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The Inefficiencies of Legislative Centralization: Evidence from Provincial Tax Rate-Setting

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Abstract: Legislative power in China is centralized to an unusual degree. This arrangement is both positively and normatively significant, but has received little attention in prior scholarship. We devise a novel method for analyzing the consequence of centralization by examining provincial rate setting for the vehicle and vessel tax (VVT). Because all provinces have assigned VVT revenue and VVT administration to sub-provincial governments, provincial rate-setting represents centralized, not decentralized, decision-making. Using spatio-econometric analyses, we find that provincial tax rate choices fail to reflect local economic and demographic conditions and display traces of tax mimicking. Both support the hypothesis that provincial officials lack information and incentives to make effective policy.

Introduction

A most fundamental feature of China's current legal and political system is a high degree of legislative centralization. The feature has two basic manifestations. First, within the central-provincial relationship, the central government possesses much greater legislative power. This is illustrated by the reservation of legislative power to the central government for several broad categories of policy in the Law on Legislation,[1] but more importantly, characterizes the disparate laws and regulations operative in a wide array of policy areas.[2] Second, relatively few sub-provincial governments have legislative power. At present, only 49 quasi-provincial and prefecture-level jurisdictions can enact local statutes and regulations,[3] whereas there are overall 333 prefecture-level, 2,856 county-level and 40,906 township-level jurisdictions. According to Law on Legislation, local statutes (*difang fagui*) and government regulations (*difang zhengfu guizhang*) are the only forms of local rules with general applicability that have a formal legal effect.[4] Therefore, congressional bodies and executive offices in most municipal governments, and all county and lower-level governments, do not have lawmaking power. People's congresses at most sub-provincial jurisdictions are thus not "legislatures" but mere electoral and quasi-governing bodies, despite the constitution's recognition of them as "seats of state power".[5]

Surprisingly, such a core feature of Chinese legal institutions has received little analysis in either legal or social scientific scholarship. The neglect is particularly remarkable in the social scientific literature, where it has been long recognized that, in terms of administrative and spending responsibilities, China is a highly decentralized state. In 2008, direct expenditures by the central government represented only 21.42% of total public expenditures. Moreover, provincial governments generally make only between 25% and 30% of sub-national public expenditures, leaving well over half of total public expenditures to sub-provincial governments. This high level of sub-national expenditures has been the historical pattern for several decades.[6] The paradoxical co-existence of high legislative centralization and high administrative decentralization implies that very substantial policy discretion is exercised by sub-provincial authorities, but such decisions must of necessity take place outside the legislative system.[7] The combination has nonetheless elicited little commentary.[8]

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[1] The Law on Legislation (2000), Article 8.

[2] For current arrangements of legislative centralization in tax policymaking, for instance, see Wei Cui, "Fiscal Federalism in Chinese Taxation," *World Tax Journal* 3 (2011): 455-80. .

[3] These are located in 27 provincial capitals, 4 cities that host special economic zones, and 18 "relatively large cities" specially designated by the State Council.

[4] The Law on Legislation, Chapter 4.

[5] The Constitution, Article 2.

[6] Zhou Li-An, *Zhuanxing zhongde difang zhengfu: guanyuanjili yu zhili* (Local Governments in Transition: Official Incentives and Governance) (Shanghai: Gezhi Publishing, 2008), pp. 6-7; Li Ping, eds, *Zhongguo zhengfu jian caizheng guanxi tujie* (Chinese Intergovernmental Fiscal Relations: Illustrations and Annotations) (Public Finance and Economic Press, 2006), p. 132.

[7] We define the legislative system broadly to include formal executive-branch rulemaking.

[8] Zhou offers a brief discussion and cites the current Minister of Finance Lou Jiwei as the first to discuss this combination in 2006. See Zhou Li-An, Local Governments in Transition: Official Incentives and Governance, pp. 201-7.

We believe that this neglect of legislative centralization and its causes and consequences is unfortunate from both positive and normative perspectives. From a social scientific perspective, it leaves theories of the Chinese political economy incomplete. The centralization of legislative power essentially reduces the range of actors who can make law. For a large and diverse country like China, this restriction is likely to be inefficient, because it is very difficult for those authorized to make law to gather the information necessary to produce rules that would suit local circumstances, and because it reduces the incentives of sub-national agents to offer information relevant for legislation.[9] This basic inefficiency is probably why so few other countries in the world adopt China's high degree of legislative centralization, and implies that the Chinese phenomenon requires specific explanations. Conversely, theories of Chinese political economy that ignore the phenomenon are likely to miss much else that goes on as a consequence of it.

Moreover, from a normative perspective, *if* legislative centralization is inefficient, then transgressions of this legislative framework—e.g. *ultra vires* policymaking by local governments—must be evaluated carefully. In many cases of transgression, what undermines the rule of law may not be local government officials predisposed to disregard the law, but an irrational legislative system leaving *ultra vires* acts inevitable. If one takes centralization for granted, one may be adopting the wrong normative benchmarks. Unfortunately, we believe much scholarship on Chinese law precisely subscribes to such wrong benchmarks.

In this paper, we illustrate the importance of studying centralization through an empirical investigation of how Chinese provincial governments set local tax rates pursuant to nationally-delegated powers. In particular, we examine two episodes of tax-rate-setting for the vehicle and vessel tax (VVT) in 2007 and 2011. We exploit the fact that revenue from the VVT, like the revenue of numerous other small, local taxes, has been assigned in all provinces to sub-provincial governments, who are also responsible for VVT collection. As a result, provincial rate-setting constitutes an instance of legislative centralization, even though it occurs at the sub-national level: the range of decision-makers has been restricted, and information and incentives relevant to the decisions likely lie at lower levels of government. In delegating VVT rate-setting power to provinces, the national government signals that it lacks information to set rates for different parts of the country. Legislative decentralization, therefore, ought to improve efficiency. We show, however, that because of the lack of information, incentives, or both, provincial governments were not able, either, to effectively use their rate-setting power (in the sense of incorporating provincial information in the choices of tax rates.) Thus the central and provincial governments collectively fail to adopt appropriate legislation. The detriments of centralization, interestingly, are observed at the provincial level.

Our paper is the first to analyze the determinants of legislative choices of tax rates by provincial governments in China. Following recent public finance literature originating in

[9] For theories of incentives for agents to provide information, see e.g. Philippe Aghion and Jean Tirole. "Formal and Real Authority in Organizations," *Journal of Political Economy* 105 (1997): 1-29.

North America and Europe, we look for such determinants both in exogenously given economic and demographic variables and in potential strategic behavior among provincial governments (identified through spatial-econometric analysis). However, our hypotheses and interpretation of the results are motivated primarily by the intuitions about the defects of over-centralization in legislation outlined above, and not by public finance theory. The claim that legislative authority in general may be too centralized in China has obvious relevance to policy fields other than taxation, and our ultimate aim is to motivate further study of this general claim. For example, we suggest that failures to recognize the excessive legislative centralization in China has led to confusions in academic and policy discussions, e.g. the treatment of all sub-national levels of government as "local" and the equation of law with centralized law. Such confusions in turn lead to erroneous assessments of the relationship between law and development and the potentials of proposed policies such as imposing a property tax.

The paper proceeds as follows. Section I describes the legal and institutional background for Chinese provincial tax policymaking and for the particular type of tax, the VVT, which we study. Section II briefly reviews the existing Chinese literature on sub-national government tax policymaking, as well as the recent international literature on determinants of choices of local tax rates. Section III describes the actual processes and outcomes of provincial VVT rate-setting in 2007 and 2011 and preliminary evidence that provincial governments lacked the information and incentives to legislate effectively. Section IV statistically tests for determinants of provincial choices of VVT rates. We find that the variables typically considered to be determinants of local tax rates offer little predictive power regarding provincial choices. Section V discusses evidence of strategic interactions among provinces and its interpretations. Finally, Section VI considers the theoretical and policy implications of our findings.

