CAN POLITICAL PARTICIPATION BY FIRMS INCREASE GOVERNMENT LEGITIMACY AND REGULATORY COMPLIANCE IN DEVELOPING COUNTRIES?

A FIELD EXPERIMENT WITH A BUSINESS ASSOCIATION IN VIETNAM *

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ABSTRACT:

Firms in developing countries commonly choose not to comply with regulations due to low opinions of government legitimacy and enforcement capacity. In this paper, we describe the results of a randomized controlled trial in Vietnam designed to test whether this threat to public interest can be reduced by providing firms the opportunity to comment on draft regulations. We find that firms given the opportunity to participate improved their views of government legitimacy more than other firms over the study period. Treatment firms were 8-10 percent more likely to allow inspections by chemical safety experts working for a government-affiliated business association. Most importantly, they also demonstrated greater regulatory compliance on the factory floor, especially with costlier requirements. None of these three main outcomes was positively influenced by early transmission of information during the participation period, none required that firms actually take up the opportunity to participate, and all were concentrated among small and medium-sized enterprises. *JEL* Codes: D22, J81, J88, K31, M48.

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> "The question should not be why compliance by firms is low. The question we need to be asking is what government can do to increase the degree to which firms believe the government is a legitimate regulator and that it is producing laws that should be followed."
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> - Nguyen Dinh Cung, Director, Central Institute of Economic Management (CIEM) during "Regulatory Participation and Compliance" workshop at CIEM in Hanoi, Vietnam on November 1, 2016.

I. INTRODUCTION

An explosion in a Sinochem subsidiary's warehouse in Tianjin, China killed 173 people and injured 795 others on August 12, 2015.[1] Subsequent investigations revealed that, despite being directly owned by the state, the warehouse's storage procedures were illegal. Two other nearby Sinochem warehouses were subsequently found to have similarly illegal practices, including close proximity to nursery and primary schools.[2] Government failure also played a central role in the much deadlier collapse of the Rana Plaza building in Dhaka, Bangladesh on April 24, 2013: just one day earlier, officials chose not to act on clear violations of structural safety regulations exposed during onsite inspections.[3] These tragic anecdotes indicate the dangerous implications of disregard for the rule of law that is prevalent among firms in developing countries. Recent empirical work identifies a negative correlation between prevalence of industrial accidents and quality of government institutions and suggests that this stems from a toxic mix of weak enforcement capacity and rampant corruption (Takala et al. 2014).[4] Under these conditions of weak state capacity, what can be done to to incentivize firms to abide by government regulations and ultimately protect the public interest?

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[1] See, for example, the Sept. 10, 2015 article in the New York Times Opinion section titled "Tianjin Chemical Explosion Raises Concerns, in China and the U.S.": http://www.nytimes.com/2015/09/10/opinion/tianjin-chemical-explosion-raises-concerns-in-china-and-the-us.html.

[2] Phillips, Tom (19 August 2015). "Tianjin blast: more warehouses accused of violating rules on toxic materials". *The Guardian*.

[3] See, for example, the May 10, 2013 story on BBC titled "Bangladesh factory collapse toll passes 1,000": http://www.bbc.com/news/world-asia-22476774.

[4] Duflo et al. (2013) show a similar dynamic of corruption and poor compliance when regulation of environmental standards is carried out by private auditors paid for by firms themselves. Their study identifies policies for increasing compliance within this system of private regulation.

This paper examines whether more positive perceptions of government legitimacy and, ultimately, greater regulatory compliance could result from allowing firms to provide feedback during the design of regulations aiming to limit the negative externalities of business operations.[5] The logic for this pathway builds upon previous work on the societal benefits of participatory institutions (Bardhan 2000, Frey 1998).[6] Of particular relevance is Dal Bo, Foster, and Putterman (2010), who show that players of a prisoner's dilemma game are significantly more likely to comply with rules incentivizing socially beneficial behavior after learning that the constraints on their behavior came about through consultation with fellow players. Their study uses a laboratory experiment to address the selection bias in previous work, whereby participants in the rule making process differ systematically from non-participants.

Our empirical study consists of a two-year randomized controlled trial that evaluates an initiative by the Vietnam Chamber of Commerce and Industry (VCCI) to mobilize comments on a draft labor regulation from a broad, representative sample of domestic firms in northern Vietnam. VCCI is a quasi-governmental organization[7] established during the central planning era, headed by a Vietnamese Communist Party member, and formally responsible for keeping government abreast of business interests (Stromseth 2003). This includes mobilizing comments from firms on draft business regulations,[8] which VCCI does by hosting workshops and

[5] There is a long history of debate in economics on whether and when government regulation benefits the public. Skeptics suggest that benefits are frequently outweighed by increased transaction costs, entry barriers that protect inefficient monopolies, and facilitation of the "grabbing hand" of local officials (Shleifer and Vishny 2002, Djankov et al. 2002, Friedman et al. 2000).

[6] It also builds on previous work on the effects of participation in rule making by political scientists looking at citizens in China (Truex 2014, Fishkin et al. 2010) and by organizational behavior scholars looking at employees within organizations (Folger and Konovsky 1989, Tyler and Blader 2005)

[7] A quasi-governmental organization (QUANGO) is a semipublic administrative body outside the civil service but receiving financial support from the government, which makes senior appointments to it. Despite its deep ties to the government and Vietnamese Communist Party, VCCI currently self identifies as a QUANGO.

[8] Specifically, in the 2015 version of the Law on Laws, Article 6 states that the "Vietnam Chamber of Commerce and Industry…has the right to and should be provided the opportunity to provide comments on proposals for the need for new legal documents and on new draft legal documents themselves." Article 10 of Decree 34/2016/NĐ-CP

maintaining its own online regulatory feedback platform (www.vibonline.com.vn). But participation by firms has been very limited in both forums,[9] so our study can be understood as an experiment with implementation of a largely dormant government policy.

Our study design involved random assignment of sample firms to one of three distinct on-site visit interactions with a VCCI representative in the treatment round. Firms in our key participation treatment group were visited by a VCCI representative who described the operational requirements of a newly drafted labor regulation and asked for feedback on how it could be improved. Firms in a second treatment group also learned the same information, but were not given the opportunity to provide comments. This key distinction between treatments allows us to separate the pathway of greater compliance through improved government legitimacy from a pathway based more simply on transmission of information. Firms in a placebo treatment were informed about VCCI's broader efforts to facilitate communication between government and the business community during the regulatory design process, but were not given special notice about the target draft labor regulation. All sample firms were visited again, approximately a year later. This time, VCCI sent experienced chemical safety auditors to provide advice on how to most cost effectively adhere to the final regulation, while at the same time judging relevant safety conditions and the degree to which the firms were in compliance.

There were, at least, two major challenges that made it less likely that our study would identify a positive relationship between participation and compliance. The first relates to basing a theory of firm-level behavior on an individual-level psychological relationship. Firms are not people and, while people create and manage them, there is reason to believe firms face greater pressures to maximize self-interest than do individuals (Posner 1974, Peltzman 1976b, Millon

on implementation of the Law on Laws further states that: "In the process of proposing new legal documents, the legislative body is responsible for consulting VCCI for input on the rights and obligations of businesses.

[9] See Online Appendix A for count statistics on commenting activities on VCCI's VIBonline website.

1990).[10] The second challenge is that firms have many different interactions with the state, making it very difficult to influence their impressions of government legitimacy through just one. In fact, much like in China, government calls for participation in policy making have become increasingly common in Vietnam, so our experiment was not the first case of this specific type of interaction for our sample firms.[11] There is even some evidence in both countries that cynicism about the meaningfulness of participation is on the rise due to perceived lack of government responsiveness (Stromseth, Malesky, and Gueorguiev 2016, Malesky and Taussig Forthcoming).

Our experiment overcame these challenges and delivered four important findings. First, we find direct experimental evidence that the opportunity to participate in the regulatory design process increases firm perceptions of government legitimacy. We asked firms in both the treatment and the audit round whether they agreed with a statement that government officials had sufficient industry knowledge to carry out their regulatory responsibilities. Perceptions of government regulators improved significantly between visits across the sample, potentially reflecting an overall positive influence of their shared interactions with VCCI. But firms that received the participation treatment exhibited one third of a standard deviation higher improvement in their views of government on this metric than firms in the other two groups.

Second, as compared to the rest of the sample, a firm given the opportunity to comment was 8-10 percent more likely to allow a chemical safety expert sent by VCCI to evaluate its factory operations in the audit round and provide suggestions on how to most efficiently achieve

[10] On the other hand, the distinction between individual and firm-levels may be less significant in the case of most firms in developing countries, where participation and compliance decisions are both likely to be carried out by either the same person or by people who are either members of the same family or are close friends. Further, it should be easier for these heads of SME to translate any increased desire to comply into actual compliance on the factory floor because, even when their firms grow to more medium-sized scale, there is reluctance to outsource to professional middle managers (Bloom et al. (2013).

[11] 28 of 1,200 firms (2.3%) asked in the treatment round of our experiment said they had commented by any means on any regulation over the previous year. Larger firms were more likely to comment, with 9.7% of those employing 200 or more workers having made comments on drafts in the past year.

compliance. This decision to cooperate with VCCI was particularly meaningful because the language of the target labor regulation was far from clear in precisely how it defined regulatory compliance. This caused an uncertainty for firms that appears to be the norm in developing countries.[12] As a result, we interpret this finding as strong evidence that participation in the regulatory design phase makes a firm more open to cooperating with government regulators to sort through the messy and subjective compliance process that necessarily follows introduction of a flawed new regulation.

Our third finding is that the randomly assigned participation opportunity was associated with a higher likelihood of overall compliance with the target regulation on the factory floor. Firms in the participation treatment demonstrated average compliance of 42 percent on relevant clauses, whereas those in the control group averaged 36 percent compliance. This constitutes a nearly 15 percent improvement. Importantly, this result is not driven primarily by the 28 percent of firms in the participation treatment that provided truly substantive comments. In fact, we find that coefficient sizes and statistical significance of the participation treatment effect are largely unchanged when we eliminate these commenters from our analyses. As a result, it is highly unlikely that the greater compliance witnessed among firms in the participation treatment was motivated by idiosynchratic benefits achieved through their own comments.[13]

[12] In an interview in Hanoi on May 9, 2014, Dr. Nguyen Thai Hoa, National Project Coordinator for International Labor's "Occupational Safety and Health in Hazardous Work in Viet Nam" Program, stressed that business regulations in developing countries are usually of such low quality that lobbying for significant further revisions has to begin almost immediately after they are first put on the books.

[13] Our design does not allow us to directly test the effect of substantive change to the regulation on regulatory compliance. Experiments are not well suited to testing this pathway, since random assignment makes it likely that each treatment group will exhibit a largely identical array of preferences regarding the regulation. Unless the preferences of treated firms are highly variegated or idioysynchratic, we are unlikely to see differences between the control and treatment groups in outcome variables. Nevertheless, we did carefully track changes to the draft regulation throughout the study period and observed that most changes made to the regulation between the treatment and audit rounds were the result of comments from chemical safety experts, not from firms. Furthermore, while we find some evidence of substantive change resulting from firm comments, these suggestions were quite general, applying to numerous firms in both treatment and control groups.

Finally, tests of the heterogenous effects of our participation treatment indicate that its effect on all three main outcomes was strongest among small and medium-sized enterprises (SMEs). This is consistent with the logic of our government legitimacy pathway, given that large firms are both more likely to already have their own political connections and to expect more serious government enforcement.[14] The lack of a relationship between participation and compliance for micro enterprises may reflect how different their operations are and potentially even an inability to believe that government would ever really take seriously their input.

The remainder of this paper is organized as follows. Section II discusses further the important role of SMEs in our study. Section III outlines the research context and experimental design. Section IV describes data collection and presents summary statistics. Section V discusses the empirical results and Section VI concludes.

II. FIRM SIZE AND THE NATURE OF FIRM INFLUENCE ON GOVERNMENT

In this section, we discuss how the type of participation in the regulatory design process we study in this paper, and its potential to produce public benefits, is shaped by firm size. It is important to be clear that we are referring to a form of participation that is meaningfully different from regulatory capture by a small set of large, politically connected firms, which serves as the status quo in most developing countries (Hellman and Kaufmann 2001, Hellman and Schankerman 2000). Instead, our interest is in participation by SMEs, which make up over 95 percent of firms in the US and Europe (OECD 2000) and significantly more in developing

[14] Greater government enforcement would be the most straightforward response to regulatory non-compliance, but detection and punishment of regulatory non-compliance is costly (Glaeser and Shleifer 2003, Becker 1968, Ehrlich 1996, Becker and Stigler 1974) and it is reasonable to expect that lack of legitimacy makes it even more difficult for already resource-strapped governments in poor countries to raise the revenues needed to cover enforcement costs. To make matters worse, a less legitimate government may also find enforcement costs to be higher than in other states, due to firms' greater commitment to hiding their transgressions (Glaeser and Shleifer 2003).

countries (ILO 2015).[15] As such, we are interested to examine the benefits of a more formal and broad-based participation system that brings new insights from previously disenfranchised SMEs into the government's regulatory design process.

Previous work has shown that the existence of competing interest groups can increase government's power to arbitrate in ways that benefit broader society (Laffont and Tirole 1991, Peltzman 1976a). Because of their limited resources, far larger overall numbers in the economy, and presence in more competitive industries, SMEs naturally have a very different relationship with government officials than larger operations in more concentrated industries (Stigler 1971, Olson 1971, Baron 2000). As a result, when conceptualizing pressure groups competing for political influence over government (Becker 1983), it makes sense to place SMEs in a fully distinct and even competing category relative to that of their large firm counterparts.

Recognizing the differences between SMEs and large, politically connected firms is critical for proper consideration of the most important alternative pathway by which participation by firms can shape their regulatory compliance. This alternative is that participation in the regulatory design process could affect a firm's compliance behavior by altering the costs of compliance through change to the actual substance of the resulting regulation. We term this alternative the stubstantive change mechanism.

There are two distinct versions of the substantive change mechanism: one positive for the public interest, the other negative, but both potentially increasing compliance. The underlying dynamics of these two versions of the substantive change mechanism mirror the broader debate in economics over whether business consultation in the rulemaking process leads to higher

[15] The definition of SMEs tends to focus on firms with up to either 200 or 250 employees. The United States, however, defines them as firms with fewer than 500 workers. Because of such definitional issues and data constraints across countries, the percentage figures on share of SMEs cited by the OECD and the ILO actually include micro enterprises, which are defined as firms with up to either 5 or 10 employees (ILO 2015, OECD 2000).

quality law (Sappington and Stiglitz 1987b, Viscusi and Zeckhauser 1979b) or capture of the policy-making apparatus (Owen and Braeutigam 1978, Posner 1974, Martimort 1999, Levine and Forrence 1990) and rent-seeking (Kreuger 1974, Buchanan and Tullock 1975).

