From Internet to social safety net: The policy consequences of online participation in China

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1 | INTRODUCTION

Effective use of digital technologies is an essential part of modern governance. In the past two decades, national and local governments around the world have set up new Internet-based interfaces to interact with their citizens. In countries as diverse as Japan, United States, China, Colombia, and Ukraine, online participation (also known as e-participation) has become a common method for citizens to contact political authorities and articulate their issues and grievances (United Nations, 2016, p. 56). These developments have also triggered an intense debate among scholars about the nature and policy ramifications of online participation. While optimists view online participation as having the potential to expand civic engagement, enhance responsiveness of public institutions, and promote transparency and equity in policymaking (Bimber, 1998; Castells, 1996), others remain skeptical about its ability to benefit underrepresented constituencies and its effectiveness in inducing broad policy changes (Chadwick & May, 2003; Lindner & Riehm, 2011).
In this article, we contribute new evidence to this debate by analyzing online participation in China. After almost two decades of rapid expansion of the Internet, China now hosts the largest Internet-using population in the world.\textsuperscript{1} The Chinese government has been very active in creating various types of e-participation initiatives, including electronic petition platforms, online public consultation, and government-sponsored social media accounts.\textsuperscript{2} However, the question remains whether these initiatives are just for window-dressing purposes, or whether they have genuine influence over government policies. To answer this question, our analysis focuses specifically on the Local Leader Message Board (LLMB), a major online petition forum that allows citizens to directly register complaints to party and government leaders in their localities. Launched by China’s central media since 2008, the LLMB exemplifies a new class of government-sponsored electronic participation platforms that are now being adopted worldwide (see Supporting Information Table A.1 for a list of similar institutions in other countries/regions). Compared to the more conventional participatory institutions, this platform offers an unusually cheap and transparent way for citizens to communicate their issues and concerns to the authority. As a result, we hypothesize that it would be especially attractive to lower-class citizens, who tend to be discriminated against in the “normal” political process and are usually most sensitive to changes in participation costs. Based on a large body of research suggesting that lower-income groups tend to hold stronger preference for redistribution (Alesina & La Ferrara, 2005; Meltzer & Richard, 1981), we further postulate that expanded online participation will shift government policies toward placing greater emphasis on social welfare and redistributive issues, as the voices of the poor become better heard.

To evaluate these hypotheses, we first examine the content of petitions filed on the LLMB platform. We manually code issues and user backgrounds for a random sample of petitions, and then use a non-parametric content analysis method developed by Hopkins and King (2010) to estimate their distributions within the entire body of over 900,000 petitions. Our analysis shows that a substantial share of the LLMB petitions concern personal problems that are most likely to be experienced by lower-class citizens, including employment, neighborhood environment, and land-taking compensation. We also find that a sizable share of the petitions are originated from rural and suburban areas, which are inhabited primarily by individuals who belong to the lower strata of the Chinese society.\textsuperscript{3}

We then investigate how expanded online participation affected substantive policy priorities of local governments. To construct a consistent measure of government policies that can be compared across time and space, we apply natural language processing techniques on over 4,400 Government Work Reports (GWRs), which are comprehensive policy blueprints published annually by the Chinese government at various levels, and estimate the relative proportions of different “topics” (i.e., clusters of words) as a measure for government policy priorities. Our baseline results show that cities that receive a larger number of online petitions in a year tend to devote significantly higher proportions of government reports in the following year to a topic on social welfare, which broadly includes issues such as low-income subsidies, unemployment protection, and medical assistance. We also find that the policy effect appears to be mainly driven by petitions filed by rural residents concerning issues related to their pocketbook conditions. We subject these results to a number of robustness checks and adopt several different strategies to address the problem of endogeneity between online petition and government policy. Furthermore, leveraging data from the Minimum Living Standard Guarantee Scheme (dibao), a key low-income assistance program targeting the poor, we show that those changes in stated policy priorities are not merely empty talk, but are accompanied by substantive improvements in the coverage of the dibao program.

This article contributes to the literature on e-governance. Researchers have investigated the nature and characteristics of different e-governance techniques (Chadwick & May, 2003; Norris & Reddick,
2013; Torres, Pina, & Acerete, 2006), the conditions under which certain e-governance techniques are adopted (Royo, Yetano, & Acerete, 2014; Wong & Welch, 2004), and the relationship between citizens’ attitudes and their participatory experiences (Kim & Lee, 2012). However, there is still little systematic evidence on the critical question of whether online participation can have any substantive impact on government policies. Some research on advanced democracies suggests that e-government initiatives typically prioritize efficient service delivery over expanding participation opportunities for citizens (Chadwick & May, 2003; Norris & Reddick, 2013). Others analyze cross-national data and find that development in e-participation is not strongly associated with reduction in corruption perception or improvement in quality of government (Linde & Karlsson, 2013). Leveraging more fine-grained subnational data on e-participation and government policies, our article offers evidence that e-participation can indeed pressure local governments to devote more attention to social welfare issues even in the absence of electoral accountability. These findings lend support to the view that the Internet and information technologies can be a tool of empowerment for citizens in the digital age (Dutton, 2009).

