

**Racing to the Bottom or to the Top?  
Decentralization and Governance Reform in China**

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Abstract: 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 show that cities with weaker revenue bases are slower to implement new transparency regulations. Additional evidence points to a bifurcation in development strategies. In fiscally strong cities, increased foreign investment leads to greater disclosure of pollution. In fiscally weak cities, foreign investment is associated with decreased disclosure, suggesting they aim to be pollution havens. Similarly, high levels of pollution induce fiscally strong cities to increase pollution disclosures if they are highly polluted while the opposite holds in fiscally weak cities.

## 1 Introduction

Hoping to improve governance, many countries have experimented with various forms of decentralization (Manor 1999). 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 et al. 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. But does decentralization always lead to improved governance?

Recent work has shown that the effects of decentralization are far more contingent than often posited (Treisman, 2007; Faquet 2014; Weingast 2014). China's reforms in the post-Mao period provide an important test case. China has experimented with fiscal and administrative decentralization, and these reforms have been linked to China's gradual (if incomplete) transition to a market economy (Montinola, Qian and Weingast. 1995). However, while the Chinese leadership took steps to decentralize its fiscal and administrative system, the party maintains exclusive control over access to power, and local officials can only advance through the ranks of the party by appointment from above (Xu 2011, 1078). While competition for promotion appears to have created incentives to generate economic growth (Jia et al, forthcoming), it has also undermined some of the claimed positive effects of decentralized institutions (Cai and Treisman, 2006). In addition, a major reform in the 1990s recentralized important elements of the fiscal system, leaving local governments unable to independently adjust taxation in response to

changing revenue needs. Instead, they must rely on fiscal transfers from the center to cover budget shortfalls, although they continue to have considerable autonomy in their expenditures.

In the context of the mixed results of economic decentralization, China's leaders have experimented with a variety of governance reforms that strengthen the ability of ordinary citizens to place pressure on the local authorities empowered by decentralizing reforms (Manion 1996; O'Brien and Li, 2000; Distelhorst, 2015). However, the decentralization of fiscal and administrative power also means that local governments can stymie the implementation of these reforms, which may threaten their interests. In a decentralized system, when do local governments implement centrally mandated reforms that may restrict their previous autonomy?

We find that China's current fiscal structure has created incentives for local officials to undermine other governance reforms. We examine local implementation of new national regulations imposing greater transparency and disclosure on all levels of government, focusing in particular on the environmental arena, one of China's most contentious and politically salient. We find that cities with weaker sources of revenue were notably less compliant with central mandates to increase transparency. Moreover, this compliance decreased further the more polluted the city, and the greater the importance of foreign direct investment (FDI) in its economy. These fiscally-weak cities appear to be engaged in a race to the bottom, attempting to conceal the sources and extent of their pollution problems and perhaps serving as a pollution haven for foreign firms. On the other hand, cities with stronger sources of revenues implemented these regulations more rapidly and pollution and FDI had the opposite effects.

These findings are striking in light of the fact that 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 (Gervasoni 2010, Rodden 2004, Faguet 2014, 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 results show that revenue-starved cities are *less* likely to implement centrally-mandated reforms.

What explains this divergence? We propose that in addition to making reform prohibitively expensive for some cities, inadequate revenue creates incentives for officials from cash-strapped jurisdictions to engage in a race to the bottom: Instead of pandering to the center's directives in return for transfers, these officials focus on attracting and retaining local investment—and therefore local tax revenue—from highly polluting industries. Specializing in non-transparency can be a useful comparative advantage for cities desperate for foreign investment and tax revenue. It allows these poor cities to compete with their richer cousins by giving businesses an alternative set of benefits, in particular lax public disclosure of industrial pollution. By contrast, fiscally strong cities appear more willing to respond to their residents' concerns about pollution and may attract cleaner showcase foreign investors that are more willing to disclose information about pollution discharges.

The fiscal system plays a crucial role here, but not in the way suggested by previous literature. Our analysis suggests that the partial recentralization of the fiscal system, combined with the continued decentralization of many other policy decisions, has played an important role in undermining these more recent attempts to improve local government accountability through increased bottom-up supervision. Specifically China's fiscal system makes local governments particularly vulnerable to budget shortfalls. These budget shortfalls have elevated the importance of own-source revenue — that is, revenue raised and retained at the local level — for local

governments. This strongly incentivizes officials, whose promotion hinges on the amount of taxes they collect (Shih, Adolph and Liu, 2012; Lü and Landry, 2014; Kung and Chen, 2014), and who rely on own source revenue to meet the local expenditure needs (Man 2011, Zhang and Zheng, 2011), to shield polluting industries in fiscally weak cities for fear of losing what little they have. Our research therefore shows how mismatched decentralization policies can undermine other important governance reforms, even ones that might be expected to be complementary to decentralizing initiatives.

The remainder of this article is organized as follows. It begins with a discussion of decentralization and transparency reforms in China. It then moves on to discussing data and measurement before presenting statistical results.

## **2. The Dark Side of Decentralization**

China's mixed experience with decentralization reflects the more cautious note of recent studies, which problematize the link between decentralization and good governance. Crucially, for decentralization to work, political authority must be distributed somewhat evenly between central and local governments so that they depend on each other to stay in power (Faguet 2014, 10-12). However, existing power arrangements often undermine attempts to distribute authority evenly between central and local government (Bardhan 2002). If decentralized policies are imposed on political systems where power is concentrated at the national level then these reforms may at best have little impact on local accountability. At worst, they may encourage local politicians to disregard local interests entirely (Weingast 2014, 19-20). This is especially true when fiscal transfers from the center are tied to the fulfillment of national government priorities (Garman et al. 2001). This recent scholarship suggests that the incentives for local

politicians to improve or impede governance may depend on how decentralization reforms interact with existing institutions and power arrangements. To recognize these incentives, we need to look at the design of decentralized institutions, and how they evolved (Faguet 2014,12).

