

# Street-Level Responsiveness of City Governments in China, Germany, and the United States

**Ekkehard Köhler**<sup>a</sup> University of Siegen

**John G. Matsusaka**<sup>b</sup> University of Southern California

**Yanhui Wu**<sup>c</sup> University of Hong Kong

This paper presents evidence from parallel field experiments in China, Germany, and the United States. We contacted the mayor's office in over 6,000 cities asking for information about starting a new business. Chinese and German cities responded to 36-37 percent of requests while American cities responded only to 23 percent of requests. American and German cities were more responsive to requests from citizens than foreigners; Chinese cities were more responsive to requests from men than women. Chinese cities were more responsive to requests about starting a construction than a green business, and when the mayor was up for promotion. The evidence suggests that street-level bureaucrats exercise substantial discretion in all three countries, but use that discretion in different ways.

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<sup>a</sup> [ekkehard.koehler@uni-siegen.de](mailto:ekkehard.koehler@uni-siegen.de)

<sup>b</sup> [matsusak@usc.edu](mailto:matsusak@usc.edu)

<sup>c</sup> [yanhuiwu@hk.uhk](mailto:yanhuiwu@hk.uhk)

## 1. Introduction

Government performance is often viewed as the product of decisions made by political leaders, who formulate policies and are ultimately accountable for outcomes. Yet the effectiveness of government also depends on how policies are implemented at the operational level by unelected government workers who form the primary point of contact between citizens and their governments. The critical role of street-level workers was cast in a harsh light during China's lockdown of Shanghai during the COVID pandemic, where so-called "Big Whites" – the lowest level of government workers, named for the hazmat suits they wear – were on the front lines distributing food supplies, conducting tests, and enforcing lockdowns, and became the target of citizen frustration when things went wrong.<sup>1</sup> The challenge of motivating and monitoring street-level bureaucrats is relatively unexplored in the study of government effectiveness under both democracy and autocracy.<sup>2</sup> In this paper, we provide both descriptive facts and large-scale experimental evidence on the provision of operational-level services by street-level bureaucrats in more than 6,000 cities in China, Germany, and the United States based on identical field experiments conducted in each country in 2017-2018. We find that local workers in each country exercise substantial discretion in ways that bias and reduce government effectiveness.

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<sup>1</sup> See <https://www.bloomberg.com/news/articles/2022-05-23/shanghai-easing-stalls-over-resistance-of-neighborhood-enforcers>; <https://www.bloomberg.com/news/articles/2022-04-26/anger-erupts-at-xi-s-big-white-army-of-lockdown-enforcers>; and Cheng et al. (2022). We draw the term "street-level" bureaucracy from the public administration literature (Lipsky, 2010).

<sup>2</sup> For examples of recent research on bureaucratic performance, see Finan et al. (2017); Rasul and Rogger (2018); Best et al. (2019); Bandiera et al. (2021); and Bosio et al. (2022).

The specific service we study is provision of information about city rules and regulations: we contacted the mayor's office in each city, requesting information on the procedures for starting a new business. The outcome of interest is whether a city responded to our request or not. We chose to assess this particular service because it is a universal function of local governments, simple to provide, and easy to measure. Almost all citizens need to navigate the bureaucracy of their governments from time to time. Our choice to focus on information about starting a new business was motivated by the fact that countries require completion of numerous procedures in order to open a business, such as registering, acquiring a tax ID, and so forth (Djankov et al. 2002). Helping the public get through this thicket is important for new business formation and economic performance.

Formally, street-level bureaucrats are charged to carry out policies established by higher-level political officials, but in practice they may have significant discretion in how – or even whether – they implement policies. Street-level agents may not share or even be fully aware of the goals of political leaders, and the tools available to motivate government workers are limited due to flat wages and civil service protections that make removal difficult. Consequently, street-level bureaucrats may substitute their own goals, prioritize service to those they deem most worthy, or simply not provide the service. A key question is how well top leaders are able to manage the agency problems within their organizations: to what extent do bureaucrats follow top-down policies versus their own “bottom-up” preferences (Besley and Ghatak 2005; Lipsky 2010; Finan et al. 2017)?

The amount of discretion depends on incentives embedded in the political hierarchy. In an autocracy like China, political leaders have strong incentives to create top-down pressure on bureaucrats whose actions can directly affect the performance measures that determine the

leaders' career advancement, and office workers sometimes receive bonuses based on achievement of policy goals, such as attracting foreign investment. The cost of such incentive schemes is potentially inefficient substitution into measured activities and out of unmeasured activities. In a democracy, adherence to policy directives depends to a large degree on bureaucrats' intrinsic motivation, and they may use discretion to advance their personal policy preferences or biases instead of political leaders' career concerns. It is unclear a priori which political system produces more effective bureaucratic performance. One reason we run our experiments across three countries is to begin creating an evidence base on the differences and similarities in bureaucratic practices under different forms of government.

For roughly 2,000 cities in each country, we identified the most common electronic method to contact the mayor's office.<sup>3</sup> We sent each office a letter in the country's native language indicating a desire to form a new business in the city, and requesting help identifying the requisite procedures, with a fictitious signatory and return email address. These surveys establish some comparative stylized facts: overall, Chinese cities responded to 36 percent of requests, compared to 37 percent in Germany and 22 percent in the United States. Street-level responsiveness was materially higher in China and Germany than the United States. Although Chinese officials do not have to face voters, they appear to have incentive to respond to public inquiries. At the same time, in all three countries nearly two-thirds of requests for help were ignored, indicating that street-level bureaucrats exercised considerable discretion in deciding whether to respond.

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<sup>3</sup> As the analog to American and German cities, we use Chinese *xian*, not prefectures; see below.

To formally test for the use of discretion, we varied the experimental treatment in terms of the gender and nationality of the person sending the letter. These characteristics may matter to street-level workers if they are biased against certain groups – but discriminating on those grounds is not a top-down directive. In terms of gender, we find that Chinese cities were 6 percent less likely to respond to an inquiry from a woman than a man; German cities showed no significant difference in responses by gender; and American cities were 4 percent *more* likely to respond to a woman than a man. In terms of nationality, we find that American cities were 16 percent and German cities 11 percent more likely to respond to an inquiry from a citizen than a foreigner, while Chinese cities were equally likely to respond to requests from citizens and foreigners. These causal effects align with social biases documented in each country by the World Values Survey. Since all three countries have high-level policies against discrimination on gender, and to some extent nationality, the existence of these types of discrimination appears to be an exercise in bureaucratic discretion.<sup>4</sup>

We conducted additional tests tailored to detect the presence of top-down pressures specifically in China. In nondemocratic governments, a politician's career advancement depends on gaining approval from higher-level leaders that control the promotion process (Xu, 2011), and theory suggests that autocrats will emphasize economic growth in order to maximize the

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<sup>4</sup> The bias against foreigners in Germany and the United States could be due to top-down pressure to favor voters over nonvoters, as the logic of vote-maximization suggest. Audit studies on American legislators tend to find that they respond more to their voting constituents than others, for example, Broockman (2013). However, we find no connection between response rates and voter turnout in these countries, suggesting that responses are not driven by a desire to please voters.

resources they can extract (Olson 1993).<sup>5</sup> If street-level bureaucrats in an autocracy are influenced by top leaders, theory then suggests they would prioritize of economic growth. To test this proposition, we varied the nature of the business mentioned in the letter between a conventional industrial product (construction materials) and an environmentally friendly product (recycling). Chinese cities were 9 percent more likely to respond to a letter mentioning the industrial business than the green business. In American and Germany cities, which function here as a benchmark, bureaucrats did not significantly differentiate between these requests. The Chinese evidence is consistent with the idea of top-down pressure for economic growth, which squares with autocratic theory and conventional descriptions of Chinese politics.

To further assess the importance of top-down pressures in China, we conducted another experiment calibrated to features of the Chinese promotion process. We conjecture that mayors are more likely to care about responsiveness when they are being considered for promotion. To test this, we randomized the date of our inquiry, either before or after the quinquennial Chinese National People's Congress, which occurs around the time that mayors for the next five years are selected at provincial and prefectural congresses. We find modest support for this channel: mayoral offices were 4 percent more likely to respond to an inquiry before than after the National Congress. Interestingly, the response rate to green proposals (environmentally friendly projects) rose 5 percent prior to the National Congress, while support for dirty proposals (industrial businesses) was statistically unchanged. In light of rhetoric by top Chinese leaders on the importance of environmental protection, this finding suggests that, at the critical moment of

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<sup>5</sup> Olson's stationary bandit theory holds that autocrats support wealth creation in order to maximize the resources they can expropriate. Authoritarian regimes also care about public opinion in order prevent opposition from coalescing (Wintrobe 1998; Chen et al. 2016; Fisman et al. 2021).

promotion, local politicians may pressure bureaucrats to advance goals articulated by top leaders.

