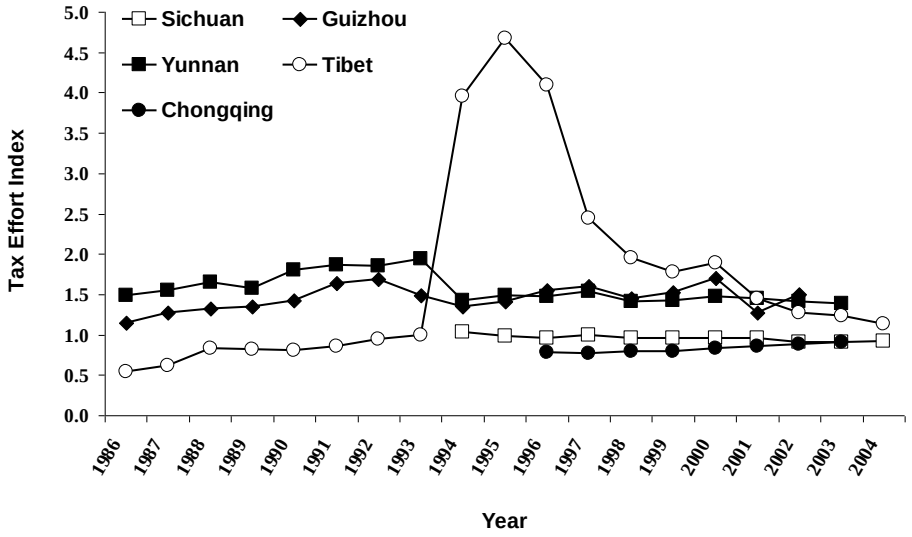
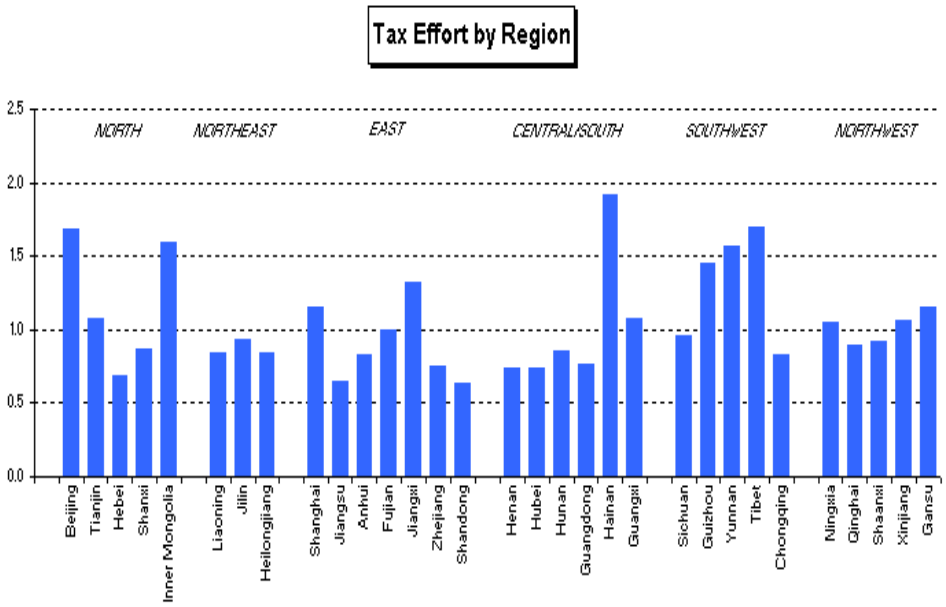


Figure n°18 : The Average Tax Effort Indices over the period 1986–2004



Nationwide, Hainan, Tibet and Inner Mongolia feature the highest tax effort, while, Shandong and Jiangsu, two coastal regions, have the lowest average tax effort. In general, tax collections are higher in provinces where per capita income is lower. In other words, some low-income provinces collect more taxes than might be predicted by their tax capacity. Poorer provinces, such as Inner Monoglia, Gansu, Guizhou, Yunnan, and Tibet, have above-average tax efforts, especially Inner Monogia and Tibet, 60% above average, which indicate a regressive tax effect. They may wish to look for alternative financial resources, such as grants from the central government or international agencies, because there is limited room for them to further utilize their tax bases in order to meet expenditure needs.