In the 1980s, China experimented with a variety of forms of decentralization as it moved away from central planning.<sup>1</sup> In the course of a few years, the Chinese leadership granted subnational governments the power to autonomously raise and allocate government revenue (Kennedy 2013); regulate local economic actors through increased control of local land and financial resources (Xu 2011, 1078-1079); and experiment with policy implementation to suit local circumstances (Heilmann and Perry, 2011).

As decentralization continued apace, the Chinese leadership began to develop public input mechanisms to monitor its increasingly autonomous local officials, especially as reports of official corruption soared. They introduced popular elections in villages (O'Brien and Li, 2000; Manion 1996); mandated greater levels of transparency (Lorentzen, Landry and Yasuda, 2014); allowed the media to report on local government corruption (Zhao, 2000; Distelhorst, 2013); and rolled out online feedback mechanisms that enable citizens to express their opinions directly to bureaucrats (Truex, 2014; Distelhorst and Hou, 2014; Meng, Pan and Yang, 2014). These series of quasi-democratic reforms can give the impression that decentralization has set China on the path to greater political accountability, and better governance.

In fact, decentralization in China has produced contradictory institutional designs: For instance, fiscal institutions have been designed to make local governments responsible for paying and providing for the majority of local public goods and services. However, revenue collection and tax rates are strictly governed by the center, making it difficult for local governments to

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<sup>1</sup> Of course, China has a long history of decentralized policy experimentation (Heilmann and Perry, 2011).

independently balance their budgets (Man 2011). Similarly, while regulation of private market actors has been decentralized to the local government level, credit and input markets are still closely controlled by the central government, the better to serve the top tier of industries that are still regulated by the central state (Pearson 2011, Ong 2012).

Scholars suggest that these mixed institutional arrangements emerged following large-scale protests over corruption and opportunistic spending in the late 1980s. The central government, fearing the consequences of devolving too much authority to unruly local officials, chose to tighten control over fiscal and political administration (Ong 2012, Huang 2008). But these reforms came at a price. By re-establishing central authority over these institutions, the Chinese leadership undermined the distribution of power between central and local governments that is required to maintain truly decentralized governance. This combination of partially centralized, partially decentralized institutions has generated mixed incentives for local officials.

This paper examines the impact of these mixed incentives in the context of two specific reforms: The 1994 reforms to the fiscal system and the more recent Open Government Information reforms. We argue that the partial recentralization of fiscal policy in China has undermined more recent attempts to improve local government accountability and performance through increased transparency.

## **2.1 Fiscal Decentralization and Budget Shortfalls**

Fiscal decentralization is conceptualized as the balance of expenditure and revenue between the local and national government, and the degree to which local governments retain 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 the national government has little authority over how this revenue is raised and allocated (Garmand et al. 2001, 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 (e.g. Rodden, 2004).

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, and the presence of one without the other can have a significant impact on local politics. For instance, when local politicians have both 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, 110-111; Gervasoni 2010, 307). These fiscal ‘rents’ can promote opportunistic spending, where non-tax fiscal resources are used carelessly to boost electoral support (Rodden 2002). Alternately, politicians might use the windfall fiscal resources to build up patronage networks or invest in repressive apparatuses, thus silencing public opposition and excluding political opponents (Gervasoni 2010, 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, 484). Garman et al. (2001) show that when political authority is



concentrated at national level, fiscal transfers are more likely to be earmarked and discretionary local spending is limited. Governance degrades when local governments lack resources, and must pander to the national government's policy priorities—at the expense 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 balance of fiscal authority between central and local governments (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, 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 22 per cent of GDP, among the highest levels in Asia (World Bank and United Cities and Local Governments, 2009). However, taxation rates are set by the central government so local governments cannot independently raise taxation to meet fluctuations in demand for local expenditure. Nor do they have much control over how revenue is allocated (Wang and Herd 2013, 9-14). Fiscal transfers are heavily earmarked, meaning the center dictates how and how much local revenue is spent.

The center's strict control over local government expenditure can be traced back to tax reforms in 1994, which brought large-scale changes to China's fiscal system. In an effort to reduce arbitrary taxation and corruption at the local level, the central government reasserted control over revenue collection and distribution (Kennedy 2013, 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, many of these subsidies are designed to equalize the budgets of local governments across the country, but in practice the amount of subsidies that governments actually receive is politicized. Local governments jockey with each other for larger subsidies during negotiations with the central government (Tsui, 2005).

Recent studies suggest that this combination of high expenditure burdens and inadequate transfers have led to a vacuum in discretionary funding for the local state (Oi et al. 2012, 666-668). While some counties might receive fiscal transfers worth over 200% of local GDP (Wang and Herd 2013, 21), spending of this revenue is so closely dictated by the central government that far from spending opportunistically, local officials occasionally have to take on debt to meet their expenditure responsibilities (Man 2011). Second, nearly all local governments now face a shortfall between the amount of revenue they collect and keep and the amount they spend (Shih and 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 own-source revenue gap between wealthier provinces (with a strong tax base) and poorer provinces (Zhang and Zheng, 2011).