Our study is related to research on the quality and responsiveness of government across regimes.<sup>6</sup> The COVID pandemic rekindled debate over the effectiveness of autocratic versus democratic governments. In the early stages of the pandemic, authoritarians touted the quick and (apparently) effective responses of China and other one-party states, but subsequent lengthy and harsh lockdowns under China's zero-COVID policy have revealed a less-flattering side of the story. Most research on government quality relies on publicly available data, surveys of experts, or self-surveys of government workers.<sup>7</sup> Our study follows in the path of Chong et al. (2004) which uses a field experiment to assess the quality of postal services in 159 countries. We introduce a new metric – street-level responsiveness – which suggests that the governments of Chinese cities are about as responsive as the governments of German cities, and more responsive than American cities.

Our study is also related to an emerging literature on the importance of low-level bureaucrats for state effectiveness, which focuses on how incentives and bureaucratic discretion affect government performance (Finan et al. 2017). While this literature has studied the effects of granting discretion in specific countries, the basic question of how bureaucratic discretion and its use varies across countries is unexplored. Perhaps our central finding is that street-level

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<sup>6</sup> On policy responsiveness see Tausanovitch and Warshaw (2014), Caughey and Warshaw (2018), and Matsusaka (2020).

<sup>7</sup> For example, La Porta et al. (1999), Boittin et al. (2016), and the World Bank's Worldwide Governance Indicators: <https://info.worldbank.org/governance/wgi/>.

bureaucrats in these three countries appear to have exercised significant discretion, but used it in different ways.

Finally, our study is also close in spirit to correspondence studies involving local governments. Chen et al. (2016) and Distelhorst and Hou (2017) studied China, and Jensen et al. (2020) and White et al. (2015) studied American cities. Our study follows these others in assessing responsiveness, but it differs in its treatments, in requesting information about starting a new business, and its scope is broader in covering three countries. To the best of our knowledge, our paper is the first audit study of bureaucrats that asks identical questions across multiple countries.

## **2. Data and Methods**

### *2.1. Field Experiment*

Our field experiments involved sending electronic requests to the office of the city manager (“mayor”) for a sample of “cities” in China, Germany, and the United States in 2017 and 2018. The letters asked for help in locating information about how to open a business in the city. The requests were written in Chinese, German, or English, depending on the country. Table 1 shows the text of the letter, the treatments, and variants by country.<sup>8</sup>

We asked about starting a business for several reasons. First, new business formation is legally complex; Djankov et al. (2002) report that in order to start a new business, entrepreneurs must complete 12 regulatory procedures in China, 10 in Germany, and 4 in the United States.

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<sup>8</sup> Our gender treatment relies on variances in first names. We selected names based on internet searches of the most popular male and female names in each country.



Helping individuals navigate this bureaucracy could be important for new business formation. Second, this is a natural inquiry for a local government to receive in all three countries so is unlikely to trigger suspicions about the reason for the inquiry. Third, this experiment can be compared across countries (which would not be the case, for example, for a request to access a specific local welfare program). Fourth, information about business formation is nonpolitical in nature, so we are measuring the “routine” performance of local governments. Finally, responding to the inquiry is not difficult; the letter did not request the office to provide any documents, forms, etc. itself, only to direct the inquiry to the place where the information could be attained.

The outcome of interest is whether a city responded to the request for information. Our letter requested a response by email. We coded a city as having responded if it sent a response to the email address within 90 days, not counting automated responses. Cities in all three countries are familiar with using email to handle such inquiries, and most of them supply email contact information on their municipal web sites. In China, we used a city’s online platform instead of email when that was its preferred mode.

We chose China because our primary interest was understanding bureaucratic response in that country. We selected Germany and the United States because they are both economically advanced and give us democratic comparators in Europe and North America. With these three nations, we also include the most populous countries on these three continents, which we hope provides a useful baseline for future research. It would be interesting to extend the analysis to large countries that are less developed such as India and Brazil.

We chose to study cities because they are the lowest level of government that seemed (more-or-less) common across countries. Nevertheless, it should be recognized that there is

variation in the functions and powers of cities between countries, and even within countries, so the comparisons are not between perfectly identical units. We focused specifically on mayors (or their equivalent) because formally they are the top-level managers in cities. There are differences between the powers and responsibilities of mayors between the countries (and even within countries) and Chinese cities are larger, averaging 430,000 residents in our sample, compared to 57,000 in Germany and 65,000 in the United States. We would not expect those differences to have a big impact on how well a city fields routine inquiries from citizens since that is a basic function of government.

Our stratification involved block-randomization of treatments at the level of subnational governments encompassing the cities, as discussed below, in order to balance the treatments across cities within provinces/states. Appendix Table A1 reports covariate balance across different treatment groups.

## *2.2. Country-Specific Details*

**China.** At the subnational level, mainland China is divided into 31 provincial-level administrations that are divided into 333 prefectures. The prefectures are divided into *xian*. These lower-level administrative subdivisions are the closest analog to American and German cities, so our analysis focuses on them, and we call them “cities” for ease of exposition.<sup>9</sup> China

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<sup>9</sup> This may create some confusion since in English *xian* are often referred to as “counties” and prefectures are often called “cities,” but it substantially simplifies our exposition. We chose to study cities so-defined because they stand in approximately the same position in the administrative hierarchy as American and German cities. They are also the natural level of contact for starting a new business, although

has about 2,800 cities, so defined. For 2,164 of them we were able to locate contact information for the chief executive, which we call the “mayor,” who is appointed for a 5-year term.<sup>10</sup>

We conducted a pilot study in two of the least populated provinces in January 2017 to understand the administrative procedures of Chinese cities and familiarize our research assistants with the setting and technical issues. We conducted the actual study by sending requests in two waves, one in March/April 2017 and the second in March 2018. The reason for two waves was to distinguish responsiveness before and after reappointment, as discussed below. Cities were randomly assigned to waves. Most of our letters were sent by email, but some cities required use of an online forum or (rarely) a text message.<sup>11</sup> Our return email address was registered with 126.com, a popular Chinese email provider. Given that many prefectures do not have enough counties to support our multi-dimensional treatment, we stratified at the provincial level. Stratification at the prefecture level would have caused us to lose about one quarter of the cities.

**Germany.** Germany has a federal structure, with 16 states (*Länder*). The next lower government level consists of 107 cities (urban districts) and 295 *Landkreise* (rural districts). The rural districts perform some traditional city functions such as fire services sometimes, but are

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governments in some large townships (one level of government lower) are also responsible for new businesses.

<sup>10</sup> China is a single-party state controlled by the Chinese Communist Party (CCP). Every organization has a dual party-government structure, meaning that each city has a chief executive (mayor) and a CCP secretary that operate, roughly speaking, in parallel. When examining promotion incentives, we focus on the mayor, whose functions include supervision of routine investment-related matters.

<sup>11</sup> When a city required the inquiry to be verified by a registered phone number, we used a phone set up in China specifically for our experiment.

subdivided into smaller towns and villages that perform other city functions. We include all three types of governments in our study, and refer to them all as “cities.” Each of these cities so defined has an elected chief administrative officer that we call the “mayor” who serves a term ranging from 4 to 9 years, depending on the city.

We attempted to collect the mayor’s email address from each city’s web site for every city with at least 10,000 inhabitants. We sent requests for information in a single wave in December 2017 to 1,800 mayoral offices. The return email address was a combination of the alleged sender’s first and last names, registered with gmx.de, the German market leader for email. Our messages were bounced by the system in only 8 cases. We stratified at the state level.

**United States.** The United States has a federal structure with 50 states. Each state is divided into counties, and within counties are approximately 20,000 cities, towns, and villages. We identified contact information for 2,438 of the 2,540 cities with a population over 10,000.

A city’s chief executive may be elected, usually called a “mayor,” or appointed by the city council, usually called a “city manager.” For ease of exposition, we refer to all of these executives (including variants such as “town president”) as the mayor. We identified email addresses from [www.usmayors.org](http://www.usmayors.org). If that did not work, we looked up the address on the city’s web site.

We sent requests for information in November 2017. The return email address was a combination of the alleged sender’s first and last name, registered with gmail.com, a leading email provider in the United States. We stratified at the state level.