I. The Institutional Background of Provincial Tax Policymaking

Since 1994, China's central government has received a much larger share (now greater than 50%) of overall tax revenue than its share of national expenditures (now around 20%), and has thus been in a position to make large transfers to sub-national governments. This is the result of the 1994 tax reform, which created a nationally uniform set of rules allocating tax revenue between the national and sub-national governments for different taxes. The allocation of the sub-national shares of tax revenue among the provincial and lower-tiers of governments, by contrast, is determined by the provinces themselves. Provincial governments, by being able to decide on the provincial/sub-provincial divisions of tax revenue, and by being the direct recipients of central government transfers, can generally cover their direct expenditures with provincial own revenue and grants from the central government. It is the sub-provincial, and especially county and township governments, that are most adversely affected by the "vertical fiscal gap" created by top-heavy revenue receipts and bottom-heavy government outlays.

In recent years, due to their relative fiscal security, many provinces have allocated

revenue from minor taxes (including the VVT) to sub-provincial (i.e. municipal, county, and township) governments.[10] However, legislative power regarding taxation has remained centralized. Tax policy discretion—understood as not to include matters of revenue allocation, which are considered a part of budgetary affairs—can at most devolve to provinces.[11] Even provincial governments have been authorized to make only certain narrowly circumscribed decisions with respect to numerous shared and local taxes since 1994.[12]

A notable instance of provincial tax policymaking in the last few years is the setting of tax rates for the VVT. The VVT was created in 2007 by combining two previous small local taxes. In 2006, on the eve of their replacement by the VVT, these two prior taxes together generated a mere 0.13% of total national tax revenue and 0.37% of tax revenue claimed by sub-national governments. The 2007 VVT incrementally broadened the tax base and raised tax rates. This, along with expanding car ownership and improved tax administration, led to VVT revenue growth of nearly 400% within 4 years. Still, in 2010, VVT generated only 0.74% of sub-national tax revenue, and ranked 16th in terms of revenue among 18 types of nationally-recognized taxes.

Nonetheless, VVT policy received wide attention both in 2007, when the tax was first implemented through an executive decree, and during 2010 and 2011, when the Law on Vehicle and Vessel Tax (VVT Law) was debated and ultimately enacted. In 2007, the VVT was said to be "the first local tax subject to comprehensive reform since the1994 reform of the tax system, as well as the first tax for which the treatment of domestic and foreign taxpayers is unified. The wholesale reform of the VVT is conducive to the development and perfecting of China's local tax system."[13] In 2010, the VVT made news again because the VVT Law was to become the first statutory codification of the rules of a local tax and thus supposedly represented a milestone in completing the "socialist legal system".[14] Nor was the salience of VVT legislation observable only in official propaganda. The 2010 draft VVT Law received the fourth largest number of public comments among 44 proposed legislation or legislative amendments for which public comments were solicited since 2005.[15]

Political salience aside, it should be noted that the VVT's small size does not detract

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[10] Budget Department, Ministry of Finance (2006), *Zhongguo shengyixia caizhengtizhi 2006* (Sub-Provincial Fiscal Systems) (China Public Finance and Economics Press 2007).

[11] This is why provinces, and not lower-level governments, are the agents to whom the central government delegated VVT rate-setting power, even though VVT revenue does not accrue to provincial budgets.

[12] For a list of limited legislative delegations to provinces to determinate tax base and rates, see Wei Cui, "Fiscal Federalism in Chinese Taxation," pp 466-7.

[13] "*Ershuiheyi difangshuigaigequdexindejinzhan* (Two Taxes Combined into One: Local Tax Reform Achieves New Developments," *Zhongguo shuiwu bao* (China Taxation News), 21 Feb. 2008.

[14] Tax Policy and Legal Departments, Ministry of Finance (MOF) and the Property and Transaction Tax Department of the State Administration of Taxation, "*Chechuanshui lifagongzuo zongjie*" (Summary of Vehicle and Vessel Tax Legislation), available at http://www.mof.gov.cn/preview/shuizhengsi/zhengwuxinxi/gongzuodongtai/201104/t20110411_535024.html [23 March 2014].

[15] <http://www.npc.gov.cn/npc/flcazqyj/node_8195.htm.> [23 March 2014] VVT legislation received such public attention because car owners pay the VVT: like property taxes on homes in other countries, the VVT possesses salience for a wide and vocal constituency.

from its representativeness as an instance of provincial tax policymaking. Even for China's largest taxes, the items over which provincial governments have policy discretion all have a small revenue impact.[16] With the possible exception of rate-setting for the Deed Tax, it is hard to point to any tax policy item within provincial discretion that gives rise to more "high-powered" incentives to provincial policymakers than VVT rate-setting. We would also point out that in the context of the significant fiscal deficit at the lowest levels of government, lower-level governments and taxpayers can be sensitive to even small taxes. For example, the very controversial agricultural tax that was abolished in 2005 generated only 1.87% of total tax revenue in 2001. But because it represented over 12% of county-level budgetary revenue at the time, its abolition was politically difficult.

Against the above background, the empirical question we aim to answer is: how do provincial governments go about making tax policy, given that, as in the case of the VVT and other taxes, they are removed from both the implementation and the impact of their decision?

II. Chinese and International Literature on Local Tax Rate-Setting

There is a growing interest among economists in China in studying local government pursuit of tax policies.[17] A major research constraint is that, as already stated, the central government maintains a monopoly over the most important tax legislative decisions. Substantial local tax policies thus tend not to be reflected in sub-national legislation, but would instead assume disguised forms, such as tax rebates or grants to taxpayers tied to the amount of tax payments. It is commonly believed that such disguised policies often defeat the purposes of national laws and regulations,[18] and that legislative centralization has failed to stem local tax competition through the offering of unauthorized tax preferences. However, systematic information about the content of negotiations between low-level governments and businesses regarding tax rates is difficult to gather.

Currently, a popular device for studying local tax policies is to examine the effective income tax rates (ETR) of listed companies and infer behavior of government officials from them.[19] Three comments may be made about this still-burgeoning literature. First, after

[16] For example, in deciding the taxable threshold for the value added tax (the largest tax), a provincial government essentially controls the size of the population of "small taxpayers" in the province that pay the VAT. In 2008, small taxpayers contributed altogether only 4% of VAT revenue nationally, i.e. just over 0.1% of total tax revenue. The provincial share of such revenue is even smaller.

[17] For a review, see Cao Shujun, Liu Xing, Zhang Wanjun, "*Caizheng fenquan, difang zhengfu jingzheng yu shangshi gongsi shiji shuifu*" (Fiscal Decentralization, Local Government Competition and Effective Tax Rates of Listed Companies), *Shijie jingji* (World Economy) 4 (2009): 69-83.

[18] One study finding that local tax refund policies prohibited by the central government effectively reduced the effective tax rates of listed companies include Wu Liansheng and Li Chen, "*Xianzheng houfan, gongsi shuifu, yu shuishou zhengce de youxiaoxing*" (Tax Refunds, the Corporate Tax Burden and the Effectiveness of Tax Policy), *Zhongguo shehui kexue* (Social Sciences in China) 4 (2007): 61-73.

[19] See Chen Xiao, Xiao Xing and Wang Yongsheng, "*Shuishou jingzheng jiqi zai woguo ziben shichang de biaoxian*" (Tax Competition and Its Manifestation in China's Capital Market), *Shuiwu yanjiu* (Taxation Research) 6 (2003): 18-23 ((purporting to find that corporate ETRs across provinces tend to converge to a level well below the statutory tax rate, and attributing) the phenomenon to tax competition); Cao et al, Fiscal Decentralization, Local Government Competition and Effective Tax

controlling for company-specific characteristics, the existing studies have tended to directly attribute lower company ETRs to local governmental policy choices in the face of tax competition. Tax competition, and not local economic and demographic features, is assumed to drive tax policy. Other potential determinants of local tax policy are not considered.[20] In other words, existing studies have not been specifically designed to prove the existence of tax competition. Second, even if tax competition can be plausibly assumed to be a dominant sub-national tax policy consideration, existing studies fail to address the issue of where sub-national tax policies are made. After all, company ETRs (and regional gross tax burdens) can be the result of policies adopted by different levels of sub-national governments. Is it provinces that engage in tax competition, or counties and cities, or even lower levels of government? Past studies have avoided this question and instead aggregated the choices of all possible actors into provincial units. Third, ETRs at the company level and gross tax burdens in local economies are determined by many factors, and are in significant ways not within politicians' control. They are thus very rough indicators of policy choices.