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, Adolph and Liu, 2012; Lü and Landry, 2014; Kung and Chen, 2014). To be sure, the pressure to generate revenue varies by the degree of competition for promotion, among other factors (Lü and Landry, 2014). Nevertheless, these pressures generally play an key role in local decision-making, because the importance revenue generation often

extends beyond promotion. For instance, tax revenue has been shown to affect the outcomes of lawsuits involving publicly listed firms. Wang (2015) finds that when a court and a firm are based in the same location and (crucially) are under the same level of government authority, 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. 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 pollution 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 placating their tax base or 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, budget shortfalls may reinforce local obedience to the center—including actively reporting on misbehaving, polluting firms. On the other hand, fiscal reforms have also elevated the importance of each local government's own-source revenue. 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 do so, they must cater to local business interests, leading to a renewed inter-dependence between local officials and their tax base. In this context, local officials may choose to protect businesses

from Beijing's pollution 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.

## **2.2 Transparency Initiatives**

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. The law 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.<sup>2</sup> Yet the law nevertheless constituted a major step towards 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 and Underwood, 2009). An alternative interpretation sees the law as an outgrowth of earlier incremental moves towards open government, like the introduction of village and township-level transparency

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<sup>2</sup> 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.

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, but has improved over time. 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 et al., 2009). Yet in the following years, execution of the OGI law has improved. For example, in the Pollution Information Transparency Index (PITI), described in more detail below, the mean score for cities rose from 31 in 2009 to 43 points in 2012. Despite the broad trend towards improved disclosure, there was still significant heterogeneity across jurisdictions even five years after the regulations were

promulgated, with 20 cities out of 113 scoring over 60, which represents basic compliance with the regulations, but 28 cities scoring under 30.

### **3 Evidence**

We claim that municipal governments with weaker own-source revenues are less transparent, in part because they have come to specialize in “dirty” rather than green growth, relying on investment and tax revenue from high-polluting industries. In the following section, we explore how weaker own-source revenues affect transparency and political compliance in China.

#### **3.1 Dependent variables**

We test our hypothesis using four indexes that measure municipal governments’ transparency. To our knowledge, these are the only complete measures of transparency available at the municipal level in China. 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. The budgetary and overall transparency indexes serve as a robustness check. If compliance with transparency is simply a capacity issue—where cash-strapped cities don not have the resources for transparency infrastructure—we should see similar results across all measures. If, however, non-compliance stems from the tradeoff between boosting local tax revenue and punishing local polluters, then budget shortages should have a differentiated impact on pollution transparency versus other forms of transparency where this tradeoff is less stark.

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 nonprofits. The Pollution Information Transparency Index (PITI) evaluates the implementation of the OEI 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.<sup>3</sup>

The Air Quality Transparency Index (AQTI), by contrast, focuses on disclosure of information about 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. Since our goal is to measure the true propensity for disclosure, we average the AQTI index across both available years and the PITI index across its first three years. This averaging reduces measurement error, for example if bureaucrats were absent by chance when researchers called to request information, or if an over-cautious bureaucrat refrained from disclosing in a given year and was then pressed to disclose by superiors.

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<sup>3</sup> Later reports introduced a new scoring system, meaning the data are not comparable.

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, like 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) were worth a predetermined number of points. The highest score was 6 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, with the city of Ningbo coming out on top with 71 points and the city of Lanzhou scoring a relatively paltry 6 points.

### **3.2 Explanatory and control variables**

As previously discussed, we argue that cities with budget shortfalls are less likely to implement transparency measures. To measure the size of these fiscal shortfalls, we calculate the difference between budgetary expenditures and own-source revenue (defined as the sum of all taxes and fees that are collected and kept at the local level), and divide it by the total amount of own-source revenue. In principle, any gaps between own-source revenues and local expenditure should be supplemented by fiscal transfers from the center, so on the books at least, local budgets are balanced and there are no fiscal shortfalls. In reality, these transfers are politicized and do not always cover budget shortfalls. The above measure better approximates the fiscal shortfalls that local governments might face in reality, and how easily they can independently overcome shortfalls when transfers are inadequate transfers. We use data from 2007, the year before the



transparency measures took effect. The data for this measure is drawn from city statistical yearbooks. The size of fiscal gaps is often fairly substantial. The average city spends 2.2 times more than it collects in revenue. At the extreme end, some cities spend more than an order of magnitude more than they collect, while only about 6 percent of cities actually run pre-transfer surpluses.

Since environmental transparency is a crucial component of the transparency initiative, we also test whether there is an association between pollution and transparency. As Wallace (2014) notes, officials in China often have incentives to distort statistics; we were particularly concerned that more polluted places would try harder to hide sources of pollution. To side-step these concerns, we rely on a measure introduced by Lorentzen, Landry, and Yasuda (2014), which uses estimates of ground-level concentration of sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and fine particles (PM<sub>2.5</sub>) derived from satellite imagery.

It is sometimes argued that globalization and FDI can spark either a race to the top or race to the bottom in areas from labor rights to environmental governance. To measure this, we divide the amount of FDI by GDP to estimate importance of foreign investment relative to the total size of the local economy, also drawn from official city yearbooks.

Finally, we include a number of control variables that may also be associated with transparency. These include controls for the importance of services in the city's economy relative to manufacturing or extractive industries, the degree to which the city's economy is dominated by large firms, the city's level of economic development, city size, and a city's overall budget expenditures. The rationale for including each is discussed in the following section.

## **4 Findings**

Table 1 presents the results of ordinary least squares regression of each of our transparency measures on municipal fiscal shortfalls. The odd-numbered columns in Table 1 show a strong bivariate correlation between fiscal shortfalls and lower levels of transparency. Such simple bivariate results are more transparent and interpretable than “garbage can” (Achen, 2005) models that add numerous control variables. These results show that larger budget shortfalls are negatively correlated with each transparency measure. However, while the measure for fiscal transparency is statistically significant in the bivariate regressions, this result is driven by one outlier city (Jiuquan, Gansu) with a large budget shortfall and low level of transparency. Once this city is removed, the result no longer meets conventional levels of statistical significance.