We begin with the positive version whereby business participation can lead to "better law." This is essentially the inverse of the information pathway described in the Introduction, as it relates to the benefits of information flowing from firms to government instead of from government to firms. Going back to Stigler (1971) and the private interest theory of regulation, scholars have recognized that regulators do not have sufficient information with respect to cost, demand, quality, and other dimensions of firm behavior. Therefore, they can only imperfectly promote the public interest when controlling firms or societal activities. Because of this, consultation with business owners and managers can leverage their expertise and experiences to identify problems with the logic and implementation of government regulation and thereby better tailor regulatory policy to the full spectrum of real world, factory floor conditions (Baldwin and Black 2008, Ayres and Braithwaite 1994, Sappington and Stiglitz 1987a, Coen 2005, Viscusi and Zeckhauser 1979a). Given the limited understanding that poorly resourced government regulators in developing countries have about the activities of the businesses under their charge, incorporating insights from harder-to-reach firms could have this positive effect. As a result, the "better law" version of the substantive change mechanism adds to the theoretical argument in favor of involving a wider spectrum of firms in the regulatory design process.

In contrast, the negative variant of the substantive change mechanism clearly undermines the public interest case for participation programs. In this version, providing profit-maximizing firms with access to the rule making process improves compliance only by weakening the degree to which resulting regulations constrain firm operations and their negative externalities. This

concern is related to the theory of regulatory capture, which characterizes participation by firms in the policy process as harmful to public interest in favor of the colluding private interests of regulators (Martimort 1999, Posner 1974, Owen and Braeutigam 1978, Stigler 1971, Laffont and Tirole 1991) and rent-seeking firms (Kreuger 1974, Buchanan and Tullock 1975).

Importantly, however, previous work on regulatory capture and rent-seeking has not appropriately accounted for the political activities of SMEs. First, because of the large numbers of SMEs, under-resourced regulators struggle to effectively monitor their activities and punish non-compliance (Gunningham 2002, Fairman and Yapp 2005). This heightens the need for identification of policy approaches for governing SMEs that are not primarily reliant on government enforcement. Second, relative to large firms, SMEs have limited financial and political resources to expend on influencing regulations, operate in more competitive industries, and, as a group, have difficulty acting collectively (Olsen 1965, Stigler 1971). As a result of these characteristics, participation by SMEs should serve as less of a threat to the public interest. Third, the political impotence of SMEs means that their views are rarely represented adequately in legislation. SMEs are therefore more likely to unfavorably perceive regulation as the result of collusion and rent seeking by large firms and regulators (Hellman and Kaufmann 2001) that generates barriers to their entry and growth (Caves and Porter 1977, Djankov et al. 2002, Klapper, Laeven, and Rajan 2006). All of these issues point towards the value to the public of greater inclusion of SMEs in the regulatory design process.

III. CONTEXT AND EXPERIMENTAL DESIGN

III.A. Study Context

Our study covers 11 neighboring provinces in Vietnam's densely populated Red River Delta region, including the country's capital, Hanoi.[16] Since beginning its market transition, Vietnam has been one of the world's fastest growing economies, averaging 5.5% annual growth from 1990 to 2013.[17] The Red River Delta has done particularly well, with per capita income rising 34 percent faster than any other region in the country from 1999 to 2014.[18]

Development of Vietnam's government institutions, however, has significantly lagged its economic growth. The country's regulatory system remains among the world's least transparent,[19] most cumbersome,[20] and most corrupt.[21] Furthermore, with state-owned enterprises still accounting for about a third of the economy, government attention remains divided between its roles as direct market participant and objective referee.[22] Institutional

[16] Neighboring provinces included: Bac Ninh, Hai Duong, Hung Yen, Vinh Phuc, Phu Tho, Thai Nguyen, Ninh Binh, Hai Phong, Nam Dinh, and Ha Nam.
[17] According to World Bank Indicators Data at http://data.worldbank.org.
[18] Regional level economic and demographic data from GSO can be accessed at http://www.gso.gov.vn/SLTKE/pxweb/en/11.%20Health,%20Culture,%20Sport%20and%20Living%20standard/-/E_11.19.px/?rxid=5a7f4db4-634a-4023-a3dd-c018a7cf951d.
[19] The World Economic Forum (WEF) ranked Vietnam 116th of 144 countries for the transparency of its government policy making, directly behind Zimbabwe and Bangladesh and far behind China (33). This represents a sharp fall after its rise to the rank of 53 in 2009-2010. Worsening overall transparency of drafting new regulations has also been highlighted by VCCI in its annual report on ministerial efficiency (VCCI 2014).
[20] Vietnam ranked 101st out of 144 countries on the WEF's 2014-15 Burden of Regulation index. This puts Vietnam just behind Nigeria and Timor Leste, while China ranks 19th. For further details, see http://reports.weforum.org/global-competitiveness-report-2014-2015/rankings/.
[21] Vietnam was also in the bottom third on both WEF's 2014-15 Irregular Payments and Bribes index (109th of 144 countries) and Transparency International (TI)'s 2015 Corruption Perceptions Index (112th of 168 countries).For further details on TI's rankings, see https://www.transparency.org/country/#VNM.
[22] The tension between these duties is further exacerbated by evidence that privatization of SOEs is, at least temporarily, undermining the government's ability to collect the revenues it needs for strengthening its regulatory capacity (Tran and Dao 2015).

development at the provincial level, the level at which business regulations are enforced, has varied significantly in Vietnam and has been particularly slow in the Red River Delta.[23]

Vietnam's private firms are spread throughout the country, hard to reach, and have limited technological capacity, which makes them exactly the type of firms for which regulatory compliance is hardest to achieve (MOLISA 2016).[24] All of this has contributed to the prevalence of industrial accidents in Vietnam.[25] Furthermore, SMEs see the policy environment as unfair: in a survey of a representative sample of firms in 2015, 46 percent said the state is biased in favor of large, elite, private firms, particularly in regard to business entry, land access, and procurement (VCCI 2015).[26] This perception further underlines how SMEs would be the most important beneficiaries of any initiative to expand access to the policy making process.

Central to our study is the existence of Vietnam's Law on the Promulgation of Legal Normative Documents (popularly known as the Law on Laws), which, beginning in 2008, formally mandated that all ministries publicly post all draft regulations for a public comment period of at least 60 days. But, even with this requirement, which the government placed on itself, compliance has been poor and inconsistent.[27] Table I shows variation across individual

[23] Average scores for the Red River Delta on a Vietnamese provincial governance index have been consistently and significantly lower than comparable provinces around Ho Chi Minh City (VCCI Multiple Years). This may reflect the region's more sizable state sector, lesser experience with entrepreneurship, and greater proximity to political power, all of which potentially reduce grass roots pressure for continued development of market institutions (Malesky and Taussig 2009)

[24] Following a company law that drastically reduced entry barriers, over 250,000 new private companies registered with the government between 2000 and 2013. These firms are mostly quite small: 66 percent have ten employees or fewer and 82 percent have fewer than twenty (General Statistics Office Multiple Years).

[25] The absolute number of fatal industrial accidents in Vietnam continues to rise and the rate remains nearly twice that of the U.S. (MOLISA 2016). A 2015 ILO study of relatively large garment firms noted that regulatory non-compliance was "highest and most concentrated" in the area of Occupational Safety and Health (OSH): 90 percent were not compliant with requirements relating to OSH management systems, and 74 percent were not compliant with rules relating to hazardous chemicals (Better Work Vietnam 2015).

[26] This represents a shift from PCI results in previous years, when surveyed firms were more likely to cite unfair bias in favor of SOEs, rather than elite private firms.

[27] In our discussions with government officials, we were often told that violations of the Law on Laws by government agencies were not punished.

ministries in the definition of formal rules on the posting of draft documents, the frequency with which drafts have been posted, and the length of delays along the way.[28]

<Table I about Here>

III.B. Choosing a Target Draft Regulation

The first task in our research design was to identify an appropriate draft regulation on which to conduct our experiment.[29] To identify the best fit, we arranged a national workshop to explain our needs to key officials responsible for designing business regulations.[30] In the end, our choice was a still-to-be-drafted regulation by the Ministry of Labor, Invalids, and Social Affairs (MOLISA)'s Worker Safety Department (WSD), which aimed to protect workers at firms dealing with hazardous chemicals.

[28] Much like in China (Stromseth, Malesky, and Gueorguiev 2016), room for such insubordination was created by the clear message from top leadership that participatory processes must not be allowed to threaten government and party authority (Malesky, Schuler, and Tran 2012, Malesky 2014).

[29] The most fundamental condition was that this regulation would be drafted by the government in the relatively near future. We identified three additional basic requirements, all of which were complicated by the fact that it was, by definition, a draft regulation that did not yet exist in any form. First, we needed its future version to be broadly relevant to the extent that we could concentrate our test geographically but still have sufficient statistical power. Second, we needed it to be sufficiently salient and costly for affected firms, such that entrepreneurs would be motivated to provide comments to government on how intended protections could be achieved in a more effective and business-friendly way. Finally, we wanted it to involve compliance requirements that would be as easily observable to researchers as possible. This final factor was critical to our desire to avoid social desirability bias and the resulting overestimation of compliance behavior that has limited the validity of previous work relying on self-assessments of compliance (Randall and Fernandes 1991). For practical considerations, we decided to focus on a technical regulation (*dự thảo*) drafted by a ministry rather than a law drafted by the Vietnam National Assembly. Laws tend to be quite expansive and more ambiguous, with the details of compliance usually filled in later by implementing documents. This includes technical regulations, which therefore offered a cleaner test. Moreover, unlike laws, technical regulations are posted with greater regularity, increasing our options for finding a good fit and allowing more time for preparation and training.

[30] The workshop and some additional interviews were all carried out on October 15th and 16th, 2013, at VCCI headquarters in Hanoi and included representatives of the Ministry of Health, Ministry of Natural Resources and Environment, Ministry of Planning and Investment, Ministry of Science and Technology, and Ministry of Labor, Invalids, and Social Affairs (MOLISA), as well as the offices of the Prime Minister and the President.

III.C. Experimental Sample and Design

We created our sampling frame from a national firm list, which VCCI accessed from the Vietnam General Department of Taxation. Figure I details the process by which we used screening, primarily by phone, to go from an initial 18,701 firms down to our final sample of 1,200 firms.[31] Our target was 300 firms per treatment group.[32]

<Figure I Here>

For the baseline treatment round, our research teams visited sample firms over a three-month treatment period that lasted from October 2014 to January 2015. Visits followed our receipt of a draft version of the hazardous chemical regulation from MOLISA, dated September 12, 2014, and subsequent finalization of treatment materials. Blocking on available data regarding firm size, two-digit industry codes, and the CEO's gender, we assigned the 1,200 firms across our three treatment groups.

The first group was our Placebo Treatment (henceforth, the Control), which consisted of 388 firms at baseline. Baseline round visits to all sample firms included a basic tablet-based survey with 37 questions about their CEO, firm size and performance, and feelings about government's regulatory legitimacy. Control firms were also shown a placebo video presentation that we created about business services provided by VCCI's Legal Department, especially those relating to its official responsibility to mobilize input on draft regulations from the business community. The video was shown on the tablet and lasted six minutes and 48 seconds.

[31] The initial 18,701 firms were all: i) in Hanoi and the 10 surrounding provinces; and ii) registered with a four-digit industry code that our chemical safety experts identified as associated with the use of hazardous chemicals. Online Appendix B details the evolution of our sampling frame by province.

[32] This was based on power calculations that put status quo compliance at 8%, based on a rough estimate by MOLISA.

The second group was our Information Mechanism Group (T1), which consisted of 295 firms at baseline. This treatment was designed in recognition of the possibility that low levels of regulatory compliance resulted, to some significant extent, from insufficient knowledge among firms about regulatory requirements. This possibility threatened our ability to cleanly test our hypothesis regarding the government legitimacy pathway, since it was also possible for participation to influence compliance by providing firms with greater knowledge about the regulation and its requirements. To address this, instead of the placebo video, T1 were shown a different video on the labor protection aims of the target draft regulation and the operational effects of eleven key clauses that our chemicals experts had identified as likely to require the greatest firm-level investments of time, effort, and money. As with the one seen by firms in the Control, this video was tablet-based and lasted about six and a half minutes (6:24).

The third and final group was our Legitimacy Mechanism Group (T2), which included 517 firms at baseline. In addition to the core tablet-based survey and the T1 video, these firms were shown the text of the eleven key clauses and asked to respond to a tablet-based series of open- and closed-ended questions on the costs, quality, and need for improvement for each clause. According to our chemical safety experts, 28 percent of these firms offered specific comments that were of sufficient substance to be useful for potentially altering the regulation. All others only answered the close-ended questions or offered limited feedback on the regulation.

All T2 firms subsequently received a report that described results of the participation exercise. This was sent to firms through the mail in late April 2015, more than three months after our final treatment round visit. The 28 percent of firms that made truly substantitive comments received reports with tailored responses to their comments. The general version sent to the rest of the T2 firms included information on all changes made by the government's drafting committee,

as of its April 13 revision, and responses to a subset of those comments that were identified by our chemical safety experts as particularly salient. To test whether this additional round of contact with government had an influence on compliance that was separate from that of participation, we randomly assigned 97 T1 firms to receive the general report as well.[33]

Table II lists the key eleven clauses highlighted in the T1 video presented to T1 and T2 firms and how these clauses had been revised as of the mailing of the report to firms. In three cases, firm comments contributed directly to the change. These included: 1) clarification of the type and use of chemical showers and taps outside of storehouses in Clause 4; 2) addition of protective barriers as shields between reactive chemicals in Clause 9; and 3) improved explanation of what "operator position" means in Clause 11. In the other cases, clauses were changed by the drafting committee either of its own accord or in response to the opinions of other government experts. Notably, this was the case for the weakening of Clause 10, which reduced the minimum distance between mechanical equipment and flammable chemicals from 20 meters to 15 meters. A T2 firm actually did request that the 20-meter requirement be revised to allow for a reduced distance in cases where there was also a wall divider, but the committee made an explicit decision to include the reduction without this key contingency.

<Table II about Here>

III.D. Compliance Monitoring

The endline survey began in November 2015 and finished in March 2016. This meant an average of approximately 13 months between treatment and the endline. Requests to sample firms to return for visits to perform compliance audits were framed as a free business support service by VCCI, consisting of expert technical advice on how to most effectively and efficiently

[33] We found no evidence that the additional contact influenced our results.

invest into being in compliance with the target regulation. To provide this service, we identified a set of auditors who all had substantial professional experience judging the chemical safety conditions of factories in Vietnam. All of our auditors were therefore well equipped to engage firm managers in serious discussions about what constructive and cost efficient steps could be taken to maximize the odds of being judged to be in compliance by government regulators.

The advanced technical expertise of our auditors was of particular importance to implementation of our study, due to the fundamentally low quality of both the original and final draft versions of the target regulation. Specifically, it proved extremely difficult for us, as well as the experienced chemical safety experts we employed, to decipher the precise operational parameters that the document aimed to establish for regulated firms. This was true even though we had, and took advantage of, direct and regular contact with members of the drafting committee for the target regulation.

