

Climate Regulation's Effects on Businesses and Public Support for Climate Action

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Abstract

How do the effects of climate regulation on businesses impact public attitudes toward climate policy? While emissions intensity is the primary frame for understanding the effects of climate policy on business, theoretical scholarship and public discourse describe an alternative account: large firms will adjust to climate regulations easily while smaller firms will struggle. Because small businesses are sympathetic and large firms are unpopular, individuals who view climate regulation's effects in line with this firm size account should be less likely to support climate change mitigation. To test this theory, we conduct an original survey of climate policy beliefs and then a survey experiment. We find evidence that distaste for large corporations interacts with beliefs about climate policy's effects to shape climate policy attitudes. This work contributes to the literature on moral political economy, and on the enduring difficulty of enacting effective climate change regulation within the United States.

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Introduction

Businesses and corporations account for an overwhelming share of global greenhouse gas emissions in comparison with governments and households. Any plausible effort to mitigate climate change will require significant regulatory burdens, transition expenses, and investment costs for private companies. A large literature has examined how variation in regulatory incidence across companies impacts their support or opposition for climate policies. But how does the distribution of the costs and benefits of climate policy across businesses impact *the public's* views of climate policy? Answering this question is critical, because competing accounts of climate regulation's effects play a prominent role in public discourse and implicate core material and moral concerns of voters.

To address this, we begin with two leading theories of climate change policy's regulatory incidence, on emissions intensity and firm size. It is commonly argued that heavily emitting firms face the greatest regulatory burden from effective climate change mitigation.¹ However, a number of alternative theories of regulatory incidence can be unified as a competition between larger firms, who find it easier to adjust to climate regulations, and smaller firms, who find it harder. These theories include arguments on: fixed and variable costs of regulation (Gulotty, 2020); access to financial and political capital (Kennard, 2020; Drope and Hansen, 2006); ability to offshore pollution (Kolcava, Nguyen and Bernauer, 2019); and, ability to garner public benefits from costly investments.²

We argue that the public will respond to these distinct interpretations in two ways. First, they may consider their job (Gaikwad, Genovese and Tingley, 2022; Gazmararian and Milner, 2022; Aklin et al., 2013; Bayer and Genovese, 2020). An individual who has absorbed the emissions intensity account and works in a heavily emitting industry might worry about the impact of climate change mitigation policies on their employment; someone exposed to the firm size account and working at a small firm would also experience job concern. Second, voters may have normative reactions to competing stories of incidence, which we call a concern for 'redistributive rightness'. They may view heavily emitting firms as deserving of bearing regulatory costs, while small firms are undeserving. They may also see negative social consequences from harming small businesses. Due to these moral reactions, we expect people to be less supportive of climate action when exposed to the firm size account in comparison with the emissions intensity account.

To test this theory, we first run a nationally representative observational survey where we ask American adults which businesses they think will find it easy or hard to comply with climate regulations. We show that significant numbers hold beliefs in line with either the emissions intensity

¹ For example, see Bechtel, Genovese and Scheve (2019); Brulle and Downie (2022); Cheon and Urpelainen (2013); Gaikwad, Genovese and Tingley (2022); Genovese (2019); Genovese and Tvinnereim (2019); Green et al. (2022); Kennard (2020); Kim, Urpelainen and Yang (2016); Meckling (2015)

² A cleavage between big firms and small firms over climate regulation is perhaps most plausible within industries, holding industry greenhouse gas emissions intensity fixed.

account or the firm size account. We then show that a belief that large firms find it easy to comply with climate regulations (and small firms find it hard) is linked to more negative attitudes toward climate regulation and a climate treaty, even conditional on alternative explanations.

We then turn to a nationally representative survey experiment, where we treat some respondents with the firm size account of regulatory incidence and others with the emissions intensity account. We find that those given the firm size account have significantly lower support for climate change-mitigating regulation relative to both the emissions intensity account and a neutral control. We also investigate whether an employment-based mechanism or a non-material, moral reaction to the distributive consequences drives our findings. We do so using subset analyses based on measures of employer size and emittingness, and attitudes toward large corporations and the fossil fuel industries. We complement this with mediation analysis of intermediate outcomes: job concern and beliefs about regulation’s unfairness or harms in society. We find stronger evidence for the moral-normative model of preference formation, which is our primary theoretical contribution. However, some of our results also align with the employment-based account.

Our account of climate preferences connects with three literatures. First, our focus on normative reactions to regulatory incidence for businesses provides a new account of the determinants of climate policy preferences, though one that is complementary to existing accounts, not supplementary (Bechtel, Genovese and Scheve, 2019; Kennard, 2021; Gaikwad, Genovese and Tingley, 2022; Bergquist et al., 2023; Bayer and Genovese, 2020, e.g.). Second, our story connects to the long-running literatures on economic populism and hostility to big business, as well as more recent innovations in political economy which emphasize the distinct preferences and political advantages of large firms (Saad, 2019; Kim and Osgood, 2019). Third, our account taps into a fundamental question over the relative weight of material and non-material factors in attitude formation. The distributive stakes of climate policy, which implicate both pocketbook concerns for workers and normative concerns for all citizens, are a useful proving ground for comparing these ideas.

What do our findings mean for the future of climate policy? Our argument suggests that certain views of climate regulation’s impacts corrode support for climate action. Pro-climate action politicians and activists might therefore consider how to design regulation programs with more equitable costs, but also how to sell regulation or subsidies in a way that emphasizes just incidence. Views that large firms might easily surmount or evade climate regulation may also connect to the recent populist, anti-elite wave, and so make it harder to achieve climate cooperation, especially in countries with populist right-wing leadership or anti-corporate left-wing leadership. Designing and promoting global climate cooperation that doesn’t harm the “wrong” targets may be especially important in these cases.

Theory

Firms and the regulatory costs of climate change mitigation

Private businesses are among the most important contributors to climate change, and emit far more greenhouse gases than households, governments, and other institutions.³ Sufficiently reducing greenhouse gas (GHG) emissions to mitigate climate change will require significant changes in behavior among business, in part achieved through government regulations limiting direct emissions and energy consumption. A key question in the study of climate policy and politics is how the costs or incidence of climate regulation will be distributed across firms. Which firms will find it relatively easy to adapt to a world of reduced GHG emissions, and might even benefit? Which firms will find it costly or impossible to adapt to changing rules and regulations?

The leading approach holds that firms in heavily GHG-emitting and energy-consuming industries struggle with new regulations, while firms in low-emitting industries, or industries that consume less energy, have a much easier time adapting to new regulatory standards.⁴ This approach can be extended to consider the upstream and downstream linkages of firms to heavily emitting or energy-consuming industries (Cory, Lerner and Osgood, 2021). Firms that produce low-emissions substitutes for emissions-intensive products also benefit from climate regulation (Svendsen, 2011). We refer to these theories focused on the direct and indirect GHG emissions of firms as the **emissions intensity account** of climate regulation's effects on business.

A series of seemingly disparate alternative theories have also been offered which provide different, though not necessarily competing, accounts of regulatory incidence. We highlight five of the most prominent among these and argue that a core element of each is a cleavage in regulatory costs between larger firms (which find it easier to navigate climate regulation) and smaller firms (who find it harder to navigate climate regulation). Thus, these theories trace out an alternative view of the distributive consequences of climate change-related regulation, which is that regulation will impose lesser burdens on large firms and greater burdens on small or medium-sized businesses.