The even-numbered columns of Table 1 include controls for possible omitted variables, yielding smaller but qualitatively similar estimates of the fiscal shortfall effect, though we would caution that these results also only imply a correlation.<sup>4</sup> The first control is for a city’s absolute level of expenditures, since cities with a larger existing government apparatus (whether self-funded or covered by transfers) might find it easier on the margin to allocate some resources to transparency initiatives. We find some evidence of this with respect to the pollution transparency variables, but no significant relationship for the fiscal and overall transparency measures.

Next, we control for the dominance of large industrial firms, which Lorentzen, Landry, and Yasuda (2014) found to be associated with lessened environmental transparency as measured by the PITI index. Our results are consistent with these earlier findings, showing also that they hold when using the index of air quality disclosure. The results also show only a weak

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<sup>4</sup> In the appendix (Tables A1 – A3) we show that these findings are robust to alternative operationalizations of the dependent variable.

relationship between non-environmental transparency measures and large firm dominance, suggesting that firms do not necessarily attempt to thwart the disclosure of information that has little to do with their operations, for instance disclosure of information about agriculture or education.

Additional economic control variables, including GDP per capita, population, and the size of the service sector do not have a strong association with any of our measures of transparency, nor does a dummy variable indicating whether or not the city is located in one of China's coastal provinces. China's large, wealth, service-intensive coastal cities often underwent economic reforms at an earlier stage than other cities. 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. However, the results do not show a strong association with these variables or, in the case of GDP per capita and the size of the service sector, even a consistent positive or negative association across the different measures. The exception is the coastal dummy, which has a significant positive association with the overall transparency measure but no others.

Turning to air pollution (the actual level as measured by satellite imaging), there is no significant relationship between this and a city's PITI index, but there is a strong positive relationship with the AQTI index. That is, more pollution is not associated with greater disclosure of emissions from polluting firms, but it is positively related with more transparent disclosure of information about air quality that directly affects the health of city residents.<sup>5</sup>

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<sup>5</sup> Alternative ways to analyse data with multiple dependent variables include seemingly unrelated regression (SUR) (e.g. Miguel, 2004) or multivariate regression. However, these techniques require that each of the four dependent variables have measures for every observation. Unfortunately, data from the four transparency indexes do not cover every observation but an analysis using SUR on the 34 cities where this data is available (included in the supplementary materials as table A4) shows that even if we restrict ourselves to this smaller dataset of cities, the fiscal shortfall measure is strongly correlated with transparency levels.

The lack of a strong association between budget shortfalls and fiscal transparency in particular is interesting. While effective gathering and dissemination of fiscal information requires the use of scarce resources, we suspect that cities with budget shortfalls, being more reliant on central government transfers, already face more pressure to have well organized fiscal data. They may also be unwilling to risk the displeasure of central and provincial authorities by taking their money and then refusing to disclose how it is spent. Officials in the powerful Ministry of Finance might conceivably pay some attention to budgetary transparency; it seems less probable that they would hold cities to account for lack of transparency in other realms.

What explains the association between large budget deficits and low levels of transparency? The first and most obvious answer is that budget-poor cities lack the resources to carry out transparency measures. If local governments cannot fund the delivery of basic public services, they are unlikely to invest in the additional infrastructure and training required to carry out transparency measures. 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*) (Ibid. 2014, 14).

However, recent innovations in pollution monitoring suggest that the affordability explanation is insufficient, because local governments no longer need to foot bill for pollution 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, factories have been known to tamper with this technology to alter pollution readings, or city governments simply refuse to release pollution readings<sup>6</sup>. This suggests that resource limitations alone cannot explain non-compliance with transparency measures; in fact, local economic interests might also dictate whether or not the local government chooses to enforce transparency measures.

For instance, recent case studies of failed transparency suggest that powerful economic interests or local business play a role in dissuading the government from disclosing pollution information (Li Wanxin, 2011), and the Wang (2015) piece discussed earlier suggests local authorities put pressure on local courts to protect their revenue generators. Our results support this hypothesis that other interests are at play. In Table 1, we see that the association between budget shortfalls and fiscal transparency is weaker than that between budget shortfalls and pollution transparency. If transparency were simply an affordability issue, then non-compliance should be similar across these two measures. In fact, our results show that transparency is much weaker when local government rely on the cooperation of local economic actors to disclose information, specifically in the case of pollution transparency. This suggests that the affordability explanation is, at best, incomplete. How might local economic interests explain the relationship between large budget deficits and low levels of transparency?

We believe this behavior results from 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

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<sup>6</sup> Interviews with Chinese ENGOs, Beijing (February and April 2015)

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, 16-17). Nor will they risk alienating potential investors with strict pollution transparency measures. In addition, promotion in the Communist party is strongly associated with successful revenue collection, perhaps even more than GDP growth (Shih, Adolph and Liu, 2012; Lü and Landry, 2014; Kung and Chen, 2014). Officials from budget poor cities can therefore make up for poor performance in policy implementation with a strong track record of revenue collection.

In contrast, cities with a solid revenue base have incentives to balance revenue collection with other kinds of performance. 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 budget-rich cities might also use a strong performance on environmental issues to distinguish themselves from other officials in their bid to be promoted. In these cities, healthy revenue streams also free officials from making the impossible choice between wooing investors to fund local services or implementing transparency and alienating investors. Instead, they can 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 behaviour 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 (Interview with Chinese ENGO, January 2015).