The draft's lack of clarity can be understood as a result of the limited technical expertise relating to chemical safety housed within MOLISA. It is worth emphasizing that the WSD, which was responsible for worker safety across all industries in a country of nearly 90 million people, employed just ten individuals. Their research for designing the draft involved referring to a Malaysian chemical safety regulation and visiting ten chemical-producing firms in three of Vietnam's 65 provinces to learn about how they protected their workers. The firms visited were far from representative, including one owned by global giant Samsung, six that were formerly state-owned, and three that were purely private but still quite large. The stated goal of visiting these firms was to learn from existing best practices, rather than to understand common realities of handling hazardous chemicals. The strategy for ensuring relevance to a broader range of firm types was primarily to leave room for interpretation by being less specific. This intentional lack

of clarity in the written document ultimately forced us to rely on subjective judgements by our auditors on safety conditions relating to each of the key clauses in the target regulation. All of the above is important context for the general problem of terribly low levels of regulatory compliance in developing countries.[34]

IV. DATA AND DESCRIPTIVE STATISTICS

Figure II depicts the treatment conditions and final sample sizes in each group at baseline and endline. Despite our efforts to frame our return visit as a free business service from VCCI, we experienced significant attrition between the treatment and audit rounds. For each of the three treatment groups, this decline was about 30 percent. Some of the decline was due to normal churn, with firms going out of business (4% of baseline sample), moving to an unknown new location (3%), or changing their line of business into one that no longer related to hazardous chemicals (2%). However, 249 firms (21%) refused to participate despite being identified as still operating in the same line of business.

<Figure II about Here>

Closer examination indicates that attrition between rounds was not systematically correlated with features of the treatment groups and thereby is not a threat to our random

[34] Online Appendix C provides a schematic of the evolution of the regulation's key clauses throughout the experiment. There are two important points to note in this table. First, Clause 2, which related to aquaphobic chemicals, was completely dropped from the final version of the draft regulation due to the complexity of monitoring. As a result, we were left with ten clauses that were present in both the treatment and audit rounds. Secondly, in addition to the ten clauses, we instructed auditors to monitor compliance on four additional items. The first two were from the same hazardous chemicals regulation, but had not been included among the key eleven that we chose to describe in our information treatment. The second two were from a separate regulation on fire safety, which was written by a separate government agency. These were added to examine the possibility that the compliance benefits of participation could spill over into separate regulatory arenas. We are grateful to Kate Baldwin at Yale for this suggestion. We found no evidence of compliance spillover into clauses that did not receive participation and therefore do not dwell on them in the results.

assignment. Online Appendix D shows that refusal rates were identical and a variety of reasonable covariates were balanced across the three groups.[35]

A further area of potential concern is the extent to which our treatments were absorbed by sample firms. In the case of T1, it is important to determine whether firms were actually better informed about the hazardous chemicals regulation. In the case of T2, absorption implies that firms were convinced that they had really been given meaningful access to the target regulation's drafting committee.

Figure III presents responses to three questions in the audit round survey that speak to absorption of the manipulations. These include awareness,[36] understanding,[37] and perceptions of quality.[38] Reflecting the difficult realities of regulating developing country SMEs, knowledge, understanding, and quality assessments were extremely low in the Control (20%, 1.2, 1.21). These numbers were all significantly higher in T1 (45%, 1.54, 1.69).[39] Still, the fact that more than half of T1 firms did not remember hearing of the regulation may reflect the regulatory environment's lack of transparency and the preponderance and constantly shifting nature of regulatory red tape in Vietnam's transition economy. Furthermore, the absorptive capacity of SMEs may be particularly limited.[40] The opportunity to comment on the draft regulation added further to the awareness, understanding, and quality assessments of firms in T2 (58%, 1.8, 2.0),

[35] Two exceptions of post-treatment imbalance are observable. First, firms in the Control reported significantly worse post-treatment business performance than firms in T1 and T2 (see row 13). Second, we learned that our auditors were more likely to receive permission to view the factory floor in T2 than T1 (see row 2). As we noted in the introduction, however, this can actually be understood as a meaningful experimental outcome. We discuss this in detail in the Section III subsection "Outcome 2: Access to the Factory Floor."
[36] Have you ever heard of this Draft before? (No=0, Yes=1).
[37] If Yes, could you please rate your understanding of the Draft on the scale from 1 to 5? (5. Fully; 4. Well; 3. Average; 2. Slightly; 1. Not at all).
[38] How do you rate the quality of this draft regulation relative to the other regulations that you have opportunities to read or give comments on? (5. Much higher; 4. Higher; 3. Similar; 2. Lower; 1. Much Lower).
[39] If we limit the analysis to only respondents who answered in both rounds of the survey, awareness still only increases to 51%.
[40] Across all three treatment groups, larger firms demonstrated higher levels of recall.

indicating benefits above and beyond transmission of information about the regulation. The large difference in quality assessments also points toward our legitimacy mechanism.

<Figure III about Here>

V. EXPERIMENTAL ANALYSIS RESULTS

V.A. Outcome 1: Firm Perceptions of Government Legitimacy

Our first analysis studies changes in firm perceptions of government regulatory competence. Our dependent variable, *Legitimacy,* is derived from a question included in both the baseline and endline surveys. The question asked firms to record their level of agreement with the following statement, "Government officials have sufficient understanding of business like this one to effectively carry out their regulatory duties."[41] In the baseline survey, only 48 percent of firms in the Control agreed. In the endline survey, however, views of government had improved significantly, with 64 percent of Control firms in agreement with the statement.

In Table III, we show the results of a Difference-in-Difference analysis testing the relationship between our randomized interventions and answers to this question on firm perceptions about government across the two rounds.

<Table III aboutut Here>

Using a linear equation, we regress *Legitimacy* on our two treatment variables, *Information* and *Participation*. *Information* is coded as 1 if the firm received the presentation on the forthcoming hazardous chemical law, and 0 otherwise. As shown earlier in Figure II, this applies to firms in both the T1 and T2 groups. *Participation* is coded as 1 if the firm was given

[41] Original response values ranged on a scale of 1 ("Strongly Agree") to 4 ("Strongly Disagree"). When we refer to agreement, we mean a response of either 1 or 2. To simplify interpretation, we reversed the scale for *Legitimacy* by subtracting the original values from 5, such that an increase means greater legitimacy.

the opportunity to provide comments on the draft regulation. This applies only to firms in T2 and captures the variance explained by participation over and above simply learning about the law.[42]

$$\begin{aligned} &\text{Information = 1 if T1=1 or T2=1} \\ &\text{Participation=1 if T2=1} \\ &\text{Reference Category=Control Group=1 if T1=0 \& T2=0} \end{aligned} \tag{1.1}$$

As equation 1.2 shows, both *Information* and *Participation* were interacted with a dummy variable, *Audit Round*. *Audit Round was* coded 0 for *Legitimacy* scores recorded in baseline survey and 1 for those that came from the endline survey. These two interactions are displayed in Estimating Equation 1 of Table III. Following standard experimental methodology, we included fixed effects for blocking variables used in the randomization process in Equations 2 and 3.[43] Equation 4 further introduces firm fixed effects and therefore constitutes a particularly conservative test of firm-specific change to *Legitimacy*.

$$\begin{aligned} Legitimacy_{it} = {} & \beta_0 + \beta_1 AuditRound_t + \beta_2 Information_i + \beta_3 AuditRound_t * Information_i \\ & + \beta_4 Participation_i + \beta_5 AuditRound_t * Participation_i + \beta_5 Hanoi_i + \beta_6 Female_i \\ & + \lambda + \alpha + u_{it} \end{aligned} \tag{1.2}$$

Results are robust across specifications. Importantly, both the component terms for *Information* (β_2) and *Participation* (β_4) are not statistically significant, indicating that the treatment groups were statistically balanced in their views of government legitimacy in the baseline survey. In the fully specified Equation 3, we find that *Legitimacy* for the Control at

[42] This coding strategy follows the approach of Banarjee et al. 2016, p. 19. <http://economics.mit.edu/files/10825>
[43] These included a dummy variable for whether the firm was located in Hanoi (=1) or the ten surrounding provinces (=0), a dummy variable for whether or not the CEO was a female (=1), and fixed effects for our four-point employment size (λ) and for the two-digit sector in which the firm operated. The sector fixed effects primarily differentiate between firms that produced chemicals, transported chemicals, or used chemicals as part of their production (α).

baseline was 2.52 on the four-point scale. The coefficient on *Audit Round* (β_1) indicates that *Legitimacy* in the Control significantly increased between rounds by about a quarter of a point (about .37 standard deviations). Consistent with our theoretical expectations, *Participation* increased *Legitimacy* by one tenth of a point between rounds (β_5). However, this effect loses statistical significance in the more conservative Equation 4. We do not find evidence of change among firms receiving the information treatment (β_3) over time.

Discussion of Government Legitimacy Results. The general improvement in views of government legitimacy across groups is surprising. Three explanations associated directly with our experiment are possible. First, given that many firms associate VCCI with government, both our placebo treatment of informing firms about VCCI's general activities to improve communications between government and the business community and our information treatment could have positively influenced views of government legitimacy. Second, the increase could conceivably reflect spillover to the Control, whereby T1 and T2 firms may have informed other firms about their treatment experiences during the intervening months between rounds. Third, firms across groups may have been responding positively to the free business support service provided in the audit round.[44]

In any case, the finding of additional legitimacy gains among T2 firms, but not those in T1, clearly favors the government legitimacy mechanism over the information mechanism. But these results are also all based on self-reported data that is subject to perception bias. As a result, the next analyses highlight changes in behavioral outcomes.

[44] Another possible explanation is that it reflects improving views about Vietnam's government in the broader population. This could have been the result of expectations of leadership change at the 2016 Party Congress or potentially due to nationalism whipped up by increased confrontation with China over the latter's territorial ambitions in the South China Sea (Malesky and Morris-Jung 2015) Unfortunately, our study was not designed to enable us to statistically distinguish between these four mechanisms.

V.B. Outcome 2: Access to the Factory Floor

While we pitched the audit to sample firms as a free service to help them deal with the forthcoming regulation, it appears that many firms were concerned about VCCI's ties to the government and skeptical about the claim that no information from the factory floor visit would be disclosed to regulators. Of the 830 firms that participated in the audit round, 38 percent did not allow access to their warehouses or factories. Importantly, in each case, representatives of sample firms first met face-to-face with the auditor and answered the endline survey. Only after clearly understanding the auditor's technical expertise, and ability to recognize regulatory non-compliance, did they then choose to refuse access.[45]

Table IV presents the results of tests of the relationship between access and our experimental treatments. We employed a linear probability specification with robust standard errors clustered at the firm-industry level in every specification to address the fact that clusters of industries in provinces may share certain features that affect the ability to treat them as independent draws. We regressed *Access*, defined dichotomously (Access=1, No Access=0), on our two treatment variables, *Information* and *Participation*, which are coded the same as in the legitimacy analysis above. We follow the same set of analyses as above, beginning with an unadjusted linear probability model in Equation 1, before adding design-based controls for blocking variables, which include Hanoi, female, and firm size (λ) and sector (α) fixed effects in estimating equations 2 and 3. Equation 4 adds an additional set of dummies for individual auditors in the endline round, to account for variation in levels of experience and personalities that may have affected their ability to convince firms to open doors and their subjective evaluations of violations. Equations 5 and 6 are robustness tests to see whether our findings are

[45] We did not include access to the factory floor as an outcome variable for regulatory compliance in our pre-analysis plan (posted at http://egap.org/registration/704).

an artifact of the "substantive change" mechanism, whereby commenting firms were able to change the law in hard-to-detect ways that made it easier for them to comply. To address this threat, we drop the 28 percent of firms in the participation treatment that provided comments seen as truly substantive.

$$\Pr(Access_i = 1) = \beta_0 + \beta_1 Information_i + \beta_2 Participation_i + \beta_3 Hanoi + \beta_4 Female_i + \lambda + \alpha + u_i \quad (1.3)$$

<Table IV about Here>

Focusing on the fully specified Equation 4, the results are striking. First, despite the earlier finding that *Information* was associated with firms being over twice as likely to be aware of the regulation, Equation 4 indicates that this increased knowledge alone did not make them more likely to allow auditors onto their factory floors. In fact, T1 firms actually provided marginally lower access than firms from the Control. By contrast, auditors visiting T2 firms had a 8.1 percent greater probability of access to the factory floors than was the case for those in the Control, and nearly 11 percent greater probability of access than firms in T1. These results are robust to specification, including probit models, and strongly significant ($p<.01$). Equations 5 and 6 reveal that dropping commenting firms marginally increased the estimated effect of participation on factory access to 10 percent more than in the Control.

Refusal to allow access to the factory is clearly different than the normal attrition experienced in field experiments. Equations 7 through 10 replace access to the factory floor with agreement to participate in the audit round at all using the same specifications and show no difference between treatment groups in whether or not firms agreed to the return visit.

Discussion of Factory Access Results. We find that firms given the opportunity to participate in government's regulatory design process were more likely to grant government-affiliated auditors access to their factory floors. We have two main interpretations of why firms

would decide against providing access to our auditors. First, we view access to the factory floor as a direct measure of compliance with the regulation. We base this on the belief that a firm that blocks access for a business friendly audit is more likely to have something to hide and less likely to be in compliance with the underlying regulation than a firm that does provide access. An analogy to regulation of athletics is helpful. According to the code of the World Anti-Doping Association, athletes who refuse to make themselves available for random drug testing are deemed to be in violation and can suffer penalties, including suspension from competition (WADA 2016, Clause 2.3).

Second, and potentially more important, we view factory floor access as a measure of a firm's general interest in better understanding the regulation and thereby its desire to minimize the potential negative effects of its operations on society through regulatory compliance. In a developing country setting with flawed and confusing regulations, trust and openness between firms and regulators are critical. Improving regulation in a developing country should be an iterative process, where well-intentioned regulators and firms collaborate to figure out how to best achieve government's social protection goals at minimum costs for regulated firms. When doors are kept shut, this constructive back and forth cannot take place.

The two percentage point increase in the estimated effects of participation on access after dropping firms that submitted significant comments provides evidence that our results are primarily about the legitimacy of being given an opportunity to participate and not the substantive changes that resulted from consultation on the law.

Interestingly, while active participation in the rule making process appears to have increased a firm's willingness to engage in this process, simply learning about impending regulatory responsibilities did not. What accounts for the marginal decline in access exhibited by

T1 firms? One reason might be that receiving information without the opportunity to participate meant that a firm that had not yet taken actions to be in compliance with the target regulation had heightened awareness of its own non-compliance, relative to the Control, without the increased sense of the participatory nature and legitimacy of government rules.

V.C. Outcome 3: Overall Factory Floor Compliance with the Hazardous Chemical Regulation

Our third analysis relates to safety on the factory floor. Auditors first assessed a set of objective indicators of compliance with each of the core ten clauses. They then created five-point scores of subjective overall compliance with each clause.[46] Finally, we created a single dichotomous measure for each clause, scoring a firm as compliant if it received a score of three or above (Compliance=0 if Assessment<3; Compliant=1 if Assessment$\geq$3).[47]

One tricky feature of this analysis is how to address the problems posed by the refusal of some firms to allow access to their factories. For these firms, our auditors were, of course, unable to construct measures of compliance with the target regulation. As a result of this missing data, there is reason to believe that any compliance variables based solely on factory floor compliance audits suffer from a selection bias that makes a positive relationship between participation and compliance more difficult to identify. We base this assertion on the combination of the evidence of a positive relationship between participation and access presented in the previous section and our assumption that a firm that grants factory access is also more likely to be in compliance. In other words, firms that did not allow access probably had something to hide.