We pursue a very different empirical strategy in this paper. We analyze a set of explicit, legislative tax policy choices (i.e. VVT rates in 2007 and 2011) made by a well-specified group of actors (i.e. provincial politicians and bureaucrats). We consider potential determinants of such choices both in spatial interactions among provincial governments and in exogenous variables. Such an approach is much more accurate and reliable in analyzing government behavior. It is also consistent with—and indeed is based on—the recent international scholarship on the political economy of local tax policy.

Much of the recent international literature on local tax rate-setting has been influenced by the theory of political "yardstick competition".[21] According to this theory, local voters, under situations of information asymmetry regarding the cost of production of public goods, determine whether local politicians are "good" officials or rent-seeking ones by comparing the tax rates local politicians choose with those chosen in neighboring jurisdictions. This type of voter decision-making in turn leads to behavior on the part of political incumbents to *mimic* the tax rates adopted by neighboring jurisdictions (or other jurisdictions that they believe local

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Rates of Listed Companies (finding that ETRs display an inverted-U shape correlation with the fiscal dependency of provinces, and interpreting this in terms of provinces' ability to engage in tax competition); Li Yuanxu and Song Yuanyang,"*Difang zhengfu tongguo suodeshui youhui baohu bendi qiye me – lai zi zhongguo shangshi gongsi de jingyan zhengju*" (Do Local Governments Protect Local Enterprises through Preferential Income Tax—Evidence from Chinese Listed Firms?) *Zhongguo gongye jingji* (China Industrial Economics) 5 (2011): 149-159. Alternatively, some scholars have chosen measures of gross tax burden to represent regional tax policy. See Li Yongyou and Shen Kunrong, "*Xiaqu jian jingzheng, celuexing caizheng zhengce yu FDI zengzhang jixiao de quyu tezheng*" (Competition among Jurisdictions, Strategic Fiscal Policies, and Regional Characteristics of FDI's Growth Achievements), *Jingji Yanjiu* (Economic Research Journal) 5 (2008): 58-69 (income tax paid per unit of FDI stock); Yang Xiaoli and Xu Lei, "*Zhongguo fenquanxia difangzhengfu FDI shuishoujingzhengde celuexingjiqi jingjizengzhang xiaoying*" (The Strategic Character and Impact on Economic Growth of Chinese Local Government Tax Competition for FDI), *Jingji pinglun* (Economic Review) 3 (2011) (employing ratio of aggregate income tax paid over gross profit of foreign invested enterprises).

[20] It is thus notable that after controlling for provincial economic variables, Yang and Xu, ibid, find no evidence of strategic interactions among provinces (and thus no direct evidence of tax competition).

[21] See T. Besley and A. Case,"Incumbent Behaviour: Vote-Seeking, Tax-Setting, and Yardstick Competition," *American Economic Review* 85(1995): 25–44..

voters may view as comparable). Much empirical evidence has been produced in support of the existence of tax mimicking and its underlying cause in political competition.[22] Besides competition in electoral politics, two other explanations of why politicians may choose local tax rates by reference to the tax rates of neighboring jurisdictions are (1) tax competition in the face of factor mobility, and (2) public expenditure spillovers.[23] According to the former, the fear that businesses and residents may leave one's jurisdiction forces politicians to keep tax rates no higher than the tax rates in other jurisdictions that are potential destinations of business or resident migration. According to the latter, because high public spending in one jurisdiction may force its neighbors to maintain similar high spending (e.g. good policing in one county may force neighboring counties to spend more on policing than they would otherwise), the neighbors may have to adopt similarly high tax rates to maintain the same level of spending. However, studies so far have tended to produce greater support for the yardstick competition explanation.

Whatever their causes, geographical patterns in tax rates adopted have been discovered in many countries, in connection with different taxes, and at different levels of government (i.e. state, county, municipal, etc.).[24] Perhaps worthy of special mention is a series of studies conducted with respect to Spain. Like China, Spain is a unitary country which nonetheless has a relatively high degree of decentralization in government expenditures. But Spanish municipal governments, of which there are more than 8,000, are fiscally more self-sufficient than local governments in China, and possess the power to legislate local tax rates. Among the main local taxes is in fact a motor vehicle tax, which generates 15% of municipal tax revenue and which possesses structural similarities to the Chinese VVT. Separate studies have found strong mimicking effects for the tax.[25]

Nonetheless, our expectation for finding any of the foregoing types of strategic interactions in tax rate setting in China is modest. First, the theory of political yardstick competition has been fruitfully applied to China,[26] but not because politicians (especially not at the provincial-level) can be voted out of office by local constituencies. Instead, the competition takes place within the Communist Party cadre appointment system. Tax

[22] For example, local governments may mimic more when political competition is more intense. See M. Allers and J. Elhorst, "Tax Mimicking and Yardstick Competition among Local Governments in the Netherlands," *International Tax Public Finance* 12 (2005): 493–513. J. Brueckner, "Strategic Interaction among Governments: an Overview of Empirical Studies," *International Regional Science Review* 6 (2003): 175–188. F. Delgado, S. Lago-Peñas and M. Mayor, "On the Determinants of Local Tax Rates: New Evidence from Spain," Institut d'Economia de Barcelona (IEB) Working Papers 2011/4.

[23] See M. Allers and J. Elhorst, "Tax Mimicking and Yardstick Competition among Local Governments in the Netherlands;" F. Revelli, "Testing the Tax Mimicking vs. Expenditure Spill-over Hypothesis Using English Data," *Applied Economics* 33 (2002): 1101-7.

[24] These include the U.S., Canada, Germany, Belgium, Switzerland, France, the Netherlands, Spain, Italy, Norway, and the U.K., among others. Note that both federalist and unitary countries are included, consistent with the general proposition that decentralized tax policymaking can take place in both types of polities.

[25] A. Solé-Ollé, "Electoral Accountability and Tax Mimicking: the Effects of Electoral Margins, Coalition Government, and Ideology," *European Journal of Political Economy* 19 (2003): 685–713; Delgado et al, "On the Determinants of Local Tax Rates."

[26] See, e.g. Li Hongbin and Zhou Li-An, "Political Turnover and Economic Performance: the Incentive Role of Personnel Control in China", *Journal of Public Economics*, 89 (2005): 1743-62.

rate-setting is unlikely to be a part of this competition: even though sub-national officials may be rewarded for overall tax revenue generation, because the tax rates for all of the largest taxes are decided by the central government, growing the economy and strengthening tax collection are much more effective for generating tax revenue than rate-setting for small taxes. There also appears to be no other mechanism of political competition that would involve tax rate-setting. Second, because provincial expenditure is a small portion of local public good provision, and because VVT revenue represents 0% of provincial revenue, expenditure spill-overs (if they exist) are unlikely to result in spatial patterns in provincially-adopted VVT rates. Finally, while tax competition may play a role in provincial rate setting, we note that since VVT is such a small tax, it is unlikely to be a factor in decisions of business and residential locations. A province can set high VVT rates without fearing any outflow of productive factors.[27]

However, a very different explanation for tax mimicking in China, if such mimicking exists, may be plausible: mimicking is the safest and least costly thing for bureaucrats and politicians to do when they are incapable of, and/or indifferent to, making appropriate policy. Mimicking could be the result of shirking, a very common type of bureaucratic behavior. Or it could be the product of political conformity. Thus any evidence of tax mimicking that could not be explained by tax competition could still reflect specific features of bureaucratic behavior. It would also suggest that tax policy has not been made effectively, in the sense that no policy information unavailable to the central government has been incorporated into provincial decision-making. Therefore, we designed our empirical strategy to capture potential spatial interactions in provincial VVT rate-setting.