At the other end of the spectrum, many of the higher income provinces appear to exert a lower level of tax effort: Jiangsu, Zhejiang, Shandong and Guangdong all register at 80% of the average tax effort. These provinces are not limited by a low capacity to generate tax revenues. Rather, for different reasons, they have problems with exploring their potential to collect taxes. For example, they may need to consider lowering administrative costs.

The results indicate that provinces in the coastal region generally have relatively low indices of tax effort. In addition, some provinces have substantially increased their tax efforts in recent years while others have experienced marked declines. The results suggest that most provinces, such as Yunnan, Guizhou, Sichuan, and Shanxi, are relatively stable in their tax effort

indices over the period 1986–2004 and are close to one. However, some provinces experience a dramatic change during the same time period; for example, Tianjin and Qinghai experience a downward trend.

5.4. Coefficient of Variation

From Figure 19, the tax capacity across provinces shows a higher degree of divergence after 1994 than before 1994. The coefficient of variation increased by 80% after 1994. The increased variation in tax capacity provides further evidence for increased disparities in the ability to collect tax revenue since 1994. But the variation coefficients go slightly down after 1995 and then go up again after 2002. This could be explained by the increasing divergence of economies across regions since the economic reform.

The variation coefficient of tax efforts has grown from 0.24 to 0.45, indicating growing dispersion of tax effort among the provinces during the period 1986 to 2004. After the reform in 1986, the coefficient of variation for tax effort has risen slowly. From 1986 to 1993, the coefficient of variation ranged from 0.25 to 0.29. But in 1994, the coefficient of variation jumped to 0.66. Therefore, inequity in the tax effort appears to have widened probably due to disparities of tax administration and tax expenditures in 1994. However, the variation coefficient for tax effort has fallen since 1995 (following the financial reforms in 1994) from 0.73 to reach 0.45 by 2004. There has been a converging trend of tax effort among provinces since 1995.

Figure n°19 : Variation Coefficient of Tax Capacity

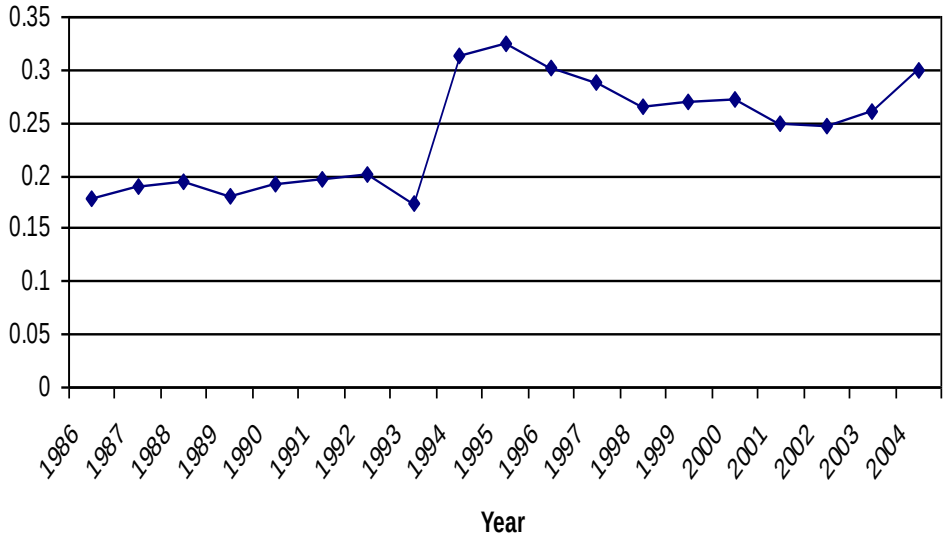
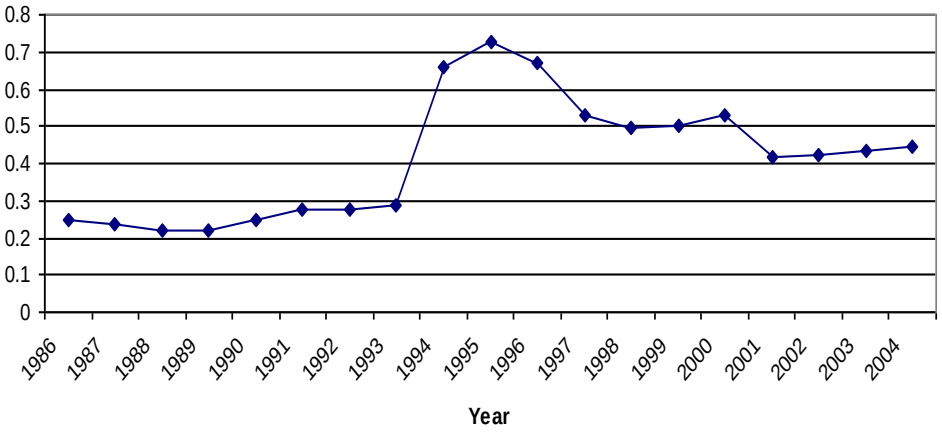