An observable implication of this theory is that the effect of pollution or FDI on disclosure should also be conditional on a city's fiscal situation. Cities with healthy budgets and small shortfalls should exhibit evidence of a race to the top, in which higher levels of FDI or pollution 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 budgets should be more tempted to engage in a race to the bottom. In cities with big budget gaps, the correlation between FDI or pollution and transparency should be attenuated or even reversed. In these cities, officials 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.

Finally, there should be no discernible relationship between overall disclosure and either pollution or FDI. The CASS broad transparency measure rates cities on a number of dimensions that are unlikely to be related to industry and investment, like disclosure of information

regarding education and agriculture. As a result, we should expect to see no statistically significant interaction when the dependent variable is the CASS measure.

Table 2 shows interaction effects consistent with this theory, in which well-financed cities race to the top to attract investors, while cities with limited own-source revenues race to the bottom. For simplicity, we present interaction effects without controls. The results show statistically significant negative interaction effects between budget shortfalls and both pollution and FDI, regressed on either of the two pollution transparency measures. Qualitatively, this means that in cities with no budget shortfall, increases in FDI or in air pollution are associated with greater pollution transparency. However, the greater the budget shortfall, the weaker this relationship becomes.<sup>7</sup>

Figure 1 illustrates this with graphical representations of the interaction results, showing plots of the “marginal effects” of pollution and FDI on transparency. The plots enable a straightforward comparison between low-deficit and high-deficit cities, by examining the left and right tails of the regression lines. We plot these results over the range of budget shortfalls that appear in the sample used, roughly 0 to 2. An examination of the left tail of the regression line in plots 1(a) and 1(b) shows that for cities with low budget deficits, more air pollution is associated with more disclosure of pollution information. At the right tail of the regression line, in high-deficit cities, the estimated correlation between air pollution and disclosure becomes negative, though it is only statistically significant for one of the indices. However, of the 173 cities in our data not included in this study due to the lack of transparency measures, approximately one fourth have budget shortfalls exceeding 2.0. Our estimates suggest that the negative relationship between pollution and transparency would be even more strongly negative for these cities.

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<sup>7</sup> In table A5 in the appendix, we show that results are similar if we include the “kitchen sink” set of controls, although they the magnitude and statistical significance of the key coefficients become more sensitive to model specification and measurement approach.



Plots 1(d) and 1(e) tell a similar story about the relationship between disclosure and FDI, conditional on the budgetary situation. The left tails of the regression lines show that in cities with low budget deficits, more FDI is actually associated with more transparency. However, that result essentially disappears or becomes negative in cities with high budget deficits. Finally, figures 1(c) and 1(f) present interaction effects in which the CASS measure of overall transparency is the dependent variable. If the statistical results were due to some other unobserved factor, this factor might also be expected to cause similar variation in the CASS measure. The flat and non-significant estimates are consistent with our theory, which implies that the coefficients of pollution and FDI effects should not be correlated with budgetary variables.

We caution that these interaction marginal “effects” are simply statistical associations. Still, they are consistent with our hypothesis about the incentives facing officials in Chinese cities, namely that the pressure to collect revenue from businesses and other sources leads to differentiated strategies. Cities with a strong budgetary position respond to foreign investment and existing pollution problems by racing to the top, taking the lead in implementing pollution transparency measures that will help mitigate the problem in order to make themselves more attractive to high-end foreign investors and to serve as showcases for China’s modernization. Cities that are struggling to get by, on the other hand, lag on pollution disclosures. They seem reluctant to harm the revenue-generating firms they already have, and may house lower-end foreign investment that also prefers not to have its operations monitored too closely.

## 5 Discussion

China's experience with decentralization has not always been so mixed. Early experiments with decentralization can be linked to astounding economic successes. Why, then, did China's experiments with fiscal decentralization fail to bring the hoped-for improvements in government efficiency and responsiveness? Moreover, how have decades-old fiscal reforms managed to undermine more recent government efforts to improve governance by increasing local accountability?

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

First, among cities with limited own-source revenue, higher levels of FDI are associated with less transparency. This offers suggestive, though not conclusive, evidence of a race to the bottom among budget-strapped cities. An important body of work argues that authoritarian governments will offer limited rule of law in order to attract foreign investment (Wang, 2014). This could explain why the Chinese central government chose to implement transparency reforms. Yet our analysis contradicts this pattern: cities with weak own-source revenue and high levels of FDI have lower levels of transparency. These results cast doubt on the idea that jurisdictions compete for foreign investment by offering limited and transparent government. Rather, certain types of investors may find the lack of transparency attractive.

Second, among cities with large fiscal shortfalls, higher levels of pollution are associated with less transparency. In conjunction with the observation that FDI is not necessarily associated with transparency, this suggests a potential motive for non-disclosure. Rather than risk the flight

of investors in polluting industries, cities resist the implementation of pollution disclosure measures. In other words, they attract investors by offering a weak regulatory environment where pollution will go unpunished. We suggest this ‘race to the bottom’ has emerged because the incentives to increase tax revenue compete with incentives to improve transparency. This tradeoff is especially stark for officials from poorer cities who, in their pursuit of promotion, 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.

Recent studies suggest that transparency is sacrificed for growth when powerful firms are connected to central government, and use these connections to evade regulations (Wang, forthcoming). Similarly, well-connected provincial governors appear to use their political ties to shirk costly anti-pollution measures (Jia, forthcoming). Our results suggest that non-compliance may also stem from decisions at the local level: firms are protected not just because of political connections but because they provide a steady stream of local revenue. And local officials shirk anti-pollution measures because the costs of not implementing these measures outweigh the benefits of revenue generation. Amidst the stark division between the haves and have-nots of local governments, we see differentiated strategies emerge: 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.