We address this problem in two ways. In the main approach, we simply coded non-access as non-compliance if a firm operated in an industrial sector for which any of the ten regulatory

[46] "Rate the level of compliance with this clause," (1) Very Low, (2) Low, (3) Compliant, (4) High, (5) Very High.
[47] This is in line with the primary outcome described in our pre-analysis plan.

clauses was likely to apply. If a firm operated in fabricated metal manufacturing (ISIC C25), we coded compliance with the clause relating to welding equipment to be zero if auditors could not access the factory floor. However, if a firm operated in food processing (ISIC C10), we did not give it a compliance score for that clause, as the firm was highly unlikely to use welding equipment in its operation.[48] This approach ensures that we do not miscode firms as non-compliant on any irrelevant clauses. In an alternative strategy, we addressed selection bias by limiting our analysis to administrative districts where auditors received nearly perfect access by firms. This limits our statistical power by cutting our sample size by 75 percent, but ensures that access to the factory floor is not associated with our experimental treatments.

Average compliance is quite low, averaging about 38 percent across all clauses and groups.[49] Not a single eligible firm was fully compliant on all 10 clauses, and 87 percent are compliant with six clauses or fewer. In fact, nine percent of firms were not compliant with any eligible clauses. Compliance also varied by clause. While 48 percent of firms were deemed as having adequate washing facilities, such as a wash basin or chemical shower, only 8 percent of firms were deemed to have appropriate safety equipment in their vehicles for transporting chemicals and only 9 percent had lighting systems that auditors believed would not generate sparks that might ignite chemicals and cause fires.

There is evidence of variation in compliance across the treatment groups. Firms assigned to T2 had average compliance scores of 40 percent, compared to 35 percent in T1 and 36 percent

[48] We determined eligibility by studying the firms that did allow auditors to access the factory floor. From this group, we calculated the share of firms for which each clause was deemed non-applicable by the professional auditor. If over 80% of firms in an industrial sector did not receive a score on a clause, we coded the non-access firms in that sector as non-applicable.

[49] Online Appendix E depicts the average compliance on each clause by our three treatment groups, after coding non-access as non-compliant.

in the Control. On some individual clauses, such as "washing facilities" and "lighting systems" there appear to be meaningful differences across groups.

To explore these patterns more systematically, we create a simple index of average compliance across the audited clauses (see equation 1.4). For each firm (i), each clause (k) is coded as 1 if the firm was compliant and 0 if it was non-compliant. We then sum up the number of instances of compliance and divide by the number of eligible clauses (t) for each firm.[50]

$$Compliance_i = \frac{\sum_{1}^{t} Clause_{k,i}}{t_i} \quad (1.4)$$

We then regress *Compliance* on our treatment variables following the same specification as the *Legitimacy* and *Access* regressions above, controlling for blocking variables and clustering standard errors at the province-sector level.

$$Compliance_i = \beta_0 + \beta_1 Information_i + \beta_2 Participation_i + \beta_3 Hanoi + \beta_4 Female_i + \lambda + \alpha + u_i \quad (1.5)$$

The results, shown in Table V, follow the same progression of previous analyses. In the fully specified Equation 3, we find that firms subject to the participation treatment demonstrate 5.5 percentage points greater compliance than the baseline compliance rate of 36.4 percent recorded by the control group—a 15.1 percent improvement. The results are robust across specifications, including the addition of auditor fixed effects in Equation 4, and statistically significant at the ($p<.05$) level. Again, firms in T1 demonstrated marginally worse compliance, although the effects are not statistically significant.

[50] Clause 2, which relateded to aquaphobic chemicals, was completely dropped from the final version of the draft regulation due to the complexity of monitoring. As a result, there are ten clauses that were present in both the treatment and audit rounds.

In Equation 5, we present our results from limiting the analysis to districts, sub-provincial jurisdictions, where auditors received near perfect access (>80%) access to factories. Our assumption is that, for political or socio-cultural reasons, firms in these areas felt greater trust that the audit would not lead to negative consequences. As a result, there was less likely to be selection bias associated with our experimental conditions in these groups, and we can therefore more accurately measure the effects of participation on compliance. The coefficient on the participation treatment in Equation 5 is remarkably similar to the previous estimates, corresponding to a 5.7 percentage point increase in average compliance. This indicates that even after addressing selection bias, we observe similar levels of improved regulatory compliance. Due to the dramatic reduction in sample size, however, the standard errors are larger and the results are not statistically significant relative to the Control.

We drop commenting firms in Estimating Equations 5-7 and again find that relying only on firms given the opportunity to participate marginally increases the substantive effect of the participation treatment on compliance.

<**Table V about Here**>

Figures IV and V illustrate the relationship between our experimental treatments and compliance with each clause in the target regulation. For consistency, we maintain the same specification as in Table V's equation 3 for all ten clauses, including the linear probability specification, clustered standard errors, and blocking variables. In Figure IV, we present the marginal effects for the information treatment, while Figure V displays the marginal effects for the participation treatment.[51] The shapes (circle, square..) display the marginal probabilities and 90 percent confidence intervals are presented as range bars. As in Table V, we present two

[51] Full regression results using a linear probability model and robustness tests using probit are available in Online Appendix F.

different sets of analyses for each clause. Our main analysis (presented in panel A) treats non-access as non-compliance if the firm operated in an industry for which the clause was applicable. A secondary test ("B: High Access Districts") studies only districts with near perfect access and therefore accepts greater inefficiency to reduce selection bias.

The results for the information treatment are straightforward. Information only had a significant impact on compliance in one of the ten clauses: T1 firms were actually less, not more, likely to have installed safe lighting systems. All other clauses are statistically indistinguishable from the Control and often also negatively signed. Correcting for selection bias by focusing on perfect access further clarifies the finding that knowing more about the regulation alone did not improve compliance. This is consistent with our Outcome 1 and 2 results above.

<Figures IV & V about Here>

Figure V applies the same procedure to the participation treatment and shows that the results are mixed. In Panel A, when non-access within the relevant industrial classification is treated as non-compliance, the coefficient on participation is positively and significantly associated with compliance on four clauses, with a fifth (welding) falling just shy of statistical significance (p=0.12). T2 firms were 10.8 percent more likely to have installed lightning protection, 10.9 percent more likely to have proper washing facilities (including basins and chemical showers), 6.1 percent more likely to have lighting systems that were deemed non-flammable, and 8 percent more likely to have barriers and lids for corrosive chemicals. A Benjamani-Hochberg correction for multiple comparisons demonstrates that these four results remain statistically significant at the 0.1 level.[52] Although not statistically significant, participating firms were 9.6 percent more likely to have protective covers and appropriate distance from welding equipment. Studying only the high access districts in Panel B, we observe

[52] See Online Appendix G for details of the test.

very similar marginal effects, although the estimates are inefficiently estimated due to the much smaller number of observations for each clause.

While the results of Panel A are consistent with our theory, five clauses (fire prevention, safety signs, chemical transport, fuses/sockets, and mixing equipment) are not significantly associated with participation. This raises an interesting theoretical question. Why did participation influence compliance with some conditions and not others? Although we did not anticipate the problem in our PAP, looking back over the conditions imposed on the firms by the hazardous chemical regulation demonstrates an interesting pattern. The significant clauses all imposed relatively costlier burdens on firms via the purchase of new equipment or a costly reorganizing of operations. Examples of the latter were the proposed requirements to move welding equipment 20 meters away from exposed chemicals and to maintain a minimum catwalk height of 0.9 meters above chemical containers; these are not standard in the factories of Vietnamese SMEs.[53] Higher costs are evident for each of the four significant clauses, as well as for two additional insignificant clauses (welding and mixing equipment). The insignificance of the latter two clauses may be due to the much smaller samples of firms for which they were relevant. As Appendix E shows, far fewer firms operated in sectors that used heavy mixing (n=373) and welding equipment (n=263) than those that required lighting systems (n=689). Consequently, estimates are less precisely estimated for these two clauses.[54]

In contrast to these six clauses, the remaining four clearly insignificant clauses required simple management changes and relatively cheap purchases. These included: 1) Fire prevention (identifiable extinguisher and training on its usage); 2) Safety signs (posted near chemicals and

[53] A catwalk refers to a bridge that goes over a container of chemicals.
[54] See Online Appendix H for regression results after classifying regulation by their ease of compliance.

outside); 3) Chemical transport (must have "suitable fire extinguishing equipment'); and 4) Installation of relatively inexpensive fuses and sockets.

Discussion of Factory Floor Compliance Results. Our identification of a significant relationship between the opportunity to comment on a draft of the target regulation and subsequent factory floor compliance is particularly impressive in light of the array and degree of real world challenges that threatened to obscure it. At least five are worth highlighting. First and foremost, the poor quality and opacity of the draft regulation undermined our ability to identify regulatory compliance. This is because it made it difficult for both VCCI and the entire study design team to interpret what requirements government regulators truly intended to impose on firms. This, in turn, complicated our efforts to design a tool for measuring compliance and ultimately led us to rely instead on the subjective judgement of our auditors about safety conditions on the factory floor.

Second, these same obstacles to interpretation of requirements imposed by the draft rule also presented problems for firms themselves that likely had a real dampening effect on actual investment into compliance. After all, firms had to make this interpretation as an input into their decision on whether or not to invest their own scarce resources into achieving compliance. In fact, this dynamic relates to our argument on the importance of access to factory floor as a measure of, at least, a firm's desire to comply with a low quality regulation.

A third real world threat that we experienced to our ability to identify a participation-compliance relationship was the cynicism and inaction of firms themselves, as reflected in their limited take up of the participation opportunity. We believe this is best interpreted as a reflection of an environment wherein government has too often not followed through on past promises of reform, the poor implementation of the Law on Laws described earlier being a particularly

salient example. Fourth, and related, was the lack of responsiveness of government to the comments that firms did make within the context of our study. Fifth, and also related, is the fact that, as of the audit round (and, in fact, even the writing of this paper), Vietnam's government had still not formally implemented the target regulation.

It is interesting to reflect on why we see the participation-compliance relationship concentrated on clauses that appear to have required more costly investments by firms. As noted earlier, we did not predict this in our PAP. Nevertheless, we retroactively see at least three potential explanations for this empirical finding. First, it is likely that the primary obstacle to compliance with provisions requiring expensive reorganization or purchase of new equipment is precisely the cost, rather than the lack of clarity about government expectations that plagues the lower cost provisions. Second, it is likely that the establishment of trust through the government legitimacy mechanism is of greater importance in getting a firm to commit to compliance when the costs of doing so are higher.

Third, and finally, it is also possible that there may have been higher pre-existing compliance with the less costly clauses before the treatment round than was the case for more costly clauses. This could have reduced the room for participation to have an effect on compliance. Unfortunately, our study design did not allow for us to gather data on baseline compliance. This is because there was no existing labor regulation on hazardous chemicals for which we could measure compliance, and because measuring pre-existing compliance during the treatment round would have threatened clean differentiation between our Control and T1 due to the extra attention firms would have seen the VCCI representatives paying to chemical safety.

V.D. Heterogeneous Treatment Effects

As discussed in the Introduction, we expect the regulatory compliance effects of participation to be strongest among SMEs. We test for this relationship in Table VI by interacting our treatment variables with a trichotomous measure of size: 1) Micro enterprise with less 10 employees; 2) SMEs with between 10 and 200 employees and 3) Large enterprises with over 200 employees.

<Table VI about Here>

The first significant difference we observe is in the control group. In Equations 1 and 3 , we see that large firms in the control group were 42 percent more likely to provide access and demonstrated 52 percentage points greater baseline compliance than micro enterprises and SMEs. This makes sense, since large firms are far more visible and are more likely to be inspected than their smaller peers.

Looking at the interactions, we see that large firms were less influenced by the participation treatment than SMEs in all four specifications. The interactions between the large firm dummy variable and the participation treatment are significant, negative, and sizable. To demonstrate this more clearly, we calculate the marginal effect of the participation treatment for all three size-categories in Figure VI using the coefficients and standard errors from equations 2 and 3.

<Figure VI about Here>

The figure demonstrates clearly that participation was associated with 12 percent greater factory access and 8 percentage points greater downstream compliance in the SME category. But positive effects are not observed within any other size category. In fact, participation appears associated with negative compliance among the very largest firms.

VI. CONCLUSIONS

We began this study with the view that government has an important core function to play in protecting society by limiting the negative externalities that come with business operations through regulations. The evidence, however, is that governments in many developing countries have done a very poor job in both designing and enforcing such regulations and, in large part due to the scourge of corruption, are not seen as governing based on the true interests of the populations that they serve. Based on this unfortunate reality, we hypothesized that the significant costs imposed on communities and the environment in developing countries by the frighteningly high share of firms that chooses not to comply with important government regulations could potentially be reduced through government policy that increases the degree to which firms see their governments as legitimate arbiters of what is socially acceptable. This perspective was informed by theoretical work on the behavior of individuals in political science's deliberative democracy and organizational behavior's procedural justice literatures, as well as work across disciplines on the importance of reciprocity.

This paper specifically reports on the regulatory compliance effects of an effort by a government-affiliated business association in communist Vietnam to increase participation by firms in the regulatory design process. Our evaluation of this initiative focused on distinguishing between three key mechanisms by which the opportunity to provide comments on a draft regulation might increase a firm's likelihood of compliance after implementation. First was the above-described government legitimacy mechanism, with its broader implications for how the social responsibility of firms is shaped by the degree to which they see government itself behaving in a socially responsible manner. Second was the alternative that participation might instead simply be a relatively inefficient means of increasing the firms' knowledge about their

regulatory environment. Third, consultation may change the substance of the law making it either better or easier to comply with. As such, our two key treatments involved random assignment to either receiving early information about a target regulation or receiving this information plus the opportunity to provide feedback to the regulatory design committee. We address the substantive change mechanism by dropping the 28 percent of firms that provided meaningful comments to remove any possibility that participation might have altered the content of the regulation.

Focusing on Vietnam's introduction of a new regulation aiming to reduce dangers to workers dealing with hazardous chemicals, we find encouraging results on the potential to make the world a safer place by allowing firms greater voice in the design of such protections. First, firms randomly assigned to receive our participation treatment showed greater improvement in their views of government legitimacy over the study period. Second, these firms were 8-10 percent more likely to allow inspections by chemical safety experts working for a government-affiliated business association. Third, they demonstrated greater regulatory compliance on the factory floor, especially with costlier requirements of the target regulation. None of these outcomes was positively influenced by early transmission of information during the participation period and all were concentrated amongst SMEs. Further, our results are the driven by only the firms given the opportunity to participate, and therefore hard-to-detect changes in the regulation cannot account for the results we observe. All of this is reason for hope and for further research and efforts towards the important goal of making markets work better and more sustainably in developing countries.

Finding support for our theory may be easier in the context of labor safety and hazardous chemicals than in other important settings. Although reducing the prevalence of labor accidents

is a globally important challenge, the costs of these accidents are, to a large degree, felt directly by the firms themselves. Damage due to fire or explosions threatens the owners' investments, and production delays caused by injured workers directly affect their bottom lines. Even short of such specific negative events, worker dissatisfaction about conditions on-the-job can also impair firm performance. Moreover, in most of our cases, the owner worked in direct proximity to the factory floor and therefore would be personally endangered by the mishandling of chemicals. Further research is necessary to test whether the positive benefits of participation extend to regulations that seek to reduce the negative externalities that are more fully external to the firm and its self-interest. Such regulations include environmental or food safety and sanitation requirements, where non-compliance poses little threat to the firms' current operations.