Figure n°20 : Variation Coefficient of Tax Effort



Overall, the fiscal reform in 1994 has led to highly differentiated tax capacities across regions as well as a high heterogeneity of tax effort.

6. POLICY IMPLICATIONS

This study provides two major policy implications regarding tax capacity and tax effort. The first is related to the redistribution issue. Tax capacity and tax effort indices could help determine the amount of resources that should be allocated to each provincial government. The second is related to the tax administration of the provincial governments.

6.1. Redistribution

The central government could use an approach based on tax capacity and tax effort indices for allocating grants and subsidies among its provinces. Before going any further, it is necessary to review both the past and the current redistribution and transfer of shared taxes, tax rebates, grants, and subsidies in China. Tremendous changes have occurred after 1994.

In the 1980s, for the total amount of tax subject to sharing, the shared rate was the result of negotiations between the central government and provincial governments. According to Bahl and Wallich's (1992) sharing formula, the shared rate was determined by combining the original amounts of tax collections and negotiation. Historically, the redistribution of shared taxes, grants, and subsidies to the provinces was determined by the ratio of the actual amount of "allowable" provincial government expenditures over the actual amount of provincial fixed plus shared revenues collected. Usually the least developed and minority provinces received a deficit subsidy. The other approach was a fixed tax quota contracted with the central government. To get a desirable contract, provinces bargained with the central government for an ad hoc tax quota. In the bargaining process, the prosperous and high-yield provinces, such as Jiangsu, Zhejiang, Beijing, Guangdong, and Shanghai,

typically took advantage of their special economic development policies when negotiating with the central government for greater subsidies (Bahl and Wallich, 1992; Zhang and Zou, 1998).

After the 1994 reform, among all the grants and subsidies transferred from the central government to the provincial governments, tax rebates became the largest subsidy. The size of the tax rebate is highly correlated with the income level, which is a regressive effect. Therefore, this method of redistribution has little equalizing effects because the coastal provinces and the most developed regions are favored (Lin, Tao and Liu, 2003). The earmarked grants, the second largest transfer item, were designed as subsidies for food and other consumer goods, which favor urban areas, and which also still have the problem of a regressive effect (Wong, 1997). To compensate for this inequality problem, in 1996, the government introduced an equalizing transfer to aid poor regions. The transfer is based on variables from both the supply side, such as GDP, and the demand side, such as student-teacher ratios, the number of civil servants, and the population density (Lin, Tao and Liu, 2003). To a certain extent, this approach could be considered as a redistribution based on the tax capacity.