2 | BACKGROUND: ONLINE PARTICIPATION IN CHINA AND THE LLMB

The rapid expansion of the Internet in China since the 1990s and especially during the first decade of the 21st century has brought profound changes to the way citizens and governments interact. The emergence of online forums, weblogs, and many other types of virtual communities facilitated lively discussion of public affairs and provided citizens with new channels to articulate their problems and interests (Yang, 2009). At the same time, the government has also undertaken systematic efforts to expand its online presence. The word “E-government (电子政府)” first appeared in a major party policy document at the 16th Party Congress in 2002, and a series of regulations were subsequently promulgated to promote the development of central and local government websites, with a special emphasis on information availability and ease of access. As of 2008, virtually all local governments at or above the county level had set up their own websites, and many used these websites regularly for disseminating information and delivering various types of services (Pan, 2017; Stromseth, Maltesky, & Gueorguiev, 2017).

To understand the patterns and policy consequences of online participation in China, this article focuses on a major government-sponsored petition platform named the LLMB (地方领导留言板). The LLMB was created in 2008 by the official website of China’s central media (人民网) with the goal of providing an integrated portal for citizens to contact leading government officials in their localities (for a snapshot of the interface, see Supporting Information Figure A.1). Ever since its launch, the platform has become a popular venue for citizens to report issues and register complaints to local authorities. As of August 2016, the LLMB has received over 900,000 petitions from all mainland provinces, making it the most heavily used platform in China today.4

LLMB hosts two message boards for each subnational unit at or above the county level (i.e., 33 provinces, 333 cities, and over 2,000 counties), one for the head of the party and the other for the head of the government. Participants can post their petitions to these message boards either anonymously or with a registered account. Registration requires only a functional cell phone number or an e-mail address, and will allow the users to customize the names that appear on their petitions. After a petition is filed and before it is publicly posted, the website will conduct a quick check on the content. While some censorship does happen at this stage, our interviews with LLMB staff suggest that the criteria are much more lenient than those used for social media sites.5 According to one member of the management team, petitions are typically only blocked if they contain vulgar language or
explicit comments/criticisms of top political leaders, and “99.9% of the petitions are displayed exactly the way they were written” (Personal interview, Beijing, December 2016).

Insofar as responsiveness is concerned, several features of the LLMB deserve special mentioning. First, in contrast to locally operated websites, in which local authorities have a direct control over the content to be displayed, the LLMB is operated by a central agency that typically has little direct interest in helping local authorities cover up their problems. This means that local governments will not be able to simply bury any undesirable issues through censorship. In addition, the website also employs several measures to increase the publicity of petitions and put pressure on local government to respond. For example, all petitions and government replies are publicly visible to all users once posted; this not only makes it easier for local residents with common grievances to find each other and organize, but can also help local leaders’ political superiors to learn about citizens’ opinions about their subordinates. Occasionally, the LLMB’s own news team will look for newsworthy materials from the petitions and conduct follow-up investigations that will be published on the central media’s website. All these features—the relative independence of the operator, the transparent design of the website, and the high publicity of the platform—may give local officials an incentive to be attentive to citizen demands made on the platform.

3 | HYPOTHESES

In this section, we develop hypotheses regarding (a) the type of citizens who would be drawn to the LLMB and (b) the potential policy consequences associated with online participation. First, we hypothesize that lower-class citizens are more likely to use these online platforms than those from a better-off background. The main function of the LLMB is to facilitate citizens’ articulation of personal grievances to local political leaders. According to the classical resource-mobilization theory of political participation, individualized interest articulation is a rather resource-demanding form of participation because there is no standardized menu for actions and the outcome depends largely on a citizen's own ability and initiatives (Marien, Hooghe, & Quintelier, 2010; Verba & Nie, 1972). This observation also holds for China. Those who can afford living in major cities (i.e., closer to where the higher-level governments reside) or offering bribes to build personal connections with government officials are usually in a better position to influence government than those who lack such resources.6 By drastically lowering the time and costs needed for long-distance communication, the LLMB can help improve rural residents’ ability to contact higher-level governments located in distant urban centers. Its integrated and simplified interface also helps lower the knowledge barriers for navigating complex bureaucratic systems. Furthermore, the anonymous and impersonal nature of the website means that it would be difficult for officials to make differential treatment based on participants’ political connections or other personal characteristics (Ward, Gibson, & Lusoli, 2003). In contrast to the upper-class citizens, whose background may give them an advantage in contacting government officials, anonymity is especially attractive to lower-class citizens, who are most likely to be discriminated against for their background.