First, a generic argument in the literature on regulation is that at least some part of the costs of regulatory compliance is *fixed* across firms (i.e., does not vary with the size of the firm) (Gulotty, 2020). For example, implementing a new set of regulations may incur learning or time costs; expenditure on consultants, lawyers or other experts; or investments in equipment, machinery, or software that do not scale one-to-one with firm size (Kitching, Hart and Wilson, 2015). Larger or more productive firms generally find it easier to absorb fixed costs because they can spread out

³ See Ekwurzel et al. (2017); Frumhoff, Heede and Oreskes (2015); Griffin (2017); Heede (2014).

⁴ Brulle and Downie (2022); Cheon and Urpelainen (2013); Genovese (2019); Genovese and Tvinnereim (2019); Green et al. (2022); Kim, Urpelainen and Yang (2016).

the costs across a greater stream of revenues or output.⁵ Thus, climate regulation with a fixed cost component imposes a greater relative burden on small firms. A related argument is that more productive firms are better able to withstand *variable* costs of production (i.e., costs that scale with the size of the firm) because they have larger profit margins per unit of production (Michaelis, 1994). Because productive firms are generally larger, this argument also suggests that larger firms will be better able to withstand climate-related regulation. Note that while both arguments stress that even big firms still face higher costs, they may benefit on net from climate regulation that harms their rivals more (Kennard, 2020; Meckling, 2015).

Second, larger or more productive firms generally have greater access to financial capital, which makes compliance with new regulations that require investments easier (González and González, 2012; Kadapakkam, Kumar and Riddick, 1998). More productive firms are more profitable, and so can self-finance major capital investments. Larger firms also tend to have well-established relationships with bank lenders, and better non-bank funding streams, especially corporate bond and equity markets but also venture capital (Ferri and Jones, 1979; Weinberg, 1994; Titman and Wessels, 1988). Many types of climate-related regulations, for example, governing direct emissions, energy efficiency, or reporting requirements, involve significant upfront investments.

Third, larger and more productive firms are more able to offshore highly polluting elements of their production or supply chain (Berry, Kaul and Lee, 2021; Levinson, 2010; Li and Zhou, 2017; Taylor, 2005; Zhang, Padmanabhan and Huang, 2018). A vast literature in the economics of trade has documented that larger/more productive firms are much more likely to trade; to offshore-*outsource* production; and to establish foreign plants (Bernard et al., 2012; Schmeisser, 2013). Each of these activities make it easier to move polluting activities that are not compliant with regulations to other markets. The offshoring of pollution may be significant, though the empirical findings on this point are nuanced (Cole, 2004; Kolcava, Nguyen and Bernauer, 2019, e.g.).

Fourth, bigger firms generally are more politically adept and more engaged in political activities like lobbying, campaign contributions, and outreach (Drope and Hansen, 2006). This political capital gives larger firms a greater say in shaping the fine-grained details of regulation (Hansen, Mitchell and Drope, 2004; Hart, 2004). For this reason, larger, politically adroit firms may face a smaller cost incidence from regulation than smaller, inexperienced ones.

Finally, even if big firms face identical costs from climate regulation, they may be more able to secure partially compensating public benefits. Big firms may be better able to advertise their green policies or achievements to key stakeholders, like employees and customers (Bull, 2012; Casadesus-Masanell et al., 2009; Kumar et al., 2017). Their greater experience with marketing and PR may help them to benefit more from the exact same green initiatives undertaken by smaller firms.

While distinct in their underlying mechanisms (and generating theoretical implications beyond

⁵ Put another way, larger firms benefit from economies of scale in compliance.

those we have focused on) we highlight again that each of these five theories suggests that a relevant cleavage over climate mitigation policy lies between larger firms and smaller firms.⁶ We refer to these ideas as the **firm size account** of climate regulation’s effects on business.

The emissions intensity account has received empirical corroboration in the above-cited literature. Is there similar evidence for the firm size account? Broadly, yes. Recent scholarship has found that firms with higher market capitalizations are more likely to adopt emissions targets and other carbon management practices (Dietz et al., 2018). Larger firms are more likely to make GHG pollution disclosures (Freedman and Jaggi, 2005; Brammer and Pavelin, 2008; Stanny and Ely, 2008; Ali, Frynas and Mahmood, 2017). Firm size, as measured by number of employees, is associated with environmental officer positions, participation in the Carbon Disclosure Project, and membership in pro-climate groups (Lerner and Osgood, 2022). Larger firms are rated higher on ESG performance (Drempetic, Klein and Zwergel, 2020; Fatemi, Glaum and Kaiser, 2018) and climate change mitigation efforts (Amran et al., 2012; Wang, Li and Sueyoshi, 2018).

Competing accounts of regulatory costs: public discourse and public opinion

So far we have traced out two competing theoretical accounts of the regulatory incidence of climate action on businesses, both of which are empirically supported in the literature on corporate private governance and political activity. However, our interest is the impact of these accounts of regulatory incidence on public opinion, so two critical questions remain. First, are the two competing accounts of climate change regulation’s effects on firms a part of public discourse around climate change? Second, do significant shares of the public believe in these two accounts (and is there variation across the public in which account they find most plausible)?

To assess the first question, we searched for examples of each theory across four domains: non-editorial news (both print/online and television); editorial news; statements by interest groups within news media; and statements by politicians within news media or social media. We focused on US sources since that it is where we test our argument. We found a rich set of examples of both the emissions intensity account and the firm size account. These accounts appear as both sincere interpretations or models of the world (e.g., describing climate regulation as a challenge to fossil fuel companies or small companies) and as deeply politicized arguments (e.g., describing climate subsidies as handouts to wealthy corporations and climate regulations as mortal threats to vital energy industries or small businesses). We also see many examples where arguments from the academic literature are echoed in public discourse, for example, on large firms’ greater ability to

⁶ We offer two clarifications on this point. First, the theories described contain much more richness and nuance which we have not described. We have only discussed the common bonds across the theories which of course sets aside much detail. Second, our goal in this endeavor is to suggest that the theoretical literature on climate politics – in some instances and often latently – concords with the idea that larger firms may find it easier to adjust to climate regulations than small firms.

shape regulation or on small firm’s inability to absorb compliance costs due to smaller margins. Due to space constraints, we supply these examples in Appendix A (“Competing accounts of regulatory incidence for business in public discourse”, page 2) for readers interested in seeing how competing arguments about regulation’s effects on business play out in public debate.

Our second key question is whether the public believes in these competing accounts of the effects of climate regulation. In particular, it would be useful to know whether some significant share of the public has beliefs in line with the emissions intensity account while another share has beliefs in line with the firm size account. If that were so, then that would further justify examining the relative impacts of the two accounts on public opinion. We found no existing literature which examines this question, and so we redress that gap within our observational study below. To preview, we ask our respondents about six competing theories of the firms that will be most harmed, or that will most benefit, from climate regulations. We find significant shares of the public that adopt beliefs in line with both the emissions intensity account and the firm size account.