Additionally, the tax effort of a government is viewed by some political entities as an indicator of the desirability for allocating further resources to that government. For example, international lending agencies use measures of tax efforts as a basis for allocating grants, thus favoring high tax effort countries (Leuthold, 1991). Similarly, in some countries, the central government uses the capability of local governments to generate tax revenues as the basis for judging their performance, and in turn allocates its grants to each local government accordingly. In addition, in countries including Canada, Australia, Germany, and Denmark, the redistribution system is based on tax capacity equalization. The equalization transfers are designed to offset tax capacity differentials (Ahmad and Craig, 1997).

Furthermore, both the tax capacity and tax effort should be taken into account when considering the redistribution. The reason for using tax effort indices to determine the redistribution rate is to give provincial governments greater incentives to exploit their own tax base. Of equal or greater importance, using the tax effort will, to some extent, offset the aforementioned problem of a regressive effect. As shown in the previous section, some provinces with low per capita GDP have tax effort indices far above one, for example, Inner Monoglia, Gansu, Guizhou, Yunnan, and Tibet. Grants and subsidies should be distributed to them since they are limited in their potential to utilize tax bases to meet their expenditure needs.

Ideally speaking, according to Boadway (2001), under the equalization redistribution, each provincial government with a comparable level of tax effort should be provided with a comparable tax capacity to make a uniform set of public services available. Therefore, redistribution should reflect all three factors: differences in hypothetical tax bases, the extent to which the provincial governments utilize their tax bases, and differences in need across provinces.

6.2. Administrative reform

The final amount of tax revenue at each government level depends not only on the tax base and the tax rate, but also on the tax administration of governments. A low efficient administration with high administrative costs (defined as the cost for government agencies to collect tax) will decrease the tax effort index significantly. In this regard, low tax effort indices might be seen as reflecting administrative problems of provincial governments, such as the failure to reform public administration and the inefficiencies introduced by under-qualified government officials and by the intervention of enterprises in the provincial administration.

The administrative reform, which aims at both lowering the administrative cost and improving administrative efficiency, has been carried out from the central government to all levels of subnational governments. Before 1994, it was the provincial tax administration's responsibility to collect tax revenue and submit it to the central government. In order to improve administrative efficiency and to limit the provincial tax administration power, in 1994, the central government split the tax administration into two parts, namely the national tax administration and provincial tax administration. The former is in charge of collecting central taxes and shared taxes. The latter is responsible for local taxes only.

The central government can judge the achievement of provincial government officials by examining their tax effort indices. For the provinces with tax effort indices situated significantly below one, such as the two coastal provinces Shandong and Jiangsu, such a judgment may introduce a potentially serious problem concerning the officials' efficiency and special relationships with enterprises, in that the most profitable enterprises may end up paying less tax than they should.

CONCLUSION

This study has shed light on the tax performance of provincial governments in China The analysis carried out in this study comprises two steps. First, we use a fixed time effects and random provincial effects model to analyze the statistical relationship between tax shares and economic and demographic variables, including per capita GDP, the share of agriculture, industry and trade, and the population density. In general, the decentralized fiscal system over the period of 1986 to 1993 had a positive impact on the tax share of GDP, whereas the recentralized system over the period from 1994 to 2004 dramatically decreased the tax share of GDP.

Secondly, we employ the estimated coefficients from the model to calculate tax capacity and tax effort indices for each province in China. Tax effort indices for each province vary over time and provincial trends show significant differences. The results suggest that some prosperous and coastal provinces, such as Shandong, Jiangsu, and Guangdong, which have a high tax capacity, show relatively low tax efforts. These provinces may consider placing

greater emphasis on administrative reforms as a means to increase local tax revenues and therefore reduce their reliance on other funding resources. On the other hand, some poorer inland provinces, such as Guizhou, Gansu, and Tibet, have a low tax capacity and a high tax effort. They may wish to look for alternative financial resources because there is limited room for them to exploit their tax bases to meet expenditure needs. The results for the variation coefficient of tax capacity and tax effort indices indicate that the fiscal reform in 1994 has led to greater differentiation of tax capacities across provinces and also to more divergence in tax efforts.