It is also worth noting that unlike many other developing countries, lower-class citizens in China do have the access to the necessary Internet infrastructure for effective online participation. Since the early 2000s, the government and state-owned telecommunication companies have made systematic efforts in building up Internet-related infrastructure (e.g., electricity, telephone lines) in remote, rural areas (Oreglia, 2015). As of 2009, Internet access was available in over 90% of the administrative villages.7 The recent advancement in mobile telecommunication technologies (i.e., 3G and 4G networks) has led to a further expansion of Internet users in rural areas. One estimate suggests that over
87% of the rural Internet users in China today access Internet primarily through smartphones (China Internet Network Information Center [CNNIC], 2016). The wide availability of relatively inexpensive Internet access makes rural and lower-class citizens an influential group in China’s cyberspace. Although direct evidence from the political sphere remains limited, indications can be found from patterns of Internet usage in other areas: Research has shown, for example, that rural residents in China are highly active in using the Internet for commercial purposes (Liu, Li, & Liu, 2015). According to a study by McKinsey, online retail channels created more new spending in China’s underdeveloped regions than in developed ones (Dobbs et al., 2013). If commercial activities are of any guidance, they suggest that the rise of online participation opportunities such as the LLMB will also likely attract more new participants from the less prosperous areas.

If the LLMB can indeed help reduce barriers for lower-class participation, a question that naturally follows is: How would that affect government policies? A large literature on political economy suggests lower-class citizens often hold stronger preferences for redistribution (Acemoglu & Robinson, 2006; Hibbs, Rivers, & Vasilatos, 1982; Meltzer & Richard, 1981). Thus, our second hypothesis is that government policies will become more redistributive as the voices of the disadvantaged become better heard. Although government officials in China are often not held electorally accountable to their citizens, existing studies suggest several reasons why citizen participation may still lead to policy changes even in the absence of electoral institutions. Participation may, for example, reveal important information about citizen preferences and local conditions (Distelhorst & Hou, 2017; Lorentzen, 2013), which can be used by an official’s superior to evaluate his/her performance. Compared to electoral democracies, the Chinese regime may be even more dependent on information conveyed through channels such as the Internet because of the underdevelopment of more conventional democratic institutions. Moreover, responsiveness may also be driven by officials’ fear of citizens’ collective actions (Chen et al., 2016). To the extent that online grievances are important signals of mass dissatisfaction, authorities may be motivated to make substantive policy concessions in response to these grievances as a way to preempt more disruptive offline actions.

Several pieces of anecdotal evidence suggest that local governments do take online petitions from the LLMB seriously. Shortly after the platform was launched, many local governments formed partnership with the platform and set up specialized agencies to process petitions and regularly report key information from online petitions to high-level decision makers. When drafting policy documents, such as the GWRs (see later), the central and local authorities have also shown a willingness to seek and incorporate suggestions from online platforms. Moreover, many local politicians use this platform to publicly engage with their constituencies: As of 2015, over 50 provincial party secretaries and governors, the highest-ranking regional leaders in China, have written personal replies to citizen petitions at the LLMB, along with many more city- and county-level leaders.

4 | ANALYZING LLMB PETITIONS: ISSUES AND USER BACKGROUNDS

We scraped all the publicly available petitions from the website (~900,000), along with a rich set of information for each petition, such as (user-classified) subject matter, time of posting, the identity of the leader to whom the petition was directed, whether a government reply has been made, and so on. We began with a descriptive analysis of the range of issues raised on the platform as well as petitioners’ areas of origins. To do so, we took a random sample of 3,500 petitions and hired two research assistants (RAs) to read through and assign to each petition one of 14 issue labels and 3 location
labels based on the content of the petition.11 Because not all petitions contain sufficient information for us to make unambiguous coding decisions, sample statistics based on coded petitions alone are likely to be biased.12 To remedy this, we adopted a nonparametric method developed by Hopkins and King (2010) to infer the overall distribution of issues and locations in the entire body of petitions based on the coded sample. The basic intuition of this method is that the frequencies of different words in a corpus can be expressed as the product of (a) the word frequencies in different issue categories and (b) the relative shares of these categories. Using the hand-coded information of word frequencies in different categories (i.e., labels) from the training sample as a proxy for quantity (a), we can back out the label composition that is most likely to generate the aggregate word frequencies observed in the entire body of petitions (i.e., quantity (b)).13 We provide more details on the estimation procedures in Supporting Information Appendix E.

Table 1 displays the estimated proportions for issues and locations, all arranged in descending order. For issues, the most frequently raised ones include (a) property transaction and management, (b) employment, (c) neighborhood environment, (d) land taking and house demolition, (e) education and health, (f) agriculture production, (g) labor disputes, and (h) social security. With the possible exception of (a),14 the other seven of the top eight issues all seem to be life problems that are more commonly experienced by the lower class than by the middle or the upper class. Collectively, the seven issues account for about 50% of all petitions.