A second concern is that scaling up this level of participation to a national level program for every technical regulation would be expensive and infeasible. One potential solution that we envision, but did not have the statistical power to test adequately, is to see whether there are compliance benefits from indirect participation. That is, a separate group of similarly-situated firms would learn about the participation of like-minded owners, but would not have the opportunity to participate themselves. Would simply learning about participation opportunities have an independent effect on legitimacy and, ultimately, compliance? Truex (2014) has found evidence consistent with this idea in a survey experiment among Chinese citizens, but no work has been done on the behavioral response of firms to indirect participation. Future field experiments could test this result either through a separate indirect participation treatment arm or through a saturation design that allowed spillover among geographically concentrated firms or industry-specific business associations. If successful, this would point toward modes of scaling

up business participation and reducing workplace accidents that might save thousands of lives around the world.

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Figure I: Firm Population to Firm Sample Screening Tree

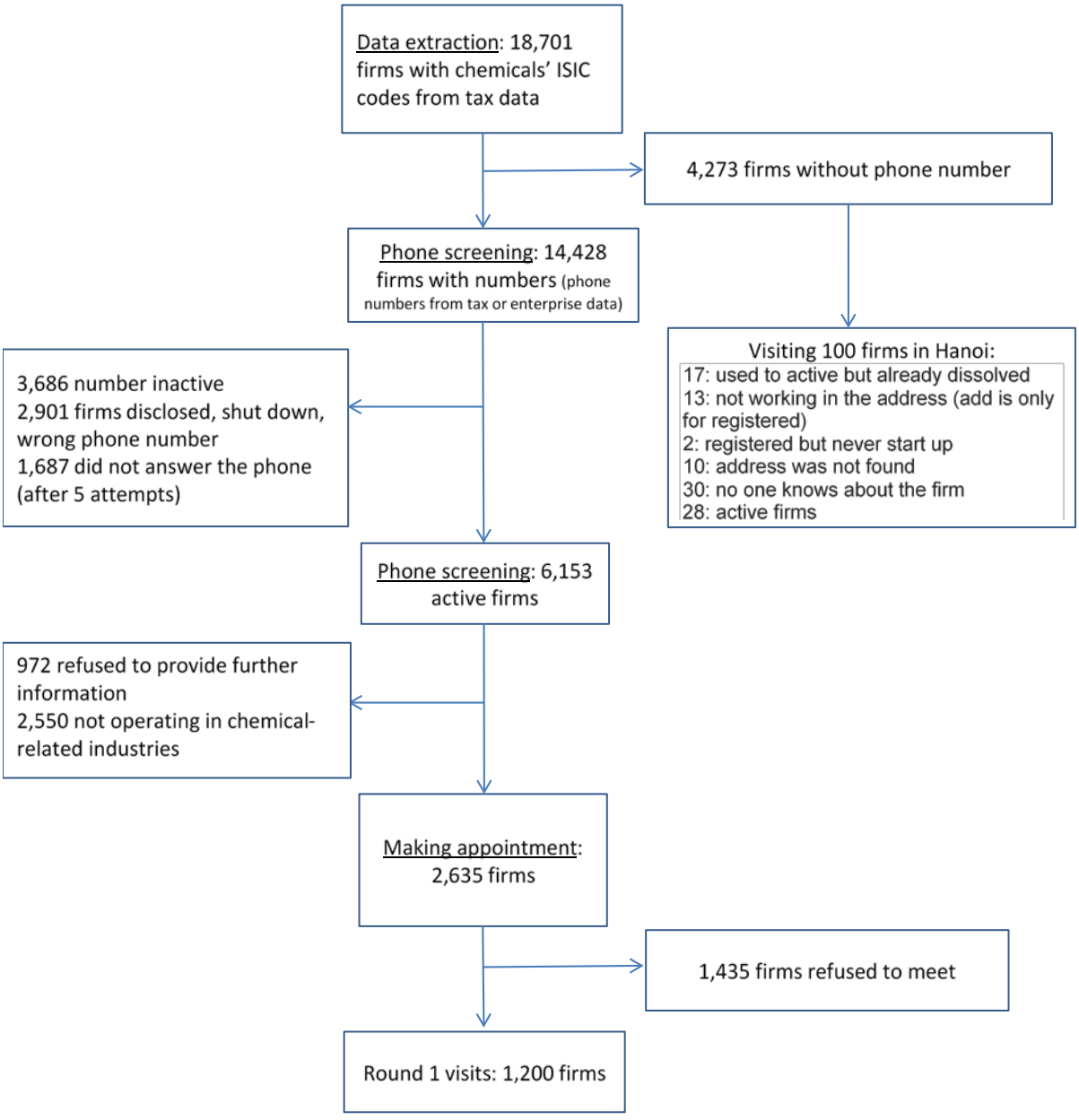


Figure II: Experimental Treatment Conditions

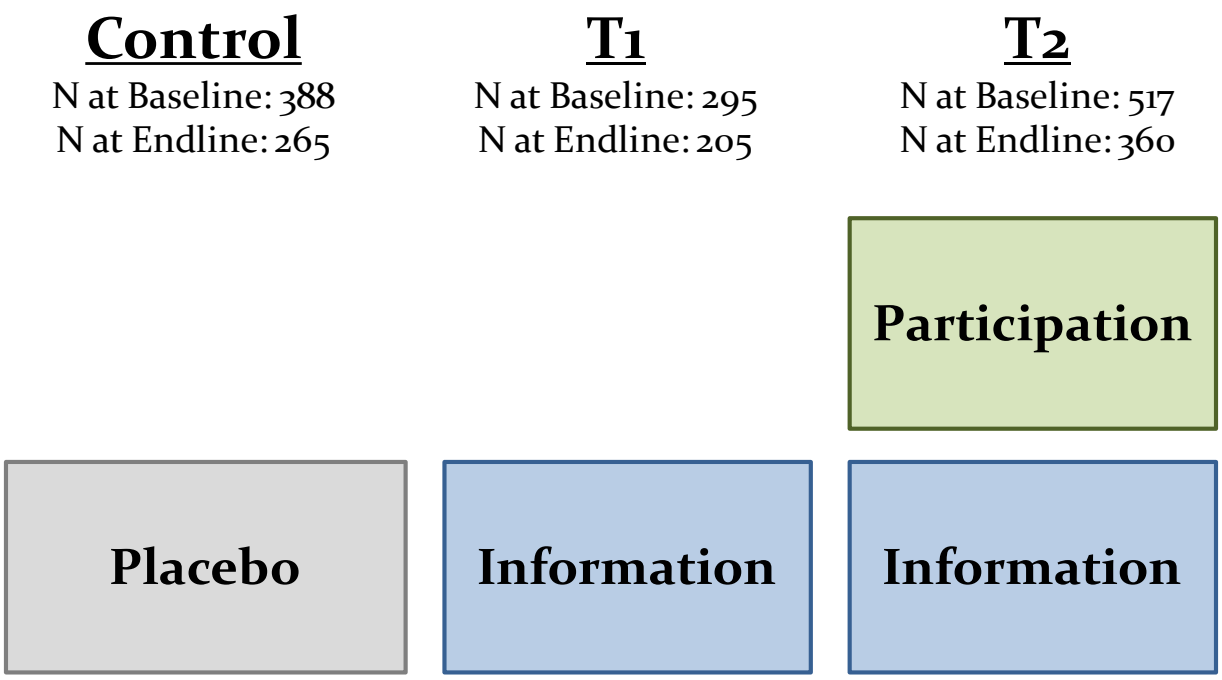
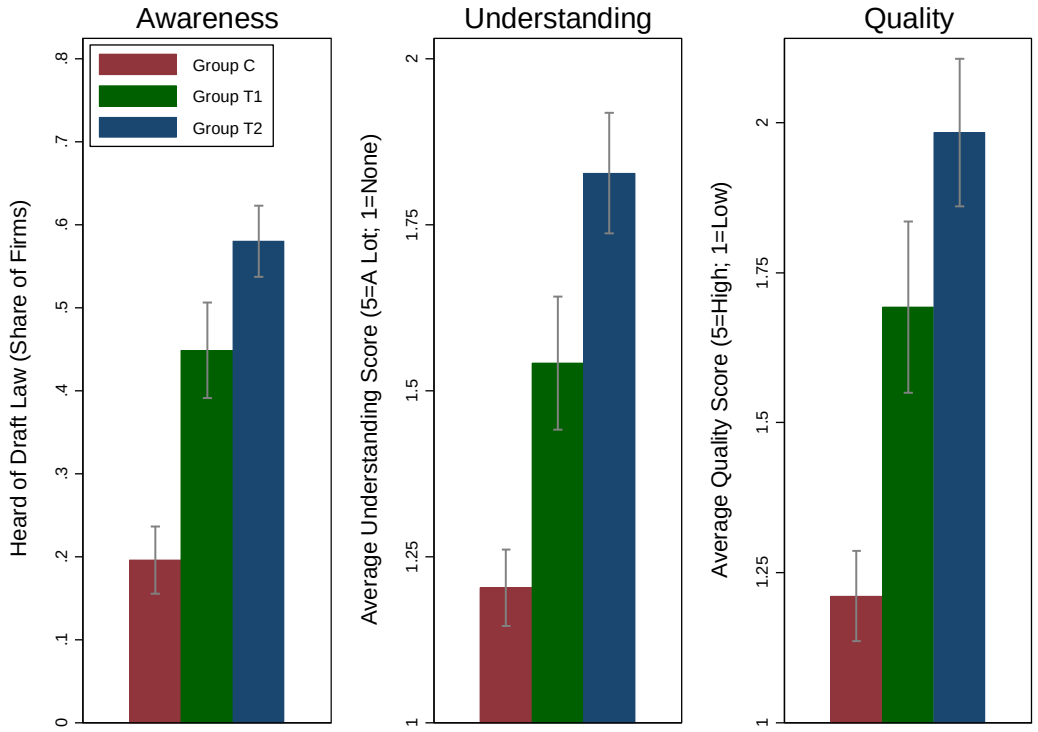
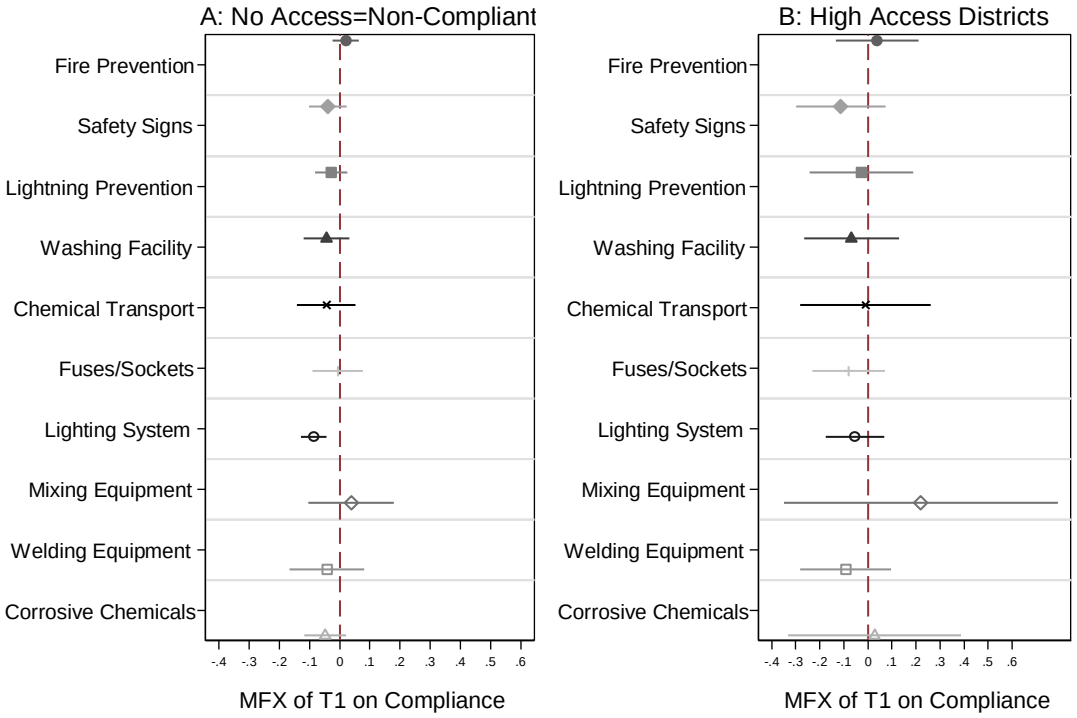


Figure III: Manipulation Checks



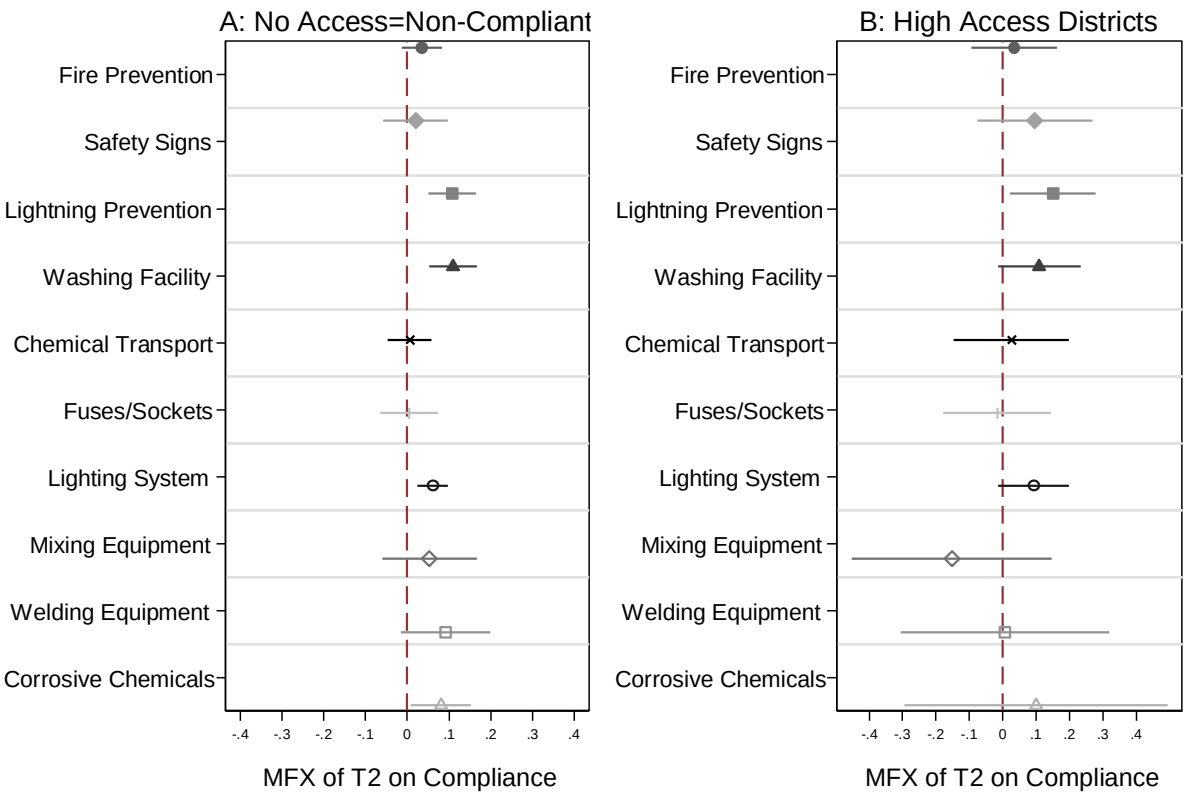
Note: Range bars represent 90% Confidence Intervals; Awareness measured using question: Have you ever heard of this Draft before? (No=0, Yes=1) from endline survey; Understanding measured using question: If Yes, could you please rate your understanding of the Draft on the scale from 1 to 5? (5. Fully; 4. Well; 3. Average; 2. Slightly; 1. Not at all). Quality measured using question: How do you rate the quality of this draft regulation relative to the other regulations that you have opportunities to read or give comments on? (5. Much higher; 4. Higher; 3. Similar; 2. Lower; 1. Much Lower).

