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Racing to the Bottom or to the Top? Decentralization, Revenue Pressures, and Governance Reform in China

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Summary. — China's decentralization has been praised for promoting inter-jurisdictional competition that incentivizes local officials to promote economic development. The downside of decentralization is that it enables these same local authorities to slow or block implementation of centrally mandated governance reforms, especially when these may negatively affect local development goals. We suggest that China's fiscal system and promotion system have created mismatched incentives that encourage cash-strapped local authorities to disregard central governance reforms. Specifically, we show that cities with weaker revenue bases were slower to implement new, centrally mandated environmental transparency regulations. Additional evidence points to a bifurcation in development strategies. In fiscally strong cities, increased foreign investment leads to greater compliance. In fiscally weak cities, foreign investment is associated with decreased disclosure, suggesting they aim to promote local development by becoming pollution havens. Similarly, high levels of pollution induce fiscally strong cities to increase pollution disclosures while the opposite holds in fiscally weak cities. These findings imply that mismatched decentralization policies can undermine other important governance reforms, even ones that might be expected to be complementary to decentralizing initiatives.
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1. INTRODUCTION

Hoping to improve governance and speed economic growth, many countries have experimented with various forms of decentralization (Manor, 1999; Martinez-Vazquez & McNab, 2003). In principle, decentralization enhances political accountability, either by increasing politicians' dependence on their own constituents' votes to stay in power (Faguet, 2012), or by making subnational governments more reliant on local revenue—and the consent of local actors—to fund their expenditure (Garman, Haggard, & Willis, 2001). Even authoritarian states, which by definition are averse to direct political accountability, stand to benefit from decentralizing. By granting local governments the power to autonomously raise and distribute revenue, or by allowing subnational leaders to adapt national policies to local contexts, authoritarian states can build more efficient economic institutions that cater to local strengths (Montinola, Qian, & Weingast, 1995; Heilmann & Perry, 2011; Xu, 2011). But does decentralization always lead to improved governance?

Research has shown that the effects of decentralization are far more contingent than initially hoped, often because existing power arrangements undermine attempts to redistribute authority to local levels (Bardhan, 2002; Treisman, 2007; Faguet, 2014; Weingast, 2014). In newly decentralized systems, weak local governments risk becoming captured by powerful local interests, leading to corruption and favoritism instead of greater local accountability (Bardhan & Mookherjee, 2006; Faguet, 2014, p. 6; Mattingly, 2016). Non-democratic systems are especially prone to local capture because discretionary institutional rules and limited public participation enable powerful groups to distort policies to their benefit (Faguet, 2014, p. 6; Weingast, 2014, p. 18). In China, for instance, efforts to regulate pollution under decentralized administration have been plagued by local capture. Local officials are prone to protecting polluters due to their

economic importance, enforcing regulations laxly or levying only nominal fines (van Rooij, 2006; Zhang, Ortolano, & Zhongmei, 2010, p. 311–314; Lo et al., 2012). Meanwhile, authoritarian restrictions on press freedom, public participation, and an independent judiciary prevent central leaders from obtaining reliable information on corrupt officials, further frustrating Beijing's efforts to punish collusion or clean up the environment (Birney, 2014; Stern, 2014)

Over the past thirty years, the Chinese central government has tried to break through these information barriers, experimenting with village elections and a variety of other quasi-democratic governance reforms that strengthen the ability of ordinary citizens to monitor and place pressure on the local authorities (O'Brien and Li, 2000; Wang, 1997; Wang & Yao, 2007; Distelhorst & Hou, in press; Manion, 2016). One of the most notable in recent years has been the introduction of new transparency regulations. Beijing now requires local governments to publicly disclose information on pollution, government budgets, and other policies, complementing these other reforms and potentially exposing them to even greater pressures from below. However, for this very reason, local governments may use their independence to resist implementation of these reforms.

A major source of leverage central governments have over localities is their control of fiscal resources. The threat of withdrawing subsidies or reducing transfers can grant a great deal of power to the national government even in nominally decentralized systems with bottom-up democratic political pressures (Weingast, 2014, p. 19–20). This implies that localities with fewer sources of fiscal revenue under their own control should be particularly susceptible to top-down pressures.

Our findings in this paper go against this expectation. We find that fiscally weak cities—ones lacking strong sources of

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revenue—were *less* likely to implement Beijing's transparency reforms, particularly in the environmental domain. We believe this is a side effect of what has been billed as one of China's great institutional strengths, a hierarchy in which advancement is determined primarily by the ability to generate economic growth or at least fiscal revenue (Shih, Adolph, & Liu, 2012; Xu, 2011; Lü & Landry, 2014). These career pressures create a strong incentive to oppose or at least foot-drag on implementation of reforms that might adversely impact the business of a city's major revenue-generating firms. This problem could only have been exacerbated by China's mid-1990s re-centralization of a number of sources of tax revenue that previously had been under local control. This fiscal reform left most cities facing a significant budget shortfall, making it challenging in some cases even to provide basic social services (Wang & Herd, 2013; Man, 2011). Any policy that threatened revenues would therefore not just threaten a local official's ability to perform and seek promotion, but also that official's ability to do the minimum necessary to keep a city functioning. We propose that this overwhelming revenue focus has encouraged fiscally weak cities to shield polluting industries from transparency measures, for fear of losing what little revenue they have.

In cities with strong sources of revenue, however, the story is different. Officials in such cities no doubt also seek to generate revenues for promotion, but face less pressure to make this their sole focus because they have sufficient revenue to cover welfare and public services. Instead, they may seek to distinguish themselves in the promotion race by standing out in their implementation of other central initiatives, even if this has an impact on revenue collection and growth. In recent years, the Central government has signaled its strong commitment to improved environmental performance by linking bureaucratic promotion to hard pollution reduction targets, and strengthening laws to punish non-compliant firms. Officials in fiscally strong cities can therefore use strong performance on environmental measures to distinguish themselves from their revenue-focused counterparts in fiscally weak cities. Investing in environmental transparency and cleaner industry may also be part of a broader industrial upgrading—rather than clinging to revenues from dirtier heavy industries, fiscally strong cities may try to move to the next level of development and attract cleaner investors. In short, the different revenue pressures introduced by fiscal decentralization have pushed richer cities and poorer cities toward two opposing developmental strategies, with one group 'racing to the bottom' as the other rises to the top. As evidence of this, we show that in cities with stronger revenue sources, more air pollution and more foreign direct investment were associated with more rapid adoption of environmental transparency reforms.

Our findings contribute to the literature on decentralization in two ways: First, the use of fiscal resources and central transfers to enforce obedience to central mandates is a common theme in the fiscal decentralization literature (Diaz-Cayeros, 2006; Garman *et al.*, 2001; Rodden, 2004). However, we show a case where greater dependence on central transfers is associated with non-compliance with the Center's policies. Our research therefore highlights how the partial decentralization of fiscal systems can undermine other important governance reforms, even ones that might be expected to be complementary to decentralizing initiatives.

Second, the paper highlights a perverse consequence of China's system of decentralized promotion, which many scholars have lauded as a key to the country's remarkable economic growth. The emphasis on revenue collection in determining bureaucratic promotion, we argue, has pushed officials in

revenue-starved cities to protect highly polluting local industries. Yet if revenue were the only path to promotion, we should see officials from both rich and poor cities seeking to increase revenue at all cost. Instead, we see officials in revenue-rich cities complying with transparency reforms at the expense of revenue generation. We argue that fiscal decentralization generates these divergent responses by putting a greater pressure on officials in fiscally weak cities to increase revenue. In contrast, officials in relatively revenue-rich cities have more latitude to comply with central mandates and out-perform their revenue-poor counterparts by responding to popular demands for more transparency and cleaner industry, which the center also promotes. In short, fiscal decentralization has led local officials to focus on different strategies for promotion, which in turn has driven rich and poor Chinese cities down different pathways of development.

Below, we first discuss China's decentralization and transparency reforms in China. We then move on to discussing data and measurement before presenting statistical results.