The composition of LLMB users can be seen even more clearly as we turn to the results on location labels.15 While the majority of the petitions still come from urban areas, about 45% of the petitions appear to be filed by users residing in rural and suburban areas, which are usually less developed economically.16 As a benchmark, it is worth noting that as of 2016, rural residents still accounted for only about a quarter of active Internet users in China (CNNIC, 2016). Rural and lower-class users, in other words, are overrepresented on the LLMB relative to their share in the Internet-using population.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Proportion</th>
<th>Location</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property transaction/management</td>
<td>0.211</td>
<td>Urban</td>
<td>0.55</td>
</tr>
<tr>
<td>Employment</td>
<td>0.111</td>
<td>Rural</td>
<td>0.32</td>
</tr>
<tr>
<td>Neighborhood environment</td>
<td>0.099</td>
<td>Town/suburb</td>
<td>0.13</td>
</tr>
<tr>
<td>Land taking and house demolition</td>
<td>0.093</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education/healthcare</td>
<td>0.074</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural production</td>
<td>0.072</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor disputes</td>
<td>0.059</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social security</td>
<td>0.052</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>0.046</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic and transportation</td>
<td>0.046</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public safety</td>
<td>0.044</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td>0.041</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hukou</td>
<td>0.026</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corruption</td>
<td>0.024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSE of 10-fold cross validation</td>
<td>0.023</td>
<td></td>
<td>0.057</td>
</tr>
</tbody>
</table>

Note. This table shows the estimated proportions for petition issues and petitioners’ area of residence using semi-automated content analysis. For each model, we report the root mean square error (RMSE), which indicates the average deviation of estimated proportion from the true proportion in a 10-fold cross validation.
5 | THE POLICY CONSEQUENCES OF ONLINE PARTICIPATION

5.1 | Data on local government policy priorities

To analyze the aggregate policy consequences of online participation, we made use of an original panel data set of government policy priorities created from the text of local GWRs (政府工作报告). GWRs are a form of official communication between the Chinese government and the legislative body at the same level. They are delivered once a year by the head of the government at the annual session of the People's Congress (PC) and have to be formally approved by PC deputies through an anonymous vote. As one of the most important policy documents that local administrations issue every year, GWRs provide comprehensive descriptions of governments' policy blueprints and highlight key socioeconomic targets for the following year. They have to be collectively read and edited by the party standing committees—the core leadership body in local governments—before they are sent out to the legislature for approval.

GWRs have a highly standardized structure: They often begin with a brief description of the overall national and local conditions, followed by a summary of governments' achievements in the past year; the bulk of the document is then devoted to laying out plans and directions for the next year. While the set of major policy areas that needs to be covered in a GWR is usually fixed (e.g., economy, public safety, culture, education, social welfare), the relative amount of emphasis on each area is often subject to political discretion and can reflect local leaders’ own policy visions. Newly published GWRs often receive close attention from media and government officials because they contain important information about leadership’s policy preferences.

We collected the full text of over 4,400 government reports at both the city and provincial levels between 2000 and 2014, and used a Latent Dirichlet Allocation (LDA) model (Blei, Ng, Jordan, & Lafferty, 2003) to uncover topics (i.e., cluster of words) from the text and estimate their relative proportions in each report. Compared to the traditional, dictionary-based coding methods, a distinct strength of the LDA algorithm is that it clusters words strictly according to their cooccurrence patterns, thus avoiding the arbitrariness and errors in hand coding. This is especially useful for analyzing complex policy documents such as the GWRs, for which commonly agreed-upon coding rules do not yet exist. Moreover, because many words can be related to multiple policy areas, human coder may face difficulties in determining to which topic a particular word should be assigned. The LDA model provides a solution to this problem by allowing each word to be associated with multiple topics at different levels of strength.

We estimated a 10-topic model as the baseline and a 20-topic model for robustness checks. Figure 1 plots the aggregate distribution of topic shares in the 10-topic model. In light of the previous findings on user background, we choose to focus on a topic for social welfare issues, which is a key concern for lower-class citizens. In this model (as well as in the 20-topic model), we are able to detect a clear and highly coherent topic cluster on social welfare issues, which on average accounts for about 8% of a GWR. High-frequency words under this topic include social safety net (社会保障), endowment insurance (养老保险), medical insurance (医疗保险), and social insurance (社会保险). According to several postestimation diagnostics that we performed, the social welfare topic is ranked as one of the highest-quality topics generated by both the 10- and 20-topic LDA models (see Supporting Information Appendix F for detailed postestimation diagnostics). A variance decomposition suggests that within-city variation accounts for about 63% of the total variation in this topic, whereas between-city variation accounts for the rest of the 37%.

5.2 | Empirical strategy

Our baseline is a fixed-effects model with the following specification:

$$\Delta \text{Welfare Topic Share}_{it+1} = \delta \log \text{Petitions}_{it} + X_{it} \beta + \phi_{i} + \tau_{t} + \epsilon_{it},$$
where $i$ indexes cities and $t$ indexes years.\textsuperscript{20} The dependent variable, $\Delta$Welfare Topic Share, is the incremental change in the proportion of welfare topic in a city's GWR from the previous year.\textsuperscript{21} Because the delivery of the GWRs typically occur at the beginning of a year (January or February), we match each city-year spell with the change in GWR welfare topic in the following year.