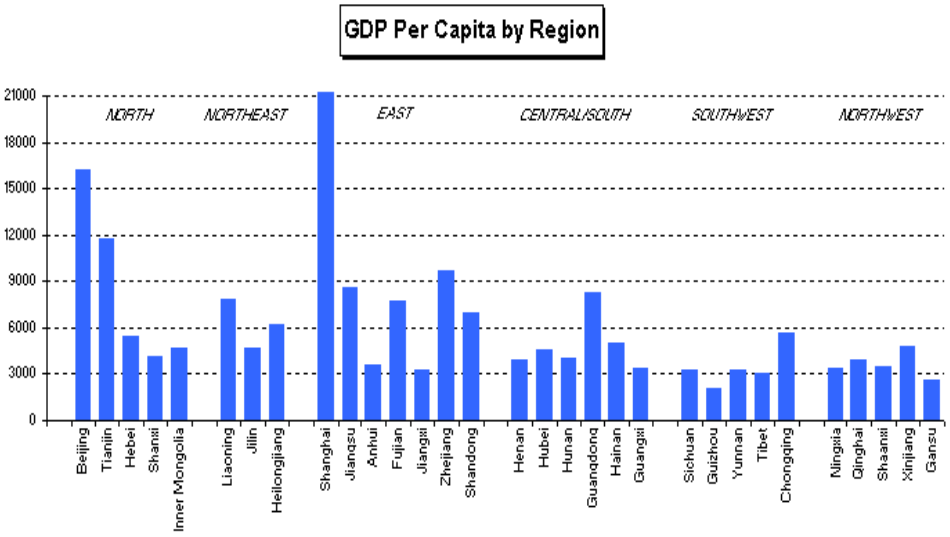
The findings from this study have important policy implications. First, tax capacity and tax effort indices could help the central government to redistribute grants and subsidies to each province. Second, these measures can also help to make judgments about the administrative efficiency of provincial governments. Along with information on expenditure needs, alternative financial sources, and political and cultural differences among provinces, measuring tax capacity and effort can provide valuable, and somewhat objective, information on the levels of tax utilization in individual provinces.

APPENDIX

Table n°1 : Average values over the period 1986–2004.