How the public react to regulation of firms

So far we have described two accounts of the effects of climate regulation on businesses, one focusing on emittingness and the other on firm size. These accounts recur in the academic literature, public discourse, and public opinion. The effects of these distributive implications on firms’ preferences and political behavior have been investigated in a rich literature on corporate climate politics. But the effects of climate regulation on business may also impact other actors in society, especially workers and the general public. This leads us to ask: what are the effects of competing *understandings* of climate regulation’s impacts on businesses for public support of that regulation? The most obvious approach to this question focuses on the fact that climate regulations impact the workers at regulated businesses, giving them a strong material stake in climate regulation via the effects on their employer.⁷ However, a possible alternative approach highlights that the distributive stakes of climate regulation for business may provoke a normative or at least non-egoistic response, rooted in feelings about the businesses helped or hurt by climate regulation.

Employment-based model: The standard political economy approach is that attitudes towards economic policy are mainly materialistic and egoistic (Drews and van den Bergh, 2016; Margalit, 2011; Owen and Johnston, 2017). In this view, the mass public mainly reacts to industrial regulation in their capacity as workers (or perhaps relatives or neighbors of workers). Climate regulation that harms businesses or industries on which workers (or their family or town) depend for employment

⁷ The emissions intensity account has been investigated in a large literature on worker’s climate policy opinions e.g. Bechtel, Genovese and Scheve (2019); Gaikwad, Genovese and Tingley (2022); Bergquist et al. (2023); Bayer and Genovese (2020); Kahn and Kotchen (2011), though we found no priming experiment similar to our own. The firm size account’s impact on workers’ climate policy preferences has not been investigated.

will be viewed negatively (Bechtel, Genovese and Scheve, 2019; O’Connor et al., 2002).

What does this employment-based model mean for attitudes about increasing the stringency of climate regulation? The answer to this question depends importantly on whether the public believes the emissions intensity account of distributive stakes or the firm size account.

If a person has internalized the emissions intensity account and acts in line with the employment-based model, we expect that they will be more opposed to climate regulation if they work in an emissions-intensive industry (or in an industry that strongly depends on energy consumption, inputs from GHG-intensive industries, or on sales to GHG-intensive industries). If they do not work in such an industry, we expect that they will be relatively more supportive of climate regulation than the former group. If on the other hand, a person has internalized the firm size account (but still acts in line with the employment-based model), we expect that they will be more opposed to climate regulation if they work at a small company or small business. If they work at a large company, we expect them to be more positive on climate regulation.

Both of these arguments describe an interaction between beliefs (about the distributive consequences of regulation) and employer characteristics (emitting or non-emitting, big or small). Put another way, the employment-based model suggests *conditional* effects of beliefs about climate policies’ consequences. Does the employment-based model suggest any *unconditional* effect of beliefs about regulatory incidence on support for regulation? Our answer is potentially yes, though the argument is somewhat involved. To start, a significant share of Americans, about 44%, work at small businesses (< 250 employees) in the 2019 quarterly workforce indicators. In contrast, only about 11-17% of Americans work in the most intensively emitting sectors.⁸ Given this asymmetry, belief in the emissions intensity account should spark a negative reaction among a smaller group (workers in heavily emitting industries) than belief in the firm size account (which sparks a negative reaction among a larger group, workers in small firms). Thus, the firm size account may have an on average negative effect on support for climate regulation due to employment concerns. We keep this point in mind as we examine unconditional treatment effects below.

Finally, we note that the employment-based approach emphasizes a particular causal mechanism: job concern. Elevated worry about employment should therefore mediate any negative impact of the firm size account on climate policy attitudes relative.

Redistributive rightness model: The public’s response to the effects of policy may not be driven by pocketbook concerns but rather by a moral evaluations (Bechtel, Genovese and Scheve, 2019; Drews and van den Bergh, 2016; Hammar and Jagers, 2007). Are the winners of some policy change good or bad, deserving or undeserving? Are the losers of a policy change sympathetic or unsympathetic? These affective forms of evaluation might be especially prevalent when the employment-based effects

⁸ We define heavily emitting sectors, whether directly or indirectly, in the appendix. The number depends on whether 4-digit industries (11%) or all 3-digit industries with a heavily emitting 4-digit industry (18%), are used. These industries account for 76-82% of America’s private sector emissions.

seem distant or hard to parse, or even if the targets of redistributive effects are just sufficiently likable or unlikable. In this affective or normative mode of evaluation, the question isn't whether the redistributive effects are remunerative, but whether they are right.

As with the employment-based account, the effects of this 'redistributive rightness' model of thinking depend on which theory of redistributive stakes is present in a person's mind.

If a person has internalized the emissions intensity account and acts in line with the redistributive rightness model, we expect that they will be more supportive of climate regulations. First, the fossil fuel industry and energy generation industries are generally not sympathetic and many people don't hold positive views of the industry (Leiserowitz, 2019).⁹ Second, we suspect that most people would view heavy emitters as being the 'correct' targets of regulation (Leiserowitz, 2019). It would only make sense that those who emit the most GHGs should bear the greatest burden of reducing GHG emissions. While this is an 'on average' argument (since most, but not all, people likely find heavy emitters unsympathetic) it also suggests a conditional effect: support for climate regulation among people who have internalized the emissions intensity account should increase with their hostility toward the fossil fuel industry and other heavy emitters.

If a person has internalized the firm size account, we expect that they will be more opposed to climate regulation. First, a majority of the public views large corporations negatively (Newman and Kane, 2014; Halliday and Thrasher, 2020; Gallup, 2022), so any policy that is seen as going easy on bigger companies will provoke a negative reaction (Saad, 2019). Small businesses are generally seen in sympathetic terms and are viewed as making important social contributions (Newport, 2017). Second, most people will not view smaller firms as being the proper targets of regulation, and a heavier burden on small firms may be viewed as evidence that regulation is ill-designed (Kitching, Hart and Wilson, 2015). Just like above, this is an 'on average' argument since most, though not all, people likely find big business less sympathetic than small companies. But it also suggests a conditional effect: opposition to climate regulation among people who have internalized the firm size account should increase with their hostility toward big business.

Finally, note that the 'redistributive rightness' model suggests a distinct moral-normative causal mechanism behind the negative effect of the firm size account on climate policy attitudes. One potential channel for this is a belief that regulation is harming the wrong targets, and so we should see that this belief mediates the effect of the firm size account on climate attitudes. Another potential channel is a belief that regulation harms businesses that are valuable to society i.e. small businesses. We examine both of these mediators below.

Summary: To conclude, we have laid out two visions for how beliefs about regulatory incidence on businesses may shape climate policy attitudes among the public. The employment-based model

⁹ Some heavily emitting industries may be more sympathetic – parts of agriculture and heavy manufacturing, eg – though we suspect they are less identified as heavy emitters in respondent's minds.

and the redistributive rightness model make similar on average predictions: people who believe the firm size account of regulatory incidence will be less supportive of climate action than people who believe the emissions intensity account. The theories depart from one another, however, in their predictions about heterogeneous effects and causal mechanisms. If the employment-based model is true, then hostility to climate regulation is moderated by the size and emittingness of one's own employer, and belief formation occurs through a job concern mechanism. If the redistributive rightness model is correct, hostility to climate regulation will be moderated by attitudes towards big corporations and heavily emitting firms, and belief formation occurs via a non-economic, normative reaction about the relative deservingness of winners and losers from regulation.