The independent variable, $\log$ Petitions\textsubscript{it}, is the (logged) aggregate number of petitions about a city in a given year. This includes both petitions filed directly at the city's own message boards and those filed at the city's supervising provincial government regarding issues from a specific city.\textsuperscript{22} Later, we also use an LDA model to detect distinct topic groups from the entire corpus of petitions and assign each individual petition to a specific topic.\textsuperscript{23} This allows us to examine which subset of petitions has the strongest impact on welfare policy change. $\phi_i$ and $\tau_t$ represent city and year fixed effects, respectively. With city fixed effects, we difference out any variation that is city specific but time invariant, and exploit the within-city variation in petition volume and welfare policy. The main regression also includes a set of province-specific linear trends to account for influence from time-variant, province-specific unobserved factors.\textsuperscript{24} $X_{it}$ is composed of a rich set of time-variant controls, which are described later.

\subsection*{5.2.1 Socioeconomic conditions}

The most important potential confounder to our analysis is the intensity of public grievances expressed through other non-Internet channels.\textsuperscript{25} Because dissatisfied citizens may concurrently use multiple means to make their grievances heard, changes in government policies may be attributable to their offline actions rather than online participation per se. Prior research has shown that collective protests are one of the most common means for lower-class citizens in China to express their discontent offline. Large-scale protests often receive a good deal of attention from the authority and can sometimes produce major shifts in government policies (Heurlin, 2016).

To address this, we make use of two of the best available data sets. The first one is the Collective Incidents Dataset, compiled by the Institute of Sociology at the Chinese Academy of Social Sciences (CASS). This data set contains detailed information about major mass protests in China between 2007 and 2013, collected from both internal government documents and through extensive searches of domestic and overseas media reports. The second one, China Strikes (www.chinastrikes.crowdmap.com), is a crowd-sourced website that focuses specifically on labor-related unrest. For our
analysis later, we combine all the unique events from both sources and calculate the frequency of protests for each city-year spell as a control variable.

In addition to protest frequency, we also include controls for a city's population (Log Population) and the size of employment (Log Employment), as unemployment is a common source of popular grievances and a main driver for welfare expansion. Moreover, because welfare-related spending in China is covered primarily by local government budgets, it is likely to be affected by local economic and fiscal conditions. We thus include Log GDP, GDP Growth Rate, Log Fiscal Revenue, and Log Fiscal Expenditure to control for a locality's level and pace of development as well as fiscal capacity.

5.2.2 | Leadership characteristics
The second set of controls is about personal characteristics of local leaders. We include a number of demographic variables (for both the city secretary and the mayor), including age, tenure length, and political connection with the provincial leadership. Age and tenure length, in particular, have been found to be correlated with the career incentives of local leaders as well as their policy preferences. We also include the number of years a city leader has served in a given locality, as prior studies have shown that officials with longer local careers may be more attentive to local interests and spend more on social issues (Persson & Zhuravskaya, 2016).

5.3 | Baseline results
The main results are presented in Table 2. Column 1 presents the most parsimonious model with only two sets of fixed-effects and linear province trends as controls. We see that the (logged) total volume of online petitions is strongly and positively associated with governments' emphases on welfare policies. Specifically, the coefficient indicates that for an average city, a 1 SD increase in online petition (~155 more petitions for a median city) is associated with a 0.48 percentage point, or about 17% of a standard deviation, increase in GWR welfare topic share. To put this figure in perspective, in a recent study of policy responsiveness in the United States, Caughey and Warshaw (2018) find that in the non-South, a 1 SD change in mass liberalism is associated with about 3.7% of a standard deviation immediate change in social policy and 1.4% of a standard deviation change in economic policy. In another study, Miller (2014) finds that a 1 SD loss in electoral vote in electoral autocracies is associated with about 30% of a standard deviation increase education and welfare spending. While such comparisons should always be carried out with caution as these studies are based on very different measures of public sentiments, they nonetheless still provide some reassurance that the magnitude of our estimate is within a reasonable range.