Figure IV: Treatment Effect of Information (by Clause)



Range bars=90% CIs; High Access=>80%; For full regression results see Appendices F1 and F3

Figure V: Treatment Effect of Participation (by Clause)



Range bars=90% CIs; High Access=>80%; For full regression results see Appendices F1 and F3

Figure VI: Conditional Effect of Size on Regulatory Compliance

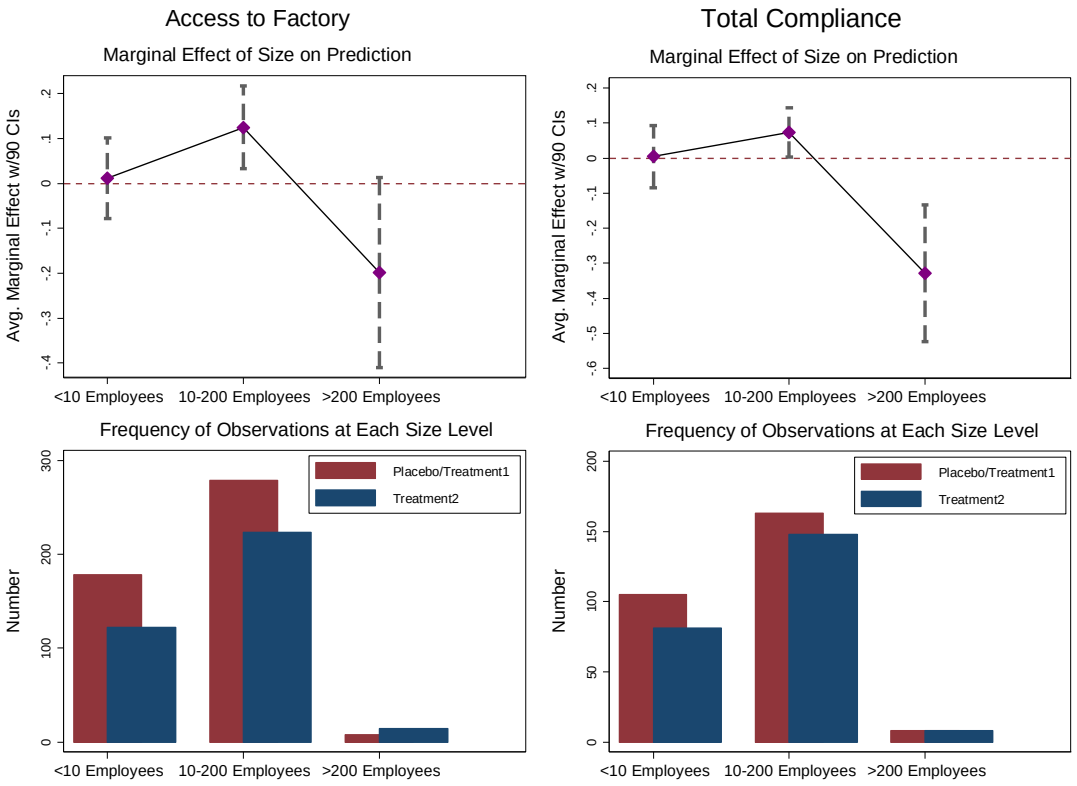


Table I: Online Posting of Legal Documents According to Vietnam's Law on Laws, by Ministry

Name of Ministry	**Total Legal, Normative Documents Issued**	**Posted Online**	**Share Posted for Online Comment**	**Delay in Posting Laws & Decrees Online** (Difference in Months between Date in Legislative Calenadar and Actual Posting)	**Delay in Posting Circulars Online** (Difference in Months between Date in Legislative Calenadar and Actual Posting)	**Formally Defined Time Frame for Online Comment**	**Formal days for Online Comment**
Ministry of Trade and Industry	55	36	65.5%	6.71	3.81	Yes	60
Ministry of Transportation	75	8	10.7%	11.2	5.58	No	
Ministry of Planning and Investment	13	6	46.2%	11.05	9.82	No	
Ministry of Science and Technology	34	13	38.2%	8.83	8.43	Yes	25
Ministry of Labor, Invalids and Social Affairs	40	24	60.0%	5.18	5.96	No	
Ministry of Agriculture and Rural Development	74	10	13.5%	9.11	4.73	No	
Ministry of Finance	174	106	60.9%	6.96	5.55	No	
Ministry of Natural Resources and Environment	43	13	30.2%	8.54	4.71	No	
Ministry of Information and Communications	36	21	58.3%	7.02	7.02	No	
Ministry of Justice	10	7	70.0%	6.66	5.58	No	
Ministry of Culture, Sports and Tourism	15	3	20.0%	8.43	4.22	Yes	60
Ministry of Construction	14	6	42.9%	9.69	10.34	Yes	60
Ministry of Health	37	3	8.1%	9.85	8.71	Yes	60
State Bank of Vietnam	42	0	0.0%	8.32	8.33	No	
Average	**662**	**256**	**38.7%**	**8.40**	**6.63**		**53**

Sources: Vietnam Chamber of Commerce and Industry (2012). *Report on the Ministry Effeciency Index. Hanoi, Vietnam (p. 70 and 74). <http://mei.vibonline.com.vn/Home/AboutUs.asp*

Table II: Clauses in Original Draft and Final Draft of Hazardous Chemical Regulation

Original Draft Regulation (September 12, 2014)	**Revised Draft Regulation** (April 13, 2015)	**Original Draft Regulation** (September 12, 2014)	**Revised Draft Regulation** (April 13, 2015)
1. Hazardous chemicals must be placed inside a storage place. Hazardous chemicals must be arranged according to their chemical properties. Do not put chemicals that can form chemical reactions or have different extinguishing methods in the same storehouse.	Hazardous chemicals must be arranged according to their chemical properties. Do not put chemicals that can form chemical reactions or have different extinguishing methods in the same storehouse .	7. Breaker, fuse, socket outlet shall be installed outside areas containing flammable chemicals, explosives. Any branch wires must always have a fuse or equivalent protective equipment.	*(No changes)*
2. For **merchandise** that is packaged in woven plastic bags, such items must be placed on brackets, shelves at least 0.5 meter away from the wall; hydrophobic chemicals must be placed in a platform that is at least 0,3 meters high.	For **chemicals** that are packaged in woven plastic bag, such items must be placed on brackets, shelves at least 0.5 meter away from the wall; **for** hydrophobic chemicals, they must be placed in a platform that is at least 0.3 meters high. (REVISED BUT DROPPED in FINAL REGULATION AUGUST 2015)	8. Lighting system must be the type made for explosion prevention; it is necessary to prevent the penetration of flammable, combustible gas, dust into lighting equipment.	*(No changes)*
3. Outside factories, storehouses, there must be sign with "No Fire", "No Smoking" in large and red font and notation of extinguishing equipment. All of the signs must be placed in a clear and easy-to-read area.	*(No changes)*	9. The process of mixing solvents into chemicals in an exposed device must be done at least 10 meters away from the areas which produce flames.	The process of mixing solvents into chemicals in an exposed device must be **shielded from the areas that produce flames or** done at least 10 meters away from the areas that produce flames.
4. Storehouse of hazardous chemicals must be dry, leak-proof, have lightning protection system, and must be inspected according to the existing regulations.	Storehouse of hazardous chemicals must be dry, leak-proof, have lightning protection system **or situated inside the area that is lightning-proof**, and must be inspected according to the existing regulations.	10. Prohibit welding or other activities that can spark fire within **20 meters** from the storehouse	Prohibit welding or other activities that can spark fire within **15 meters** from the storehouse
5. Cleaning basin must be equipped right outside the areas of hazardous chemicals to make sure that the workers can wash out chemicals that splash in the body or wash their hands and bodies at the end of their shifts.	Cleaning basin or **water tap** must be equipped **inside** or right outside the areas of hazardous chemicals to make sure that the workers **can wash out chemicals that splash on the body in a timely manner** or wash their hands and bodies at the end of their shifts.	11. The path above devices containing corrosive chemicals must have sturdy barriers and handrails. The equipment and storage tanks must be higher than **the operator position** at least **0.9 meters**. It is prohibited to build the platform in any way or to stack anything that reduces the above height.	The path above devices containing corrosive chemicals must have sturdy barriers and handrails. The equipment and storage tanks must be higher than **the position of the platform where the operator stands** at least **1 meters.** It is prohibited to build the platform in any way or to stack anything that reduces the above height.
6. Specialized trucks for transporting flammable liquid chemicals **must have grounding wire and the sign "No Fire."** The trucks must be equipped with suitable fire extinguishing equipment.	Specialized trucks for transporting flammable liquid chemicals must be equipped with suitable fire extinguishing equipment.		

Bolded words depict changed language.

Table III: Difference in Difference Analysis of Experimental Effects on Legitimacy Growth Between Rounds

Dependent variable: "Government officials have sufficient understanding of business like this one to effectively carry out their regulatory duties." (1 Strongly Disagree to 4 Strongly Agree)	All Firms from Round 1 and Round 3			
	No Controls	Blocking Variables	Sector FE	Firm FE
	(1)	(2)	(3)	(4)
Audit Round=1	0.229***	0.248***	0.244***	0.223**
	(0.046)	(0.043)	(0.042)	(0.084)
Information Treatment=1	0.070	0.068	0.078	
	(0.051)	(0.051)	(0.052)	
Audit Round*Information	-0.001	-0.002	-0.000	-0.002
	(0.042)	(0.042)	(0.042)	(0.095)
Participation Treatment=1	-0.080	-0.080	-0.083	
	(0.054)	(0.054)	(0.054)	
Audit Round*Participation	0.104*	0.104*	0.104*	0.085
	(0.056)	(0.058)	(0.055)	(0.080)
Hanoi=1		-0.130***	-0.123***	
		(0.029)	(0.021)	
Female CEO=1		-0.020	-0.027	
		(0.053)	(0.048)	
Constant	2.489***	2.535***	2.520***	2.507***
	(0.033)	(0.028)	(0.045)	(0.018)
Size FE	No	Yes	Yes	No
Sector FE	No	No	Yes	No
Firm FE	No	No	No	Yes
Observations	1,888	1,888	1,888	1,888
Clusters	53	53	53	53
R-Squared	0.046	0.056	0.062	0.700
RMSE	0.631	0.628	0.628	0.573

OLS with standard errors, clustered by Province-Sector, in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Equation 1 is unadjusted, Equation 2 controls only for blocking variables, Equation 3 introduces ISIC two-digit sector fixed effects, and Equation 4 introduces firm fixed effects.

Table IV: Effects of Experiment on Access of Auditors to Factory Floor

	DV: Allowed Audit of Factory=1						DV: Agreed to Interview=1			
Dependent variable	No Controls	Blocking Variables	Sector FE	Auditor FE	Drop Commenters		No Controls	Blocking Variables	Sector FE	Drop Commenters
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Information Treatment=1	-0.020	-0.023	-0.018	-0.027	-0.017	-0.025	0.012	0.022	0.024	0.027
	(0.036)	(0.037)	(0.035)	(0.030)	(0.035)	(0.030)	(0.030)	(0.037)	(0.033)	(0.033)
Participation Treatment=1	0.081**	0.079***	0.081***	0.081**	0.095***	0.101***	0.001	0.005	0.007	0.033
	(0.031)	(0.029)	(0.028)	(0.030)	(0.030)	(0.031)	(0.030)	(0.031)	(0.028)	(0.027)
Hanoi=1		-0.251***	-0.210***	-0.039	-0.211***	-0.041		0.455***	0.489***	0.484***
		(0.037)	(0.040)	(0.029)	(0.040)	(0.027)		(0.094)	(0.084)	(0.075)
Female CEO=1		-0.139***	-0.142***	-0.113**	-0.165***	-0.130**		-0.027	-0.029	-0.036
		(0.049)	(0.047)	(0.055)	(0.049)	(0.056)		(0.028)	(0.028)	(0.031)
Constant	0.600***	0.707***	0.563***	0.903***	0.626***	0.919***	0.683***	0.542***	0.305***	0.290***
	(0.049)	(0.051)	(0.052)	(0.069)	(0.055)	(0.067)	(0.021)	(0.097)	(0.063)	(0.064)
Size FE	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Sector FE	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Auditor FE	No	No	No	Yes	No	Yes	No	No	No	No
Observations	830	830	830	830	728	728	1,200	1,200	1,200	1,055
Clusters	48	48	48	48	46	46	53	53	53	52
R-Squared	0.005	0.089	0.119	0.371	0.126	0.364	0.000	0.211	0.232	0.218
RMSE	0.485	0.466	0.460	0.391	0.457	0.393	0.462	0.412	0.407	0.412

Linear probability model (OLS) with standard errors, clustered by Province-Sector, in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Panel 1 studies whether auditors were able to visit factor after conducting endline interview. Panel 2 studies normal attrition in the panel. Equations 1 & 7 are unadjusted, Equations 2 & 8 control only for blocking variables, Equations 3 & 9 introduce ISIC two-digit sector fixed effects, and Equation 4 introduces auditor fixed effects. Estimating equations 5, 6, and 10 drop firms in the participation treatment that provided comments.

Table V: Effects of Experiment on Aggregate Score of Regulatory Compliance Judgements by Auditors

	All Firms					Drop Commenters		
Dependent variable: Clauses with which firm is judged to be in compliance (% of total)	No Controls	Blocking Variables	Sector FE	Auditor FE	Only High Access Districts	Sector FE	Auditor FE	Only High Access Districts
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Information Treatment=1	-0.017	-0.016	-0.017	-0.020	-0.021	-0.016	-0.018	-0.020
	(0.024)	(0.024)	(0.022)	(0.024)	(0.057)	(0.023)	(0.025)	(0.053)
Participation Treatment=1	0.052**	0.049**	0.055**	0.047*	0.057	0.060**	0.059*	0.045
	(0.023)	(0.022)	(0.022)	(0.025)	(0.054)	(0.028)	(0.031)	(0.065)
Hanoi=1		-0.137***	-0.113***	-0.025	0.100	-0.117***	-0.025	0.092
		(0.024)	(0.031)	(0.023)	(0.086)	(0.030)	(0.021)	(0.089)
Female CEO=1		-0.085*	-0.084*	-0.059	-0.105*	-0.100**	-0.075	-0.086
		(0.044)	(0.044)	(0.046)	(0.054)	(0.046)	(0.049)	(0.062)
Constant	0.364***	0.398***	0.354***	0.554***	0.714***	0.393***	0.583***	0.722***
	(0.035)	(0.050)	(0.046)	(0.044)	(0.141)	(0.046)	(0.042)	(0.168)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Auditor FE	No	Yes	No	Yes	No	Yes	No	No
Observations	813	813	813	813	207	711	711	187
Clusters	48	48	48	48	38	46	46	38
Mean in Control Group	0.36	0.36	0.36	0.36	0.55	0.36	0.36	0.55
R-Squared	0.003	0.062	0.086	0.255	0.198	0.098	0.255	0.197
RMSE	0.376	0.367	0.363	0.330	0.316	0.360	0.330	0.313

OLS with standard errors, clustered by Province-Sector, in parentheses (*** p<0.01, ** p<0.05, * p<0.1). The first panel analyzes all firms where auditors were given access. The second panel drops firms in the participation treatment that provided comments. Equation 1 is unadjusted, Equation 2 controls only for blocking variables, Equation 3 introduce ISIC two-digit sector fixed effects, and Equation 4 introduces auditor fixed effects. Estimating equations 5 and 8 restrict the analysis to districts where auditors were able to access over 80% of factories in the jurisdiction. Because they employ selection strategy at the district level, standard errors are now clustered at district level.