If mixed fiscal institutions continue to drive budget-poor and budget-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 driven revenue-starved local governments to defy the center's attempts to offer limited rule of law by engaging in a 'race to the bottom'. Early experiments with decentralization may have improved local governance precisely because they aided growth. 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.

## References

- Achen, Christopher H. 2005. "Let's Put Garbage-Can Regressions and Garbage-Can Probits Where They Belong." *Conflict Management and Peace Science* 22 (4): 327–339.
- Bardhan, Pranab. 2002. "Decentralization of Governance and Development." *Journal of Economic Perspectives*, 16 (4): 185-205
- Cai, Hongbin and Daniel Treisman. 2006. "Did Government Decentralization Cause China's Economic Miracle?" *World Politics* 58 (4): 505–535.
- Darch, Colin and Peter G Underwood. 2009. *Freedom of Information and the Developing World: The citizen, the state and models of openness*. Oxford: Chandos.
- Distelhorst, Greg. 2013. *Publicity-Driven Accountability in China*. PhD thesis. Massachusetts Institute of Technology.
- Distelhorst, Greg 2015. "The Power of Empty Promises: Quasi-democratic Institutions and Activism in China." MIT Department of Political Science Working Paper.
- Distelhorst, Greg and Yue Hou. 2014. "In group Bias in Official Behavior: A National Field Experiment in China." *Quarterly Journal of Political Science* 9(2): 203–230.
- Faguet, Jean-Paul. 2012. *Decentralization and popular democracy: Governance from below in Bolivia*. Ann Arbor: University of Michigan Press
- Faguet, Jean-Paul. 2014. "Decentralization and Governance." *World Development* 53: 2–13
- Gallagher, Mary E. 2006. "Mobilizing the Law in China: "Informed Disenchantment" and the Development of Legal Consciousness." *Law & Society Review*. 40(4): 783-816.
- Garman, Christopher, Stephan Haggard, and Eliza Willis. 2001. "Fiscal Decentralization: A Political Theory with Latin American Cases." *World Politics*. 53(2): 205-237
- Gervasoni, Carlos. 2010. "A Rentier Theory of Subnational Regimes: Fiscal Federalism, Democracy, and Authoritarianism in the Argentine Provinces." *World Politics* 62(2): 302–340.
- Heilmann, Sebastian, and Elizabeth J. Perry, eds. *Mao's invisible hand: the political foundations of adaptive governance in China*. Cambridge, MA: Harvard University Asia Center, 2011.
- Holdaway, Jennifer .2010. "Environment and Health in China: an introduction to an emerging research field," *Journal of Contemporary China*, 19(63): 1-22

- Huang, Yasheng. 2008. *Capitalism with Chinese Characteristics: Entrepreneurship and the State*. New York: Cambridge University Press
- Jia, Ruixue. Forthcoming. "Pollution for Promotion." IIES, Stockholm University (Working paper)
- Jia, Ruixue, Kudamatsu, Masayuki, and Seim, David. Forthcoming. "Complementary roles of connections and performance in political selection in China." *Journal of the European Economic Association*.
- Kennedy, John. 2013. "Finance and Rural Governance: Centralization and Local Challenges." *Journal of Peasant Studies*. 40(6): 1009–1026
- Kung, James Kai-sing and Ting Chen. 2014. "Land Revenue Windfalls, Signalling, and Career Incentives of China's Local Leaders." (working paper)
- Landry, Pierre F. 2008. *Decentralized Authoritarianism in China*. New York: Cambridge University Press.
- Li, Shiyu and Shuanglin Lin. 2011. "The Size and Structure of China's Government Debt." *The Social Science Journal* 48(3): 527–542.
- Li, Wanxin. 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
- Liebman, Benjamin. 2014. "Legal Reform: China's Law-Stability Paradox." *Daedalus*. 143(2): 96-109
- Lo, Carlos Wing-Hung, Gerald E. Fryxell, Benjamin van Rooij, Wei Wang, Pansy Honying Li. 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 (2012): 227-235
- Lorentzen, Peter, Pierre Landry and John Yasuda. 2014. "Undermining Authoritarian Innovation: The Power of China's Industrial Giants." *The Journal of Politics* 76(01): 182-194.
- Lü, Xiaobo, and Pierre F. Landry. 2014. "Show Me the Money: Interjurisdiction Political Competition and Fiscal Extraction in China." *American Political Science Review* 108 (3): 706-722.
- Man, Joyce Yanyun. 2011. "Local Public Finance in China: An Overview." in Man, Joyce Yanyun and Hong, Yu-Hung ed. 2011. *China's Local Public Finance in Transition*. Lincoln Institute of Land Policy: 3-20