Observational Survey-Based Study

Observational hypotheses, design, and data

We translate our theory from above into two symmetric hypotheses tailored to an observational study. Both hypotheses build off the 'on average' or unconditional predictions in the employment-based or redistributive rightness accounts of preference formation. (We reserve tests of moderators and mediators to our experimental setting below.)

Hypothesis 1a. Respondents who believe that large and very large firms find it easiest to comply with climate regulations support those regulations (and international climate cooperation) less than respondents who think that non-emitting firms find it easiest to comply.

Hypothesis 1b. Respondents who believe that small- and medium-sized firms find it hardest to comply with climate regulations support those regulations (and international climate cooperation) less than respondents who think that heavily-emitting firms find it hardest to comply.

To test these hypotheses, we commissioned an original survey of 2000 Americans fielded by YouGov Omnibus from February 16-28th of 2023. Our hypotheses, coding decisions, and analyses were preregistered. The sample was generated via stratified random sampling of the YouGov Omnibus panel on age, education, gender, and race. YouGov provides poststratification weights so the sample is nationally representative on these variables, as well as on presidential vote in 2016 and 2020. We use weighted means or weighted regression models in all instances.

Support or opposition to climate action is the outcome of interest for Hypotheses 1a and 1b. We measure support for regulation and climate cooperation with the following questions:

To what extent would you support new regulations on businesses' greenhouse gas emissions and energy consumption to reduce climate change?

To what extent do you support the United States participating in the Paris Climate Agreement, an international treaty which commits countries to domestic efforts to slow down climate change?

In both cases, respondents are provided the answers: Totally oppose; Mostly oppose; Somewhat oppose; Neither favor nor oppose; Somewhat Favor; Mostly Favor; Totally favor. While our primary focus is on support or opposition to regulations (and how that may be driven by beliefs about regulation's effects), we ask respondents about their views on an international climate treaty to examine an alternative climate policy that nonetheless mandates effective regulation.

We ask the following two questions to get at respondents' pre-existing beliefs about which firms they believe will find it easier or harder to handle climate-related regulations.

Many countries are working on rules to make companies reduce greenhouse gas emissions and cut energy usage and fuel consumption. These rules may slow down climate change. However, new rules will also create costs for companies which may hurt their productivity or sales.

Which companies do you think will find it easiest to comply with these new environmental rules? In other words, which companies do you think will be able to follow new environmental rules without seriously affecting their business or profitability?

- Large and very large companies
- Small and medium-sized companies
- Companies in industries that heavily emit greenhouse gases or consume energy
- Companies in industries that do not heavily emit greenhouse gases or consume energy
- All companies will find it easy to comply
- No companies will find it easy to comply

Which companies do you think will find it hardest to comply with these new environmental rules? In other words, which companies do you think will face the greatest damage to their business or profitability as a result of new environmental rules?

The second question has the same answers, except that answers 5 and 6 are changed to "All companies will find it hard to comply" and "No companies will find it hard to comply".

To test Hypothesis 1a, we first report the difference in means for the climate regulation question for respondents answering "Large and very large companies" will easily adjust versus respondents answering "Companies in industries that do not heavily emit greenhouse gasses or consume energy". (Results on the climate treaty question are included in the appendix.) This is followed by models

which sequentially introduce controls: birth, gender, and race; a college dummy, family income, and employment dummies; indices for partisanship and political ideology; and two measures of material threats based on whether the respondent works in a heavily emitting industry¹⁰ and exposure to climatic risk.¹¹ Coding decisions on controls are provided in the appendix. A significant number of respondents (491) did not provide answers to at least one demographic question asked by YouGov (usually income, ideology, or party) and a very small (5) number of respondents did not answer some of our questions. We use multiple imputation on the cleaned analysis dataset so that we may analyze the entire sample in models that include covariates. All estimates and models are based off of 10 multiply imputed datasets generated with the Amelia software package (Honaker, King and Blackwell, 2011). The imputation models in both the observational and experimental data include all analysis variables except for the survey weights.

To test Hypothesis 1b, we use the same steps as above but replace responses to the “Easiest to comply” question with responses to the “Hardest to comply” question. Specifically, we will focus on comparing respondents who answer “Small and medium-sized companies” with respondents answering “Companies in industries that heavily emit greenhouse gases or consume energy.”

Observational results

Beliefs about costs of compliance: We begin by presenting a cross-tabulation of results to the questions about which firms respondents think will find it easiest or hardest to comply with climate regulations. The marginal distributions of these questions are presented in purple cells in Figure 1. The joint distribution is presented in blue cells.

Respondents most commonly believe that non-emitters will find it easiest to comply with climate regulations (29%) though quite a few also answered big firms (21%) and no firms (24%). The first and second of these answers are consistent with the standard accounts in the literature. The third of these may be a ‘protest vote’ to express hostility toward climate action, or just pessimism about the difficulties of decarbonization. The answers provided on which firms will find it hard to comply with climate regulations mirror these, with “heavy emitters” the clear front-runner (35%), but quite a few respondents answering “small firms” (21%) or “all firms” (14%).¹²

Looking at the joint distributions, we see that by far the most common responses are that “non-

¹⁰See the appendix for a detailed description of this measure.

¹¹We use the average Risk Index Score from FEMA’s National Risk Index from six forms of climate change-related weather: wildfire, tornado, hurricane, heat wave, drought, and coastal flooding. We use the “All Counties - County-level detail (Table)” available from <https://hazards.fema.gov/nri/data-resources>.

¹²We also note that a significant number of respondents felt that small firms would find it easy to comply with regulations and big firms would find it hard, 12% and 14%, respectively. These answers are clearly in a second tier compared to the main arguments offered in the literature and public discourse, but the numbers are notable.

Which businesses find it easiest to comply?

		Big firms	Small firms	Non-emitters	Heavy emitters	All firms	No firms	
Which businesses find it hardest to comply?	Big firms	0.02	0.06	0.03	0.01	0.00	0.02	0.14
	Small firms	0.12	0.02	0.03	0.02	0.00	0.02	0.21
	Non-emitters	0.01	0.01	0.01	0.01	0.00	0.00	0.05
	Heavy emitters	0.05	0.03	0.21	0.02	0.01	0.03	0.35
	All firms	0.01	0.00	0.01	0.00	0.02	0.12	0.16
	No firms	0.01	0.00	0.00	0.00	0.03	0.05	0.09
		0.21	0.12	0.29	0.07	0.07	0.24	

Figure 1: Cross tabulation and marginal proportions for responses on which business will find it easiest and hardest to comply with climate regulations

emitters will find it easy to comply, heavy emitters will find it hard to comply” in line with the emissions intensity account. We also find it striking the number of respondents who pair “big firms find it easy to comply, small firms find it hard to comply,” consistent with the firm size account. Quite a few also answer that no firms will find it easy to comply and all firms will find it hard.