III. VVT Rate-Setting: Processes and Outcomes

The VVT Provisional Regulation adopted by the State Council (effective in 2007) set out, for each of four broad categories of vehicles, a range of specific duties (non-ad-valorum tax amounts) based on the unit or weight of vehicles.[28] The Ministry of Finance (MOF) and State Administration of Taxation (SAT) were given the authority to prescribe more detailed sub-categories and the appropriate range of tax amounts for them, and provincial people's governments were to prescribe the appropriate amounts of tax within the MOF/SAT-specified ranges. After specifying further sub-categories of passenger vehicles for the VVT in 2007,[29] the MOF and SAT expected that their provincial counterparts (finance and tax bureaus) would

[27] Allers and Elhorst reject expenditure and tax competitions as the cause of mimicking in property tax rates in the Netherlands on similar grounds. See Allers and J. Elhorst, "Tax Mimicking and Yardstick Competition among Local Governments in the Netherlands."

[28] Because the VVT is not ad valorum, its tax base depends not on the value of taxable vehicles but simply their quantity, thus eliminating issues of discrepancy between nominal and effective tax rates.

[29] Implementation Rules for the Provisional Regulations on the Vehicle and Vessel Tax (MOF and SAT, published and effective on Feb. 1, 2007). According to our communication with MOF officials, the range of taxable amounts for each taxable category were set in a two-step process: (i) a reference amount was computed by multiplying a tax rate of 0.5%-1% to the average value of vehicles in the category (the implicit tax rate is similar to property tax rates commonly observed internationally); and (ii) degrees of variation around the reference point are allowed.

study appropriate tax rates for their respective jurisdictions, and make recommendations to provincial people's governments.[30]

All provinces published VVT rates as well as other implementation measures between April and December of 2007. We gathered the tax rates that resulted from these provincial processes for the 31 provincial-level jurisdictions. Because there were 8 taxable categories, there are 8 sets of rates, each set with 31 possible different values. A brief look at these rates in Table 1 reveals that provincial choices were highly stylized and clustered. For each of the sub-categories of taxable vehicles, a few discrete figures were chosen from a large number of possible integer values. Many provinces chose identical rates. For example, for large passenger vehicles, 31 provinces chose only 4 different rates, out of 180 possible integer choices. Even for the category with the largest degree of rate variation, motorcycles, only 11 rates were chosen by 31 provinces (out of 144 possible integer values). Thus the rates were unlikely to have been chosen based on specific revenue estimates. Table 2 also shows that for most of the categories, provinces were hesitant to choose rates in the higher permissible range.[31] On the other hand, there is no sign of across-the-board race to the bottom, either. Only for three of the eight taxable categories, a majority of provinces chose rates in the lower range of permissible rates.

Starting in 2007 and 2008, VVT revenue experienced dramatic growth in many provinces (albeit starting from a low baseline), yet no province changed VVT rates up until 2011, when they were required to set VVT rates again as a result of the adoption of the VVT Law. Given the informality of the rate-setting process and the simple administrative requirements of the VVT (much of which is collected by insurance companies), rate changes should have been easy to execute. It is likely that VVT tax policy simply did not have a place on provincial government agendas.

In 2011, 25 provinces adopted VVT rates after deliberation of the relevant provincial government's executive committee, as compared to 16 in 2007. This suggests that VVT rate setting received greater political attention in 2011. In terms of the tax rates actually adopted (Table 2), provincial choices remain highly stylized and clustered: the degree of variation is even slightly smaller than in 2007. The taxable categories for passenger vehicles in 2007 and 2011 are not directly comparable. For freight vehicles and motorcycles, however—where the taxable categories in 2007 and 2011 are comparable—comparisons for each province (not shown in Table 2) indicate that provinces generally chose lower rates than in 2007. This occurred without the central government substantively altering the permissible rate range. This lowering of rates may be explained, however, by factors other than tax competition.[32]

[30] MOF and SAT, Notice regarding Issues in the Implementation of the Provisional Regulations on the Vehicle and Vessel Tax and Its Implementation Measures, Caishui [2007] 23, Feb. 8, 2007.

[31] We divided the permissible rate range for each category evenly into three segments, designating them as the low, medium and high segments of the range.

[32] Professor Dong Xuebing suggests that for motorcycles, this may be attributable to the fact that they are primarily used in rural areas and there has been an explicit government policy to lower tax rates in general for the rural economy.

The next section evaluates statistically the outcome of provincial VVT rate setting, by examining both how the rates relate to certain economic and demographic variables and whether there is inter-provincial strategic behavior. Local tax rates can be expected to bear certain relations to local economic and social conditions that affect expenditure needs. If Chinese VVT rates and provincial economic and social circumstances do not bear such relations, the rates chosen can be said to be *arbitrary* in the following sense: the rates contain *no information* regarding provincial conditions (even though utilizing such information in rate-setting was the reason why rate-setting power was delegated to the provinces). The possible presence of tax mimicking is also interesting because, as discussed in Section II, the mechanisms that are generally viewed as responsible for tax mimicking in western democracies are not operative in China, but mimicking may be explicable in terms of bureaucratic shirking or political conformity in situations of indifference or insufficient information.

IV. Data and Methodology

In analyzing the determinants of provincial VVT rate choices, we first adopt a simple linear regression model:

$$T = \beta X + \mu \qquad (1)$$

T is a vector of tax rates adopted by different provinces, and *X* is a vector of independent economic and demographic variables. In a second stage of our analysis, strategic behavior among the provinces is tested, with the economic and demographic variables serving as controls.

Dependent and independent variables

In specifying *T*, the dependent variable in the analysis, for both 2007 and 2011, we aggregate the original sets of VVT rates into three sets: the first is the sum of the tax amounts chosen by each province for the subcategories (4 in 2007 and 8 in 2011) of passenger vehicles; the second is the sum of the tax amounts for freight vehicles, three-wheeled motor vehicles and special-use vehicles; and the third is the tax amount chosen for motorcycles. This aggregation produces a slightly greater number of values (thus more variation) across the provinces than the original sets of tax rates display.[33] For each set of figures, we have 31 observations corresponding to the 31 provinces in 2007, for a total of 93 observations. Tibet appears not to have issued any public document to implement the new VVT law in 2011 and the new rates applicable in Tibet are unknown. Therefore we exclude Tibet from our analysis of 2011 data, resulting in 30 and 90 observations, respectively, for the three sets of rates individually and in aggregate.

Public finance theory does not offer any simple functional relationship that allows the prediction of local tax rates from independent economic and demographic variables. Existing studies have adopted overlapping sets of such variables, implying a general consensus about

[33] We also performed separate analyses of the dis-aggregated tax rates for 2007 for robustness and obtained consistent results (omitted from the presentation below but can be provided upon request).

what factors are plausibly relevant. Commonly used variables include:

- Per capita disposable income: assuming publicly-provided services to be normal goods, demand will rise as incomes rise. This has been taken as the basis for expecting higher income to lead to higher tax rates (in order to finance higher levels of public services).
- The relative size of the elderly and youth populations in the jurisdiction: the hypothesis, generally confirmed, is that higher proportions of such age groups result in higher tax rates because they increase the need for public expenditures.
- Some, although not all, studies use the urbanization rate (urban population as a percentage of total population), presumably on the ground that a higher urbanization rate gives rise to higher public expenditures and thus higher tax rates.[34]
- Some studies have found population to be positively correlated with tax rate, supporting the theory that greater demand for public services is observed in more populous jurisdictions. However, others find a negative coefficient for population variable, supposedly explained by an increasing return in public goods provision.[35]
- Some posit a positive correlation between area and tax rates, reflecting costlier public goods provision in a larger area.[36]
- Per capita grant from higher levels of government: a positive sign could be interpreted as illustrating the "flypaper effect."[37]

For our regression, we use the following independent variables:

1. population;
2. area;
3. urbanization rate (the ratio of urban residents over the total population in a province);
4. urban per capita disposable income;
5. dependent ratio the percentage of children and the elderly in a given population);
6. transfers from the central government the population-averaged subsidy from national government received by each province), and
7. a dummy variable, "rate setting agency", which is assigned the value of 1 if VVT rules (which contain VVT rates) were adopted by the executive committee of the provincial government, and is 0 otherwise (i.e. if rates were chosen merely by provincial tax agencies). Our hypothesis is that the review by the provincial government executive committee would lower the tax rates eventually chosen: tax

[34] See M. Bordignon, F. Cerniglia and F. Revelli, "In Search of Yardstick competition: a Spatial Analysis of Italian Municipal Property Tax Setting," *Journal of Urban Economics* 54 (2003): 199-217. A significant positive correlation between gross tax burden on foreign direct investment and urbanization rate is found in the Chinese context; see Yang and Xu, "The Strategic Character and Impact on Economic Growth of Chinese Local Government Tax Competition for FDI."