Next, we decompose petitions into several more refined topic groups and examine their respective impacts on welfare policy change. We apply a 30-topic LDA model to the petition text and, based on the estimated topics, classify petitions by (a) whether they are from rural or urban areas and (b) whether they involve issues directly related to one's pocketbook conditions. This gives rise to four distinct groups of petitions: rural petitions about pocketbook issues (RP), urban petitions about pocketbook issues (UP), rural petitions about nonpocketbook issues (RN), and urban petitions about nonpocketbook issues (UN). The details about the classification can be found in Supporting Information Appendix H.2. Type RP petitions are those related to rural low-income assistance, land-taking compensations, and financing of basic public goods. Common issues in type UP petitions include medical reimbursement, compensation for house demolition, wage disputes with employers, and unemployment benefits. Nonpocketbook issues include environmental degradation for rural areas and traffic control, public safety, education access, and property management for urban areas. Our expectation is that changes in welfare topics should be more strongly associated with types RP and UP petitions than with the other two types.
Columns 2–5 of Table 2 report the results from using the more refined petition groupings. Column 2 makes the distinction only between petitions concerning pocketbook and nonpocketbook issues, and column 3 further distinguishes between petitions from rural and urban areas. Columns 4 and 5 incrementally add to the specification of column 3 socioeconomic and leadership controls. The results largely confirm our expectation: Petitions concerning pocketbook issues appear to matter more for welfare policy change than do nonpocketbook petitions, and pocketbook petitions from rural areas appear to have the strongest association with changes in welfare topic share among the four types of petitions. For pocketbook petitions from urban areas, the coefficient is still positive but much smaller and less precisely estimated. One explanation for the weaker association may be that active participation by the middle class in urban areas has diverted some government attention from the lower class (as evidenced by the high frequency of property-related complaints).

### 5.4 Robustness and endogeneity

We conduct several additional robustness checks on the main results. In the interest of space, we provide only a brief summary here and leave the details to the Supporting Information. We find that our
main results are unchanged when we use the welfare topic proportion generated by an alternative, 20-topic LDA model as the dependent variable (Supporting Information Table A.7). Our results are also robust to including or excluding cities with special political status or distinct ethnic compositions (Supporting Information Table A.8). Moreover, we show that our results are not sensitive to removing cities with active local online petition platforms (Supporting Information Table A.10).

We also take special care to address the issue of endogeneity. One major concern, for example, is that the volume of online petition may itself be the result of prior government welfare policies. To address this concern, we conduct several Granger-style tests. We find little evidence to support the reverse link: GWR welfare topic shares are not strongly correlated with petition volumes in subsequent years (Supporting Information Appendix N). Another concern is that both policies and online participation may be driven by some unobserved time-varying events, such as a shift in societal preference for social welfare. We address this issue through an instrumental variables (IV) analysis, which we detail in Supporting Information Appendix O. The IV results are largely consistent with the ordinary least squares (OLS) ones.

5.5 Effects of online participation on substantive outcomes

The preceding analyses have demonstrated that LLMB petitions, especially those about rural, pocketbook issues, have a measurable impact on the emphasis of social welfare policies in government work reports. However, one may still question whether changes in policy rhetoric reflect actual changes in governing priorities. To address this issue, we examine the effect of online participation on more substantive policy outcomes. Our specific focus here is the Minimum Living Standard Guarantee Scheme (dibao), which is a major cash-based social assistance program targeted at the poor. Although this program is not the only welfare program that the government implements, we choose to focus on it because it has the best available data and is unambiguously an issue that concerns the lower class. Researchers have shown that local governments typically have a lot of discretion in designing and implementing their own dibao programs (Solinger & Hu, 2012). We thus expect that they will expand this program when pocketbook demands from lower-class groups become more salient.

**TABLE 3** Change in substantive outcomes: rural minimum living standard guarantee (dibao)

<table>
<thead>
<tr>
<th>Coverage (individual)</th>
<th>Coverage (family)</th>
<th>Total spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log petitions (rural pocketbook)</td>
<td>0.0167***</td>
<td>0.0371***</td>
</tr>
<tr>
<td></td>
<td>(0.0078)</td>
<td>(0.0127)</td>
</tr>
<tr>
<td>Log petitions (urban pocketbook)</td>
<td>−0.0002</td>
<td>0.0008</td>
</tr>
<tr>
<td></td>
<td>(0.0129)</td>
<td>(0.0150)</td>
</tr>
<tr>
<td>Log petitions (rural nonpocketbook)</td>
<td>−0.0101</td>
<td>−0.0095</td>
</tr>
<tr>
<td></td>
<td>(0.0062)</td>
<td>(0.0080)</td>
</tr>
<tr>
<td>Log petitions (urban nonpocketbook)</td>
<td>−0.0108</td>
<td>−0.0202</td>
</tr>
<tr>
<td></td>
<td>(0.0125)</td>
<td>(0.0167)</td>
</tr>
<tr>
<td>City and year fixed-effects</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Number of cities</td>
<td>301</td>
<td>301</td>
</tr>
<tr>
<td>Observations</td>
<td>1,762</td>
<td>1,762</td>
</tr>
</tbody>
</table>

Note. The table reports results using several implementation outcomes of the rural dibao program as the dependent variable. The specification is based on column 5 of Table 2. Robust standard errors clustered at city level are reported in parentheses. *p < 0.1. **p < 0.05. ***p < 0.01 (two-tailed test).
We collect city-level data on the coverage of the rural *dibao* program from the website of the Ministry of Civil Affairs, and correlate them with type RP petitions (along with other types). Table 3 displays the regression results for three metrics: individual coverage, family coverage, and total spending. We can see that RP petitions have a positive and significant impact on the implementation of rural *dibao* across all these metrics. The IV analysis yields largely similar, if not stronger, results (Supporting Information Table A.14). These patterns to suggest that online participation does have substantive redistributive consequences that go beyond policy rhetoric.