Costs of compliance and attitudes toward climate regulation: In the top half of Table 1, we provide the results of our testing of Hypotheses 1a-b. We compare only respondents who believe that large firms easily adjust to climate regulation with respondents answering that light-emitters will easily adjust, to highlight the groups that our theory suggests should be the least and most supportive, respectively, of climate regulations based on their beliefs about the distributive implications of such

Table 1: Support for climate regulations and attitudes on which businesses find it easy or hard to adjust to climate regulations

Model	Support for Climate Regs.: Oppose (1) to Favor (7):				
	1	2	3	4	5
Non-emitters easily adjust versus large and very large firms easily adjust:					
Large firms easily adjust	-0.37** (0.12)	-0.38** (0.12)	-0.35** (0.12)	-0.20* (0.10)	-0.21* (0.10)
N	1009	1009	1009	1009	1009
Heavy emitters hard to adjust versus small firms hard to adjust:					
Small firms hard to adjust	-0.75*** (0.11)	-0.77*** (0.11)	-0.73*** (0.11)	-0.39*** (0.10)	-0.40*** (0.10)
N	1126	1126	1126	1126	1126

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models are WLS with WLS standard errors. In the top panel, ‘Large firms easily adjust’ is compared relative to ‘Non-emitting firms easily adjust’. Controls introduced sequentially: Model 1 is bivariate; 2 introduces age/gender/race; 3 introduces education, employment, income; 4 party and ideology; 5 industry emittingness and climate change exposure.

policies. Hypotheses 1a predicts significantly more negative attitudes towards climate regulation among people who believe that large firms will easily adjust, even conditional on our controls. That is the case across all of our models, though the effect of the ‘Large firms easily adjust’ belief is blunted somewhat by the inclusion of political/ideological controls. We see very similar effects and effect sizes in the online appendix where we examine support for climate treaties (Table A1).

In the bottom half of Table 1, we examine the effects of respondents’ beliefs about which firms will struggle to adapt to climate regulation. In line with Hypothesis 1b, those who believe that small firms will find it hard to adjust are much more negative on climate regulation than those who think that heavily emitting firms will find it hard. We see similar results using the treaty outcome variable (appendix Table A2).

Overall, the results of our observational survey suggest significant variation among the public in their beliefs about climate regulations’ effects on business, and a robust conditional correlation between those beliefs and support for climate regulation. We now turn to demonstrating the causal impact of those beliefs.

Experimental study

Experimental hypotheses

Our theory suggests a main testable hypothesis about an average treatment effect and series of heterogeneous treatment effects and causal mediation effects. On average, we expect that:

Hypothesis 2. Respondents exposed to a treatment emphasizing large companies’ ease and small

companies' difficulty with climate regulations will be more opposed to climate regulations (and international climate cooperation) than respondents exposed to a treatment emphasizing heavily emitting industries' difficulty and non-emitting industries' ease.

Note again that the firm size account is our first treatment and the emissions-focused account is our second treatment, so we expect a negative treatment effect. We also provide, without additional hypotheses, average effects of these treatments relative to a neutral control condition.

Our theory suggests two possible mechanisms. The first of these is an employment-based or pocketbook mechanism, which suggests the following heterogeneous treatment effects:

Hypothesis 3a. Respondents employed at relatively larger employers should have a less negative treatment effect. Respondents employed in heavily emitting industries should have a less negative treatment effect.

The second mechanism is moral or normative, and concerns respondents' attitudes towards big business, on one hand, and the fossil fuel industry, on the other.

Hypothesis 3b. Respondents with relatively positive attitudes towards larger companies should have a less negative treatment effect. Respondents with relatively positive attitudes towards fossil fuel industries should have a less negative treatment effect.

Finally, we have three hypotheses about causal mechanisms. The first relates to the employment channel described above; the second and third to the normative mechanism. We divide up the normative mechanism into a channel emphasizing deservingness of regulation-induced costs, and a separate channel emphasizing bad consequences for society that result from harm to regulated businesses.

Hypothesis 4a. Opposition to climate regulation/cooperation generated by the firm size treatment will occur due to a heightened feeling that climate regulations increase personal job insecurity.

Hypothesis 4b. Opposition to climate regulation/cooperation generated by the firm size treatment will occur due to a heightened feeling that climate regulations unfairly harm some businesses.

Hypothesis 4c. Opposition to climate regulation/cooperation generated by the firm size treatment will occur due to a heightened feeling that climate regulations harm businesses that are valuable to society.

Experimental design and data

To examine these hypotheses, we again commissioned an original survey of 2000 Americans fielded by YouGov Omnibus from February 16-28th of 2023. The sample was generated in the same fashion

as the observational survey. Note that, by design, this survey had no overlapping respondents with our observational survey. Our hypotheses, coding decisions, and analyses were pre-registered.

Our survey experiment is designed to gauge the effect of priming individuals about the firm size account of climate regulation's distributive consequences relative to the emissions intensity account. To do so, we randomly assigned the following treatment texts to our respondents, as well as a no text control condition:

[**Treatment I:**] The US is working on rules to limit companies' greenhouse gas emissions and energy usage. These rules may slow down climate change, but will also create costs for companies.

New regulations will be especially costly for small and medium-sized companies, who will find it challenging to lower their emissions and use less energy. Some small businesses may even shut down. **New regulations will have fewer negative effects on large and very large companies.**

[**Treatment II:**] The US is working on rules to limit companies' greenhouse gas emissions and energy usage. These rules may slow down climate change, but will also create costs for companies.

New regulations will be especially costly for companies that heavily emit greenhouse gases or consume energy, who will find it challenging to lower their emissions and use less energy. Some heavily emitting businesses may even shut down. **New regulations will have fewer negative effects on companies that do not heavily emit greenhouse gases or consume energy.**

The treatment text was immediately followed on the same page by the two climate policy attitude questions used as DVs in the observational study above. The no-text control condition included only the climate policy attitudes questions without any preceding text. We randomized treatments I and II to 800 respondents each, and the no-text control to 400 respondents.

We initially report a difference in means (for both outcomes) between the two treatment conditions. To guard against post-randomization covariate imbalance and to potentially tighten the confidence intervals, we then sequentially introduce the same controls as in the observational study. We examine the difference between the treatments and the control in the appendix, and describe those results in words only.

To examine whether treatment effects might be driven by feelings of job insecurity resulting from the size of the firm an individual works at, we ask respondents to report their firm's size:

Roughly how many employees would you say work at the company, business, or organization where you are currently employed? If you work at a company with more than

one location or branch, please try to answer for the company as a whole, not just your location or branch. If you work at multiple companies, please answer for the company that is your main source of income.

Respondents were given 7 options that increased the number of employees exponentially (e.g., 1-5, 6-19, 20-49, 50-199, etc.) For respondents who previously answered that they were not employed, we provide a reworded question asking them to answer the above for the last place where they worked and providing an additional response: “I have never been employed”. We dichotomize the resulting measure of employer size in a variable called “Large employer.” Respondents at or below the median response (which was 50-199) were coded as a 0 for this variable; respondents above the median response were coded as a 1. Respondents who have never been employed are dropped from the analysis when this variable is used.

We also use the employment in Highly emitting industries measure (described in detail in the appendix) to examine employment in those industries as a moderator of the treatment effect. To examine the heterogeneous effects, we interact “Large employer” and “Highly emitting” with the treatment indicator in separate regression models both without and with the complete covariate vectors used previously. We include the models for the climate regulations outcome in the main text and place the models for the climate treaty outcome in the appendix.