Our American experiment varied in one respect from the other two: we resent the message after one week if there was no response. We did this after noticing an unexpectedly low response rate in the initial wave; we were concerned that the messages might have been

labeled as spam or for some other reason went into a junk mail filter.<sup>12</sup> Lost messages would not create a problem from the viewpoint of assessing overall responsiveness – if a message did not get through then the inquiry did not get a response – but it could create a power issue when analyzing treatment effects. Because the treatment effects are central to the study, we decided to resend the message after seven days, which caused a modest bump in responses. With messages going twice to American cities, their response rate is not directly comparable with the rates from China and Germany. As discussed below, we have no reason to believe that the second message biases the treatment effects.

### **3. Experimental Evidence for China, Germany, and the United States**

#### *3.1 Main Findings*

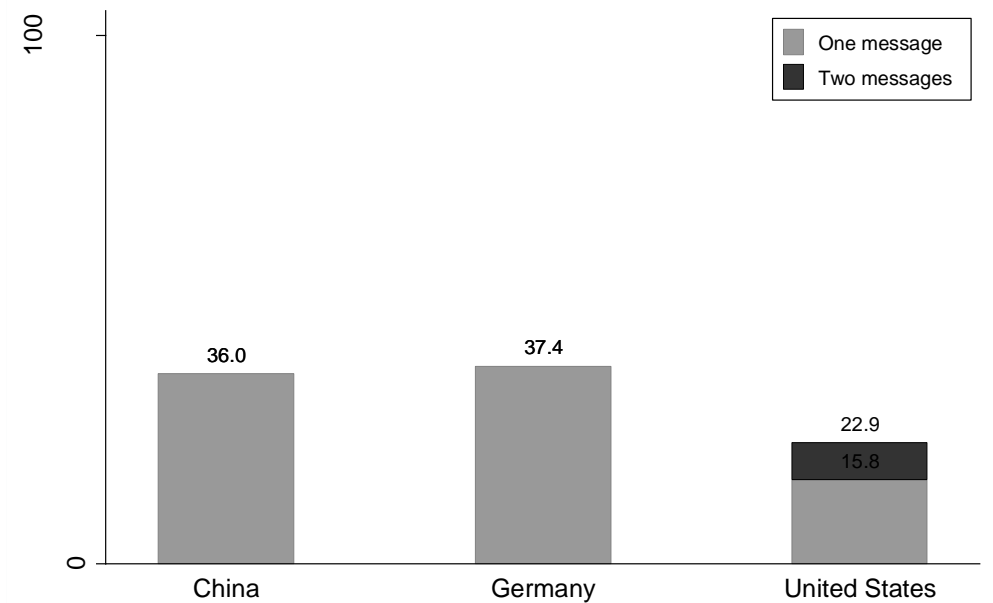
Figure 1 shows the response rates in the three countries. China and Germany had similar rates, 36.0 percent and 37.4 percent, respectively, while American cities were much less responsive, 22.9 percent. The low American response rate is especially notable since we sent the message twice to cities that did not respond within one week (the response rate in the first week was 15.8 percent.) Given that about two-thirds of requests in every country did not receive a response, it seems there is significant scope for bureaucratic discretion in every country, and top-down control may be limited.<sup>13</sup>

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<sup>12</sup> Our email messages bounced in 79 cities, which we treat as nonresponses.

<sup>13</sup> One can imagine situations in which a nonresponse is the result of a top-down directive, for example, in China inquiries about certain political topics might be out of bounds. We are unaware of reasons that mayors would prohibit responses to questions about starting a business. In Germany, Article 17 of the

Figure 1. Response to Public Inquiries by Mayoral Offices



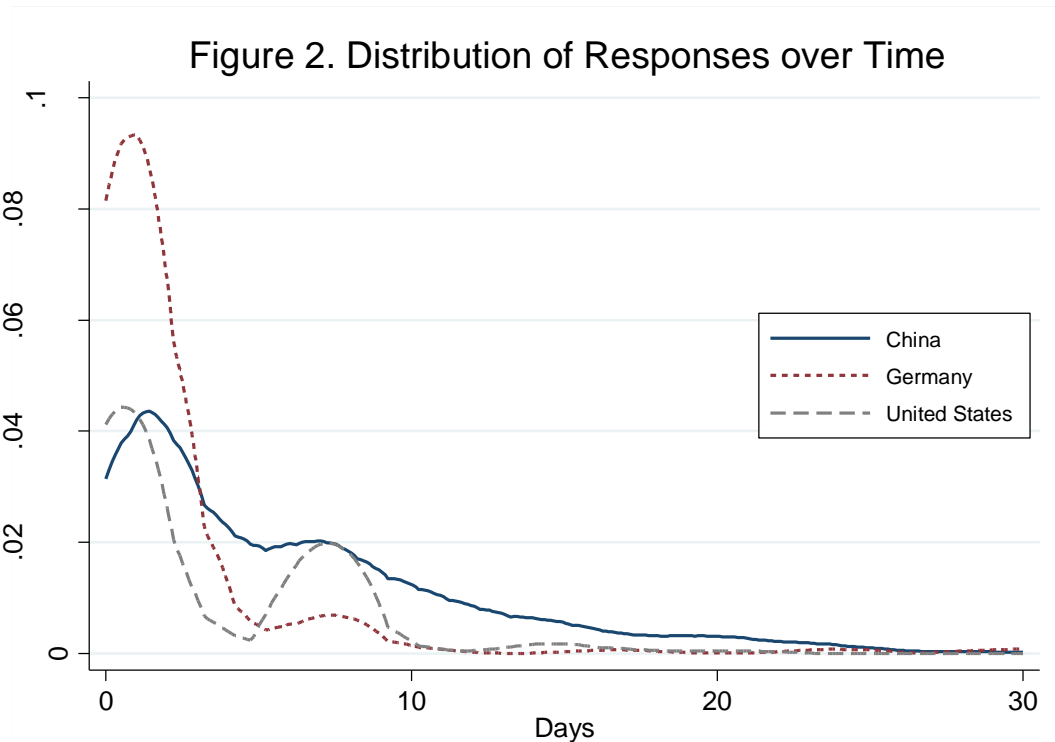
The Chinese response rate to our inquiry was comparable to the reply rate in two other Chinese audit studies that sought information through online forums. Chen et al. (2016) received a response from 32 percent of the 2,103 Chinese counties, and Distelhorst and Hou (2017) received a response from 43 percent of 1,225 service requests sent to prefectural governments.

Our study provides some context for these numbers by making identical inquiries in two other countries. Taken on its own, the response rate in China from these studies might seem low in that two-thirds of inquiries are ignored. However, with the perspective of similar evidence from Germany and the United States, local governments in China appear to be fairly responsive

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European Code of Good Administrative Behavior

(<https://www.ombudsman.europa.eu/de/publication/en/3510>) mandates a prompt response.



to requests for information. Not being a democracy does not imply a lack of responsiveness to public concerns.<sup>14</sup>

To flesh out the basic picture, Figure 2 shows the distribution (kernel density) of response times by country over the first month. German cities had the fastest initial response. Chinese cities responded with a lag, but passed the two other countries in less than a week. The second peak in American responses was due to the second message that we sent if a city did not respond after one week. The impression is that requests in China might have gone through an initial screening process that was absent in some German and American cities.

Figure 3 shows three treatment effects, one in each panel, with 95 percent confidence intervals. The top panel shows how responses varied for inquiries from a man versus a woman.

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<sup>14</sup> Some research suggests that Chinese governments may use communication platforms with citizens to monitor incipient discontent (Qin et al., 2017).

In Chinese cities, men were 6.1 percent more likely than women to get a response, statistically significant at the 1 percent level. In Germany there was a 3.1 percent bias in favor of men, not statistically different from zero. In the United States, there was a 3.9 percent bias in favor of women, statistically significant at the 5 percent level. Since all three countries have high-level policies prohibiting gender discrimination, these patterns indicate the exercise of some degree of street-level discretion, especially in China. Gender discrimination is well-documented in Chinese labor markets; our evidence indicates its presence in provision of government services as well.<sup>15</sup> For the United States, the findings may have been influenced by the “me-too movement” that dominated public discourse during the period of our experiment.<sup>16</sup>

The middle panel shows how responses varied with whether the inquiry came from a resident of the country as opposed to a foreigner. In letters to Chinese mayors, the foreigner was American; in the American and German letters the foreigner was Chinese. The desire to cultivate votes in a democracy suggests top-down pressure to favor their own citizens over foreigners, and that is what we see. In the United States, citizens were 16.5 percent more likely to get a response, and in Germany citizens were 10.8 percent more likely to get a response, both differences statistically significant at the 1 percent level. In contrast, in Chinese cities responses