Table VI: Conditional Effect of Firm Size on Regulatory Compliance

	All Firms				Drop Commentators			
Dependent variable:	Access to Factory=1		Compliance Index		Access to Factory=1		Compliance Index	
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Size Category 2 (SME)	0.000	-0.007	0.014	0.000	-0.003	-0.008	0.012	0.000
	(0.043)	(0.043)	(0.037)	(0.038)	(0.043)	(0.043)	(0.038)	(0.039)
Size Category 3 (Large)	0.421***	0.274***	0.521***	0.466***	0.419***	0.277***	0.521***	0.460***
	(0.073)	(0.057)	(0.028)	(0.042)	(0.071)	(0.054)	(0.028)	(0.041)
Information Treatment=1	0.022	0.032	0.009	0.015	0.017	0.031	0.006	0.014
	(0.058)	(0.043)	(0.055)	(0.044)	(0.060)	(0.045)	(0.056)	(0.046)
SME*Information	-0.048	-0.085	-0.030	-0.043	-0.041	-0.084	-0.026	-0.044
	(0.088)	(0.076)	(0.093)	(0.083)	(0.090)	(0.078)	(0.094)	(0.084)
Large*Information	0.014	-0.040	0.076	-0.036	0.017	-0.008	0.075	0.001
	(0.134)	(0.064)	(0.153)	(0.090)	(0.140)	(0.068)	(0.159)	(0.098)
Participation Treatment=1	0.026	0.012	0.024	0.004	0.032	0.033	0.030	0.021
	(0.055)	(0.053)	(0.052)	(0.053)	(0.054)	(0.054)	(0.061)	(0.064)
SME*Participation	0.093	0.113	0.054	0.068	0.103	0.108	0.049	0.058
	(0.092)	(0.094)	(0.081)	(0.082)	(0.088)	(0.092)	(0.084)	(0.083)
Large*Participation	-0.480**	-0.210	-0.536***	-0.332***	-0.361*	-0.107	-0.420**	-0.239**
	(0.217)	(0.137)	(0.174)	(0.122)	(0.208)	(0.123)	(0.158)	(0.102)
Hanoi=1	-0.215***	-0.045	-0.118***	-0.029	-0.215***	-0.043*	-0.120***	-0.026
	(0.040)	(0.028)	(0.031)	(0.022)	(0.040)	(0.026)	(0.030)	(0.020)
Female CEO=1	-0.144***	-0.111*	-0.088**	-0.061	-0.167***	-0.128**	-0.104**	-0.077
	(0.048)	(0.057)	(0.043)	(0.046)	(0.048)	(0.057)	(0.044)	(0.048)
Constant	0.710***	0.905***	0.410***	0.517***	0.718***	0.919***	0.416***	0.542***
	(0.037)	(0.038)	(0.032)	(0.036)	(0.036)	(0.043)	(0.032)	(0.034)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Auditor FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	824	824	807	807	722	722	705	705
Clusters	48	48	48	48		46	46	46
R-Squared	0.124	0.372	0.086	0.256	0.130	0.362	0.095	0.251
RMSE	0.458	0.391	0.363	0.330	0.456	0.393	0.361	0.331

OLS with marginal probabilities in parentheses. Standard errors, clustered by Province-Sector, in parentheses (*** p<0.01, ** p<0.05, * p<0.1). The first panel analyzes all firms where auditors were given access. The second panel drops firms in the participation treatment that provided comments.

CAN POLITICAL PARTICIPATION BY FIRMS INCREASE GOVERNMENT LEGITIMACY AND REGULATORY COMPLIANCE IN DEVELOPING COUNTRIES?

A FIELD EXPERIMENT WITH A BUSINESS ASSOCIATION IN VIETNAM

ONLINE APPENDIX

Appendix A: Outcomes of Online Posting of Drafts on VIB Online, by Ministry

Name of Ministry	Average Page Views per Document	Total VCCI Comments	VCCI Comments Fully Accepted by Drafing Committee	VCCI Comments Partially Accepted by Drafing Committee	VCCI Comments NOT Accepted by Drafing Committee	Publically Released Table of Responses	Share of Drafts Passed into Legislation
Ministry of Trade and Industry	637.7	75	9.3%	17.3%	73.3%	0%	100%
Ministry of Transportation	660.9	19	36.8%	15.8%	47.4%	0%	100%
Ministry of Planning and Investment	683.1	11	18.2%	27.3%	54.5%	0%	100%
Ministry of Science and Technology	636.5					0%	100%
Ministry of Labor, Invalids and Social Affairs	787.7					0%	100%
Ministry of Agriculture and Rural Development	753.0		50.0%	7.1%	42.9%	0%	100%
Ministry of Finance	622.1	154	38.3%	14.9%	46.8%	0%	100%
Ministry of Natural Resources and Environment	708.4	42	38.1%	11.9%	50.0%	0%	100%
Ministry of Information and Communications	753.7					0%	100%
Ministry of Justice	631.0					0%	100%
Ministry of Culture, Sports and Tourism	627.9	38	63.2%	7.9%	28.9%	0%	100%
Ministry of Construction	740.3	7	28.6%	28.6%	42.9%	0%	100%
Ministry of Health	698.0	27	14.7%	18.5%	40.7%	0%	100%
State Bank of Vietnam	688.0					0%	100%
Average	**674.3**	**415**	**35.9%**	**14.5%**	**49.6%**	**0%**	**100%**

Sources: Vietnam Chamber of Commerce and Industry (2012). *Report on the Ministry Effeciency Index. Hanoi, Vietnam. Web scraping of VIB online website for page views http://www.vibonline.com.vn/Duthao/default.aspx. Conducted on April 21, 2014. Vietnam Chamber of Commerce Legal Department. 2013. "Evaluation of Ministerial Response to Comments." Internal Review for VCCI Chairman Vu Tien Loc. Jan. 2014. (VCCI shared this report with researchers)*

Appendix B: Firm Population to Firm Sample, by Province

Phases		Hanoi	Bac Ninh	Hai Duong	Hung Yen	Vinh Phuc	Phu Tho
Step 1: Original Sample	**Firms under hazardous chemical codes**	11,369	884	786	556	360	638
	Without contact number	3,071	38	20	29	12	8
	With contact numbers	8,298	846	766	527	348	630
Step 2: Phone Screening of Chemical Firms	*Firms with contact numbers*						
	Number inactive	1,768	304	212	137	102	200
	Bankruptcy or not operating yet	2,622	28	37	29	25	34
	Not accepting calls after 6 trials	37	238	168	118	95	181
	Active firms	3,871	276	349	243	126	215
	Of all active firms						
	Not involving hazardous chemicals	1,824	41	70	38	22	84
	Refuse to participate	830	20	23	28	4	7
	Involving hazardous chemicals	1217	215	256	177	104	124
Step 3: Phone Schedulin	*All active firms whose business involving hazardous chemicals*						
	Accepted	556	88	127	86	52	56
	Refuse	661	127	129	91	52	68
Response rate		27%	37%	46%	42%	48%	43%

Phases		Thai Nguyen	Ninh Binh	Hai Phong	Nam Dinh	Ha Nam	TOTAL
Step 1: Original Sample	**Firms under hazardous chemical codes**	456	374	2,376	626	276	18,701
	Without contact number	3	374	1,077	10	5	4,647
	With contact numbers	453	374	1,299	616	271	14,428
Step 2: Phone Screening of Chemical Firms	*Firms with contact numbers*						
	Number inactive	140	134	437	188	64	3,686
	Bankruptcy or not operating yet	19	25	65	15	2	2,901
	Not accepting calls after 6 trials	106	86	342	208	108	1,687
	Active firms	187	129	455	205	97	6,153
	Of all active firms						
	Not involving hazardous chemicals	74	45	239	77	36	2,550
	Refuse to participate	7	7	20	17	9	972
	Involving hazardous chemicals	106	77	196	111	52	**2,635**
Step 3: Phone Schedulin	*All active firms whose business involving hazardous chemicals*						
	Accepted	52	32	75	50	26	**1,200**
	Refuse	54	45	121	61	26	**1,435**
Response rate		46%	38%	35%	39%	43%	**33%**

Appendix C: Evolution of Clauses in Hazardous Chemical Regulation

Safety Clause		Received Comments	Revised	In Final Draft	Audited
1	Storage/Fire Prevention	Yes	Yes	Yes	Yes
2	Aquaphobic Chemicals	Yes	Yes	No	No
3	Safety Signs	Yes	No	Yes	Yes
4	Lightning Prevention	Yes	Yes	Yes	Yes
5	Washing Facility	Yes	Yes	Yes	Yes
6	Chemical Transport	Yes	Yes	Yes	Yes
7	Fuses/Sockets	Yes	No	Yes	Yes
8	Lighting System	Yes	No	Yes	Yes
9	Mixing Equipment	Yes	Yes	Yes	Yes
10	Welding Equipment	Yes	Yes	Yes	Yes
11	Corrosive Chemicals	Yes	Yes	Yes	Yes
In hazardous chemical regulation but not part of Round 1 Treatment					
12	Wastewater Treatment	No	No	Yes	Yes
13	Chemical Stacks	No	No	Yes	Yes
In separate fire safety regulation					
14	Fire Alarm	No	No	No	Yes
15	Fire Safety Equipment	No	No	No	Yes

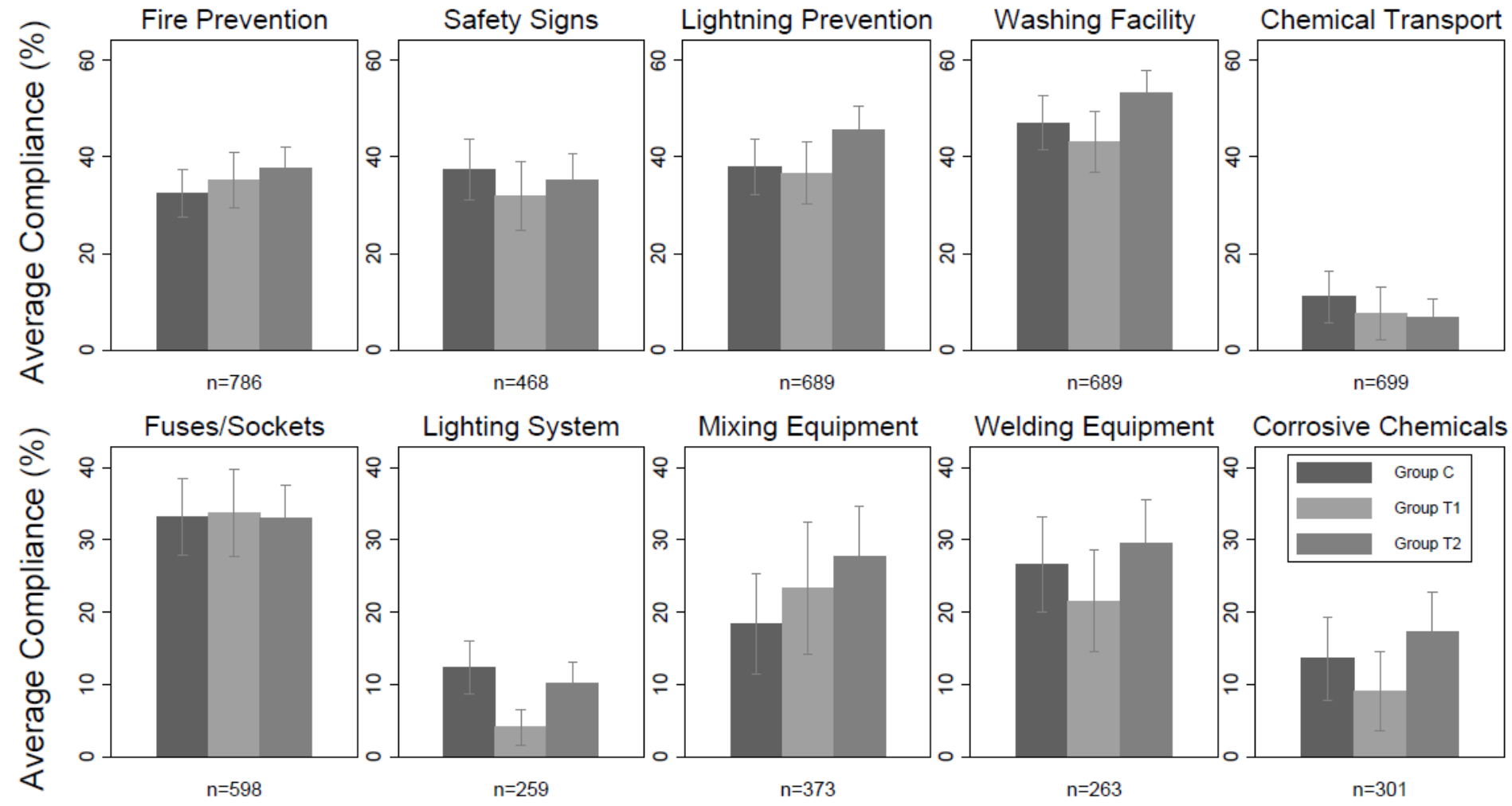
Diamond indicates clauses was included in the stage. X indicates the clause was dropped or was not included.