To identify individuals who hold negative sentiments toward big businesses and fossil fuel companies in general, we use the answers on the second and fourth items in the following multi-item feeling thermometer question:

We would like to learn about your feelings toward different groups listed below. Please position each one on a feeling scale/thermometer. The higher the number, the warmer feelings you have toward this group. For instance, a ranking of 0-49 means that you feel negative/cold feelings toward the group. A ranking of 51-100 means that you feel positive feelings toward the group. If your feelings are neutral, please select exactly 50.

- The US Congress (Senate and House of Representatives)
- Corporate America (aka “Big Business” or the Fortune 500)
- The Entertainment Industry (aka “Hollywood”)
- Oil and gas companies (aka the Fossil Fuel industry)
- The Catholic Church
- The National Football League (NFL)

We split the responses on the thermometers at their medians to create two dichotomous variables called “Positive view of corporations” and “Positive view of fossil fuel industries”. To examine the heterogeneous effects, we interact “Positive view of corporations” and “Positive view of fossil

fuel industries” with the treatment indicator in separate regression models without covariates. We again include the models for the climate regulations outcome in the main text, and place the models for the climate treaty outcome in the online appendix.¹³

Finally, use the following question to measure mediators:

To what extent do you agree or disagree with the following statements about efforts to regulate greenhouse gas emissions in order to limit climate change:

- “Climate-related regulations could endanger the jobs of people like me.”
- “Climate-related regulations may harm some businesses that haven’t done anything wrong.”
- “Climate-related regulations will harm companies that make important contributions to the economy and society.”

Individuals can provide one of 5 responses: strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, and strongly agree.

We use WLS for the mediator models and include the complete set of demographic, education/employment, party/ideology, and climate attitude controls. We use WLS for the outcome models which again include all of the controls. We report treatment effects on the mediating variables; average causal mediation effects; and average direct effects.

Experimental results

Main results: Table 2 provides the results of our main tests of Hypothesis 2. Recall that the estimand is the average difference in the climate attitude outcomes between respondents receiving a treatment that emphasizes big firms’ ease and small firms’ difficulty with climate regulations and a treatment describing non-emitting firms’ ease and heavily emitting firms’ difficulty. We expect the former treatment to provoke a negative response relative to latter, and that is what we see in the average treatment effects in Table 2. The first column of the table shows the simple difference in means, and the subsequent columns include additional covariates. The top half of the table examines the climate regulation attitudes outcome while the bottom half of the table examines the climate treaty outcome. We see similar results across both outcomes.

We examine in the appendix the difference between our treatments and the control condition (Table A3-A4). We find the firm size treatment provokes a large, negative, and statistically significant treatment effect relative to control for the regulations question; and a moderate, negative, and

¹³One concern that might occur to readers is that perhaps workers at large firms are more favorable to big corporations, or workers in heavily emitting industries are more favorable towards the fossil fuel industry. Such a correlation would make it harder to pull apart the effects of employment versus attitudes. We find no statistically significant correlation within these pairs of measures in our survey.

Table 2: Effect of priming firm size account of climate regulation adjustment costs versus emissions intensity account on support for climate regulation and a climate treaty.

Outcome: Attitude towards Climate Regulations, Oppose (1) to Favor (7):					
Average treatment effect	-0.48***	-0.50***	-0.52***	-0.48***	-0.48***
ATE 95% CI	[-.67, -.29]	[-.69, -.32]	[-.71, -.33]	[-.64, -.32]	[-.65, -.32]
N	1600	1600	1600	1600	1600
Outcome: Attitude towards Climate Treaty, Oppose (1) to Favor (7):					
Average treatment effect	-0.19 ⁺	-0.21*	-0.23*	-0.18*	-0.18*
ATE 95% CI	[-.39, .01]	[-.41, -.01]	[-.43, -.03]	[-.35, -.01]	[-.35, -.01]
N	1600	1600	1600	1600	1600
Controls employed:					
Demo. controls	No	Yes	Yes	Yes	Yes
Educ./Emp. controls	No	No	Yes	Yes	Yes
Party/ideology controls	No	No	No	Yes	Yes
Climate controls	No	No	No	No	Yes

Notes: +p<0.10, *p<0.05, **p<0.01, ***p<0.001. All models are WLS with WLS standard errors. Treated = 1 for large firms find it easy/small firms find it hard; Treated = 0 for firms in non-emitting industries find it easy/firms in heavily emitting industries find it hard.

not significant treatment effect for the treaty question. The emittingness frame generally provokes a very modest, positive, and insignificant treatment effect relative to control.

Treatment effect heterogeneity: Table 3 provides the results of our models concerning treatment effect heterogeneity, examining the employment-based model of Hypothesis 3a in columns 1 and 2 and the redistributive rightness model of Hypothesis 3b in columns 3 and 4.

Hypothesis 3a predicts a positive and significant interaction term between the Large employer dummy and the treatment indicator. Looking at the models without controls in the top half of Table 3, we do not see this and the overall size of the coefficient is quite modest. Likewise, Hypothesis 3a also predicts a positive sign on the interaction between the Heavily emitting industry dummy and the treatment indicator. We do see a positive coefficient, and one that is somewhat larger in size, but it is again not significant at the 5% level. Our findings are substantively similar when we include the full battery of controls in the lower half of Table 3. The results for the treaty outcome variable, supplied in the appendix, are very similar (Table A5). Thus, we see little support within the heterogeneous treatment effects for the employment channel.

Hypothesis 3b predicts that respondents with positive attitudes towards big corporations or positive attitudes towards the fossil fuel industry will have less negative treatment effects. We see some weak evidence in favor of the first interaction effect, with an interaction term between the treatment indicator and the positive view of corporations variable of .26 (without controls) and .39 (with controls). In the former case, this means that the treatment effect among those with a negative view of big corporations is $-.57$ but among those with a positive view of corporations is $-.31$. While the size of this difference is noticeable, it is not statistically significant at conventional

Table 3: Treatment effect heterogeneity

Outcome: Attitude towards Climate Regulations, Oppose (1) to Favor (7):				
	1	2	3	4
Moderator	Large employer	Heavy emitter	Pos. view corps.	Pos. view fossil fuels
Models without controls:				
Treated	-0.51*** (0.14)	-0.52*** (0.11)	-0.57*** (0.14)	-0.74*** (0.13)
Moderator	0.02 (0.14)	-0.18 (0.16)	-0.73*** (0.14)	-1.54*** (0.13)
Treated · Moderator	0.09 (0.20)	0.18 (0.23)	0.26 (0.19)	0.57** (0.18)
Models with controls:				

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models are WLS with WLS standard errors. Treated = 1 for large firms find it easy/small firms find it hard; Treated = 0 for firms in non-emitting industries find it easy/firms in heavily emitting industries find it hard.

levels. The difference is significant, however, in the models with controls.