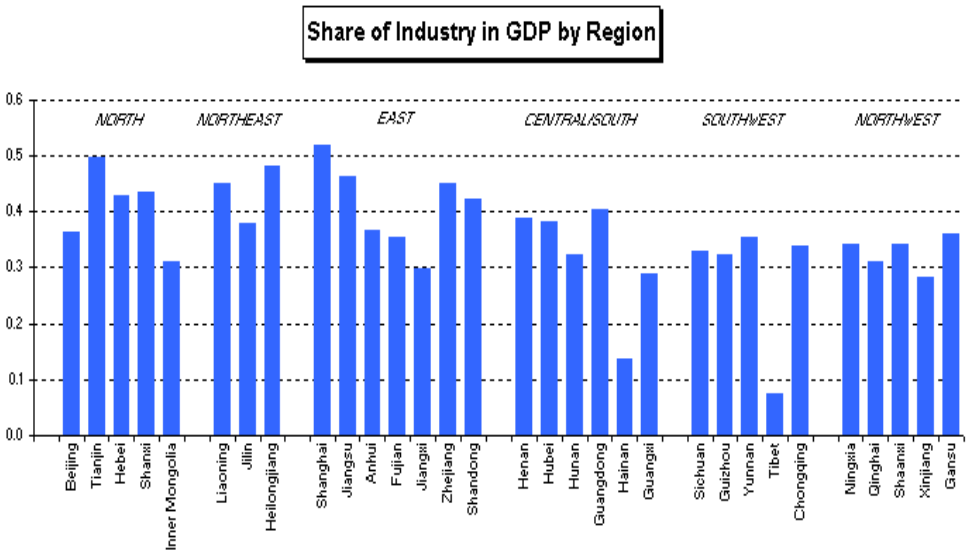
Province	GDPPC	GDPpc growth	Tax share	Tax growth	Buoyancy	Agri share	Agri growth	Indu share	Indu growth	Popden	Tax Capacity	Tax effort
Shanghai	21478.32	15.96%	13.71%	12.97%	0.98	2.63%	-10.94%	51.94%	0.93%	2100	0.16	1.16
Beijing	16229.70	15.55%	14.97%	15.97%	1.17	5.42%	-10.40%	36.31%	-1.31%	695	0.14	1.68
Tianjin	11775.42	15.61%	12.59%	8.55%	0.66	6.32%	-8.40%	49.79%	3.17%	787	0.16	1.08
Zhejiang	9645.20	18.17%	7.55%	15.57%	1.23	16.25%	-6.69%	45.14%	1.56%	431	0.13	0.76
Jiangsu	8555.75	17.68%	6.23%	15.41%	1.30	16.98%	-6.05%	46.46%	2.94%	683	0.14	0.65
Guangdong	8315.00	17.40%	8.01%	18.42%	1.32	16.70%	-5.30%	40.27%	1.82%	366	0.15	0.76
Liaoning	7877.70	13.98%	8.26%	10.61%	0.89	13.19%	-3.36%	45.06%	0.36%	276	0.14	0.85
Fujian	7673.95	18.50%	8.45%	20.76%	0.88	21.58%	-0.89%	35.35%	1.40%	264	0.12	1.00
Shandong	6927.15	17.63%	5.36%	15.57%	1.11	20.70%	-2.44%	42.40%	2.17%	566	0.13	0.63
Heilongjiang	6155.60	14.28%	8.65%	8.80%	0.71	16.22%	-1.34%	48.31%	0.79%	78	0.14	0.84
Chongqing	5637.67	10.27%	4.57%	14.40%	1.79	18.69%	33.98%	34.03%	-0.45%	376	0.12	0.83
Hebei	5419.70	17.04%	6.24%	10.09%	0.67	19.95%	-4.42%	42.78%	10.80%	336	0.13	0.69
Hainan	4983.25	15.39%	6.47%	16.90%	0.97	38.83%	1.08%	13.79%	-1.09%	209	0.10	1.92
Xinjiang	4811.53	15.11%	5.26%	16.93%	1.95	27.90%	-3.15%	28.32%	15.66%	10	0.12	1.06
Inner Mongolia	4695.35	16.80%	9.30%	17.95%	1.27	27.58%	-2.74%	31.16%	0.78%	19	0.11	1.59
Jilin	4647.89	14.64%	7.20%	10.59%	1.02	24.32%	-1.61%	37.97%	1.72%	135	0.12	0.93
Hubei	4551.95	14.94%	6.22%	10.15%	1.04	24.31%	-1.67%	38.13%	0.36%	304	0.12	0.74
Shanxi	4128.60	16.44%	8.43%	11.07%	0.87	13.04%	21.51%	43.42%	0.05%	197	0.14	0.86
Hunan	4010.10	15.49%	5.99%	11.10%	0.95	29.11%	-0.08%	32.20%	-0.59%	302	0.11	0.85
Henan	3940.95	16.64%	5.74%	11.66%	0.92	26.29%	2.69%	38.95%	0.24%	543	0.12	0.74
Qinghai	3917.40	13.57%	6.63%	12.14%	1.08	19.97%	-2.63%	31.02%	0.71%	7	0.12	0.90
Anhui	3609.90	14.28%	6.02%	12.00%	1.29	28.05%	-3.82%	36.76%	0.73%	429	0.12	0.83
Shaanxi	3460.15	15.19%	7.03%	13.21%	1.10	20.80%	-2.25%	34.20%	0.66%	169	0.12	0.92
Ningxia	3369.37	13.57%	7.96%	14.82%	1.39	21.45%	3.03%	34.28%	0.03%	77	0.12	1.06
Guangxi	3321.40	16.34%	7.32%	13.65%	0.98	31.23%	4.55%	28.85%	-0.77%	191	0.11	1.07
Yunnan	3314.20	15.52%	11.66%	14.00%	1.00	26.77%	-1.37%	35.43%	1.19%	102	0.12	1.57
Jiangxi	3258.63	15.37%	7.70%	15.78%	0.81	30.28%	3.71%	29.84%	-1.37%	240	0.11	1.33
Sichuan	3222.37	15.68%	4.61%	13.47%	0.67	28.87%	6.91%	33.04%	-1.06%	167	0.12	0.96
Tibet	3068.11	13.28%	4.29%	14.19%	1.42	39.27%	29.70%	7.59%	-2.77%	2	0.08	1.70
Gansu	2605.68	12.93%	9.25%	9.12%	0.90	23.09%	-0.42%	36.15%	0.37%	53	0.12	1.16
Guizhou	2018.05	13.39%	9.26%	13.67%	1.47	32.26%	-2.23%	32.26%	1.29%	200	0.11	1.45