Appendix D: Balance in Covariates

Covariates/Treatment Group	C: Placebo		T1: Information		T2: Participation		Difference in Mean Tests (p-value)			Observation
	Mean	90% CI	Mean	90% CI	Mean	90% CI	C v. T1	C v. T2	T1 v. T2	
(1) Successfully re-interviewed in Round 3=1	0.683	(0.644 - 0.722)	0.695	(0.651 - 0.739)	0.696	(0.663 - 0.730)	0.739	0.668	0.967	1,200
(2) Able to vist in factory floor=1	0.600	(0.551 - 0.649)	0.580	(0.525 - 0.636)	0.661	(0.619 - 0.703)	0.665	0.120	0.058	830
(3) Respondent was CEO/General Manager=1	0.694	(0.646 - 0.743)	0.620	(0.565 - 0.674)	0.633	(0.592 - 0.675)	0.100	0.114	0.741	830
(4) CEO of company is female=1	0.140	(0.102 - 0.177)	0.161	(0.118 - 0.204)	0.186	(0.154 - 0.218)	0.537	0.122	0.439	830
(5) Firm is located in Hanoi=1	0.487	(0.436 - 0.537)	0.449	(0.391 - 0.506)	0.444	(0.401 - 0.488)	0.413	0.295	0.921	830
(6) Firm is located in rural sub-district=1	0.343	(0.295 - 0.392)	0.337	(0.282 - 0.392)	0.361	(0.320 - 0.403)	0.878	0.647	0.557	830
(7) Employment Size (8pt scale)	2.713	(2.614 - 2.813)	2.732	(2.619 - 2.845)	2.767	(2.681 - 2.852)	0.840	0.502	0.685	830
(8) <5 employees	0.113	(0.081 - 0.146)	0.122	(0.085 - 0.159)	0.119	(0.091 - 0.147)	0.771	0.812	0.929	830
(9) 5-9 employees	0.287	(0.243 - 0.330)	0.229	(0.180 - 0.279)	0.219	(0.182 - 0.257)	0.150	0.053	0.794	830
(10) 10-49 employees	0.419	(0.368 - 0.469)	0.473	(0.416 - 0.530)	0.481	(0.437 - 0.524)	0.242	0.127	0.866	830
(11) >50 employees	0.181	(0.142 - 0.220)	0.176	(0.131 - 0.220)	0.181	(0.147 - 0.214)	0.877	0.985	0.883	830
(12) Change in employment between surveys (ln)	0.133	(0.004 - 0.263)	0.117	(-0.030 - 0.264)	0.177	(0.066 - 0.289)	0.890	0.670	0.589	830
(13) Performance of business between surveys (5pt scale	3.669	(3.571 - 3.767)	3.845	(3.734 - 3.956)	3.724	(3.638 - 3.809)	0.051	0.491	0.153	797
(14) Capital Size (8pt scale)	3.328	(3.206 - 3.450)	3.302	(3.164 - 3.441)	3.311	(3.206 - 3.416)	0.818	0.860	0.935	830
(15) <0.5 Billion VND ($23,000)	0.034	(0.011 - 0.057)	0.063	(0.037 - 0.090)	0.069	(0.049 - 0.089)	0.171	0.058	0.766	830
(16) 0.5 to 1 Billion VND ($46,000)	0.121	(0.087 - 0.154)	0.122	(0.084 - 0.160)	0.131	(0.102 - 0.159)	0.969	0.715	0.767	830
(17) 1 to 5 Billion VND ($230,000)	0.532	(0.481 - 0.583)	0.502	(0.445 - 0.560)	0.483	(0.440 - 0.527)	0.525	0.229	0.663	830
(18) 5 to 10 Billion VND ($460,000)	0.147	(0.112 - 0.182)	0.127	(0.087 - 0.166)	0.133	(0.104 - 0.163)	0.525	0.619	0.829	830
(19) 10 to 50 Billion VND ($2.3 Million)	0.166	(0.127 - 0.205)	0.185	(0.141 - 0.229)	0.183	(0.150 - 0.217)	0.588	0.577	0.952	830
(20) Capital/Labor	1.342	(1.284 - 1.399)	1.299	(1.233 - 1.365)	1.294	(1.245 - 1.344)	0.422	0.308	0.929	830
(21) Manufacturing Sector=1	0.758	(0.714 - 0.803)	0.673	(0.622 - 0.724)	0.742	(0.703 - 0.780)	0.039	0.639	0.078	830
(22) Wood products=1	0.208	(0.167 - 0.248)	0.185	(0.140 - 0.231)	0.189	(0.155 - 0.223)	0.547	0.561	0.919	830
(23) Metal products=1	0.166	(0.128 - 0.204)	0.141	(0.098 - 0.185)	0.194	(0.162 - 0.227)	0.484	0.353	0.109	830
(24) Paper products=1	0.075	(0.048 - 0.103)	0.073	(0.042 - 0.104)	0.083	(0.060 - 0.107)	0.927	0.718	0.666	830
(25) Chemical manufacuring=1	0.087	(0.057 - 0.116)	0.093	(0.059 - 0.126)	0.097	(0.072 - 0.122)	0.828	0.658	0.858	830
(26) Chemical Transport=1	0.030	(0.012 - 0.048)	0.049	(0.028 - 0.069)	0.025	(0.010 - 0.040)	0.260	0.718	0.126	830
(27) Sole Propiertorship=1	0.091	(0.059 - 0.122)	0.122	(0.086 - 0.158)	0.111	(0.084 - 0.138)	0.525	0.413	0.689	830
(28) Limited Liability Company=1	0.596	(0.546 - 0.646)	0.590	(0.534 - 0.647)	0.581	(0.538 - 0.623)	0.896	0.695	0.822	830
(29) Joint Stock Company=1	0.313	(0.267 - 0.360)	0.288	(0.235 - 0.341)	0.308	(0.268 - 0.348)	0.554	0.896	0.611	830
(30) Round 1: Understanding of regulation*	2.494	(2.432 - 2.556)	2.553	(2.482 - 2.624)	2.499	(2.446 - 2.551)	0.301	0.927	0.310	780
(31) Round 1: Regulations used to extract bribes*	2.531	(2.466 - 2.596)	2.443	(2.369 - 2.518)	2.564	(2.508 - 2.620)	0.145	0.524	0.033	756

* Round 1 survey questions coded 1) Strongly Disagree; 2) Disagree; 3) Agree; 4) Strongly Agree. (30) "Government officials have sufficient understanding of business like this one to effectively carry out their regulatory duties." (31) "It is common for government officials to use regulations to extract rents from businesses in my industry."

Appendix E: Compliance by Clause



90% Confidence Intervals; n=Eligible Firms

Appendix F1: Effects of Experiment on Individual Clauses (OLS)

Dependent variable: Auditors rate firm in compliance with clause =1	Fire Prevention	Safety Signs	Lightning Prevention	Washing Facility	Chemical Transport	Fuses/ Sockets	Lighting System	Mixing Equipment	Welding Equipment	Corrosive Chemicals
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Information Treatment=1	0.021	-0.039	-0.028	-0.043	-0.044	-0.006	-0.085***	0.038	-0.041	-0.047
	(0.026)	(0.037)	(0.032)	(0.045)	(0.057)	(0.050)	(0.025)	(0.078)	(0.073)	(0.040)
Participation Treatment=1	0.034	0.020	0.108***	0.109***	0.005	0.004	0.061***	0.053	0.092	0.080*
	(0.028)	(0.046)	(0.034)	(0.034)	(0.031)	(0.042)	(0.022)	(0.062)	(0.063)	(0.042)
Hanoi=1	-0.069	-0.149***	-0.120	-0.108	-0.028	-0.067	-0.001	-0.139**	-0.129**	-0.068
	(0.080)	(0.037)	(0.072)	(0.066)	(0.025)	(0.052)	(0.034)	(0.056)	(0.055)	(0.051)
Female CEO=1	-0.084*	-0.146***	-0.201***	-0.175***	-0.042	-0.178***	-0.004	-0.095*	-0.166***	-0.031
	(0.045)	(0.046)	(0.055)	(0.053)	(0.035)	(0.043)	(0.021)	(0.049)	(0.035)	(0.041)
Constant	0.186***	0.171**	0.390***	0.432***	0.056	0.275***	0.008	0.063	-0.056	0.128
	(0.055)	(0.070)	(0.076)	(0.071)	(0.057)	(0.051)	(0.034)	(0.089)	(0.078)	(0.096)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	786	468	598	699	263	689	689	259	373	301
Clusters	48	41	45	47	29	46	46	11	33	27
R-Squared	0.056	0.113	0.106	0.085	0.018	0.084	0.034	0.068	0.105	0.024
RMSE	0.468	0.455	0.469	0.482	0.279	0.455	0.288	0.414	0.424	0.348

Linear probability model (OLS) with standard errors, clustered by Province-Sector, in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Estimating equations 5, 6, and 10 drop firms in the participation treatment that provided comments.

Appendix F2: Effects of Experiment on Individual Clauses (OLS)

Dependent variable: Auditors rate firm in compliance with clause =1	Fire Prevention	Safety Signs	Lightning Prevention	Washing Facility	Chemical Transport	Fuses/ Sockets	Lighting System	Mixing Equipment	Welding Equipment	Corrosive Chemicals
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Information Treatment=1	0.023	-0.037	-0.032	-0.047	-0.039	-0.005	-0.105***	0.049	-0.037	-0.050
	(0.027)	(0.041)	(0.035)	(0.048)	(0.053)	(0.051)	(0.039)	(0.076)	(0.079)	(0.049)
Participation Treatment=1	0.036	0.018	0.118***	0.117***	0.005	0.004	0.075**	0.050	0.101	0.083*
	(0.029)	(0.051)	(0.037)	(0.037)	(0.033)	(0.043)	(0.032)	(0.059)	(0.068)	(0.047)
Hanoi=1	-0.071	-0.164***	-0.128*	-0.114	-0.028	-0.071	0.002	-0.151***	-0.152**	-0.068
	(0.084)	(0.038)	(0.075)	(0.069)	(0.027)	(0.053)	(0.035)	(0.053)	(0.060)	(0.045)
Female CEO=1	-0.087*	-0.151***	-0.209***	-0.179***	-0.040	-0.182***	-0.007	-0.096**	-0.177***	-0.033
	(0.045)	(0.045)	(0.056)	(0.053)	(0.031)	(0.042)	(0.019)	(0.049)	(0.035)	(0.044)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	786	468	598	699	263	689	689	259	373	301
Clusters	48	41	45	47	29	46	46	11	33	27
Pbar	0.354	0.350	0.408	0.488	0.0837	0.332	0.0929	0.236	0.265	0.140
Log Likelihood	-488.3	-274.9	-370.7	-453.6	-73.34	-408.5	-201.1	-131.7	-193.8	-117.8

Probit model with standard errors, clustered by Province-Sector, in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Appendix F3: Effects of Experiment on Individual Clauses (OLS) in High Access Districts (>80% Access)

Dependent variable: Auditors rate firm in compliance with clause =1	Fire Prevention	Safety Signs	Lightning Prevention	Washing Facility	Chemical Transport	Fuses/ Sockets	Lighting System	Mixing Equipment	Welding Equipment	Corrosive Chemicals
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Information Treatment=1	0.038	-0.113	-0.028	-0.069	-0.010	-0.081	-0.055	0.220	-0.093	0.028
	(0.102)	(0.109)	(0.127)	(0.116)	(0.152)	(0.089)	(0.072)	(0.311)	(0.110)	(0.203)
Participation Treatment=1	0.034	0.095	0.149*	0.109	0.025	-0.017	0.092	-0.153	0.006	0.100
	(0.075)	(0.100)	(0.075)	(0.072)	(0.096)	(0.095)	(0.062)	(0.164)	(0.181)	(0.222)
Hanoi=1	-0.157*	-0.285***	-0.270**	-0.108	-0.126	-0.008	-0.020	-0.133	-0.127	-0.289
	(0.092)	(0.099)	(0.105)	(0.109)	(0.117)	(0.123)	(0.097)	(0.225)	(0.183)	(0.175)
Female CEO=1	0.218***	-0.033	0.073	0.055	0.116	-0.086	-0.066	-0.089	-0.178***	0.161
	(0.072)	(0.078)	(0.066)	(0.054)	(0.108)	(0.083)	(0.040)	(0.088)	(0.062)	(0.132)
Constant	0.089	0.814***	0.773***	0.974***	-0.149	0.914***	0.007	-0.054	-0.112	0.221
	(0.124)	(0.095)	(0.163)	(0.085)	(0.116)	(0.139)	(0.123)	(0.293)	(0.203)	(0.486)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	195	84	132	148	42	158	158	45	83	32
Clusters	0.096	0.199	0.221	0.098	0.323	0.090	0.050	0.083	0.101	0.138
R-Squared	30	23	26	28	13	30	30	10	22	14
RMSE	0.491	0.419	0.392	0.388	0.346	0.488	0.322	0.514	0.501	0.482

Linear probability model (OLS) with standard errors, clustered by Province-Sector, in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Appendix G: Benjamini-Hochberg Multiple Comparisons Correction

Auditors rate firm in compliance with clause =1	**Unadjusted p-value**		**Adjusted p-value**	
Fire Prevention	0.384	FALSE	0.549	FALSE
Safety Signs	0.734	FALSE	0.917	FALSE
Lightning Prevention	0.005	TRUE	0.025	TRUE
Washing Facility	0.002	TRUE	0.02	TRUE
Chemical Transport	0.993	FALSE	0.993	FALSE
Fuses/Sockets	0.958	FALSE	0.993	FALSE
Lighting System	0.018	TRUE	0.06	TRUE
Mixing Equipment	0.078	FALSE	0.156	FALSE
Welding Equipment	0.12	FALSE	0.2	FALSE
Corrosive Chemicals	0.039	TRUE	0.097	TRUE

To perform the test, we run the standard regressions and order the p-values from smallest to largest. Then we find the largest p-value that satisfies the question $p_k \leq \frac{k}{m}\alpha$ where m is the number of outcomes, k is the index for each p-value, and α is the level of significance (.05).

Appendix H: Relationship between Participation and Additive Indices

Dependent variable:	Total Compliance			Only Easy Reforms			Only Hard Reforms		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Information Treatment=1	-0.019	-0.021	-0.029	0.004	-0.029	0.003	-0.043	-0.043	-0.010
	(0.023)	(0.025)	(0.061)	(0.027)	(0.061)	(0.029)	(0.026)	(0.028)	(0.057)
Participation Treatment=1	0.058***	0.049*	0.051	0.034	0.051	0.026	0.089***	0.077***	0.070*
	(0.022)	(0.025)	(0.057)	(0.031)	(0.057)	(0.037)	(0.020)	(0.023)	(0.041)
Hanoi=1	-0.112***	-0.024	0.131**	-0.119***	0.131**	-0.041	-0.108***	-0.024	0.092
	(0.030)	(0.023)	(0.064)	(0.028)	(0.064)	(0.025)	(0.035)	(0.025)	(0.060)
Female CEO=1	-0.083*	-0.059	-0.123*	-0.087*	-0.123*	-0.066	-0.080*	-0.054	-0.124**
	(0.044)	(0.047)	(0.063)	(0.048)	(0.063)	(0.051)	(0.046)	(0.049)	(0.051)
Constant	0.354***	0.548***	0.238	0.314***	0.238	0.494***	0.369***	0.574***	0.654***
	(0.045)	(0.040)	(0.262)	(0.043)	(0.262)	(0.046)	(0.055)	(0.046)	(0.114)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Auditor FE	No	Yes	No	No	No	Yes	No	Yes	No
Observations	813	813	202	800	202	800	803	803	207
Clusters	50	50	38	50	30	38	50	50	38
Mean in Control Group	0.36	0.36	0.54	0.38	0.54	0.38	0.35	0.35	0.53
Pseudo R-Squared	0.086	0.254	0.138	0.091	0.138	0.219	0.066	0.222	0.133
RMSE	0.362	0.329	0.375	0.396	0.375	0.370	0.378	0.348	0.320

OLS with marginal probabilities in parentheses. Standard errors, clustered by Province-Sector, in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Model 1 controls only for blocking variables. Model 2 introduces enumerator fixed effects. Model restricts the analysis to districts where auditors were able to access over 80% of factories in the jurisdiction. Because Model 3 employs a selection strategy at the district level, standard errors are now clusterd at district level.