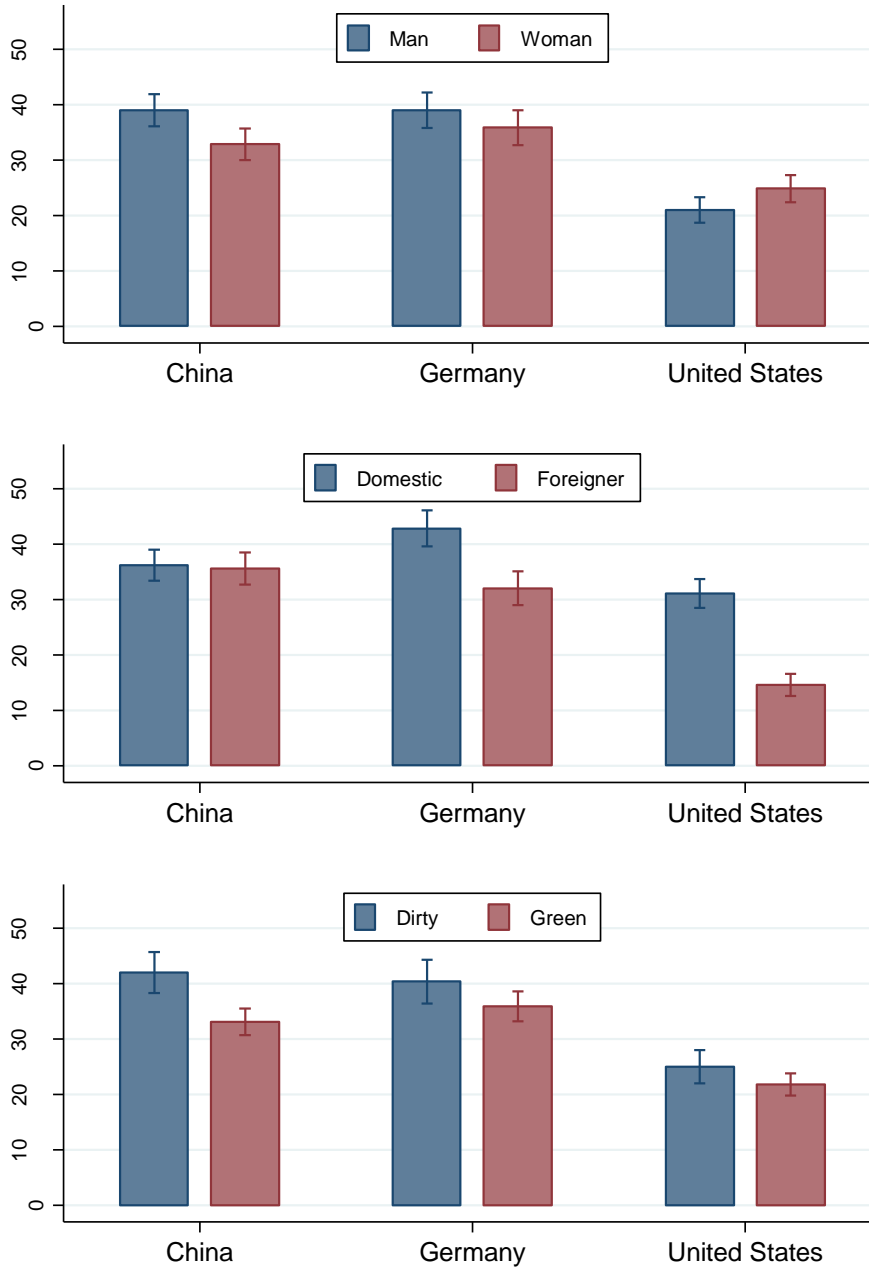
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<sup>15</sup> Private sector job listings in China often state a preference for or restriction to men, and field experiments show bias against women in hiring (Zhang et al. 2021). Similarly, 11 percent of civil service postings in China either indicate a preference or requirement for men (Human Rights Watch 2020).

<sup>16</sup> The “me-too movement” was sparked by allegations of sexual harassment against film producer Harvey Weinstein in October 2017, and quickly expanded to the broader issue of unequal treatment by gender.



Figure 3. Response Rate Treatment Effects



did not vary with the inquirer's nationality. This could be a consequence of not needing to please voters.

The bottom panel of Figure 3 shows how responses varied with the nature of the business to be set up. According to the letter, the new business would have been in construction

("dirty") or recycling ("green"). Chinese cities were 8.9 percent less likely to respond to inquiries that mentioned a green business compared to a dirty business, statistically significant at the 1 percent level. German and American cities were also less likely to respond to inquiries for green than dirty businesses, but the magnitudes are smaller, 4.5 percent and 3.2 percent respectively, and on the edge of conventional cutoffs for statistical significance ( $p = 0.07$  and  $p = 0.08$ , respectively). The favoritism of dirty businesses in China is consistent with notion of top-down pressure to promote economic growth, even at the cost of environmental degradation.<sup>17</sup>

### *3.2 Interpreting the Evidence*

At first glance, the evidence appears somewhat consistent with the idea that top-down pressures influence street-level responsiveness. The desire to maximize votes in democracies would account for better service for citizens than foreigners in Germany and the United States; while the absence of voters in China would account for its nondiscrimination against foreigners. The emphasis on dirty as opposed to green business in China is consistent with top-down pressures for economic growth as predicted by the stationary bandit theory of autocracy.

But other evidence suggests that bureaucratic discretion may be a big part of the story. For one thing, the simple fact that most responses went unanswered in every country indicates significant discretion. In addition, most biases observed in Figure 3 echo biases in public

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<sup>17</sup> We also estimated how response time (as opposed to a response dummy) varied with the treatments, coding nonresponses as 30 days. The differences remain qualitatively the same for all three treatments, for example, Chinese cities took longer to respond to women and American cities responded faster to women.

attitudes in each country according to the World Values Survey 2017-2020.<sup>18</sup> When asked about the impact of immigrants on the development of their country, 30.5 percent of Germans said that immigrants have a “bad” or “quite bad” impact, compared to 16.0 percent of Americans, and only 7.8 percent of Chinese. When asked if men make better business executives than women, 34.1 percent of Chinese respondents said they did, compared to 12.6 percent in the United States and 9.1 percent in Germany. If street-level bureaucrats share the biases of the population from which they are drawn, then the treatment effects by nationality and gender could be explained as discretionary bias in which bureaucrats give better service to members of socially favored groups.<sup>19</sup>

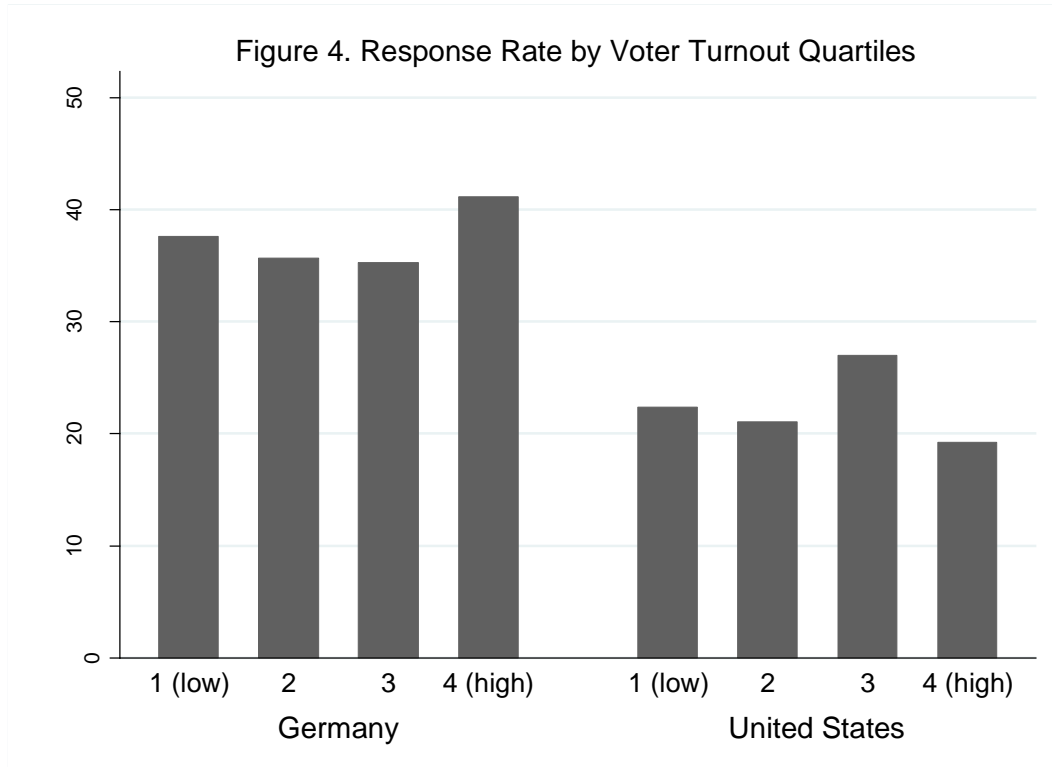
The public opinion data do offer some evidence for top-down pressure in China. When asked whether protecting the environment or creating jobs should be given priority, a large majority of Chinese and Germans favor prioritizing the environment, 68.2 percent and 63.4 percent respectively, while Americans were evenly split. The lower response to environmental projects in Chinese cities is not what would be expected if it was due to bureaucratic discretion, so this could be an instance where top-down pressure for economic growth was effective.