2. FISCAL DECENTRALIZATION AND REVENUE PRESSURES

Fiscal decentralization is conceptualized as the balance of expenditure and revenue collection between the local and national government, providing local governments with greater power over taxing and spending (Rodden, 2004). Under highly decentralized systems, the majority of public goods and services are funded by local government revenue, and national governments have little authority over how this revenue is raised and allocated (Garman *et al.*, 2001, p. 207). Most countries have experimented with decentralization to one degree or another, and the early wave of research on decentralization and "fiscal federalism" came to mostly optimistic conclusions. Initial studies based on aggregate cross-national data suggested that these efforts would likely increase accountability and reduce government waste (Weingast, 2009). Yet what Weingast calls "second generation fiscal federalism" has reached a more tempered view.

One key insight from the second-generation literature is that the transfer of fiscal resources does not always lead to the transfer of fiscal authority. For instance, when local politicians have access to revenue acquired from outside their local tax base (such as fiscal transfers) *and* enormous discretion over how this revenue is spent (fiscal authority), fiscal transfers can be likened to 'windfall revenue' (Morrison, 2009, p. 110–111; Gervasoni, 2010, p. 307). These fiscal 'rents' promote opportunistic spending, and are used carelessly to boost electoral support (Rodden, 2002) or invested in repressive apparatuses to keep out political opponents (Gervasoni, 2010, p. 308–309). However, this scenario requires the center to transfer both fiscal revenue *and* authority to local level.

More often, we see cases where expenditure responsibilities are devolved to the local level, but the central government maintains such tight control over how revenue is collected and spent that "expenditure decentralization [alone] may communicate very little about the locus of authority" (Rodden, 2004, p. 484). Garman *et al.* (2001) show that when political authority is concentrated at national level, fiscal transfers are more likely to be earmarked and independent local spending is limited. Governance may degrade when local governments lack resources, and must pander to the national government's policy priorities at the expense of local interests to win more of these earmarked funds. Under such cases, "own-source revenue"—that is, revenue raised and retained at the local level

through taxes, fees, and borrowing—becomes a key measure of a local government's revenue autonomy (Rodden, 2004). In systems where expenditure responsibilities are highly decentralized, own-source revenue also reflects the ability of local governments to independently respond to local needs (Garman et al., 2001, p. 234–235). This is especially true of large countries where spending priorities and spending burdens vary significantly between localities.

China, for its part, exemplifies this model of high expenditure decentralization paired with highly centralized fiscal authority. Subnational governments in China spend 70 per cent of public money, amounting to 22 per cent of GDP, among the highest levels in Asia (World Bank, 2002; World Bank & Local Governments, 2009). Yet power over raising and allocating fiscal resources is firmly concentrated in the center. Taxation rates are set by the central government so local governments cannot independently raise taxation to meet fluctuations in demand for local expenditure (Wang & Herd, 2013, p. 9–14). Nor do local governments have the authority to borrow or define their tax base (Wu & Wang, 2013, p. 179). As such, the only means for local governments to increase revenue is to attract more outside investment, or promote growth in existing local industries.

The center's strict control over local government expenditure can be traced back to tax reforms in 1994. Fearing the consequences of devolving too much authority to unruly local officials, Beijing chose to tighten control over fiscal and political administration (Ong, 2006; Huang, 2008). In an effort to reduce arbitrary taxation and corruption at the local level, they reasserted central authority over revenue collection and distribution (Kennedy, 2013, p. 1010–1011). Local governments are now required to give revenue from lucrative sources like the Value Added Tax (VAT) to Beijing (Zhang, 1999). Beijing then transfers this revenue to local governments through a complex system of grants and subsidies. In principle, these transfers from Beijing help to balance local government budgets; central transfers supplement 'own source revenue' by covering expenditures that local governments cannot independently afford. Subsidies are also issued to equalize the budgets of local governments across the country, but in practice the amount of transfers and subsidies that governments actually receive is politicized. Local governments jockey with each other for larger subsidies during negotiations with the central government, meaning that some localities receive funds in excess of what they need while other, less-favored localities fall far short (Tsui, 2005). In budget-poor regions that rely heavily on transfers, predatory provincial governments are also more likely to 'grab' central transfers for their own interest instead of disbursing them to city and county governments (Wu & Wang, 2013, p. 181). This has driven local governments to take on debt to meet their expenditure responsibilities (Man, 2011), further highlighting the failures of a politicized transfer system.

Recent studies suggest that this combination of high expenditure burdens and unreliable fiscal transfers has led to a vacuum in funding for the city and county governments (Oi, Babiarz, Zhang, Luo, & Rozelle, 2012, p. 666–668). A majority of local governments now face a shortfall between the amount of revenue they collect and keep and the amount they spend (Shih & Zhang, 2006). However, the size of this shortfall varies significantly between localities, because tax rebates make up a large proportion of fiscal transfers and play an important role in offsetting local budget shortfalls (Man, 2011). Initially designed to incentivize revenue generation and encourage wealthier local governments to accept the 1994 reforms, these tax rebates now serve to widen the revenue gap between wealthier provinces (with a strong tax base) and poorer provinces (Zhang & Zheng, 2011). As a result, the combination of unreliable fiscal transfers and serious budget shortfalls has sent local governments scrambling to raise more own source revenue—of which local tax revenue is a key component—to cover their debts. In other words, local governments are choosing to increase own source revenue instead of depending on fiscal transfers to cover budget shortfalls.

Further exacerbating the pressures felt by local authorities, recent scholarship suggests that one of the most important determinants of advancement within China's party-state hierarchy is revenue generation (Shih et al., 2012; Lü & Landry, 2014; Kung & Chen, 2014). To be sure, the pressure to generate revenue varies by the degree of competition for promotion, among other factors (Lü & Landry, 2014). Nevertheless, these pressures generally play a key role in local decision-making, because the importance of revenue generation often extends beyond promotion. For instance, tax revenue has been shown to affect the outcomes of lawsuits involving publicly listed firms. Wang (2016) finds that when a firm's case is heard in court, if that firm contributes most of its taxes to the level of government overseeing this court, then court judgments are more likely to be in the firm's favor. Simply being local is not enough, the key is whether local authorities, who have substantial influence over their courts, directly benefit from the tax revenues the firm produces. These pressures only reinforce incentives for revenue-hungry local authorities to focus on raising tax revenue at the expense of other policies.

China's recent efforts to increase local government transparency provide an interesting context to examine the consequences of fiscal recentralization reforms in an even more politically fraught arena. In the case of environmental transparency, the choice between appeasing local economic actors and being accountable to the central government is especially stark: Beijing has mandated that local governments publish details on pollution emissions, which means reporting on firms that are openly violating emissions' standards. In other words, local officials must choose between protecting their tax base and placating the center.

Taking into account the incentives created by China's fiscal reforms, we see two possible behavioral pathways emerge: On the one hand, fiscal reforms have made local governments more dependent on the center for resources. If transfers are politicized and fiscal resources are tied to winning favor from higher levels, then theoretically, revenue shortfalls may reinforce local obedience to the center—including actively reporting on misbehaving, polluting firms. And action on the environment does win favor from Beijing, especially since the Central government drastically stepped up its efforts to resolve China's pollution problems. Local authorities all over China have been known to sacrifice pillar industries (Lau, 2015), close down dozens of profitable factories (Li, 2015), or punish large, revenue-generating firms (Huang, 2013) to directly appease Beijing's demands for cleaner air and cleaner water.

On the other hand, fiscal reforms have elevated the importance of own source revenue for local governments, and pressures from the central government further encourage local revenue generation. Given that tax revenue is now a key component of own-source revenue, local governments may choose to overcome their budget problems by increasing local tax revenue to avoid being forced to go hat-in-hand to Beijing. To do so, they must cater to local business interests, encouraging further collusion between local officials and powerful business groups. In this context, local officials may choose to protect

businesses from Beijing's environmental transparency initiatives, especially if profits suffer under these initiatives.

China therefore provides an illuminating case on the consequences of mismatched decentralization policies, and why counter-intuitive, 'disobedient' behavior emerges in contexts where decentralization is expected to provoke greater local obedience to the center.

3. EMPIRICAL APPROACH

Our empirical strategy is straightforward: we examine how different factors affect the extent to which these regulations were implemented in their first few years. We measure these explanatory variables in 2007, the year in which the new Open Government Information regulations were announced and a year before they began to take effect. This avoids the obvious risk of reverse causality that arises if effective implementation of the OGI regulations affects the economic structure of a city.