- Manor, J. (1999). *The Political Economy of Democratic Decentralization*. Washington, DC: The World Bank.
- Meng, Tianguang, Jennifer Pan and Ping Yang. 2014. "Conditional Receptivity to Citizen Participation: Evidence from a Survey Experiment in China." *Comparative Political Studies* :1-35
- Miguel, Edward. 2004. "Tribe or nation? Nation building and public goods in Kenya versus Tanzania." *World Politics* 56(03): 328–362.
- Montinola, Gabriella, Yingyi Qian and Barry R Weingast. 1995. "Federalism, Chinese Style: The Political Basis for Economic Success in China." *World Politics* 48(01): 50–81.
- Morrison, Kevin M. 2009. "Oil, Nontax Revenue, and the Redistributive Foundations of Regime Stability." *International Organization* 63(01): 107–138.
- O'Brien, Kevin J., and Rongbin Han. 2009. "Path to democracy? Assessing village elections in China." *Journal of Contemporary China*. 18(60) : 359-378.
- O'Brien, Kevin J and Lianjiang Li. 2000. "Accommodating Democracy in a One-Party State: Introducing Village Elections in China." *The China Quarterly* 162: 465–489.
- Oi, Jean, Kim S. Babiarez, Linxiu Zhang, Renfu Luo and Scott Rozelle. 2012. Shifting Fiscal Control to Limit Cadre Power in China's Townships and Villages. *The China Quarterly* 211: 649-675
- Ong, Lynette. 2006. "The Political Economy of Township Government Debt: Township Enterprises and Rural Financial Institutions in China." *The China Quarterly* 186: 377-400.
- Pearson, Margaret. 2011. "Variety Within and Without: The Political Economy of Chinese Regulation," in Kennedy, S. ed. *Beyond the Middle Kingdom*. Stanford: Stanford University Press
- Pei, Minxin. 1997. "Citizens v. mandarins: administrative litigation in China." *The China Quarterly*. 152: 832-862.
- Perry, Elizabeth and Sebastian Heilmann. 2011. *Mao's Invisible Hand: The Political Foundations of Adaptive Governance in China*. Harvard: Harvard University Press
- Piotrowski, Suzanne J, Yahong Zhang, Weiwei Lin and Wenxuan Yu. 2009. "Key Issues for Implementation of Chinese Open Government Information Regulations." *Public Administration Review* 69(s1): S129–S135.
- Ran, Ran and Han, Donglin. 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: April 2014.
- Rodden, Jonathan. 2002. "The Dilemma of Fiscal Federalism: Grants and Fiscal Performance around the World." *American Journal of Political Science* 46(3): 670–687.
- Rodden, Jonathan. 2004. "Comparative Federalism and Decentralization: On Meaning and Measurement." *Comparative Politics* 36(4): 481–500.
- Shih, Victor, Christopher Adolph and Mingxing Liu. 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, Victor, and Qi Zhang. 2006. "Who receives subsidies? A look at the county-level in two time periods." In Vivienne Shue and Christine Wong (eds.), *Paying for Progress in China*. London: Routledge.
- Stockmann, Daniela. 2012. *Media Commercialization and Authoritarian Rule in China*. New York: Cambridge University Press,
- Treisman, Daniel. 2007. *The Architecture of Government: Rethinking Political Decentralization*. Cambridge: Cambridge University Press.
- Truex, Rory. 2014. "Consultative Authoritarianism and Its Limits." *Comparative Political Studies*.
- Tsui, Kai-yuen. 2005. "Local Tax System, Intergovernmental Transfers and China's Local Fiscal Disparities." *Journal of Comparative Economics* 33(1):173–196.
- Van Rooij, Benjamin. 2010. "The People vs. Pollution: Understanding Citizen Action Against Pollution in China." *Journal of Contemporary China*. 19(63): 55-77.
- Wallace, Jeremy L. 2014. "Juking the Stats? Authoritarian Information Problems in China." *British Journal of Political Science*. Forthcoming.
- Wang, Alex. 2013. "The Search for Sustainable Legitimacy: Environmental Law and Bureaucracy in China," *Harvard Environmental Law Review*. 37: 365-440
- Wang, X. and R. Herd. 2013. "The System of Revenue Sharing and Fiscal Transfers in China", *OECD Economics Department Working Papers*, No. 1030, OECD Publishing. <http://dx.doi.org/10.1787/5k4bwnwtmx0r-en>
- Wang, Yuhua. 2014. *Tying the Autocrat's Hands: The Rise of the Rule of Law in China*. Cambridge: Cambridge University Press.
- Wang, Yuhua. 2015. "Judicial Hierarchy and Judicial Outcomes: Evidence from a Natural Experiment in China." Working paper.



- Wang, Yuhua. Forthcoming. "Politically-connected polluters under smog," *Business and Politics*
- Weingast, Barry R. 1995. "The economic role of political institutions: market-preserving federalism and economic development." *Journal of Law, Economics, & Organization* 11(1): 1-31.
- Weingast, Barry R. 2009. "Second Generation Fiscal Federalism: The Implications of Fiscal Incentives." *Journal of Urban Economics* 65(3): 279–293.
- Weingast, Barry. 2014. "Second Generation Fiscal Federalism: Political Aspects of Decentralization and Economic Development," *World Development* 53: 14-25
- 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.
- Xiao, Weibing. 2013. "Freedom of Information Reform in China: Information Flow Analysis." *International Review of Administrative Sciences* 79(4): 790–808.
- Xu, Chenggang. 2011. "The Fundamental Institutions of China's Reforms and Development," *Journal of Economic Literature*. 49(4): 1076-1151
- Zhang, Le-Yin. 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, Li and Zheng, Xinye. 2011. "The Determinants of Intergovernmental Transfer," in Man, Joyce, Yanyun and Hong, Yu-Hung ed. 2011. *China's Local Public Finance in Transition*. Lincoln Institute of Land Policy: 191-202
- Zhao, Yuezhi. 2000. "Watchdogs on party leashes? Contexts and implications of investigative journalism in post-Deng China." *Journalism Studies* 1.4 : 577-597.

Table 1: Least squares regressions of city-level fiscal shortfalls on several measures of transparency.