Voter turnout rates provide another piece of evidence that runs against the top-down explanation. If street-level bureaucrats were responding to pressure from above to maximize votes, we would expect higher responsiveness in cities where people are more likely to vote. However, Figure 4, which compares the response rates for cities by voter turnout quartiles, does

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<sup>18</sup> World Values Survey, Wave 7, 2017-2020, question Q21, Q121, and Q111.

<sup>19</sup> This parallels Distelhorst and Hou (2014), which finds that local officials in China discriminated against citizens with ethnic Muslim names.



not reveal such a pattern.<sup>20</sup> The relatively high response rate for the highest turnout quartile cities in Germany is not statistically different from the percentage in the lowest turnout quartile cities, and none of the differences are statistically significant in American cities either.<sup>21</sup>

The most natural explanation for variation in responses in Germany and the United States appears to be the personal attitudes of street-level bureaucrats. For China, personal

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<sup>20</sup> For American cities, we consulted state and county web sites and were able to locate city-level turnout numbers for the 2016 presidential election for 670 cities, which we divided by population. For Germany, we used district-level data from the 2017 federal election, produced by the Federal Returning Officer (<https://www.bundeswahlleiter.de/bundestagswahlen/2017/ergebnisse/wahlatlas.html>), assigning each city the turnout rate for its district, where the denominator is the number of citizens 18 years or older. Mean turnout was 76 percent in Germany and 61 percent in the United States. The picture is similar if we restrict to letters from domestic senders.

<sup>21</sup> We also estimated regressions in which the dependent variable was a response dummy and the explanatory variable was voter turnout and various regional fixed effects, with equally null results.

attitudes are also the likely explanation for response patterns with respect to foreigners and gender, but top-down incentives may play a role in responses to green versus dirty businesses.

#### **4. Exploring Top-Down Incentives in China**

The relatively high response rate in China suggests that top-level control of local bureaucrats might be more effective in China than in the United States. Here we search for other evidence of top-down pressure in China by estimating whether mayors increased responsiveness when they were being considered for promotion.

In a nondemocratic state such as China the career advancement of lower-level politicians is in the hands of upper-level officials, not voters. A strand of literature has found evidence of a corresponding “political business cycle” in China – increased investment and economic activity at the end of a term – for provincial and prefectural political leaders (Imai 1994; Guo 2009; Nie et al. 2013; Chen and Zhang 2021). Extending this argument to bureaucratic performance, we expect that mayors would put more pressure on street-level workers to respond when the mayor is being evaluated for promotion.

Because the exact date of promotion decisions for local officials is not public information and varies somewhat by region, it is not possible to design an experiment directly linked to the decision. Nevertheless, the convening of the quinquennial National People’s Congress provides a potential country-wide top-down treatment. In China, promotion decisions related to local government leaders are largely made by leaders in the next-higher-up level of government. Li et al. (2019) estimate that the probability of promotion for prefectural leaders was 3-5 times higher in the year before than the year after the National Congress during 1997-2014. Local promotion

decisions are formally made by local congresses most of which follow the National Congress. Mayors can be dismissed or transferred at any time, but we conjecture that much of the groundwork for standard promotion decisions is laid down before and during the National Congress, and therefore that the mayors have a stronger concern with managing their performance during the treatment period – before the National Congress—than in the control period after the Congress concludes. By exerting more top-down pressure during the treatment period, mayors can signal competence and avoid adverse publicity from disgruntled citizens.

Consistent with this idea, the response rate was 4.3 percent higher before than after the National Congress, statistically significant at the 5 percent level. This is not a huge effect, but one might have doubted that it was possible to detect any effect at such a routine level of public service.

Promotion depends in part on standards established by the Chinese Communist Party's Organization Department in Beijing. The standards are formalized in written contracts that specify goals across multiple dimensions (and are also used to determine compensation). The goals are prioritized from "targets with veto power" (most important) to "hard" and then "soft" targets, with points are allocated to each target to further establish priorities (Ang, 2016). Economic performance has a high weight in the formal goals, and observational studies find that economic performance is an important determinant of promotion, especially for local officials.<sup>22</sup> However, the central government's rhetoric has increasingly expressed concern about improving the environment, both internally and on the international stage (Zheng et al. 2014) because of

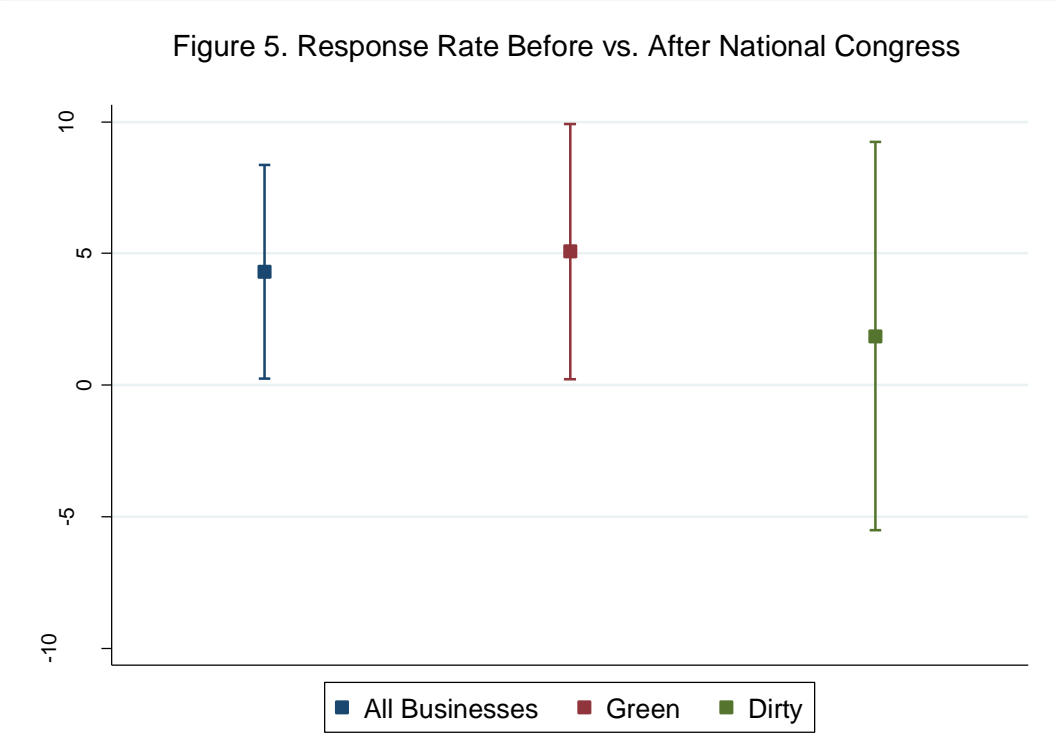
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<sup>22</sup> Empirical studies on the determinants of promotion include (Li and Zhou 2005; Shi et al. 2012; Zheng et al. 2014; Jia et al. 2015; Landry et al. 2018). Evidence that political connections matter (Shi et al. 2012; Jia et al. 2015; Landry et al. 2017) indicates that more than formal metrics are at work.

the country's high levels of pollution (Zheng and Kahn 2017). The evidence on whether environmental protection increases the prospect of promotion is mixed (Zheng et al. 2014; Wu et al. 2014).

Figure 5 shows the difference in responsiveness before versus after the National Congress separately for different project types. The promotion effect shows up almost entirely for green businesses: responses were 5.1 percent higher to green business inquiries before than after the Congress (significant at the 5 percent level); responses to traditional business inquiries were only 1.9 percent higher (statistically insignificant). Cities appear to have increased their responsiveness to inquiries concerning green businesses in the weeks before the mayor faced a promotion decision (although not by enough to erase the bias toward the dirty project).