The more difficult challenge is that of omitted variable bias. One strategy is to include controls, since this can eliminate this bias if the model is correctly specified. However, adding controls can be problematic, especially in the context of observational research, for a number of reasons (Angrist and Pischke, 2009, p. 59–68; Achen, 2005; Schrodt, 2014). While there is no perfect solution, we use only a minimal set of controls for which there is a strong theoretical justification, and provide all key results without controls either in the main text or in the online appendix [1]. The consistent results we find suggest that results are neither biased nor highly dependent on particular specifications.

(a) Dependent variables

China's State Council published the Regulations on Open Government Information (OGI) in January 2007; the regulations, which took effect on May 1, 2008, mandate the disclosure of a relatively broad range of government information, at least by the standards of authoritarian government (State Council, 2007). Officials are now required to disclose to the public information on everything from regulations and government budgets to urban planning and land requisition plans, although the regulation leaves room for officials to deny requests for information that might "endanger state security, public security, economic security and social stability" (State Council, 2007, Article 8). In some contexts, local governments have interpreted the meaning of sensitive state information quite broadly. [2] Yet the law nevertheless constituted a major step toward greater openness.

There is some disagreement over why the government introduced the OGI regulations. One interpretation is that the reforms had an economic rationale; for example, government secrecy about business regulations can lead to misallocated investment (Darch & Underwood, 2009). An alternative interpretation sees the law as an outgrowth of earlier incremental moves toward open government, like the introduction of village and township-level transparency initiatives, and as a part of a broader strategy to reign in local governments through administrative laws giving citizens tools to challenge wayward lower level officials (Xiao, 2013).

Whatever the reasons for its introduction, the implementation of the law has been stronger in some policy domains than others. Bureaucrats in environmental agencies have been unusually innovative. The Ministry of Environmental Protection (MEP) was the first national bureau to issue a set of guidelines that outlined how lower levels should implement the OGI law, called the "Measures on Open Environmental Information" (OEI Measures). The OEI Measures specified that each local Environmental Protection Bureau needed a separate office responsible for assembling and disclosing information. It also mandated the proactive, automatic disclosure of certain types of information, including information on emission quotes, permits, pollution penalties, and even the names of firms in violation of the law. Since 2013, several cities have been required to release real-time reporting of air quality, which has received broad media attention.

The implementation of the OGI laws was initially shaky. A survey of bureaucrats conducted four months after the law took effect found widespread confusion; while officials were generally aware of the law, there were few procedures and guidelines for implementing it, and little training (Piotrowski, Zhang, Lin, & Wenxuan, 2009). This improved over time, but more importantly for this study, there was a wide degree of variation across localities in the speed and comprehensiveness with which these reforms were implemented over their first few years.

We test our hypothesis using four indexes that measure the extent of municipal governments' compliance with the OGI regulations in the years immediately after they took effect. Two of the indexes, which measure the disclosure of pollution information, were compiled by an environmental NGO. A third index, which captures the disclosure of budgetary information, was created by academics at Tsinghua University. A fourth index, intended to measure overall transparency, was created by the Chinese Academy of Social Sciences. We argue that non-compliance stems primarily from the tradeoff between boosting local tax revenue and punishing local polluters. This implies that limited revenues should have a greater impact on environmental transparency than on other forms of transparency, which do not require this tradeoff, and also implies that we should not see a differential impact of FDI or pollution on transparency regulations that are not relevant to pollution.

The two environmental indexes were created by the Institute of Environmental and Public Affairs (IPE), a Chinese NGO, in conjunction with other Chinese and Western non-profit organizations. The Pollution Information Transparency Index (PITI) evaluates the implementation of the OGI measures in 113 cities, which include many of China's largest metropolitan centers. This index focuses on the degree to which cities disclose information about polluting firms, including firm pollution levels, fines, and complaints. IPE researchers examined information that local Environmental Protection Bureaus made available online, and also contacted each bureau to request additional information. A city could score between 0 and 100 points, with 60 points representing basic compliance with the open government regulations, and additional points awarded for higher levels of disclosure. IPE and its partners released a report each year from 2009 to 2012, during which the average score rose from 31 to 43. [3] We average across the first three years of this study in order to reduce measurement error.

The Air Quality Transparency Index (AQTI), by contrast, focuses on disclosure of information about current air quality. The index rates each city on its disclosure of nine categories of air pollution, like particulate matter and sulfur dioxide levels, noting the degree to which cities release comprehensive, timely, and consumer-friendly information for each of the air quality categories. Indexes have been released for 2012 and 2013. Between the first and second index, there was a large improvement in scores, with the average rising from 22 to 59, with many cities moving to real-time disclosure of pollution levels. We average across both years to reduce measurement error.

A third index was created by Tsinghua's School of Public Policy and Management, which rated 81 cities on their level of fiscal transparency. The index rated cities on a number of specific measures, such as whether or not they disclosed their administrative structure and what elements of the city budget they publicized. Within each category, disclosure of certain types of information (for example, publication of information on land transfer fees) was worth a predetermined number of points. The highest score was six points, earned by the city of Beijing, and the lowest score was 0.5 points, earned by the city of Shihezi.

Finally, we also use an index created by scholars at the Chinese Academy of Social Sciences (CASS) in 2010 that assesses overall implementation of the OGI regulations across 43 Chinese cities. The study rated cities on a 0 to 100 scale, evaluating their performance on each statute of the OGI including: institutional support for OGI initiatives, government responsiveness to requests for information, government initiative in disclosing information, and crisis management. In this assessment, the city of Ningbo comes out on top with 71 points and the city of Lanzhou scores a relatively paltry 6 points. Given the small sample size, we would not place great weight on results using this one variable, but include it for completeness.

(b) Explanatory, interaction, and control variables

As previously discussed, we believe that cities with a stronger ability to mobilize independent revenues are more likely to implement transparency measures that might harm local firms. We measure this using logged per capita revenue: the ratio of own-source revenue (defined as the sum of all taxes and fees that are collected and kept at the local level) [4] to a city's population. We scale revenue by population in order to avoid simply proxying for a city's size. Lower per-capita revenues mean that a city is less successful at raising funds from its inhabitants and therefore faces a greater pressure to protect its revenue sources. The data are drawn from city statistical yearbooks for 2007, the year before the transparency measures took effect.

Two other variables are of particular importance to our theory not because it predicts their relationship with transparency levels, but because it implies that they may interact with a city's revenue position in particular ways. The first is pollution. This is particularly challenging to measure. As Wallace (2016) notes, officials in China often have incentives to distort statistics; we were concerned that more polluted places would both be less transparent and have less accurate self-reported data. To avoid this problem, we use satellite-based pollution measures introduced by Lorentzen, Landry, and Yasuda (2014). These estimate ground-level concentration of sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and fine particles ($PM_{2.5}$), three crucial atmospheric pollutants, using imagery from NASA satellites. In order to eliminate unsystematic variation due to short-run weather patterns, these measures are each averaged over several years leading up to the introduction of the OGI regulations. [5] Following the earlier study, we estimate the underlying level of pollution for each city in the pre-transparency years using the first principal component of the logs of these three measures.

The second interaction variable is foreign direct investment. A widespread concern is that global competition for capital puts pressure on governments to adopt the lowest possible standards in areas from labor rights to environmental governance (Rodrik, 1997). However, others have found evidence to the contrary (Wheeler, 2001), leading to suggestions that multinational corporations prefer to operate in well-governed societies (Globerman & Shapiro, 2002), or that foreign investors tend to bring with them practices from their home countries even if these hold them to a higher standard than existing regulations in the host country (Prakash & Potoski, 2006). Relatedly, recent research on China has found that foreign direct investment results in improvements in the business environment even for domestic firms (Long, Yang, & Zhang, 2015). [6] Our theory suggests that the effects of FDI may be heterogeneous, depending on a city's revenue situation. To explore this issue, we use the amount of FDI, divided by GDP and then logged, to estimate the importance of foreign investment relative to the total size of the local economy. These data are also drawn from official city yearbooks for 2007.