Domain:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Source:	Pollution PITI	Pollution PITI	Pollution AQTI	Pollution AQTI	Fiscal Qinghua	Fiscal Qinghua	Overall CASS	Overall CASS
Fiscal shortfall	-19.10*** (3.311)	-10.61** (4.388)	-16.66*** (2.277)	-5.764** (2.362)	-0.408*** (0.132)	-0.152 (0.199)	-30.84*** (4.334)	-20.91*** (6.067)
Ratio of services in GDP		-11.67 (11.42)		5.712 (7.462)		0.255 (1.483)		-9.133 (21.86)
Large firm dominance		-3.360*** (1.024)		-2.123*** (0.641)		-0.158 (0.174)		-0.631 (1.509)
Air pollution (PCA)		0.726 (0.802)		2.037*** (0.473)				
Log GDP per capita		2.188 (3.506)		0.376 (2.903)		-0.0181 (0.417)		-3.191 (8.375)
Log population 2007		1.115 (3.304)		0.0790 (2.566)		0.0424 (0.404)		2.921 (4.613)
Coastal city		0.344 (3.174)		2.448 (1.996)		0.0928 (0.338)		8.562** (4.199)
Log budget expenditure		5.354* (2.927)		5.895** (2.341)		0.170 (0.369)		4.356 (5.213)
Constant	43.76*** (1.872)	-39.87 (29.11)	47.14*** (1.602)	-34.31 (22.98)	3.746*** (0.151)	1.886 (3.086)	56.63*** (2.245)	14.41 (55.37)
Observations	113	113	113	113	78	78	43	43

Robust standard errors in parentheses

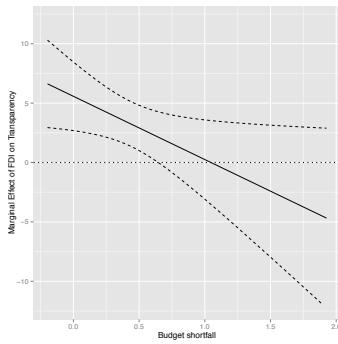
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 2: Least squares regressions of city-level fiscal shortfalls, FDI, and pollution on several measures of transparency.

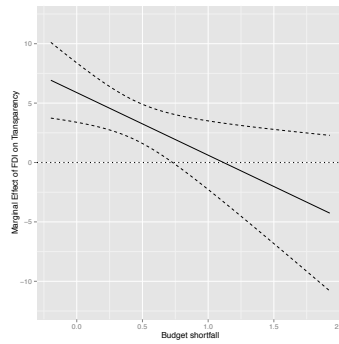
	(1)	(2)	(3)	(4)	(5)	(6)
Domain:	Pollution	Pollution	Overall	Pollution	Pollution	Overall
Source:	AQTI	PITI	CASS	AQTI	PITI	CASS
Fiscal shortfall	-41.06*** (8.792)	-42.99*** (14.16)	-10.91 (37.60)	-16.19*** (2.158)	-21.73*** (3.397)	-22.00** (6.238)
FDI to GDP ratio	5.886*** (0.979)	5.831*** (1.274)	3.583 (2.888)			
Fiscal shortfall X FDI to GDP ratio	-5.271*** (1.513)	-5.135** (2.297)	2.351 (6.655)			
Air pollution (PCA)				4.205*** (0.800)	3.250*** (0.992)	2.333 (2.053)
Fiscal shortfall X Air pollution (PCA)				-3.552*** (0.874)	-4.742*** (1.449)	0.332 (2.376)
Large firm dominance				-3.185*** (0.578)	-3.478*** (0.769)	-4.633*** (1.175)
Constant	76.48*** (5.265)	72.94*** (6.851)	73.10*** (14.14)	60.41*** (3.234)	59.35*** (4.486)	75.89*** (5.213)
Observations	107	107	42	113	113	41

Robust standard errors in parentheses

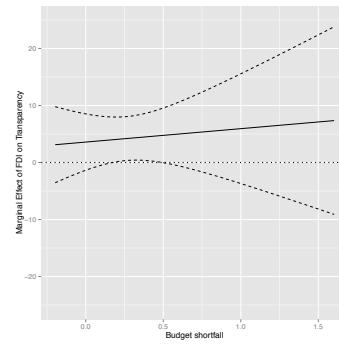
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



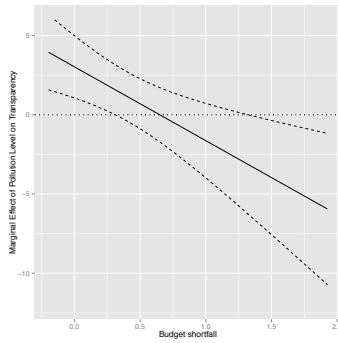
(a) Marginal Effect of FDI on Transparency, PITI



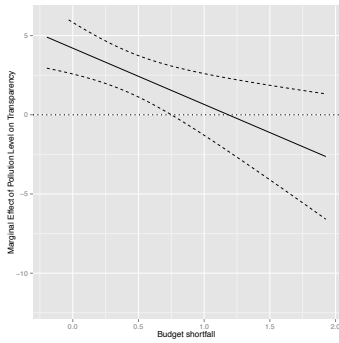
(b) Marginal Effect of FDI on Transparency, AQTI



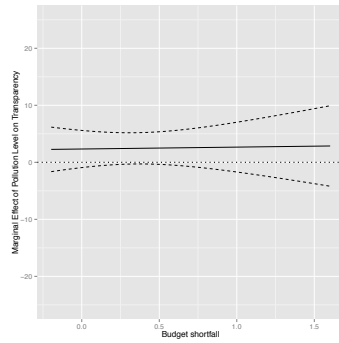
(c) Marginal Effect of FDI on Transparency, CASS



(d) Marginal Effect of Pollution on Transparency, PITI



(e) Marginal Effect of Pollution on Transparency, AQTI



(f) Marginal Effect of Pollution on Transparency, CASS

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