Figure n°5 : Average per Capita GDP (in thousand RMB Yuan) over the period 1986–2004



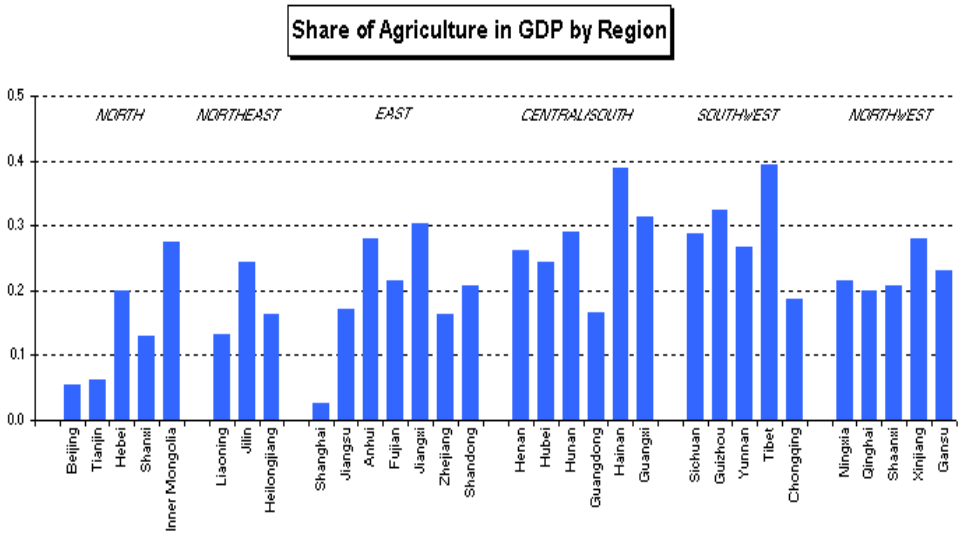
Source : China Data Online (1986–2004).

Figure n°6 : Average Industrial Share of GDP over the period 1986–2004



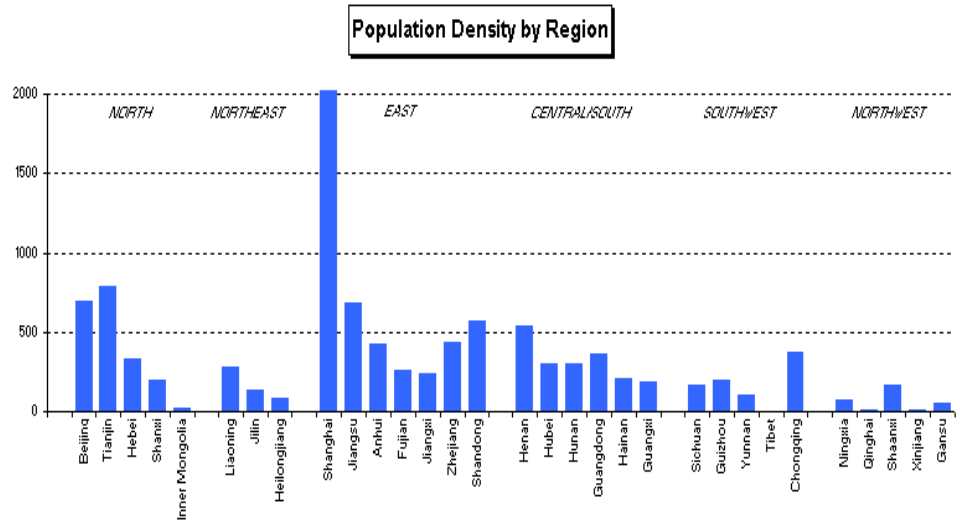
Source : China Data Online (1986–2004).