Finally, in some specifications we include a set of controls for factors that might be sources of omitted variable bias. Large firm dominance measures the importance of large industrial firms in a city's economy, which Lorentzen et al. (2014) found to be associated with lessened environmental transparency as measured by the PITI index. We also include three additional controls that can serve as a proxy for a city's degree of development or modernization. China's coastal cities are more developed, having undergone economic reform at an earlier stage than inland cities, and more modernized cities seem to be more responsive to constituent demands (Distelhorst & Hou, in press). [7] Consequently, one might be concerned that the results are driven by the group of cities that were early adopters of economic reforms, which might also have a high propensity to adopt political reforms. Specifically, we include controls for GDP per capita to reflect the overall prosperity of the city's inhabitants, for the ratio of services to GDP, to capture the degree to which a city's economy has moved beyond mining and industrial production, and also a dummy variable indicating whether or not the city is located in one of China's coastal provinces. As noted earlier, however, the fact that these variables are closely related to each other and to foreign direct investment (for example, coastal location is a likely cause of both FDI and GDP) hinders clear interpretation of results containing these controls.

4. FINDINGS

In the following section we explore how a city's ability to independently generate revenue affects transparency and political compliance in China. We demonstrate first that municipal governments with a weaker revenue base are less transparent, particularly in environmental domains, while those with stronger sources of revenue tend to be more transparent. Next, we show that these governments appear to be influenced differently by the opportunities afforded by foreign direct investment and the dangers of popular mobilization resulting from air pollution concerns. In cities with strong revenues, greater foreign direct investment and heavier air pollution are both associated with more thorough adoption of environmental transparency reforms. In cities with weaker revenues, this association is absent or even negative. This difference suggests that revenue-rich governments are more able to focus on environmental quality and green growth, while revenue-poor ones instead rely on investment and tax revenue from more-polluting industries and put their priority on protecting these.

(a) Revenue and transparency

Table 1 presents the results of ordinary least squares regression of the environmental transparency measures first just on per-capita revenue, then in a bare-bones specification including only the variables of central interest-per-capita revenue,

Table 1. *Regression of Environmental transparency measures on per-capita revenues*

	(1) PITI Average	(2) PITI Average	(3) PITI Average	(4) AQTI Average	(5) AQTI Average	(6) AQTI Average
Revenue per capita (log)	11.81***	9.753***	7.468**	10.52***	7.622***	5.224*
	(1.641)	(2.264)	(3.370)	(1.387)	(1.511)	(2.861)
Principal component of pollution measures		1.208	1.507		2.876***	3.169***
		(0.952)	(0.997)		(0.792)	(0.697)
FDI as percent of GDP		2.416**	1.631		2.291**	1.198
		(1.049)	(1.233)		(0.880)	(0.923)
Ratio of services in GDP			−4.490			18.84*
			(11.39)			(9.766)
Large firm dominance			−2.575**			−1.804**
			(1.139)			(0.766)
Log GDP per capita			4.658			3.066
			(4.040)			(3.635)
Coastal city			0.998			2.970
			(3.294)			(2.334)
Constant	−59.20***	−30.12	−52.37	−44.44***	−10.61	−31.26
	(13.25)	(22.00)	(32.61)	(11.20)	(14.79)	(24.75)
Observations	113	107	107	113	107	107

Standard errors in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

FDI, and air pollution, and finally with additional control variables. Per-capita revenue shows a significant and positive relationship with both kinds of environmental transparency in all specifications, although with the full set of controls the relationship with AQTI is only significant at the 10% level. Without controls, a one standard deviation increase in revenue autonomy is associated with around a 10-point increase in the PITI scale, which is the equivalent of moving up approximately 30 spots from the bottom of the ranking. Substantively, this is the difference between a city that perfectly discloses pollution audits and one that never discloses them. A one-standard deviation increase in revenue autonomy is associated with an 8-point increase in the AQTI scale, which is the equivalent of moving up around 20 spots from the bottom of the ranking. This difference is the equivalent of disclosing carbon monoxide, ozone, or lead levels in the air.

What explains the association between stronger revenue-generating capacity and transparency? The first and most obvious answer is that cities with stronger revenues simply have more resources to carry out transparency measures. By contrast, if local governments are struggling to raise revenues needed to fund the delivery of basic public services, they are less able to invest in the additional infrastructure and training required. This gap between the demands of transparency reforms and the funds made available for it have led to the widespread maxim among local officials that "the center extends the invitation but the local government foots the bill" (*zhongyang qingke, difang maidan*) (Ran & Donglin, 2014, p. 14).

However, field research by one of us (Denise van der Kamp) suggests that the affordability explanation is at best partial. Innovations in pollution monitoring mean that local governments often do not need to bear heavy costs to implement environmental transparency. In recent years, the central government has required polluting factories to install end-of-pipe technology that measure and report their emissions directly to a centralized online monitoring platform. The central government not only subsidized the cost of installing this technology, but also supports the cost of updating this information to provincial online monitoring platforms. To comply with transparency requirements, city governments simply have

to release information provided by this centrally funded pollution-monitoring infrastructure. However, city governments sometimes simply refuse to release pollution readings, even though they have all the information on hand.[8] This suggests that resource limitations alone cannot explain non-compliance with transparency measures.

Table 2 offers evidence supporting this conclusion. Using the same specifications as in Table 1, we evaluate the effects of revenue-generating capacity on the two other transparency measures. While both have a positive association with revenue, it is only statistically significant in one of the specifications with controls, and then only at the 90% level. While this may in part be due to the smaller sample of cities for which these variables were available, the estimated effect sizes are also substantively quite small. In the models with controls, a one-standard deviation increase in revenue autonomy is associated with moving up just about 2 spots in either transparency ranking. If the simple availability of revenue to cover the costs of implementing new transparency requirements were decisive, we would expect to see a larger estimated effect and a more robust relationship between revenue and transparency regardless of the type of transparency examined.[9] The absence of such a relationship suggests something else may be going on.

We believe these results are driven by the desire to protect local revenue sources. Case studies of several provinces suggest that powerful economic interests or local business play a role in dissuading the government from disclosing pollution information (Li, 2011). An earlier statistical study of factors affecting the PITI index found that cities with larger firms tended to be less transparent (Lorentzen et al., 2014), a finding we replicate here, and which also applies to the AQTI index. By design, disclosure of pollution emissions and air quality information creates a risk of bottom-up pressures that could impact the businesses of heavily polluting firms, creating a strong incentive for city governments to protect them if sources of revenue are hard to come by. By contrast, increased fiscal transparency and broad-based transparency would not have the same direct impact on polluting businesses.

As a result, we believe that the positive association between environmental transparency and budget revenues results from

Table 2. *Regression of other transparency measures on per-capita revenues*

	(1) Qinghua	(2) Qinghua	(3) Qinghua	(4) CASS OGI	(5) CASS OGI	(6) CASS OGI
Revenue per capita (log)	0.336**	0.302	0.549*	12.64***	4.447	3.925
	(0.155)	(0.194)	(0.327)	(2.836)	(3.241)	(4.764)
Principal component of pollution measures		−0.0143	0.0280		4.110**	5.066***
		(0.118)	(0.125)		(1.539)	(1.598)
FDI as percent of GDP		0.00495	−0.0905		5.613**	3.736
		(0.0928)	(0.102)		(2.329)	(2.646)
Ratio of services in GDP			−0.745			−3.039
			(1.530)			(23.98)
Large firm dominance			−0.267			−2.086
			(0.168)			(1.986)
Log GDP per capita			−0.434			−4.997
			(0.476)			(7.998)
Coastal city			−0.0533			10.35**
			(0.362)			(4.777)
Constant	0.857	1.244	4.867	−57.22**	36.13	90.04
	(1.246)	(1.893)	(3.855)	(23.43)	(35.16)	(66.70)
Observations	78	70	70	43	42	42

Standard errors in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

differentiated development strategies. As outlined above, budget-poor cities have strong incentives to increase revenue collection. First, under China's fiscal arrangements, tax revenue makes up a significant proportion of the own-source revenue that local governments collect and keep instead of transferring to the center. Since tax rates are fixed by the center, the only way to increase tax revenue is to attract more investment or retain existing investment to maintain high levels of economic growth. Disclosure of, for example, factory pollution might lead to unwanted popular attention on local firms that are major revenue contributors and discourage new firms from investing in the area. Thus, in budget-poor cities that can barely afford to provide basic public services, local governments are reluctant to risk slowing growth (and cutting into tax revenue) with strict pollution regulations (Holdaway, 2010, p. 16–17). Nor are they eager to risk alienating potential investors with strict environmental transparency measures. In addition, promotion in the Communist party is strongly associated with successful revenue collection, perhaps even more than GDP growth (Shih *et al.*, 2012; Lü & Landry, 2014; Kung & Chen, 2014). Officials from revenue-starved cities may therefore face particularly intense pressure to protect what sources of revenue they have.