A positive view of the fossil fuel industries does moderate the treatment effect in a statistically significant fashion both with and without controls; the overall interaction effect is quite large, too. Without controls, for example, the firm size treatment effect among people with a negative view of the fossil fuel industry is $-.74$; among people with a positive view of the fossil fuel industry, the treatment effect is substantially reduced, to $-.74 + .57 = -.17$. We see very similar sizes and signs of effects when we examine the treaty outcome (Table A5). Overall, we view the heterogeneous treatment effects results as more supportive, though not perfectly supportive, of the redistributive rightness mechanism.

Mediation: Our final set of hypotheses concern mediation effects. The results of these models, examining both the climate regulation and climate treaty outcome, are presented in Table 4.

Causal mediation effects are identified under stringent assumptions (Imai et al., 2011), so we start with an intermediate outcome that is well-identified without strong assumptions: what are the effects of the competing treatments on our mediators? First, the firm size treatment has a positive and significant treatment effect on the “job concern” mediator relative to the emissions treatment. On average, the firm size treatment increases job concern by .16 points on the five-point scale, which is about 12% of a standard deviation. Second, the firm size treatment has a positive and significant effect on the “regulatory fairness” mediator. The firm size treatment increases concern about the unfairness of climate regulations’ effects by .16 points on the five-point scale, which is 13% of a standard deviation. Finally, the firm size treatment has a smaller, positive, but insignificant effect on the “harmful consequences” mediator. Overall then, our treatment seems to be provoking both job concern – consistent with the employment channel – and concern about the fairness of regulation – consistent with the redistributive rightness model.

Moving on to the causal mediation effects, we find that the effect of the treatments on climate

Table 4: Mediation analysis of trade attitudes and beliefs about trade’s distributive effects

Effect:	Estimate	95% CI
<u>Climate regs.: Oppose (1) to Favor (7):</u>		
Total average treatment effect	-0.48***	[-.64, -.32]
<u>Mediator: Regulation-induced job concern:</u>		
Coefficient from mediator model	0.16*	[.04, .28]
Average causal mediation effect	-0.09**	[-.15, -.02]
Average direct effect	-0.40***	[-.54, -.25]
<u>Mediator: Unfairness of regulation’s effects:</u>		
Coefficient from mediator model	0.16**	[.06, .27]
Average causal mediation effect	-0.10**	[-.17, -.04]
Average direct effect	-0.38***	[-.53, -.23]
<u>Mediator: Harms of regulation on valuable businesses:</u>		
Coefficient from mediator model	0.11	[-.01, .22]
Average causal mediation effect	-0.07	[-.15, .00]
Average direct effect	-0.41***	[-.55, -.26]
<hr/>		
<u>Climate treaty: Oppose (1) to Favor (7):</u>		
Total average treatment effect	-0.18*	[-.34, -.01]
<u>Mediator: Regulation-induced job concern:</u>		
Coefficient from mediator model	0.16*	[.04, .28]
Average causal mediation effect	-0.09**	[-.16, -.02]
Average direct effect	-0.09	[-.24, .06]
<u>Mediator: Unfairness of regulation’s effects:</u>		
Coefficient from mediator model	0.16**	[.06, .27]
Average causal mediation effect	-0.10**	[-.18, -.04]
Average direct effect	-0.07	[-.22, .08]
<u>Mediator: Harms of regulation on valuable businesses:</u>		
Coefficient from mediator model	0.11	[-.01, .22]
Average causal mediation effect	-0.07	[-.15, .00]
Average direct effect	-0.10	[-.25, .05]

Notes: *p<0.05, **p<0.01, ***p<0.001. All mediator models are WLS regression with a treatment dummy and the following controls: age, gender, race, college, income, employed, unemployed, party, ideology, climate exposure, heavily emitting. All outcome models are WLS. Treated = 1 for large firms find it easy/small firms find it hard; Treated = 0 for firms in non-emitting industries find it easy/firms in heavily emitting industries find it hard.

attitudes are mediated by both “job concern” and concerns over “regulatory fairness” but not by concerns over “harmful consequences” to valuable businesses.¹⁴ The scale of the causal mediation effects are significant, accounting for roughly 20% of the total causal effect for the climate regulation outcome and 50% of the total causal effect for the treaty outcome. However, these causal mediation effects rely on a very strong sequential ignorability assumption, and the proximity of the top end of the confidence intervals to zero suggests that modest amounts of unmeasured confounding might upend this conclusion. So we are cautious in interpreting these numbers. Overall, the results provide partial support for both the employment channel and for the redistributive rightness channel.

¹⁴We employ the Mediation package in R (Tingley et al., 2014).

Conclusion

We conclude by summarizing our argument and findings and making some observations on the future of climate policy. Our argument began with the observation that effective climate-change mitigating regulations will have significant effects on private business and industry, including requiring costly investments, significant changes in production practices, and the decline of certain industries. In interpreting which businesses will face the greatest costs, the academic literature and public discourse has primarily focused on relative emittingness of industries. That being said, a consistent thread through both scholarship and public debate is that large firms will find it easier to adjust than small firms. These two accounts form the core of our investigation, though many other theories regarding the costs of regulation have also been offered.

Could the public's views about the effects of climate change regulations on businesses impact public opinion on that regulation? The prominent role of both of these accounts in public discourse suggest they might. We argued that knowledge of these stories about the distributive consequences of regulation could affect climate opinion via two mechanisms: an employment mechanism and a moral or 'redistributive rightness' mechanism. Under the employment mechanism, learning about the effects of regulations on businesses might spark concern or calm among the working public, depending on whether their employer is likely to be negatively impacted or not. Under the moral mechanism, learning about the effects of regulations on businesses might spark support or hostility for those regulations, depending on whether the impacted businesses are either unlikable/deserving of regulation or likable/undeserving of extra costs. Both of these mechanisms also suggest that learning that firm size determines regulatory costs should spark a more negative reaction to climate regulation than learning that emittingness drives costs, an 'on average' argument that is especially clear in the moral-normative model.

We find strong support for this 'on average' effect in both an observational and an experimental setting. Respondents who hold or are exposed to the belief that firm size drives climate adjustment costs are much more negative on climate regulations than respondents who believe that emittingness determines costs. Turning to treatment effect moderators and mediating variables, we examined whether the employment or moral channel appears stronger. While we found some evidence for both mechanisms across all of our tests, overall the evidence is more strongly supportive of the moral mechanism. Respondents with a positive view of big corporations and a positive view of the fossil fuel industry have weaker negative effects of the firm size treatment. A significant share of our main treatment effect is mediated by a belief that regulation unfairly harms the wrong firms.

What do our findings imply for the design and prospects of effective climate policy? Firstly, our findings reinforce the importance of designing climate regulation that does not place a relatively higher burden on small and medium-sized enterprises. For policymakers, achieving this end is complicated by several factors. Regulations that seem *prima facie* equal regardless of firm size may

disproportionately harm small businesses because of their smaller scale and more limited resources. Effectively designing policies to ameliorate these disparate impacts is not trivial. Avoiding harms on small businesses may backfire by undermining the efficacy of climate regulations, since reducing SMEs' emissions is critical to stabilizing the climate and avoiding worst case scenarios. Nonetheless, our findings strongly suggest that earning small business buy-in, and heading off any plausible claim that small businesses will be harmed, are important to secure public support for climate action.