Figure n°7 : Average Agricultural Share of GDP over the period 1986–2004



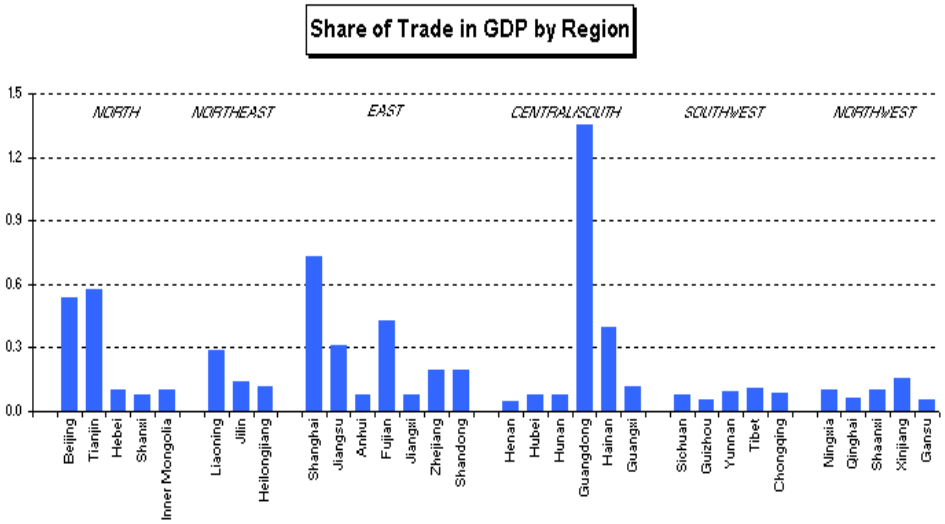
Source : China Data Online (1986–2004).

Figure n°8 : Average Population Density (Inhabitants per Sq.Km) over the period 1986–2004



Source : China Data Online (1986–2004).

Figure n°9 : Average Trade Share of GDP (%GDP) over the period 1986–2004



Source : China Data Online (1986–2004).

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LA POLITIQUE FISCALE DES GOUVERNEMENTS LOCAUX EN CHINE : UNE ANALYSE DE LA PERFORMANCE FISCALE DES PROVINCES

Résumé *– Cet article cherche à comparer la performance des politiques fiscales régionales entre 1986 et 2004 en Chine en mettant plus particulièrement l'accent sur les effets des réformes majeures effectuées dans les années 1980 et en 1994. Dans un premier temps, en s'appuyant sur des données de panel, nous utilisons un modèle hybride qui combine effets temporels fixes et effets régionaux aléatoires, permettant d'analyser la relation entre le poids de la fiscalité dans le PIB et les variables économiques et démographiques régionales. Les résultats obtenus montrent que le système décentralisé de la période 1986-1993 a eu des effets plus bénéfiques sur la croissance du PIB que le système, plus centralisé, de la période 1994-2004. Dans un deuxième temps, nous proposons la construction d'indicateurs régionaux représentant le potentiel de recettes fiscales additionnelles et permettant d'analyser l'impact d'une modification des politiques fiscales locales en matière de redistribution et de croissance.*