Table 2 reports cross-sectional regressions controlling for other potential determinants of responsiveness to explore additional hypotheses. Each column is a linear probability



regression in which the dependent variable is a dummy equal to one if a city responded to the letter. The variables in the table are summarized and defined in appendix Table A2. The regression in column (1) includes the city's population and GDP per capita as control variables. Large cities and wealthy cities were significantly more likely to respond to inquiries, perhaps due to economies of scale in populous cities and resource availability in rich cities that allow development of an effective response infrastructure (such as hiring more bureaucrats and investing in better information technology). The regression in column (2) includes the four treatment variables that we examined previously. The treatment effects remain quantitatively and statistically similar to the unconditional comparisons, which essentially confirms that our randomization was effective.

In principle, a city's interest in new green businesses should depend on its existing environmental quality, although this could go either way. If there are diminishing returns to environmental protection, then polluted cities would covet green businesses more than clean cities want them. If there are diminishing returns to environmental damage – adding one more smokestack to a city with heavily polluted air might not be noticeable – one could imagine cities specializing; rather than spread polluting industries across the country, it might be better to concentrate them in one region – in which case green cities might seek green businesses while dirty cities seek dirty businesses. To test for the role of pre-existing conditions, columns (3), (4), and (5) of Table 2 interact the green business treatment with various measure of environmental quality. The measure is industrial soot emissions in (3), sulfur dioxide emissions in (4), and



wastewater in (5).<sup>23</sup> The interaction coefficients are statistically insignificant in all three regressions. Columns (6), (7), and (8) use the growth rate of these same three pollution measures over the previous five years as the control, to allow for the possibility that it is not the level but the change in pollution that matters. None of these interaction coefficients are statistically distinguishable from zero either. Somewhat unexpectedly, we are unable to establish a link between a city's differential response to green and dirty proposals and its existing environmental condition.

Following a similar line of inquiry, we might expect a city's embrace of green versus dirty businesses to depend on its stage of economic development. A heavily industrialized city might forego a new industrial project in favor of a green business, while a poor undeveloped city might be willing to accept environmental attrition in exchange for industrialization. The regression in column (9) of Table 2 allows for this possibility by interacting the green business treatment dummy with GDP per capita. The interaction term is not substantial or statistically significant. Kahn and Zheng (2016, Ch. 9) observe that rich and poor Chinese cities have different mindsets about environmental protection, but apparently this does not carry over to their street-level bureaucrats. Regression (10) controls for foreign direct investment (FDI). Such investment is a formal target for some local government officials, raising the possibility that they

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<sup>23</sup> Industrial soot pollution is  $PM_{2.5}$ , a common measure of pollution, emphasized by China's Ministry of Environmental Protection (Zheng and Kahn 2017). We explored several other pollution variables, none of which displayed a significant connection to responsiveness.

might have been more open to green projects sponsored by foreign investors. The coefficient on FDI and its interaction with green business are both statistically insignificant.<sup>24</sup>

## **5. Female vs. Male Mayors**

Finally, we take a closer look at the gender-based bias in responsiveness. One strand of research among public administration scholars suggests that governments may treat citizens better if bureaucrats are similar to the constituents they serve in terms of sociodemographic characteristics (Raaphorst and Groenveld 2019). One could imagine, for example, that a female bureaucrat might be less likely to discriminate against women. We are interested in whether the discrimination we observe for or against women in responses was mitigated (or amplified) if the mayor was a woman, perhaps due to creation a different office culture. In our data, women comprised 9.1 percent of mayors in China, 10.7 percent in Germany, and 19.9 percent in the United States.

To evaluate if responsiveness was related to the mayor's gender, Table 3 compares the amount of discrimination under male and female mayors, one regression for each country. Each regression includes a dummy for female letter-writers, a dummy for female mayors, and an interaction between the two dummies, as well as control variables. All three regressions show a higher responsiveness in cities with female mayors, but none of those coefficients are statistically different from zero. The China regression shows a 6.12 percent discrimination against inquiries from women, noted above; the small and insignificant coefficient on the

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<sup>24</sup> We also estimated all regressions in Table 2 using the number of days (capped at 30) as the dependent variable instead of a response dummy. None of the interaction terms are statistically significant for this specification either.

dummy interaction implies that having a female mayor did not mitigate this discrimination. The Germany regressions shows a negative but insignificant bias against inquiries from women, with a negative but insignificant interaction coefficient. The American regression shows a 3.13 percent bias in favor of inquiries from women, at the edge of conventional statistical significance; the positive coefficient on the interaction term suggests that female mayors amplified this bias but again the coefficient is not statistically distinguishable from zero. Across all three countries, we fail to find evidence that women received different treatment in cities with female mayors.

## **6. Discussion**

Political leaders choose policies, but the effectiveness of those policies depends on how they are implemented by street-level bureaucrats. Our understanding of the effectiveness of street-level bureaucrats is at an early stage, especially from a cross-country comparative perspective, where even basic descriptive information is limited.

This study reports the results of parallel field experiments in China, Germany, and the United States. We contacted over 6,000 mayoral offices across the three countries, requesting help in locating information to start a business in the city. We believe this is the first audit study to pose identical questions to bureaucrats in multiple countries.

One contribution is basic facts about bureaucratic responsiveness across three important countries with different forms of government. Overall, we find that only about one-third of inquiries received a response, and Chinese and German cities were more likely to respond than American cities. In terms of experimental treatments, we conducted a series of tests that

illustrate ways in which bureaucrats used discretion, and how that varied across countries. German and American cities were more likely to respond to requests from citizens than foreigners, while Chinese cities did not discriminate along that dimension. In contrast, Chinese cities were more likely to respond to men than women, while German cities showed no statistical difference, and American cities showed a slight favoritism toward women. Chinese cities were more likely to respond to requests that mentioned starting a construction business than a green business. We note that bureaucratic discretion tends to be biased against groups that are generally disfavored in that particular society. The extent of discretion suggests that intrinsic motivations of lower-level workers are likely to be critical for effective delivery of street-level services, a point emphasized in the theoretical literature (Besley and Ghatak 2005; Alesina and Tabellini 2007).

The best evidence for top-down pressures comes from China. The higher response rate to inquiries for industrial compared to green projects in China is consistent with top-down pressures, as reflected in promotion criteria, and runs counter to general public attitudes. We also find higher response rates in the months before the mayor is considered for promotion. This suggests that political elites in China are somewhat effective in transferring their objectives to the bureaucracies they oversee. One way this might happen is profit-sharing: in some cities bonuses paid to bureaucrats are linked to the city's performance in terms of its assigned targets (Ang, 2018).

It seems appropriate to end with a caveat. While it is natural to suspect that the differences across the three countries have roots in their form of government – and establishing if there are observable differences in street-level responsiveness between autocracies and democracies was one of our motivations – our research design cannot conclusively link

differences to form of government. There are other factors that could play a role, such as culture, different roles of mayors and functions of cities, different propensities to use email, and so on. We view our contribution as highlighting some ways in which bureaucracies work the same and differently across countries on a routine and common task, as a first step in the larger program of understanding autocracy and democracy.

## References

Ang, Yuen Yuen, 2016. *How China Escaped the Poverty Trap*, Ithaca, NY: Cornell University Press.

Ang, Yuen Yuen, 2018. "Autocracy with Chinese Characteristics: Beijing's Behind-the-Scenes Reforms," *Foreign Affairs*, Vol. 97(3), 39-46.

Bandiera, Oriana, Michael Carlos Best, Adnan Qadir Khan, and Andrea Prat, 2021. "The Allocation of Authority in Organizations: A Field Experiment with Bureaucrats," *Quarterly Journal of Economics*, Vol. 136(4), 2195-2242.

Besley, Timothy and Maitreesh Ghatak, 2005. "Competition and Incentives with Motivated Agents," *American Economic Review*, June 2005, Vol. 95(3): 616-636.

Best, Michael Carlos, Jonas Hjort, and David Szakonyi, 2019. "Individuals and Organizations as Sources of State Effectiveness," working paper, Columbia University.

Boittin, Margaret, Gregory Distelhorst, and Francis Fukuyama, 2016. "Reassessing the Quality of Government in China," working paper, York University, MIT, Stanford University.

Bosio, Erica, Simeon Djankov, Edward Glaeser, and Andrei Shleifer, 2022. "Procurement in Law and Practice," *American Economic Review*, Vol. 112(4), 1091-1117.

Broockman, David E., 2013. "Black Politicians Are More Intrinsically Motivated to Advance Blacks' Interests: A Field Experiment Manipulating Political Incentives," *American Journal of Political Science*, Vol. 57(3), 521-536.

Caughey, Devin and Christopher Warshaw, 2018. "Policy Preferences and Policy Change: Dynamic Responsiveness in the American States, 1936-2014," *American Political Science Review*, Vol. 112(2), 249-266.