[35] For the former results, see Delgado et al, "On the Determinants of Local Tax Rates;" for the latter, see Bordignon et al, "In Search of Yardstick competition," and F. Delgado and M. Mayor, "Tax Mimicking among Local Governments: Some Evidence from Spanish Municipalities," *Port Econ J* 10 (2011): 149–164

[36] See Bordignon et al, "In Search of Yardstick competition".

[37] The "flypaper effect" refers to the phenomenon that a government transfer to a local authority can lead to a higher increase in local governmental spending than an increase in local income of an equivalent size

bureaucrats are more likely to propose higher tax rates whereas generalist politicians have incentives to temper such proposals.

Moreover, for 2011, we include as an independent variable the tax rate adopted by each province in 2007 (in the relevant category): we hypothesize that, other things equal, a province that chose higher tax rates in 2007 would also choose higher tax rates in 2011. Table 3 shows the descriptive statistics for the dependent and independent variables.

OLS estimation; issues of spatial dependence

We first run a conventional OLS estimation of the dependent variables as linear functions of the independent variables. As seen in Table 4, in both 2007 and 2011, most of the independent variables of interest attain no statistical significance in predicting tax rates. The main correlations confirmed are that, for freight vehicles and motorcycles, 2011 rates are positively and significantly correlated with 2007 rates. For passenger vehicle rates, the correlation is positive, though not significant (which is consistent with the substantial overhaul of the rate structure in this taxable category). In 2007, the "rate setting agency" dummy had a uniform negative effect on all three sets of tax rates, with the correlation for passenger vehicles weakly significant. This supports our hypothesis that approval by politicians as opposed to technocrats would lower tax rates. But the effect disappears in 2011.

The other statistically significant relations from the OLS estimation have unexpected signs. In 2007, the disposable income and dependency ratio variables have a negative impact on some tax rates. In 2011, a negative correlation is found between dependency ratio and passenger vehicle rates. These correlations are contrary to the findings of determinants of local tax rates in the international literature. While these results may be viewed as uninformative or even counter-intuitive from the perspective of traditional public finance theory, they are not inconsistent with the hypothesis that provinces choose tax rates arbitrarily.

Nevertheless, there are reasons not to draw any immediate conclusions from the OLS estimation based on Equation (1). As discussed in Section II, spatial dependence has often been found in local tax rates. If there is spatial dependence for VVT rates as well, the normal OLS is not suitable for model testing because either coefficients or standard errors or both are distorted by the spatial effect.[38] The estimation could be biased and/or inconsistent. Since it is our intention to test for the presence of strategic interactions among provincial governments in VVT rate setting, and since such interactions may manifest themselves in spatial patterns, modeling for such interactions also allows us to confirm the results regarding the explanatory variables in the initial OLS estimation.

Two statistical models commonly used for analyzing the effect of spatial dependence are the spatial autoregressive (SAR) model and the spatial error model (SEM). The SAR model is intended to capture "substantive" spatial dependence, in the sense that the value of a variable at a given location depends on values of the variable in its "neighbors" of interest. The model

[38] L. Anselin, *Spatial Econometrics: Methods and Models* (Kluwer Academic Publishers, 1988), pp. 58-9.

can be expressed through Equation (2):

$$T = \rho WT + \beta X + \mu \quad (2)$$

Equation (2) expresses the idea that the tax rate of a given region, t_i, is influenced by the tax rates in neighboring jurisdictions (and vice versa). This spatial dependence is captured by the variable *WT* on the right-hand side, where *W* is a pre-specified spatial weights matrix. The (i,j) entry of the matrix is non-zero if jurisdictions i and j are "neighbors" in some pre-defined sense; the diagonal entries are zero by convention; and rows are standardized to 1 (i.e. the row elements are divided by their sum). *WT* should thus be a vector representing, for each jurisdiction, the average tax rates of its neighbors. ρ would measure the degree of spatial correlation.

In the SEM model, the spatial dependence is the result of spatial autocorrelation in the error term of Equation (1):

$$T = \beta X + \mu$$

$$\mu = \lambda W\mu + \upsilon \quad (3)$$

The idea of Equation (3) is that certain omitted variables that may influence tax rates are spatially auto-correlated. For example, unobserved shocks could play a role in determining tax rates across the contiguous regions.

The estimation of both models faces significant statistical problems. To deal with the problems, existing literature generally relies on two methods: maximum likelihood estimation (MLE) and a two-stage least square (2SLS) model using instrumental variables. The MLE is considered more appropriate for small-sized samples,[39] and we use it here.

In addition, there are several diagnostic tests for the existence of spatial dependence. These include the traditional Moran's I test, a modified "Moran's Error" test and certain Lagrange Multiplier (LM) tests performed on the residuals of an OLS estimation.[40] The application of these tests, as well as the SAR and SEM models discussed above, all depend on the choice of an appropriate contiguity matrix describing the spatial relations among jurisdictions. We use a contiguity matrix where the (i,j) entry of the matrix is non-zero if provinces i and j share a common border. The results of the application of these diagnostic tests to 2007 and 2011 VVT rates are reported in Table 5.

As Table 5 exhibits, although not all tests yield the same results, the Moran's I test and Moran's Error test offer evidence of spatial correlation for tax rates for both passenger vehicles and motorcycles. On the other hand, no spatial dependence (based on the contiguity measure of common borders) is found for the aggregate tax rates for freight vehicles. In other words, for freight vehicles, the conclusion from the OLS estimation that the choice of rates bears no detectable relation to the independent variables should be free from bias or

[39] D. Das, H. H. Kelejian and I. R. Prucha, "Finite Sample Properties of Spatial Autoregressive Models with Autoregressive Disturbances," *Papers in Regional Science*, 82 (2003): 1-26.

[40] For Moran's Error, see Cliff, A. and J.K. Ord. 1981. *Spatial Processes: Models and Applications* (London: Pion, 1981). For the LM test using OLS residuals, see P. Burridge, "On the Cliff-Ord test for Spatial Autocorrelation," *Journal of the Royal Statistical Society* B 42 (1980): 107-108.

inconsistency due to spatial auto-correlation. In the following, we explore whether taking spatial autocorrelation into account could better explain the choice of tax rates for passenger vehicles and motorcycles. Following the international literature, we estimate using both the SAR and SEM models, and rely on various statistical measures to determine which of the two models offer better explanations.

V. Evidence of Strategic Interactions and Its Interpretation

The results from our MLE estimation are reported in Table 6. Consider first the results for passenger vehicle rates. In 2007, the SAR model yields no evidence of spatial dependence. The coefficient of correlation between the tax rates of a given province and those of its bordering provinces, ρ, is positive but not statistically significant. The rest of the SAR estimation results are consistent with the OLS estimation. Only the "rate setting agency" dummy and the dependency ratio have a statistically significant impact on the dependent variable. However, spatial dependence does show up under the SEM estimation for 2007, since λ achieves the statistical significance at 95% level. The signs of the coefficients for the control variables remain the same as under the OLS and SAR estimations, but their statistical significance is accentuated. More surprisingly, a negative coefficient of spatial correlation (λ is negative) suggests that a 1 unit increase in the omitted unknown variable in adjacent regions results in 0.98 unit decreases in passenger vehicle rates.[41]

The results for 2011 are more straightforward. Both the SAR and SEM models produce positive and statistically significant spatial coefficients. In the current literature, the LM and Robust LM tests are used to choose between the SAR and SEM models. [42] Table 5 shows that both tests support that the spatial lag effect is stronger than is spatial error effect. Therefore we conclude that substantive spatial dependence characterizes the choice of tax rates here. Under the SAR model, a 1-unit increase in the average rate of a given province's neighbors leads to a 0.45 unit increase in that province's rate. Moreover, the coefficients for the control variables are also largely consistent with the results under the OLS estimation for passenger vehicle rates in 2011. In particular, the dependency ratio is still significantly and negatively correlated with the tax rate, while the other variables bear no statistically significant relations to tax rates.