### 6 | CONCLUDING REMARKS

As one of the most influential technological inventions of the 20th century, the Internet is seen by many as having the potential to give citizens a louder voice in the political process. However, concrete evidence on whether and how Internet-based participation can affect government policies remains limited to date. This article addresses this gap by presenting new evidence on the policy consequences of online participation from China’s largest electronic petition platform. Contrary to the prevailing view that in developing countries the Internet is still a luxury technology enjoyed mainly by middle- and upper-class elites (Norris, 2001), our results suggest that when broadband infrastructure is made nearly universal, those from lower-class backgrounds will actively take advantage of new online channels to articulate their interests, and that their participation can lead local governments to place higher priority on social welfare issues in both rhetoric and actual policy implementation.

Our article speaks to the literature on the relation between the Internet and governance. Existing research has found that the Internet can help strengthen government accountability (Besley & Burgess, 2002) and reduce corruption (Bailard, 2009), but may also suppress voter turnout (Campante, Durante, & Sobbrio, 2013) and increase ideological polarization (Lelkes, Sood, & Iyengar, 2017). On the issue of political inequality, more specifically, empirical findings from survey-based studies in advanced democracies (the United States in particular) tend to support the view that the Internet will reinforce, rather than alleviate, the participation and influence gaps in the offline world (Norris, 2001; Schlozman, Verba, & Brady, 2010). Our findings suggest that the conclusion drawn from the experience of developed countries may not necessarily apply to a developing context where the opportunities for conventional forms of participation are more biased and limited. We provide evidence that supports the Internet’s potential to mitigate participation inequality among citizens and show that bringing in new voices into politics can substantively change governments’ policy priorities. While we certainly need to be cautious to not overgeneralize findings from one platform, it is worth noting that some of the key features that made the platform effective, including operational independence, ease of access, and transparency, are not rare qualities in the cyberspace. As many other countries and regions have started to adopt similar electronic petition platforms, a promising direction of future research will be to investigate whether a similar equalizing impact also exists in other country settings.

This article also contributes to a nascent but rapidly growing literature on nonelectoral responsiveness. Several recent studies have shown that in some non-Western political systems, and China in particular, inquiries and demands made by individual citizens receive replies from governments at a comparable rate as in electoral democracies (Chen et al., 2016; Distelhorst & Hou, 2017), and that individual politicians are generally attentive to citizen opinions (Meng, Pan, & Yang, 2014; Truex, 2016). So far, however, there is still limited evidence on whether, in the absence of formal electoral accountability, the preferences and demands expressed by citizens will be systematically taken into
account in government policymaking—a more fundamental criterion of political responsiveness according to the original formulation of this concept (Dahl, 1998; Miller & Stokes, 1963). Our findings suggest the existence of a form of responsiveness in China that matches with its canonical definition in the democratic context.

Finally, our analysis advances a more nuanced view on the relation between the Internet and the durability of the Chinese regime. While previous studies tend to portray a largely confrontational picture, focusing on either the subversive capacity of the Internet or the regime's efforts to control and manipulate the cyberspace (King, Pan, & Roberts, 2013, 2017), our findings suggest that the interaction between the two is not always zero-sum: The democratic potential of the Internet may be harnessed by the government to fulfill important governing functions. As such, the development of Internet may contribute to the regime's vitality by allowing it to improve the quality of governance without making more radical changes to its political institutions.

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ENDNOTES

1According to China Internet Network Information Center (CNNIC), the number of Internet users in China is estimated to be over 710 million as of July 2016.
2As of 2016, China is ranked 22 among the top 50 performers in e-participation (United Nations, 2016), a standing on par with Denmark and higher than Luxembourg (43), Portugal (50), and Iceland (50).
3In this article, we conceptualize the lower class in the Chinese context as including farmers and low-skill/migrant workers who usually live in rural areas or city outskirts (i.e., towns/suburban areas). This is consistent with the prevailing views about the social hierarchy in contemporary China (e.g., Goodman, 2014).
4The LLMB is not the only online petition platform available in China. Inspired by the LLMB, many local governments later developed similar platforms to receive and process petitions (for related studies, see Chen, Pan, & Xu, 2016; Distelhorst and Hou, 2017). However, because of the concern about censorship and data availability issues (many local platforms do not make petition data publicly available), we focus only on the LLMB for this study. In Supporting Information Appendix D, we compare LLMB petitions with petitions at a select set of local platforms on which we can get complete data. We find that the volumes of petitions from the two sources are highly correlated. This suggests that petitions at LLMB can be seen as broadly representative of the general patterns of online petitions in China.
5This is in part because, unlike an online forum, LLMB users only interact with the government but not with each other; the lack of horizontal communication makes it less pressing to censor posts for the purpose of preventing collective actions.
6Consistent with this view, existing research shows that the traditional offline participation channels in China are disproportionately used by those of higher political and socioeconomic status. Guo (2007), for example, finds that members of the Chinese Communist Party (CCP) and various “mass organizations” have a higher propensity to utilize the official channels in political
participation than do nonmembers. Tsai and Xu (2018) show that citizens with political connections are more likely to contact the authorities with complaints about public services.