Chen, Ling and Hao Zhang, 2021. "Strategic Authoritarianism: The Political Cycles and Selectivity of China's Tax Break Policy," *American Journal of Political Science*, Vol. 65(4), 845-861.

Chen, Ye, Hongbin Li, and Li-An Zhou, 2005. "Relative Performance Evaluation and the Turnover of Provincial Leaders in China," *Economics Letters*, Vol. 88(3), 421-525.

Chen, Jidong, Jennifer Pan, and Yiqing Xu, 2016. "Sources of Authoritarian Responsiveness: A Field Experiment in China," *American Journal of Political Science*, Vol. 60(2), 383-400.

Cheng, Rita, Qiao Long, and Chingman, 2022. "China's `White Guards' Gain Reputation for Brutal Enforcement of Shanghai Lockdown," Radio Free Asia, available at: <https://www.rfa.org/english/news/china/shanghai-whiteguards-05292022070418.html>.

Chong, Alberto, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2014. "Letter Grading Government Efficiency," *Journal of the European Economic Association*, Vol. 12(2), 277-299.

Distelhorst, Greg and Yue Hou, 2014. "Ingroup Bias in Official Behavior: A National Field Experiment in China," *Quarterly Journal of Political Science*, Vol. 9, 203-230.

Distelhorst, Greg and Yue Hou, 2017. "Constituency Service under Nondemocratic Rule: Evidence from China," *Journal of Politics*, Vol. 79(3), 1024-1040.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2002. "The Regulation of Entry," *Quarterly Journal of Economics*, Vol. 117(1), 1-37.

Downs, Anthony, 1957. *An Economic Theory of Democracy*, New York, NY: Harper & Row.

Finan, Federico, Benjamin A. Olken, and Rohini Pande, 2017. "The Personnel Economics of the Developing State," in *Handbook of Economic Field Experiments*, Volume 2, edited by Abhijit Vinayak Banerjee and Esther Duflo, North Holland.

Fisman, Raymond, Hui Lin, Cong Sun, Yongxiang Wang, and Daxuan Zhao, 2021. "What Motivates Non-Democratic Leadership: Evidence from COVID-19 Reopenings in China," *Journal of Public Economics*, Vol. 196, 1-9.

Guo, Gang, 2009. "China's Local Political Budget Cycles," *American Journal of Political Science*, Vol. 53(3), 621-632.

Human Rights Watch, 2020. "China: Gender Discrimination in Hiring Persists: 11 Percent of Civil Service Ads Specify `Men Only'", April 29, 2020, available at: <https://www.hrw.org/news/2020/04/29/china-gender-discrimination-hiring-persists>.

- Imai, Hiroyuki, 1994. "China's Endogenous Investment Cycle," *Journal of Comparative Economics*, Vol. 19(2) 188-216.
- Jensen, Nathan M., Michael G. Findley, and Daniel L. Nielson, 2020. "Electoral Institutions and Electoral Cycles in Investment Incentives: A Field Experiment on Over 3,000 U.S. Municipalities," *American Journal of Political Science*, Vol. 64(4), 807-822.
- Jia, Ruixue, Masayuki Kudamatsu, and David Seim, 2015. "Political Selection in China: The Complementary Roles of Connections and Performance," *Journal of the European Economic Association*, Vol. 13(4), 631-668.
- Kahn, Matthew E. and Siqi Zheng, 2016. *Blue Skies over Beijing: Economic Growth and the Environment in China*, Princeton University Press.
- Landry, Pierre F., Xiaobo Lu, and Haiyan Duan, 2018. "Does Performance Matter? Evaluating Political Selection Along the Chinese Administrative Ladder," *Comparative Political Studies*, Vol. 51(8), 1074-1105.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1999. "The Quality of Government," *Journal of Law, Economics, and Organization*, Vol. 15(1), 222-270.
- Li, Hongbin and Li-An Zhou, 2005. "Political Turnover and Economic Performance: The Incentive Role of Personnel Control in China," *Journal of Public Economics*, Vol. 89(9/10), 1743-1762.
- Li, Xing, Chong Liu, Xi Weng, and Li-An Zhou, 2019. "Target Setting in Tournaments: Theory and Evidence from China," *Economic Journal*, Vol. 129(623), 2888-2915.
- Lipsky, Michael, 2010. *Street-Level Bureaucracy: Dilemmas of the Individual in Public Services* [30th Anniversary Expanded Edition], New York, NY: Russell Sage Foundation.
- Matsusaka, John G., 2020. *Let the People Rule: How Direct Democracy Can Meet the Challenge of Populism*, Princeton, NJ: Princeton University Press.
- Nie, Huihua, Minjie Jiang, and Xianghong Wang, 2013. "The Impact of Political Cycle: Evidence from Coalmine Accidents in China," *Journal of Comparative Economics*, Vol. 41(4), 995-1011.



Olson, Mancur, 1993. "Dictatorship, Democracy, and Development," *American Political Science Review*, Vol. 87(3), 567-576.

Qin, Bei, David Strömberg, and Yanhui Wu, 2017. "Why Does China Allow Freer Social Media? Protests versus Surveillance and Propaganda." *Journal of Economic Perspectives*, 31 (1): 117-140.

Raaphorst, Nadine and Sandra Groeneveld, 2019. "Discrimination and Representation in Street-Level Bureaucracies," in *Research Handbook on Street-Level Bureaucracy: The Ground Floor of Government in Context*, edited by Peter Hupe, Northampton, MA: Edgar Elgar Publishing.

Rasul, Imran and Daniel Rogger, 2018. "Management of Bureaucrats and Public Service Delivery: Evidence from the Nigerian Civil Service," *Economic Journal*, Vol. 128(1), 413-446.

Shih, Victor C., 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*, Vol. 106(1), 166-187.

Tausanovitch, Chris and Christopher Warshaw, 2014. "Representation in Municipal Government" *American Political Science Review*, Vol. 108(3), 605-641.

White, Ariel R., Noah L. Nathan, and Julie K. Faller, 2015. "What Do I Need to Vote? Bureaucratic Discretion and Discrimination by Local Election Officials," *American Political Science Review*, Vol. 109(1), 129-142.

Wintrobe, Ronald, 1998. *The Political Economy of Dictatorship*, Cambridge, UK: Cambridge University Press.

Wu, Jing, Yongheng Deng, Jun Huang, Randall Morck, and Bernard Yin Yeung, 2014. "Incentives and Outcomes: China's Environmental Policy," *Capitalism and Society*, Vol. 9(1), available at: <https://capitalism.columbia.edu/journal/9/1>.

Xu, Changgang, 2011. "The Fundamental Institutions of China's Reforms and Development," *Journal of Economic Literature*, Vol. 49(4), 1076-1151.

Zhang, Jian, Songqing Jin, Tao Li, and Haigang Wang, 2021. "Gender Discrimination in China: Experimental Evidence from the Job Market for College Graduates," *Journal of Comparative Economics*, Vol. 49(3), 819-835.

Zheng, Siqi and Matthew E. Kahn, 2017. "A New Era of Pollution Progress in Urban China?," *Journal of Economic Perspectives*, Vol. 31(1), 71-92.

Zheng, Siqi, Matthew E. Kahn, Weizeng Sun, and Danglun Luo, 2014. "Incentives for China's Urban Mayors to Mitigate Pollution Externalities: The Role of the Central Government and Public Environmentalism," *Regional Science and Urban Economics*, Vol. 47, 61-71.

Table 1. Experimental Letter

Letter	<p>To Whom It Concerns:</p> <p><b>A1/A2</b>, and I am looking for information on how to start a factory which <b>B1/B2</b>, in your city limits. In particular, I request information on business licensing, fees, and preferential policies. Can you point me to a web site or give me contact information for the appropriate person?</p> <p>Thanks in advance for your reply, and I can be reached at <a href="mailto:XXX@126.com">XXX@126.com</a> / <a href="mailto:C1/C2@gmx.de">C1/C2@gmx.de</a> / <a href="mailto:C1/C2@gmail.com">C1/C2@gmail.com</a>.</p> <p>Sincerely,</p> <p><b>C1/C2</b></p>
<p><b>Treatment A</b> Domestic / foreign</p>	<p>China: A1. My name is C1/C2 A2. I am representative of a US-based firm</p> <p>Germany: A1. My name is C1/C2 A2. I represent a China-based firm</p> <p>United States: A1. My name is C1/ C2 A2. I represent a China-based firm</p>
<p><b>Treatment B</b> Project type</p>	<p>B1. produces construction materials B2(i). recycles trash and waste with green technology B2(ii). recycles trash and waste with green and automated technology</p>
<p><b>Treatment C</b> Man / woman</p>	<p>China: C1. Wei Zhang (张伟) C2. Na Li (李娜)</p> <p>Germany: C1: Michael Jung C2: Dorothee Jung</p> <p>United States: C1. James Lee C2. Linda Lee</p>

*Note.* The letter was written in Chinese, German, or English depending on the target country. Return addresses for the Chinese emails were varied.