Turning now to motorcycle tax rates, in both 2007 and 2011, there is strong evidence of spatial dependence. The SAR and SEM models yield results that are mutually consistent and consistent with the OLS results. Again, on the basis of both LM and Robust LM test (Table 5) and the estimation comparison (ρ vs. λ in Table 6), we favor the SAR model and the "substantive" spatial dependence explanation of spatial correlations. The SAR estimation indicates that a 1-unit increase in tax rates in neighboring provinces contributes to 0.46 (2007) and 0.63 (2011) unit increase in the rate in the home province. The coefficients are significant

[41] We speak of units instead of yuans in connection with tax rates because our dependent variable for passenger vehicles is the sum of tax amounts for multiple categories. For motorcycles, the units are yuans. For SEM estimations, the meaning of a unit for the unknown variable is also unknown.

[42] See F. Revelli, "Testing the Tax Mimicking vs. Expenditure Spill-over Hypothesis Using English Data"; Delgado and Mayor, "Tax Mimicking among Local Governments."

in both years.

In terms of the other variables, 2011 tax rates are significantly positively correlated with 2007 tax rates for motorcycles: other things equal, the provinces that chose higher rates in 2007 also chose higher rates in 2011 (despite the general reduction of motorcycle tax rates across the country). However, there is no other consistent predictor of tax rates; the coefficients for population, urbanization rate, disposal income, and dependency ratio variables all changed signs between 2007 and 2011.

The foregoing findings are complex and require discussion in terms of both internal consistency and the plausibility of alternative explanations. First, in respect of consistency, we find support for the tax mimicking hypothesis—provinces consider the tax rates that may be chosen by geographical neighbors in setting their own tax rates—for passenger vehicles in 2011, and for motorcycles for both 2007 and 2011. However, for passenger vehicles in 2007, there is no evidence of tax mimicking, even though an anomalous type of spatial dependence due to omitted variables seems to exist (i.e. a rise in neighbors' tax rates leads to a decrease in one's own tax rates). Moreover, for freight vehicle rates, there is evidence for neither tax mimicking nor spatial dependence due to omitted variables. There is no intuitive reason why provinces would copy their neighbors with respect to motorcycle tax rates but not with respect to passenger or freight vehicles. Findings of "selective" tax mimicking are not unprecedented,[43] but no explanation for this phenomenon has been offered in the existing literature.

Overall, our inability to find evidence of tax mimicking across all VVT categories diminishes our willingness to embrace the idea that there is strategic interaction among provinces in VVT rate-setting. Nonetheless, our modeling for spatial interactions increases our confidence in the regression results with respect to the economic and demographic explanatory variables. No inconsistency in estimation for these variables has emerged among the OLS, SAR and SEM models.

Turning now to matters of interpretation, two aspects of our empirical findings are significant: (1) the limited finding of tax mimicking; and (2) the finding that the major economic and demographic variables do not predict tax rates chosen (or, in the case of dependency ratio, offers a counter-intuitive prediction). With respect to the first finding, (despite the caveat stated in the two preceding paragraphs) one might view even the limited evidence of mimicking as significant. The question then is what explains such evidence. As discussed in Section II, the two most plausible explanations in the Chinese context would be tax competition and political conformity/bureaucratic shirking. For motorcycle tax rates, where we find strong evidence of tax mimicking, the fact that the rates chosen by provinces

[43] In studying tax rates in 105 municipalities near Barcelona, Solé-Ollé finds significant positive response of property and vehicle tax rates to changes in neighbors' rates, but weak evidence for mimicking in a third local tax. See A. Solé-Ollé, "Electoral Accountability and Tax Mimicking." Delgado and Mayor examine 78 municipalities in the Asturias region and find tax mimicking with respect to the property tax and building activities tax, but not the motor vehicle tax. See Delgado, and Mayor, "Tax Mimicking among Local Governments".

generally decreased from 2007 to 2011 may seem to favor the tax competition explanation. But it may be explained by other policy factors as well.[44] Moreover, for passenger vehicles, tax mimicking in 2011 is not accompanied by any sign of tax competition.

By contrast, the hypothesis that provincial officials acted out of conformism and indifference in choosing VVT rates can be viewed as supported by whatever degree of tax mimicking there is, *and* by other types of evidence as well. Such other evidence includes:

(i) the stylized and clustered tax rate choices made in both 2007 and 2011: for all taxable categories, every province's choice is matched by an *identical* choice by at least two other provinces, and by as many as six other provinces;

(ii) the fact that no province bothered to change VVT rates after 2007 until they had to, in 2011, due to national legislation; and

(iii) tax rate choices bore no significant relationship to the provinces' levels of economic development (as represented by per capita disposable income and urbanization ratio), fiscal needs (as represented by the dependency ratio, urbanization ratio, and per capita transfers from the central government) and other demographic variables.

That is, evidence of types (i) to (iii) may be interpreted as showing that provinces took an arbitrary approach to VVT rate setting—introducing no new information into the rates chosen—even if there is no evidence of strategic interactions in rate setting. Any further evidence showing such strategic interaction would only support such interpretation.

Our interpretation is perhaps most controversial in respect of item (iii). We have only found that certain variables have no noticeable impact on the choice of VVT rates. It seems rushed to infer from this that no important policy consideration has impact on rate choice—that the choice of VVT rates is arbitrary from all policy perspectives. But this is not our claim. Instead, we identified certain factors that have been found in other studies (Chinese and international) to be relevant determinants of local tax rates. Moreover, these factors are good proxies for a wide range of factors relevant to policymaking. We cannot, of course, rule out that *some* omitted variable may have determined VVT rate choices.

Overall, our investigation has revealed that in setting tax rates for the VVT, Chinese provincial governments may have engaged in tax mimicking in respect to passenger vehicles (which represent 87% of the total number of vehicles in China) and motorcycles. Moreover, both when they engaged in such mimicking and when they did not, no other significant policy factors seemed to affect rate choice. Both of these findings suggest that provincial governments lacked information and/or incentives to set rates effectively. Provincial choices offer no improvement, in terms of incorporating local information, over what the central government would have chosen. Ironically, by delegating rate-setting authority to provincial governments, the central government clearly expected such improvement.

VI. Theoretical and Policy Implications

For students of federalism and decentralized governance, that centralized

[44] See note 20 supra.

decision-making can be inefficient is a familiar idea and may even seem *a priori*. Our analysis of provincial tax rate setting confirms this longstanding notion but introduces one novel insight in the Chinese context: provincial decision-making can be an instance of over-centralized decision-making. We believe this insight is important: it challenges at least two conventional assumptions in discourses about China, both of which, we suspect, result from an unreflective acceptance of Chinese legislative centralization.

First, provincial and sub-provincial governments are often lumped together in scholarly and policy discourses and treated all as "local". In literatures on governance and decentralization elsewhere in the world, the term "local government" tends unambiguously to refer to the lowest levels of government (i.e. towns and municipalities). Yet in discourses about China, the term becomes highly ambiguous and could refer to any of the four levels of subnational government. This ambiguity can be seriously misleading: probably only in China would it go unquestioned (by everyone) that legislation for a tax administered and used only by sub-provincial governments should be conducted by the national parliament, and that sub-provincial governments should be entirely excluded from lawmaking regarding such a tax. Such equivocations not only breed considerable inaccuracy but also would have precluded the identification of the kind of phenomena investigated in this paper. We have tried to show that "provincial" may not equal "local", not just as a semantic but also as a substantive matter. Moreover, we suggest that it is perhaps only because the monopoly on legislation by the national and provincial governments in a wide range of policy areas is casually assumed that one can easily elide the distinctions among provincial and sub-provincial levels of policymaking.