In contrast, cities with a solid revenue base have positive incentives to balance revenue collection with environmental performance. First, healthy revenue streams free local officials from making the impossible choice between wooing investors to boost budgets or implementing transparency and alienating investors. In fact, in cities where high-tech manufacturing or services sectors contribute to healthy budgets, local officials may use environmental transparency to drive out dirtier industries that threaten 'clean investment' in these sectors. In 2015, this type of pollution-driven restructuring contributed to the closure of 500 polluting firms in the city of Dongguan in Guangzhou province (Lau, 2015). Second, since 2006, official promotion and bonuses have been tied to hard pollution reduction targets, signaling the center's emphasis on pollution reduction as a policy priority (Wang, 2013). While every city government wants to develop its economy, officials from revenue-rich cities could also use a strong performance on environmental issues to distinguish themselves from other offi-

cials in their bid to be promoted. This may lead them to focus on implementing more far-sighted policies—such as environmental transparency—racing to the top instead of to the bottom.

The space for this differentiated development strategy is especially noticeable in the wake of recent NGO campaigns to shame foreign companies for their polluting behavior in China. Local NGOs note that foreign brands such as Nike and Apple—perhaps fearing consumer backlash—are quicker to respond and clean up their production process when they are caught openly violating environmental standards. Some of these companies have even begun to rely on local government pollution transparency data to hold their local suppliers accountable. In contrast, foreign companies who invest in heavy industry—where consumer backlash is less immediate—are noticeably less attentive to pollution transparency and much less responsive to shaming campaigns[10].

These findings resonate with research about the disbursement of social welfare benefits in China, which also finds sharp disparities in behavior between cities with stronger and weaker fiscal positions. Poorer cities tended to encourage the poor to establish quasi-legal street-side businesses in order to reduce the fiscal burden of supporting them with welfare payments. By contrast, wealthier cities extended welfare benefits more generously and did their best to shut down street business in the interest of maintaining an image they believed would be attractive to businesspeople and tourists, despite the fiscal costs of this strategy (Solinger & Hu, 2012). Interestingly, this same impulse led wealthier cities to comply less readily than poor cities when the center began to encourage reductions in welfare payments to able-bodied recipients. With a ready supply of funds, city leaders preferred to continue to disburse funds more generously in order to pre-empt any potential for visible expressions of discontent that might harm their career prospects (Solinger & Jiang, 2016).

This explanation does not rule out the idea that other factors can, at the same time, play a role in determining compliance with transparency mandates. For example, a simple lack of capacity may hobble some city government efforts to put together comprehensive and timely transparency measures. However, the evidence we have provided is we think more con-

sistent with a lack of will to implement central mandates driven by political considerations.

(b) Effects of pollution and FDI conditional on revenue-generating capacity

The previous regressions effectively assume that the effect of these variables is identical across all cities. However, our theory implies that the effects of pollution and FDI on environmental transparency should be conditional on a city's revenue-generating capacity. Cities with healthy sources of revenue should exhibit evidence of a race to the top, in which higher levels of pollution or FDI are associated with higher levels of transparency. These cities compete with each other on the basis of clean government, and with relatively large tax bases, officials have less to fear from investor exit.

On the other hand, cities with anemic revenues should be more tempted to engage in a race to the bottom. Officials may fear losing investors and the tax revenue they bring, so they weaken the implementation of transparency measures. Being less attractive to high-end investors, they may choose to develop a comparative advantage in non-transparency, serving as pollution havens for domestic and foreign firms that would prefer to avoid close public scrutiny. In these cities, we would expect the association between pollution or FDI and transparency to be attenuated or even reversed.

In order to assess this implication of our theory, we will look again at the effects first of air pollution and then of foreign direct investment on transparency levels, conditional on a city's revenue picture.

(i) Air pollution

Looking back to the results from Table 1, we can see they confirm earlier research that surprisingly found no relationship between the actual level of air pollution and implementation of pollution transparency measures (Lorentzen *et al.*, 2014). However, air pollution does have a significant association with the air quality transparency index. This makes some intuitive sense, since this index measures rapid and comprehensive disclosure of information about airborne pollutants that directly affect the health of urban residents, whereas the PITI index measures disclosures regarding a variety of sources of pollution that might or might not be politically salient to city residents. However, it is surprising that this relationship is positive rather than negative. That is, this result suggests that instead of trying to hide their pollution from citizens, more-polluted cities are actually taking active steps to use transparency reforms to help them mitigate it.

But more important for our theory is how this relationship changes conditional on a city's revenue situation. Figure 1 shows marginal effect plots generated by regressing each of our four transparency measures on revenue per capita, air pollution, and their interaction, along with a set of control variables.[11] The solid line shows how the estimated effect of the variable in question (here, air pollution) varies across the range of the conditioning variable (here, per-capita revenue), with the dotted line marking the 95% confidence interval around the estimates. For all of these plots we will look at the results across a per-capita revenue range of 4.1–10.3, the full range of values in our dataset. Because transparency measures are unavailable for the 51 cities with per-capita revenues below 6.4, projections below that level are necessarily less reliable. We include this range nonetheless in order to show what our findings imply about the governments of some of China's less prominent and most revenue-poor cities.

In Figure 1(a), the upward-sloping solid line shows that the marginal effect of more air pollution on the PITI score increases with revenue.[12] When per capita revenue is near the bottom of the range, this graph suggests that more pollution is associated with a negative effect, a reduction in transparency, although this effect is small and statistically indistinguishable from zero. Then as a city's revenue picture improves, the effect becomes positive, with that positive effect statistically significant once per capita revenue exceeds a level of about 7.5.

Figure 1(b) presents the regression on air quality transparency in the same way. Again, we see that in cities with weak revenues more air pollution is estimated to have a negative but non-significant association with transparency, but in revenue-rich cities the more polluted they are, the more enthusiastically they responded to requirements to increase disclosures. By contrast, Figure 1(c) confirms that pollution has no association with fiscal transparency regardless of a city's revenue situation. Figure 1(d) is the most perplexing, as its downward slope indicates that in cities with weaker budgets, greater air pollution is associated with greater overall transparency, precisely the opposite of the association with pollution-related transparency. This may be an artifact of the particular small sample of cities selected for that study, and we found this to be fairly sensitive to the choice of specification, so we will not dwell on it. For purposes of this study, the key is that this relationship goes against the natural concern that the results shown in the other figures might have been driven by a general tendency of revenue-rich, polluted cities to be more transparent across all dimensions.[13]

(ii) Foreign direct investment

In Table 1, the coefficients in the bare-bones specifications in columns 2 and 5 suggest the presence of foreign investment leads to greater compliance with environmental transparency regulations, contrary to simple ''race to the bottom'' arguments. However, once a number of controls are included the coefficient decreases and falls below standard significance thresholds. Again, though, our primary concern is with how this relationship might change depending on a city's ability to mobilize revenues.

We therefore conduct the same exercise with our FDI/GDP variable as we just did with air pollution, again finding support for our theory of bifurcated responses to what might seem to be the same stimulus. Figure 2(a) and (b) both show FDI having a negative association with environmental transparency for revenue-poor cities and a positive association in cities with strong revenues, although this relationship is only strong enough to be statistically significant with respect to the AQTI.