Table 2. Reply Regressions for Chinese Cities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Population (log)	4.97*** (1.20)	5.05*** (1.19)	0.83 (2.03)	1.81 (2.01)	3.22* (1.95)	0.96 (2.11)	0.47 (2.10)	0.74 (2.09)	5.03*** (1.19)	1.25 (2.07)
GDP/capita	8.38*** (2.91)	8.02*** (2.89)	8.83** (3.78)	11.25*** (3.87)	9.79*** (3.79)	8.60** (3.86)	8.81** (3.85)	10.48*** (3.89)	6.75 (5.05)	9.94** (4.18)
Letter from woman	...	-6.17*** (2.13)	-4.54* (2.76)	-4.71* (2.75)	-4.80* (2.75)	-4.27 (2.91)	-4.48 (2.88)	-3.36 (2.87)	-6.18*** (2.13)	-4.94* (2.79)
Letter from foreigner	...	0.33 (2.14)	0.07 (2.77)	-0.22 (2.76)	-0.00 (2.76)	1.14 (2.90)	0.90 (2.89)	1.55 (2.88)	0.31 (2.14)	0.50 (2.79)
Green business	...	-8.37*** (2.29)	-10.23*** (3.42)	-15.07*** (4.69)	-5.93 (19.63)	-12.13*** (3.36)	-8.28 (5.77)	-12.82*** (3.45)	-9.18*** (3.50)	-8.89*** (3.40)
Sent before CPC Congress	...	3.72* (2.14)	6.28** (2.77)	6.27** (2.77)	6.05** (2.76)	7.53*** (2.91)	6.82** (2.90)	6.01** (2.88)	3.73* (2.14)	6.93** (2.80)
<i>Definition of VAR</i>			<i>Industrial soot</i>	<i>Sulfur dioxide</i>	<i>Waste-water</i>	$\Delta$ <i>industrial soot</i>	$\Delta$ <i>sulfur dioxide</i>	$\Delta$ <i>waste-water</i>	<i>GDP per capita</i>	<i>FDI per capita</i>
VAR	...	...	-4.03 (3.10)	-16.49*** (5.64)	-0.23 (0.19)	0.03 (4.06)	-2.16 (8.62)	3.61 (5.13)	...	0.19 (0.89)
VAR $\times$ green business	...	...	0.52 (3.37)	8.53 (6.66)	-0.06 (0.23)	-2.39 (4.73)	6.06 (9.00)	6.56 (6.69)	1.90 (6.16)	-1.24 (1.24)
Constant	-7.77 (9.72)	-1.42 (9.90)	34.93** (17.03)	33.06* (16.93)	31.99 (21.67)	30.50* (17.71)	34.28* (18.31)	31.73* (17.64)	-0.70 (10.17)	28.34 (17.49)
R <sup>2</sup>	0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02
Observations	1,985	1,985	1,210	1,210	1,217	1,086	1,105	1,123	1,985	1,193

*Note.* Each column is a regression in which the dependent variable is 1 if a city responded and 0 otherwise. Standard errors are in parentheses beneath coefficient estimates. The regressions differ by the definition of VAR, which is interacted with green business in (3)-(10). In (6)-(8), VAR is defined as the percentage change from 2011 to 2016. All estimates are scaled by 100. Significance: \* = 10 percent, \*\* = 5 percent, \*\*\* = 1 percent.

Table 3. Reply Regressions with Gender of Mayor

	China	Germany	U.S.A.
Letter from woman	-6.12*** (2.18)	-2.76 (2.39)	3.13* 1.88
Female mayor	0.51 (5.12)	3.34 (5.06)	3.22 (2.97)
Female mayor × letter from woman	-0.64 (7.14)	-6.66 (7.31)	3.05 (4.21)
Letter from foreigner	0.16 (2.08)	-10.72*** (2.26)	-16.27*** (1.68)
Green business	-9.07*** (2.23)	-4.49 (2.40)	-3.12* (1.78)
Population (log)	5.27*** (1.15)	4.18*** (1.04)	-0.38 (0.94)
Constant	2.83 (9.57)	3.81 (11.01)	34.64*** (10.11)
R <sup>2</sup>	.02	.02	.04
Observations	2,114	1,799	2,408

*Note.* Each column is a regression in which the dependent variable is 1 if a city responded and 0 otherwise. Other than population, all variables are dummies. Standard errors are in parentheses beneath coefficient estimates. All estimates are scaled by 100. Significance: \* = 10 percent, \*\* = 5 percent, \*\*\* = 1 percent.

## **Internet Appendixes**

Table A1. Covariate Balance Check

	Domestic (1)	Foreign (2)	Difference (1)-(2)	Dirty project (3)	Green project (4)	Difference (3)-(4)
<b>Panel A. China 2016</b>						
Population	47.83 (36.80)	48.55 (36.96)	-0.72 [0.68]	47.24 (36.42)	48.66 (37.10)	-1.42 [0.43]
GDP per capita	39182.32 (38791.15)	39115.87 (40748.98)	66.46 [0.97]	38842.24 (42132.80)	39304.97 (38509.13)	-462.73 [0.81]
Government revenue per capita	2823.15 (3902.58)	2836.25 (3863.60)	-13.10 [0.94]	2879.13 (4143.28)	2804.54 (3745.58)	74.59 [0.70]
Government expenditure per capita	9369.99 (7657.48)	10069.86 (11971.24)	-699.87 [0.13]	10107.70 (12409.44)	9512.93 (8540.31)	594.76 [0.23]
Government investment per capita	38109.62 (39711.87)	38252.28 (39130.27)	-142.66 [0.94]	37863.63 (37923.35)	38338.71 (40164.87)	-475.08 [0.81]
<b>Panel B. Germany 2012</b>						
Population	5.941 (10.06)	5.597 (9.302)	0.343 [0.46]	5.547 (84.25)	5.879 (102.6)	-0.332 [0.47]
Government revenue per capita	1342.19 (596.12)	1322.01 (729.33)	20.19 [0.58]	1346.32 (651.22)	1324.84 (673.57)	21.48 [0.57]
Government Investment per capita	262.80 (185.6)	261.79 (219.83)	1.01 [0.93]	274.63 (209.26)	256.06 (200.12)	18.58 [0.13]
<b>Panel C. United States 2017</b>						
Population	6.367 (12.38)	7.404 (30.49)	-1.038 [0.275]	5.845 (9.441)	7.401 (27.64)	-1.556 [0.04]
Government revenue per capita	2165.26 (1554)	2158.75 (1575)	6.51 [0.919]	2182.49 (1575.41)	2151.83 (1559.6)	30.66 [0.652]
Government expenditure per capita	2089.04 (1532.29)	2102.83 (1565.09)	-13.79 [0.827]	2105.86 (1556.96)	2090.96 (1554.6)	14.90 [0.824]
Government debt per capita	1950.27 (2629.94)	2070.73 (2512.61)	-120.46 [0.251]	2004.30 (2924.14)	2013.28 (2378.9)	-8.98 [0.940]

*Note.* Numbers in parentheses are standard deviations, and numbers in brackets beneath the differences are  $p$ -values obtained from a regression with robust standard errors. Population is expressed in 10,000's. Financial numbers are in Chinese yuan for China, euros for Germany, and U.S. dollars for the United States.

Table A2. Definition and Summary Statistics for Chinese Variables

Variable	Mean	S.E.	Min	Max	N
<b>Population.</b> City household population in thousands, 2016.	4,359	3,358	69	44,993	2,409
<b>GDP/capita.</b> In 10,000 yuan, 2016	0.43	0.37	0.02	3.06	2,228
<b>Industrial soot.</b> Annual volume of particulate matter emitted in the city's prefecture 2011-2016	0.53	1.15	0.01	11.1	1,453
<b>Sulfur dioxide.</b> Annual volume emitted in the city's prefecture 2011-2016 in tons	0.53	0.44	0.02	2.53	1,453
<b>Wastewater.</b> Annual percent of wastewater centrally treated as a percentage of all waste water in the city's prefecture, 2011-2016	82.7	13.0	10.9	100	1,464
<b>FDI/capita.</b> Annual foreign direct investment in the city's prefecture in \$100, 2011-2016	1.36	2.65	0.002	38.27	1,427

*Data sources:* Population and GDP/capita are obtained from China County Statistical Yearbook 2017, and the other variables are obtained from the China Prefecture Statistical Yearbooks.