Second, current discourses in the Chinese context almost inevitably equate law with centralized law. The law is what the central government announces, whereas "real practice"—enforcement or non-enforcement, compliance or non-compliance—is what happens "locally". Whereas the distinction between the law on paper and the law in practice holds everywhere in the world, in China that distinction is often aligned with the "central/local" distinction. This has even led some to postulate a conflict between decentralized experimentation and the rule of law. For example, Professor Chenggang Xu emphasizes initiatives taken by "local governments" as crucial to the path of Chinese economic reform, repeatedly pointing out that lower levels of government had to break existing law adopted by the central government to push forward reform.[45] The implication is that there may be a necessary trade-off between decentralization and the rule of law.[46] Yet this trade-off is spurious and a mere artifact of the Chinese discourse: the need for sacrificing the rule of law would go away if local governments could themselves legislate. Why should the central government (and provincial governments) have a monopoly over legislative power? If, as we have shown, provincial policy-making can be inefficiently centralized in some important cases, national policy-making would of course be even more inefficient (and in

[45] Chenggang Xu, "The Fundamental Institutions of China's Reforms and Development." *Journal of Economic Literature*, 49 (2011): 1076-1151.

[46] This is also the view taken by Sebastian Heilmann, "Experimentation under Hierarchy: Policy Experiments in the Reorganization of China's State Sector, 1978-2008" (Harvard University Center for International Development Working Paper No. 172, 2008).

even more cases).

The passive acceptance of law as centralized law may have also led many to accept that law, if not an obstacle to reform, has had—and may continue to have—a limited role to play in Chinese economic development.[47] Since the 1980s, scholars on China have managed to neglect the incongruity between legislative centralization and administrative decentralization by treating legislative centralization as a mere "formal" feature of the Chinese polity, while in the meantime viewing shifting "center-local" relations, and especially administrative decentralization, as the main, substantive theme in contemporary Chinese governance.[48] Since law originated from the center while reform occurred in the localities, the marginality of law to reform appears inevitable. However, a contrary view is that the law was quite important in many areas of policy implementation during China's reform era,[49] but it may have been prevented from playing a greater role because of centralization. To put it differently, instead of seeing the law as necessarily centralized but only contingently helpful for development, it may be that economic reform in China could have benefitted from relying more on legal mechanisms (much as traditional views of law and development hold), and that what is historically contingent was the centralization of law. This view is supported by the basic fact that, as discussed in the Introduction, the high level of legislative centralization in China is very unusual by international standards. In an obvious sense, this fact requires explanation. Our analysis of provincial tax rating emphasizes this need, by showing the national and provincial monopoly on legislation in China to be the outlier that it really should be viewed as, instead of as the norm.

Our study also has important policy ramifications. For example, recent arguments for levying a modern property tax in China have assumed that the property tax burden can be raised or lowered according to local expenditure needs. However, that relatively few sub-provincial governments have the authority to set tax rates of any kind means that it is currently *legally impossible* for many of the benefits of a local property tax to be realized. That is, arguments for the adoption of the property tax in China on the basis that it can serve as a benefit tax—as the property tax has in other parts of the world—have little grounding in China's current legal system. The failure to recognize the pernicious effects of over-centralization is likely to have led to other erroneous recommendations. We believe that

[47] That is, many who study Chinese political economy probably implicitly reject the view that the rule of law is crucial for economic development.

[48] Examples of earlier scholars casting the briefest glance at "formal" centralization before turning to "more substantive" decentralization include Michel Oksenberg and James Tong, "The Evolution of Central-provincial Fiscal Relations in China, 1971-1984: the Formal System," *The China Quarterly* 125 (1991): 1-32. Christine P Wong, "Fiscal Reform and Local Industrialization: The Problematic Sequencing of Reform in Post-Mao China," *Modern China* 18 (1992): 197-227. Leading theories subsequently developed have presented Chinese political economy in the reform era as embodying the paradigm of decentralization. See, e.g. Hehui Jin, Yingyi Qian and Barry Weingast, "Regional Decentralization and Fiscal Incentives: Federalism, Chinese Style," *Journal of Public Economics* 89 (2005): 1719-1742.

[49] For example, during an era of lack of regulatory capacity, the criminalization of activities that undermine the state's economy policy may have served as an important legal tool in implementing such policy. For an initial exploration of this idea in connection with tax administration, see Wei Cui, "The Historical Origin of Tax Legislative Centralization, *Peking University Law Journal* (English), 1 (2013): 105-131.

identifying such effects is crucial for both positive and normative inquiries regarding the Chinese polity.[50]

[50] We thank Li Dan and Zhang Yang for research assistance, and Professors Adam Chodorow, Dong Xuebing, and two anonymous referees for very helpful comments.

Table 1 2007 VVT Rates

Taxable category	*Rate Range Set by Central Government (in Yuan)*	*Number of Different Rates Adopted among All Provinces*	*No. of Provinces Choosing Rates in the Low/Medium/High Segments of Allowable Range*
Large passenger vehicles (PV)	480-660	4（600, 580, 540, 480）	7/11/13
Medium PV	420 -660	8（550, 540, 516, 510, 500, 480, 450, 420）	20/11/0
Small PV	360-660	6（600, 480, 450, 420, 400, 360）	24/7/0
Mini PV	60-480	8（360, 300, 280, 260, 240, 180, 120, 60）	8/20/3
Freight	16-120	6（96, 90, 84, 80, 72, 60）	0/19/12
3-wheel or low-speed	24-120	9（96, 90, 84, 80, 72, 60, 50, 48, 24）	5/21/5
Special use	16-120	8（96, 90, 84, 80, 72, 60, 56, 36）	2/21/8
Motorcycles	36-180	11（180, 120, 100, 96, 72, 84, 80, 60, 48, 40, 36）	24/6/1

Table 2 2011 VVT Rates

Taxable category	*Rate Range Set by Central Government (in Yuan)*	*Number of Different Rates Adopted among All Provinces*	*No. of Provinces Choosing Rates in the Low/Medium/High Segments of Allowable Range*
Passenger vehicles*: class a	60-360	6（60, 120, 180, 240, 270, 300）	9/16/5
class b	300-540	4（300, 360, 390, 420）	24/6/0
Class c	360-660	5（360, 390, 420, 450, 480）	23/7/0
Class d	660-1200	5（660, 720, 780, 840, 900）	22/8/0
Class e	1200-2400	4（1200, 1500, 1800, 1920）	11/20/0
Class f	2400-3600	6（2400, 2640, 2700, 3000, 3120, 3480）	8/21/1
Class g	3600-5400	6（3600, 3900, 4200, 4500, 4800, 5280）	8/21/1
Class h	480-1440	9（540, 600, 660, 720, 900, 960, 1020, 1140, 1200）	20/7/3
class i	480-1440	9（480, 500, 510, 516，540, 600, 720, 900, 960）	24/6/0
Freight vehicles	12-120	6（60, 72, 80, 84, 90, 96）	0/22/8
Special operation vehicle	16-120	6（30, 36, 40, 42, 45, 48）	0/22/8
Special wheeled and mechanized vehicles	16-120	7（36, 56, 60, 72, 80, 84, 96）	1/22/7
Motorcycles	36-180	7（36, 40, 60, 72, 80, 84, 96）	2/21/7

* Passenger vehicles were divided into 6 categories of consumer automobiles based on emission-level and 2 categories of commercial automobiles based on size, and the tax is imposed on a per vehicle basis. Thus the tax rates (as well as their sum) are not comparable to 2007 passenger vehicle rates.