By contrast, Figure 2(d) loosely suggests the opposite, that FDI has a positive association with broad transparency in revenue-poor cities and a negative association in revenue-rich cities, but we cannot reject the null hypothesis that FDI has no effect whatsoever, nor is the slope of the line statistically significant. Figure 2(c) also fails to follow the pattern of Figure 2(a) and (b), with the effect of FDI on fiscal transparency appearing largely insensitive to differences in a city's revenues.[14]

We caution that despite the standard terminology of ''marginal effect,'' these are simply statistical associations. Still, they are consistent with our hypothesis about the incentives facing officials in Chinese cities, namely that the pressure to maximize revenues leads to differentiated strategies by city leaders.
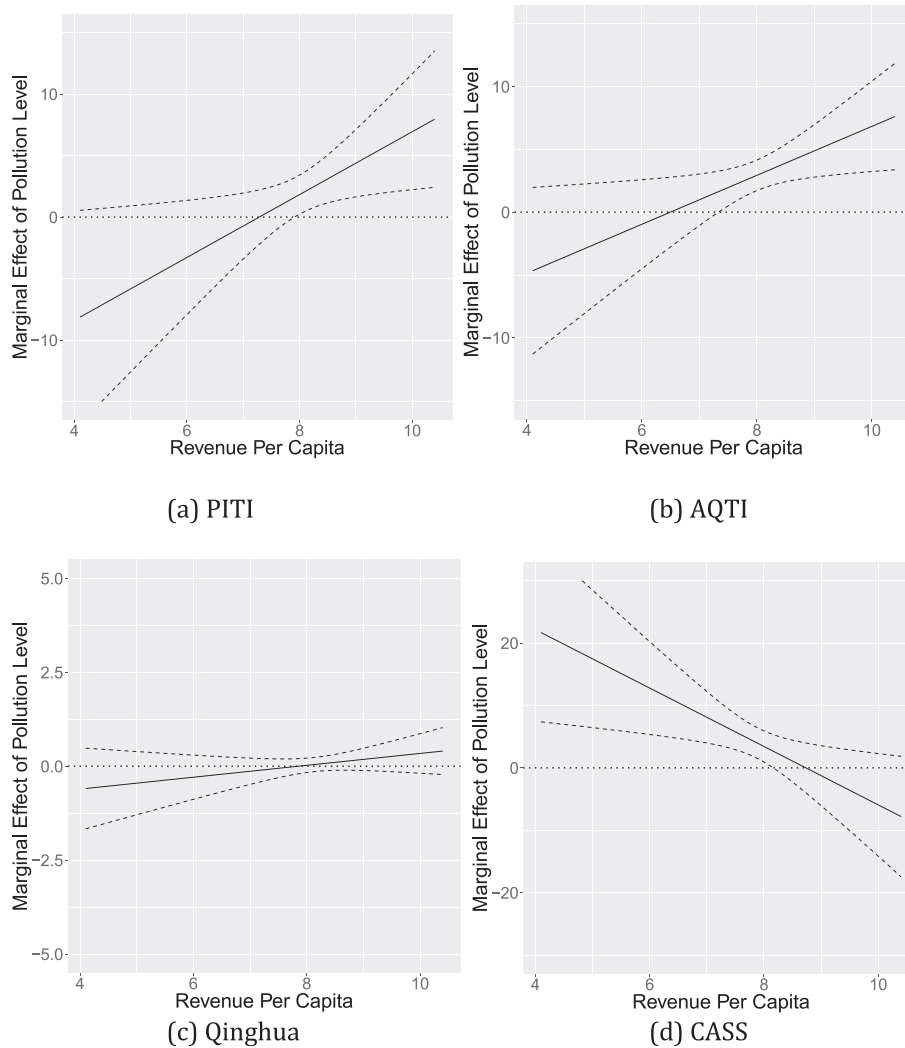
(a) PITI

(b) AQTI

(c) Qinghua

(d) CASS

Figure 1. *Interaction effect plots showing estimated marginal effects of revenue autonomy and pollution on transparency (solid line) with 95 percent confidence intervals (dotted line).*

5. DISCUSSION

In this paper, we examined the relationship between these fiscal reforms and local government transparency in China. Taking into account the mixed incentives generated by fiscal reforms, and the bureaucratic incentives for local officials to protect the revenue-generating interests of local firms, we have identified several illuminating patterns in the data.

First, we find that cities with weaker budgets were notably less compliant with central mandates to increase transparency, particularly about the environment. These findings are striking in light of the fact that, in theory, fiscally weak cities rely heavily on central transfers to make ends meet. Existing theories suggest that when subnational governments rely primarily on transfers from the center, subservience to the center's demands increases while responsiveness to local constituents declines (Faguet, 2014; Gervasoni, 2010; Rodden, 2004, p. 5). This is especially true when political authority is concentrated in strong central parties and government resources are controlled by national governments (Garman *et al.*, 2001), as we see in China. Yet our analysis contradicts this pattern: cities with stronger sources of revenue and less need for central

transfer are more likely to implement centrally mandated reforms.

What explains this finding? We argue that promotion incentives and the decentralized fiscal system play a crucial role here, but not in the way suggested by previous literature. In China's fiscal system, expenditure is decentralized but poor implementation of fiscal transfers from the center has made local governments particularly vulnerable to budget shortfalls (Wu & Wang, 2013). For local authorities, these budget shortfalls have elevated the importance of raising 'own source revenue'—such as independent taxes, fees, and borrowing—to solve local budget problems (Man, 2011; Zhang & Zheng, 2011). The importance of local revenue has been compounded by a bureaucratic promotion system that looks favorably on local officials who raise substantial amounts of local revenue. Our analysis suggests that this leads officials in jurisdictions with weak revenue-generating capacity to resist implementing transparency regulations, especially if these might affect local firms that play a crucial role in revenue generation. Non-transparency also allows these budget-poor cities to compete with their richer cousins in attracting investment by giving businesses an alternative set of benefits, in particular lax public
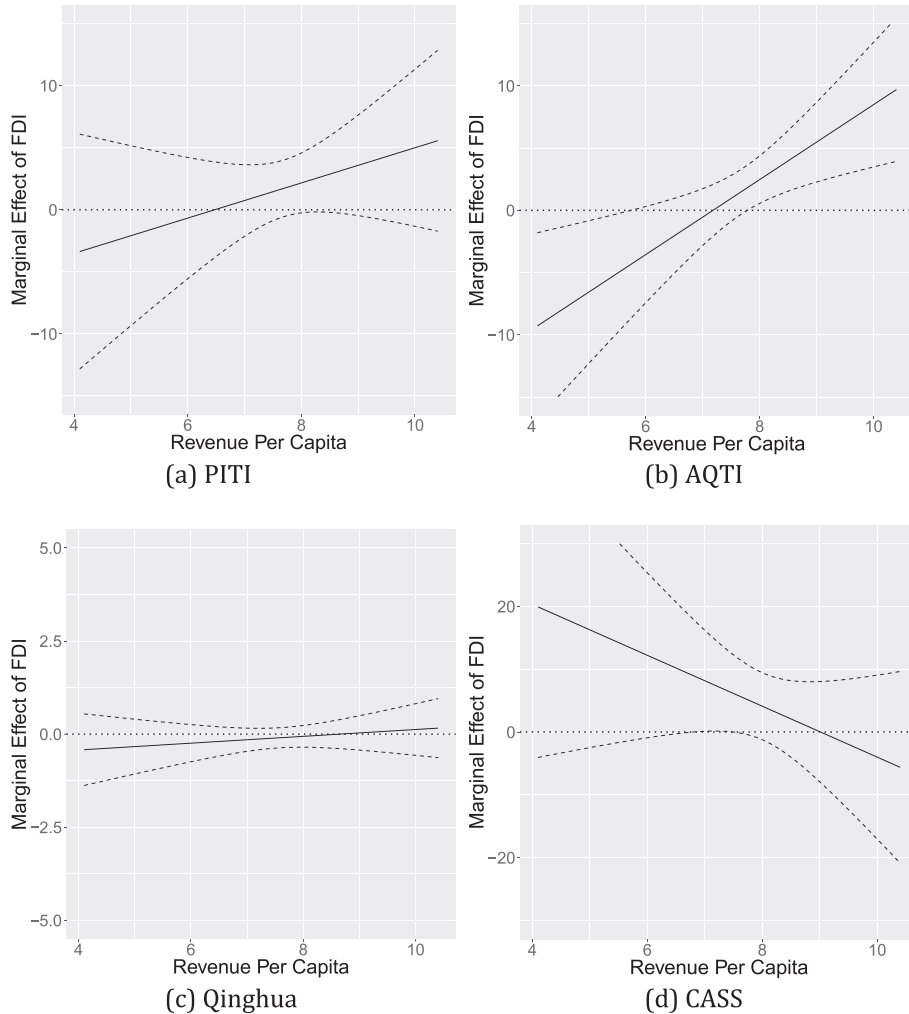
Figure 2. *Interaction effect plots showing estimated marginal effects of revenue autonomy and FDI on transparency (solid line) with 95 percent confidence intervals (dotted line).*

disclosure of industrial pollution. Budget-poor officials in pursuit of promotion also cannot out-compete officials from richer cities on indicators like public goods provision or environmental protection. Instead, they must focus on revenue generation to earn favor from higher levels, which means placing growth above all else.