3Ministry of Industry of Information Technology, https://goo.gl/CTBTGr. Although ownership of personal computer in rural areas is still not as common as in urban areas, public access venues such as Internet cafes provide inexpensive alternatives.

4Personal interviews, 2017. See Supporting Information Appendix Q for more information about the petition–policy linkage.

5The central government, for example, initiated a campaign entitled “I spoke to the Premier” to encourage netizen input to the drafting of the Central Government Work Report in 2014. Many local governments have also made their own initiatives. See “政府工作报告起草组负责人解读报告,” Xinhua News, https://goo.gl/d1oDQ, and “盐田区 2016 年政府工作报告向网友征求意见,” Shenzhen News, https://goo.gl/qwS8SG.

6On average, about 60% of the petitions on LLMB have received replies from local government agencies.

7In creating the issue groups, we consulted the output from unsupervised LDA topic models (discussed in Supporting Information Appendix H). For consistency concerns, the research assistants are instructed to independently go through all sampled petitions and we compare their coding results afterward. The intercoder reliability is above 80% for both dimensions. When the RA’s coding decisions disagree, we read the petition and determine the proper classification by ourselves.

8We could not unambiguously determine the issue topic for about 4% of the petitions and petitioner’s residence for about 19% of the petitions. These petitions are coded as missing.

9In doing so, we need to make two assumptions. The first is that that individuals who share similar grievances or social backgrounds use similar linguistic patterns, and the second is that the distribution of word for each issue in the training set is representative of the population.

10The large proportion of property-related issues is likely to be due to their frequent occurrence in daily life. Our reading suggests that many of the complaints under this category are about malfunctions of facilities in one’s apartments/residential compounds.

11We determine petitioners’ locations of residence based on the content of their petitions, which often mention where they live or even current address. Urban keywords include: residential complex 小区, urban community 社区, residential committee 居委会, urban district 城区, inside a city 城里. Rural: inside a village 村里, village 村庄/乡村, village committee 村委会, in countryside 乡下, mountain village 山村. Suburban: urban village 城中村, rural–urban fringe 城乡结合部, township 镇子, central town 中心镇, city outskirt 城郊, suburb 郊区.

12In the context of China, rural residents are generally poorer than those living in urban areas. In 2008 (the launching year of LLMB), the average disposal income for rural residents was less than one third of that of urban residents’ (4,761 yuan vs. 15,781 yuan). See https://goo.gl/K3tJSp (in Chinese).

13Full-text GWR data were collected from government websites and local yearbooks.

14The keywords with the highest association with each topic are detailed in Supporting Information Appendix F.4. We show that LDA is able to find highly meaningful policy areas. The output from the 20-topic model is available upon request.

15In Supporting Information Table A.2, we provide survey-based evidence on the difference in policy preferences for citizens of different socioeconomic backgrounds. Supporting Information Figure A.6 presents results on the effect of LLMB petitions on all GWR policy topics.

16Our main data set covers 299 cities for the period from 2008 to 2013. Due to a high level of missingness in GWR data and relatively low usage of the LLMB, we drop three far-flung western provinces (Xinjiang, Tibet, and Qinghai) from the sample. Our results remain robust to including these provinces in the sample (Supporting Information Table A.8).

21We choose to use change in welfare topic share as the dependent variable instead of its level to deal with the persistence and nonstationarity of welfare topic share.

22For the second type of petition, we identify their city origins based on posters’ IP address and mentioning of city keywords in texts. When a petition mentions multiple city name keywords, we pick the unit that receives most mentioning as a petition’s origin city.

23This procedure does not take input from the previous aggregate-level analysis. For each petition, the LDA model generates estimated proportions for all 30 topics. We assign each petition to the topic that takes up the highest proportion in that petition. For details, see Supporting Information Appendix H.

24An alternative specification is to use province-year dummies, which would consume more degrees of freedom in the estimation. Our main result is substantively the same when using this alternative specification.

25Although Chinese citizens do not enjoy the right to elect their government officials, prior research has shown that the regime does contain several nonelectoral channels for citizens to make their voices heard (e.g., Shi, 1997; Tang, 2016).
The dibao program is jointly funded by central and local governments, and local governments play an especially prominent role in raising money for the rural dibao, which is the focus of our empirical analysis here. Other responsibility of local governments include setting the maximum eligible income for local dibao applicants, approving dibao applications, disbursing the assistance, and monitoring the use of the fund (Bai & Gu, 2018).

REFERENCES