Table 3 Descriptive Statistics for 2007 and 2011*

Variables	Observations	Mean	Std. Dev.	Min	Max	Observations	Mean	Std. Dev.	Min	Max
	2007					*2011*				
Passenger (in Yuan)	31	1688.58	186.19	1320.00	2030.00	30	11883.87	1277.20	9660.00	14880.00
Freight (in Yuan)	31	286.52	60.51	168.00	384.00	30	219.13	47.69	144.00	288.00
Motorcycle (in Yuan)	31	71.10	30.35	36.00	180.00	30	53.87	21.57	36.00	120.00
Population (ten thousand)	31	4189.97	2693.48	284.00	9449.00	30	4432.60	2707.16	563.00	10430.00
Area (ten thousand Km^2)	31	31.00	38.57	0.63	166.49	30	28.03	35.44	0.63	166.49
Urbanization Rate (%)	31	47.35	14.85	28.24	88.70	30	51.02	14.44	30.94	88.90
Disposable Income (in Yuan)	31	11363.70	3294.46	8871.30	20667.90	30	18170.60	4825.79	13188.55	31838.08
Rate-setting Agency	31	0.52	0.51	0.00	1.00	30	0.83	0.38	0.00	1.00
Dependency Ratio (%)	31	37.47	6.69	24.72	55.09	30	33.91	7.08	20.95	51.03
Central Transfers (in Yuan)	31	1502.55	1238.33	571.00	7317.96	30	1083.01	490.35	319.00	2600.06

* Data for central transfers (for 2006 and 2010) comes from the China Fiscal Yearbook. Data for urban disposal income in 2007 and 2010 comes from the CEIC database and provincial statistical bulletins, respectively. Data for population, area, and dependency ratios comes from the China's Statistical Yearbook (2008 and 2011).

Table 4 Results from OLS

VARIABLES	(1) Passenger	(2) Freight	(3) Motorcycle	(1) Passenger	(2) Freight	(3) Motorcycle
		2007			*2011*	
2007 Values of Dependent Variables				0.79	0.35**	0.40**
				(1.43)	(0.14)	(0.17)
Population (ten thousand)	-0.01	0.01	0.00	-0.10	-0.00	-0.00
	(0.02)	(0.01)	(0.00)	(0.14)	(0.00)	(0.00)
Area (ten thousand Km^2)	-1.07	-0.28	-0.04	0.32	-0.04	-0.02
	(1.01)	(0.38)	(0.18)	(7.08)	(0.25)	(0.12)
Urbanization Rate (%)	3.44	2.82	1.54	7.32	0.31	-0.39
	(5.80)	(2.18)	(1.01)	(22.94)	(0.85)	(0.45)
Disposable Income (in Yuan)	-0.03*	-0.01*	-0.00	-0.06	-0.00	0.00
	(0.02)	(0.01)	(0.00)	(0.08)	(0.00)	(0.00)
Rate-setting Agency	-128.17*	-8.17	-5.21	-197.71	4.84	2.56
	(69.06)	(25.91)	(11.98)	(478.72)	(17.03)	(8.71)
Dependency Ratio (%)	-21.46**	-2.54	-0.57	-121.97**	-2.47	0.57
	(8.63)	(3.24)	(1.50)	(50.50)	(1.67)	(0.77)
Central Transfers (in Yuan)	-0.01	0.01	0.01	0.88	0.02	0.00
	(0.04)	(0.01)	(0.01)	(0.79)	(0.03)	(0.01)
Constant	2,846.52***	371.63	32.21	14,937.19***	178.86	-5.50
	(578.46)	(217.05)	(100.39)	(4,563.66)	(123.39)	(51.80)
Observations	31	31	31	30	30	30
R-squared	0.48	0.31	0.41	0.48	0.53	0.43
F test	0.019	0.22	0.06	0.05	0.02	0.09

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 5 Moran's I Test, Moran's Error and LM Tests for 2007 and 2011

		2007	2011
Moran's I	Passenger	0.35***	0.36***
		(0.00)	(0.00)
	Freight	0.07	0.06
		(0.20)	(0.22)
	Motorcycle	0.36***	0.37***
		(0.00)	(0.00)
Moran's Error	Passenger	0.32	2.26**
		(0.75)	(0.02)
	Freight	0.20	0.26
		(0.84)	(0.80)
	Motorcycle	3.22***	3.55***
		(0.00)	(0.00)
LM-error	Passenger	0.13	1.66
		(0.71)	(0.20)
	Freight	0.63	0.58
		(0.43)	(0.45)
	Motorcycle	4.07**	5.52**
		(0.04)	(0.02)
Robust LM-error	Passenger	2.49	0.18
		(0.11)	(0.67)
	Freight	0.08	2.17
		(0.78)	(0.14)

	Motorcycle	0.06	0.91
		(0.81)	(0.34)
LM-lag	Passenger	0.09	3.05*
		(0.77)	(0.08)
	Freight	0.55	0.01
		(0.46)	(0.93)
	Motorcycle	4.29**	6.78***
		(0.04)	(0.01)
Robust LM-lag	Passenger	2.45	1.57
		(0.12)	(0.21)
	Freight	0.00	1.60
		(0.98)	(0.21)
	Motorcycle	0.28	2.17
		(0.60)	(0.14)

*, **, ***significant at 90%, 95%, and 99%. P-values are in parentheses.

Table 6 SAR and SEM for PV and Motorcycles, 2007 and 2011

VARIABLES	Passenger		Motorcycle		Passenger		Motorcycle	
	2007				*2011*			
	SAR	SEM	SAR	SEM	SAR	SEM	SAR	SEM
2007 Values of Dependent Variables					0.42	-0.59	0.29**	0.27*
					(1.11)	(1.03)	(0.12)	(0.15)
Population (ten thousand)	-0.01	-0.04***	0.00	0.00	-0.10	-0.12	-0.00	-0.00*
	(0.01)	(0.01)	(0.00)	(0.00)	(0.11)	(0.08)	(0.00)	(0.00)
Area (ten thousand Km^2)	-0.98	-2.65***	-0.06	-0.03	-2.09	-9.54**	-0.11	-0.10
	(0.90)	(1.03)	(0.14)	(0.12)	(5.56)	(4.36)	(0.09)	(0.10)
Rate of Urban Population (%)	3.29	1.02	1.32*	1.13*	-3.05	-18.79	-0.38	-0.33
	(4.99)	(4.42)	(0.79)	(0.67)	(18.29)	(12.34)	(0.31)	(0.30)
Disposable Income (in Yuan)	-0.03	-0.05***	-0.00	-0.00	0.01	0.14**	0.00	0.00
	(0.02)	(0.01)	(0.00)	(0.00)	(0.07)	(0.07)	(0.00)	(0.00)
Rule-setting Agency	-123.89**	-118.08***	-10.75	-18.78*	-246.10	-175.23	-0.96	-3.39
	(60.39)	(44.04)	(9.62)	(10.40)	(368.23)	(262.16)	(6.17)	(6.45)
Dependency ratio (%)	-19.77**	-26.38***	-0.38	-1.13	-104.68***	-110.53***	0.08	-0.09
	(8.69)	(5.59)	(1.17)	(1.29)	(39.63)	(33.96)	(0.56)	(0.73)
Transfer from Central Government (in Yuan)	-0.00	-0.02	0.01**	0.01**	1.10*	1.18**	0.00	0.01
	(0.03)	(0.03)	(0.00)	(0.00)	(0.62)	(0.46)	(0.01)	(0.01)
Constant	2,558.23***	3,513.78***	-3.05	78.93	9,033.02**	14,897.72***	5.30	37.05
	(922.50)	(391.12)	(79.53)	(83.48)	(4,487.70)	(2,783.55)	(36.34)	(47.34)
rho	0.10		0.46**		0.43**		0.64***	

	(0.28)		(0.20)		(0.21)		(0.19)	
lamda		-0.98***		0.62***		0.86***		0.57**
		(0.24)		(0.18)		(0.10)		(0.26)
Squared corr.	.487	0.366	0.524	0.339	0.565	0.167	0.613	0.387
sigma	131.16***	109.01***	20.63***	19.47***	829.35***	661.73***	13.32***	14.49***
	(16.68)	(15.47)	(2.68)	(2.58)	(109.15)	(92.63)	(1.82)	(1.99)
Observations	31	31	31	31	30	30	30	30

*, **, ***significant at 90%, 95%, and 99%. Standard errors are in parentheses.

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