Second, we find that among cities with stronger sources of revenue, not only are they more environmentally transparent, they tend to be even more so if they are *more* polluted and if they have *more* FDI. These factors seem to accelerate their race to the top. By contrast, in poorer cities these same factors seem if anything to lead them to further decrease their levels of environmental transparency, racing to the bottom or at least resisting pressures to improve.

The puzzle is, if Beijing encourages and rewards local officials who generate revenue, why would officials in fiscally strong cities prioritize transparency if it threatens revenue collection? Even if leaders in revenue-rich cities are relatively independent of fiscal transfers from the center, they should still seek to increase their chances of promotion through revenue generation. Our findings suggest that fiscally strong cities promote transparency reforms because these reforms dovetail with their interests in attracting cleaner showcase foreign investors to generate revenue. Given their already strong per-

formance on conventional economic metrics, attention to transparency also allows local officials from these revenue-rich cities to distinguish themselves in the promotion race.

In sum, China's unequal fiscal system, which makes some cities more vulnerable to budget shortfalls than others, has pushed cities down different paths; cities with a strong revenue base race to the top in governance and development, while cities with weak revenue-generating capacity race to the bottom. Amidst the stark division between the haves and have-nots of local governments, we see some cities can accommodate the costs of transparency, and their local officials actually benefit from it. Shanghai, for example, eliminated its 2015 economic growth targets in a bid to focus on more qualitative goals like the environment. In contrast, in industry-heavy Hebei province, officials continue to under-report emissions data as they struggle to deal with a slowing economy and rising unemployment. In this paper, we use performance on transparency reforms to demonstrate that this kind of divergence is widespread.

If mixed fiscal institutions continue to drive revenue-poor and revenue-rich cities down different developmental paths, the Chinese leadership may begin to face a tradeoff: fiscal reforms may have increased the central government's ability to restrain local government spending, but they have also dri-

ven revenue-starved local governments to defy the center's attempts to offer limited transparency and accountability by engaging in a 'race to the bottom'. Early experiments with decentralization may have improved local governance precisely because they aided growth. Following reversals to these early experiments with decentralization, more recent attempts to improve governance, such as transparency reforms, have clear economic consequences and tradeoffs. As China's growth continues to slow, these divergent developmental paths do not bode well for future political reforms with economic consequences.

NOTES

1. The online appendix as well as full replication data and code, will be posted at [www.peterlorentzen.com] upon publication.

2. For instance, in a case unrelated to the OGI law, Shanghai employees of the Rio Tinto Group were initially arrested on suspicion of stealing state secrets, evidently because of information passed to them, voluntarily, about Chinese steel makers. The defendants later plead guilty to a bribery charge.

3. Later reports introduced a new scoring system, rendering data from subsequent years non-comparable.

4. This revenue includes the tax revenue shared between central and local government, such as VAT, but otherwise does not include any subsidies or transfers from the Central government.

5. $PM_{2.5}$ and NO_2 measures were averaged over 2001–06 and SO_2 over 2005–07.

6. See also Gallagher (2007) and Wang (2014) for further discussion of the impact of FDI on China.

7. See also Meng, Pan, and Yang (2014) and Truex (2014) for relevant discussions of receptivity and responsiveness.

8. Interview with official from Chinese Ministry of Environmental Protection, Beijing, May 12, 2016; Interviews with Chinese ENGOs, Beijing (February 5, 2015 and May 11, 2015).

9. We would also expect to see a stronger correlation between the pollution transparency measures and others. In the online appendix we include the correlation matrix between the different transparency measures. While they are all correlated, implying some common factor promoting good governance in certain cities, the pollution transparency measures have a much stronger correlation with each other than they do with either of the other measures, and the other two measures are also not strongly correlated with each other.

10. Interview with Chinese ENGO, Beijing, January 2015.

11. Because most of the coefficients in standard regression output do not have an intuitive interpretation when interaction terms are used, we focus on the graphs and include the tables in the appendix. Tables A1 and A2 present bare-bones regressions. Tables A3 and A4 present the regressions that were used to generate the figures.

12. This positive slope is statistically significant. See appendix Table A2.

13. A table and figures for the same regressions without controls is provided in the appendix. The same pattern of pollution being associated with greater environmental transparency emerges even more strongly in those specifications, while the negative slope for overall transparency diminishes in magnitude and statistical significance.

14. Results without controls are in the appendix and present the same picture.

REFERENCES

Achen, C. H. (2005). Let's put garbage-can regressions and garbage-can probits where they belong. *Conflict Management and Peace Science, 22* (4), 327–339.

Angrist, Joshua D., & Pischke, Jörn-Steffen (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press.

Bardhan, P. (2002). Decentralization of governance and development. *Journal of Economic Perspectives, 16*(4), 185–205.

Bardhan, P., & Mookherjee, D. (Eds.) (2006). *Decentralization and local governance in developing countries: A comparative perspective*. Cambridge, MA: MIT Press.

Birney, M. (2014). Decentralization and veiled corruption under China's 'Rule of mandates'. *World Development, 53*, 55–67.

Darch, C., & Underwood, P. G. (2009). *Freedom of information and the developing world: The citizen, the state and models of openness*. Oxford: Chandos.

Diaz-Cayeros, A. (2006). *Federalism, fiscal authority and centralization in Latin America*. New York: Cambridge University Press.

Distelhorst, G. & Hou, Y. (in press). Constituency Service Under Nondemocratic Rule: Evidence from China. *Journal of Politics*.

Faguet, J.-P. (2012). *Decentralization and popular democracy: Governance from below in Bolivia*. Ann Arbor: University of Michigan Press.

Faguet, J.-P. (2014). Decentralization and governance. *World Development, 53*, 2–13.

Gallagher, M. E. (2007). *Contagious capitalism: Globalization and the politics of labor in China*. Princeton: Princeton University Press.

Garman, C., Haggard, S., & Willis, E. (2001). Fiscal decentralization: A political theory with Latin American cases. *World Politics, 53*(2), 205–237.

Gervasoni, C. (2010). A rentier theory of subnational regimes: fiscal federalism, democracy, and authoritarianism in the argentine provinces. *World Politics, 62*(2), 302–340.

Globerman, S., & Shapiro, D. (2002). Global foreign direct investment flows: The role of governance infrastructure. *World Development, 30* (11), 1899–1919.

Heilmann, S., & Perry, E. (2011). *Mao's invisible hand: The Political foundations of adaptive governance in China*. Harvard: Harvard University Press.

Holdaway, J. (2010). Environment and Health in China: An introduction to an emerging research field. *Journal of Contemporary China, 19*(63), 1–22.

Huang, Y. (2008). *Capitalism with Chinese Characteristics: Entrepreneurship and the State*. New York: Cambridge University Press.

Huang, D. (2013). Qiye ruge yinxiang difang zhengce guocheng: jiyu guojia zhongxin de leixing jiangou he anli fenxi (How do entrepreneurs influence local government policy processes: A state-centered categorisation and case analysis) Shehuixue Yanjiu (Sociological Analysis). Issue 5.

Kennedy, J. (2013). Finance and rural governance: Centralization and Local challenges. *Journal of Peasant Studies, 40*(6), 1009–1026.

Kung, J.K.-S., & Chen, T. (2014). Land revenue windfalls, signalling, and career incentives of chinas local leaders. (working paper).

Lau, M. (2015). Mayor of troubled manufacturing hub Dongguan insists recovery is underway despite business closures. *South China Morning Post.* October 28, 2015. [Last accessed October 29 2015. Available from URL: http://www.scmp.com/news/china/economy/article/1873433/mayor-dongguan-chinas-troubled-worlds-manufacturing-hub-insists.

Li, W. (2011). Self-motivated versus forced disclosure of environmental information in China: a comparative case study of the pilot disclosure programmes. *The China Quarterly, 206*, 331–351.

Li, J. 2015. 60,000 jobs, the cost of one Chinese city's cleaner air. *South China Morning Post,* July 2, 2015. [Last accessed July 3 2015]. Available from URL: http://www.scmp.com/news/china/policies-politics/article/1831846/60000-jobs-cost-one-chinese-citys-cleaner-air.

Lo, C. W.-H., Fryxell, G. E., van Rooij, B., Wang, Wei., & Li, P. H. (2012). Explaining the enforcement gap in China: Local government support and internal agency obstacles as predictors of enforcement actions in Guangzhou. *Journal of Environmental Management, 111*, 227–235.

Long, C., Yang, J., & Zhang, Jing. (2015). Institutional impact of foreign direct investment in China. *World Development, 66*, 31–48.

Lorentzen, P., Landry, P., & Yasuda, J. (2014). Undermining Authoritarian Innovation: The power of China's industrial giants. *The Journal of Politics, 76*(1), 182–194.

Lü, X., & Landry, P. F. (2014). Show me the money: Interjurisdiction political competition and fiscal extraction in China. *American Political Science Review, 108*(3), 706–722.

Man, J. Y. (2011). Local public finance in China: An overview. In J. Y. Man, & Y.-H. Hong (Eds.), *China's local public finance in transition* (pp. 3–20). Lincoln Institute of Land Policy.

Manion, M. (2016). *Information for autocrats: Representation in Chinese local congresses.* Cambridge University Press.

Manor, J. (1999). *The political economy of democratic decentralization.* Washington, DC: The World Bank.

Martinez-Vazquez, Jorge., & McNab, Robert. M. (2003). Fiscal decentralization and economic growth. *World Development, 31*(9), 1597–1616.

Mattingly, D. C. (2016). Elite capture: How decentralization and informal institutions weaken property rights in China. *World Politics, 68*(3), 383–412.

Meng, T., Pan, J., & Yang, P. (2014). Conditional receptivity to citizen participation: Evidence from a Survey experiment in China. *Comparative Political Studies.* http://dx.doi.org/10.1177/0010414014556212.

Montinola, G., Qian, Y., & Weingast, B. R. (1995). Federalism, Chinese style: the political basis for economic success in China. *World Politics, 48*(1), 50–81.

Morrison, K. M. (2009). Oil, nontax revenue, and the redistributional foundations of regime stability. *International Organization, 63*(1), 107–138.

O'Brien, K. J., & Li, L. (2000). Accommodating "democracy" in a one-party state: introducing village elections in China. *The China Quarterly, 162*, 465–489.

Oi, J., Babiarz, K. S., Zhang, L., Luo, R., & Rozelle, S. (2012). Shifting fiscal control to limit cadre power in China's townships and villages. *The China Quarterly, 211*, 649–675.

Ong, L. (2006). The political economy of township government debt: Township enterprises and rural financial institutions in China. *The China Quarterly, 186*, 377–400.

Piotrowski, S. J., Zhang, Y., Lin, W., & Wenxuan, Y. (2009). Key issues for implementation of Chinese open government information regulations. *Public Administration Review, 69*(s1), S129–S135.

Prakash, A., & Potoski, M. (2006). Racing to the bottom? Trade, environmental governance, and ISO 14001. *American Journal of Political Science, 50*(2), 350–364.

Ran, R., & Donglin, H. (2014). Ruhe yong zhidu baohu shengtai huanjing? Huanjing zhili zhong de zhongyang-difang guanxi (How to use institutions to protect the environment? Center-local relations in environmental regulation. *Zhongguo Gaige Xili Baogao (China Reform Report Series), 26*.

Rodden, J. (2002). The dilemma of fiscal federalism: Grants and fiscal performance around the world. *American Journal of Political Science, 46*(3), 670–687.

Rodden, J. (2004). Comparative federalism and decentralization: On meaning and measurement. *Comparative Politics, 36*(4), 481–500.

Rodrik, D. (1997). Sense and nonsense in the globalization debate. *Foreign Policy,* 19–37.

Schrodt, P. A. (2014). Seven deadly sins of contemporary quantitative political analysis. *Journal of Peace Research, 51*(2), 287–300.

Shih, V., Adolph, C., & Liu, M. (2012). Getting ahead in the communist party: Explaining the advancement of central committee members in china. *American Political Science Review, 106*(1), 166–187.

Shih, V., & Zhang, Q. (2006). Who receives subsidies? A look at the county-level in two time periods. In V. Shue, & C. Wong (Eds.), *Paying for progress in China.* London: Routledge.

Solinger, D. J., & Hu, Y. (2012). Welfare, wealth and poverty in urban China: The Dibao and its differential disbursement. *The China Quarterly, 211*, 741–764.

Solinger, D. J., & Jiang, T. (2016). When Chinese central orders and promotion criteria conflict: implementation decisions on the destitute in poor versus prosperous cities. *Modern China.*

State Council of the People's Republic of China. (2007). Regulations of the People's Republic of China on Open Government Information (Adopted by the State Council on January 17, 2007, Effective May 1, 2008). Trans. The China Law Center, Yale Law School. https://law.yale.edu/system/files/documents/pdf/Intellectual_Life/CL-OGI-Regs-English.pdf (March 7, 2017).

Stern, R. (2014). *Environmental litigation in China: A study in political ambivalence.* New York: Cambridge University Press.

Treisman, D. (2007). *The architecture of government: Rethinking political decentralization.* Cambridge: Cambridge University Press.

Truex, R. (2014). Consultative authoritarianism and its limits. *Comparative Political Studies,* 1–33.

Tsui, K.-Y. (2005). Local tax system, intergovernmental transfers and China's Local Fiscal Disparities. *Journal of Comparative Economics, 33*(1), 173–196.

van Rooij, B. (2006). Implementation of Chinese environmental law: regular enforcement and political campaigns. *Development and Change, 37*(1), 57–74.

Wallace, J. L. (2016). Juking the Stats? Authoritarian Information Problems in China. *British Journal of Political Science, 46*(1), 11–12.

Wang, Xu. (1997). Mutual empowerment of state and peasantry: Grassroots democracy in rural China. *World Development, 25*(9), 1431–1442.

Wang, A. (2013). The search for sustainable legitimacy: Environmental law and bureaucracy in China. *Harvard Environmental Law Review, 37*, 365–440.

Wang, Y. (2014). *Tying the autocrat's hands: The rise of the rule of law in China.* Cambridge: Cambridge University Press.

Wang, Y. (2016). Relative capture: Quasi-experimental evidence from the Chinese Judiciary. *Working paper.*

Wang, X & Herd, R. (2013). The System of Revenue Sharing and Fiscal Transfers in China *OECD Economics Department Working Papers, No. 1030,* OECD Publishing.

Wang, S., & Yao, Y. (2007). Grassroots democracy and local governance: Evidence from rural China. *World Development, 35*(10), 1635–1649.

Weingast, B. R. (2009). Second generation fiscal federalism: The implications of fiscal incentives. *Journal of Urban Economics, 65*(3), 279–293.

Weingast, B. (2014). Second generation fiscal federalism: Political aspects of decentralization and economic development. *World Development, 53*, 14–25.

Wheeler, D. (2001). Racing to the bottom? Foreign investment and air pollution in developing countries. *The Journal of Environment & Development, 10*(3), 225–245.

World Bank (2002). *China: National development and subnational finance, a review of provincial expenditures.* Washington: World Bank.

World Bank and United Cities and Local Governments (2009). *Decentralization and local democracy in the world: First global report by united cities and local governments, 2008.* World Bank Publications.

Wu, A. M., & Wang, W. (2013). Determinants of expenditure decentralization: Evidence from China. *World Development, 46*, 176–184.

Xiao, W. (2013). Freedom of information reform in China: Information flow analysis. *International Review of Administrative Sciences, 79*(4), 790–808.

Xu, C. (2011). The fundamental institutions of China's reforms and development. *Journal of Economic Literature, 49*(4), 1076–1151.

Zhang, L.-Y. (1999). Chinese central-provincial fiscal relationships, budgetary decline and the impact of the 1994 fiscal reform: An evaluation. *The China Quarterly, 157*, 115–141.

Zhang, X., Ortolano, L., & Zhongmei, L. (2010). Agency empowerment through the administrative litigation law: Court Enforcement of pollution levies in Hubei Province. *The China Quarterly, 202*, 307–326.

Zhang, L., & Zheng, X. (2011). The determinants of intergovernmental transfer. In J. Y Man, & Y.-H. Hong (Eds.), *China's local public finance in transition* (pp. 191–202). Lincoln Institute of Land Policy.

APPENDIX A. SUPPLEMENTARY DATA

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.worlddev.2017.02.021.

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