Second, our findings point to the importance of messaging around 'just incidence' when introducing new regulations, especially regulations as important and impactful as those that have been developed to mitigate climate change. Designing policy in the 'right way' may have limited impact if political entrepreneurs, opposing politicians, and the media frame the issue in unfavorable terms. Our anecdotal evidence on framing climate regulations as a question of firm size strongly suggest that this is a recurring tactic for groups opposed to climate action, and our experimental findings suggest it is an impactful frame for those groups, too. Careful marketing and public relations may be just as important as policy design in the battle for public support for effective climate action.

Third, large corporations are generally not popular as a class and populists on both the left and right have demonized big business as part of their appeals. For the populist American right, criticizing large corporations and hostility towards climate action are a fine match, and in that way our findings may shed light on an underexplored facet of the recent rise of right-wing populism: hostility to elites (including elite corporations) fits hand-in-glove with hostility to effective climate change mitigation efforts. For the progressive American left, however, demonizing large corporations may be in tension with support for climate change mitigation. This is because large corporations are often leaders in supporting public and private climate governance and because demonizing large corporations may reduce mass support for climate action to the extent that the public has intuitions in line with the firm size account of climate regulation's effects. Broad brush condemnation of big business may not serve the left's environmental goals. Ensuring that small and medium-sized firms are able to confidently respond to climate regulations may be a more fruitful avenue for sustaining support for climate action among both special interests and the public.

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Appendix A

Ethical practices concerning human participants

This project, including both the observational and experimental components, was reviewed by the Health Sciences and Behavioral Sciences Institutional Review Board (IRB-HBHS) at the authors' academic institution and categorized as exempt. IRB details available upon request.

In all three studies respondents were asked to read and acknowledge the following consent language prior to answering any of the survey questions:

“You are invited to participate in a research study conducted by investigators from the Department of Political Science at [institution name]. The entire study should take around 5 minutes. The goal of the survey is to get your opinions on issues relating to politics and trade by answering several questions. This study is being conducted by the principal investigator, [author] of [institution name]. The risks involved in this study are minimal.

Findings from this study will be reported in scholarly journals or academic conferences. The data will be stored at a secured location and retained indefinitely. Your responses will remain anonymous and cannot be linked to you. Your participation is voluntary. We would like you to answer every question, but you are free to withdraw from the study at any point. Any views you express will be kept completely confidential.

Should you have any questions or concerns about this study, please contact [author], [address], [email].

I understand the above statements and agree to participate in this study: Yes/No”

No deception was employed across any of the three surveys. We collected no respondent identifiers during these surveys. Respondents – American adults – were compensated by the survey firms. This study did not focus on a participant pool that was comprised mainly of members of groups we should consider vulnerable or marginalized. This study did not differentially benefit or harm particular groups.

If the paper is accepted, the authors commit to making publicly available all the quantitative data and related code necessary to produce the results reported in this paper.

Competing accounts of regulatory incidence for business in public discourse

Importantly for our investigation of public opinion, the emitting/non-emitting account of climate regulation’s redistributive effects on business, as well as the big firm/small firm account, are both amply visible in public discourse. These accounts appear as both sincere interpretations or models of the world, and as deeply politicized arguments. We provide examples from across non-editorial and editorial news media and from interest groups and politicians to illustrate anecdotally. We focus on the United States since that it is where we test our argument.

Discussions over the effects of climate policy in non-editorial news media often frame regulation as most severely impacting the fossil fuel industry¹⁵ or parts thereof (“the loser would be coal”¹⁶). Broader formulations, still focused on GHG-emittingness, also appear, like “the chemical, coal and oil industries”,¹⁷ “the big users of power in cement and manufacturing”,¹⁸ “carbon-intensive” companies,¹⁹ or “heavily emitting industries”.²⁰ Such pieces sometimes go industry-by-industry, examining the costs of a green transition to the various GHG-intensive industries: e.g., “electricity generation”, the “oil and gas sector”, “transportation”, “agriculture” and “heavy industry”.²¹ A focus on emissions intensity at the industry level may seem self-evidently correct. But it ignores other nuances like firm-level characteristics (size or prior investments) as well as geography, political capital, and the distribution of incidence up and down the supply chain and between producers and consumers – all factors that have been highlighted in the literature.

Editorial news coverage discussing climate regulation’s effects on businesses also often uses a frame focused on emittingness, from the debate over the Kyoto Protocol (“the charge against carbon dioxide regulation was led by businesses that are large coal consumers...”)²²; to the proposed “Clean Future Act” bill of 2020-22 (“Some provisions still could prove difficult to sell to carbon-focused industries.”).²³ Emittingness-centered arguments from right-wing news may focus on “energy” rather than “fossil fuels”, and may connect the fate of firms to their workers e.g. “These are blue-collar workers who depend on these energy-related jobs...”²⁴ But others loudly support the coal and oil industries too: “When you declare war on an industry,

¹⁵Mackintosh, James. 2018. What Could Go Wrong with Climate-change Investing. Wall Street Journal. December 13th.

¹⁶Glor, Jeff and Major Garrett. 2018. EPA Head Says Industry is Necessary Partner to Protect Environment. CBS News. January 17th.

¹⁷Broder, John. 2011. House Panel Votes to Strip E.P.A. of Power to Regulate Greenhouse Gases. New York Times. March 10th.

¹⁸Mackintosh, James. 2018. What Could Go Wrong with Climate-change Investing. Wall Street Journal. December 13th.

¹⁹Houlder, Vanessa and Alan Livsey. 2021. Pricing Pollution. Financial Times. February 4th.

²⁰Ball, Jeffrey. 2007. Climate Change’s Cold Economics. Wall Street Journal. February 15th.

²¹Gold, Russell, and Collin Eaton. 2021. Biden’s Pledge to Slash Emissions would Require Big U.S. Changes. Wall Street Journal. April 23.

²²A Pressured Bush Retreats; the Coal Industry and Utilities, Major Contributors to the President’s Campaign, Led the Charge Against Carbon Dioxide Regulation. 2001. Los Angeles Times. March 15th.

²³Moore, Daniel. 2020. A 622-page Climate Change Bill Aims to Transform Industry, but What Does it Mean for Pittsburgh? Pittsburgh Post-Gazette. February 16th.

²⁴Cavuto, Neil et al. 2020. President Trump Delivers Address On Energy In Texas. Fox News Network.

when you say I'm going to tax and regulate an industry out of existence, they're not going to produce more oil, they're not going to produce more coal..."²⁵ Editorial coverage from the green left, e.g. of climate lobbying and misinformation, also emphasize the role of the fossil fuel industry.

Interest groups for and against climate action also focus on emittingness as the core dividing line. "The Trump EPA is eager to give the oil and gas industry a free pass to keep leaking enormous amounts of climate pollution..." is how the head of the Natural Resources Defense Council described the Trump Administration's Affordable Clean Energy (ACE) rules.²⁶ Politicians in favor of climate action have described the issue as a fight with "fossil-fuel bullies"²⁷: "The future of the planet is more important than their short-term profits," said Bernie Sanders.²⁸ Politicians opposed to climate regulation defend heavy emitters: "At this rate, the Biden Administration will regulate fossil fuels out of existence."²⁹ A 2021 letter from Republican state treasurers decried Biden administration efforts around climate and bank lending: "The coal, oil, and natural gas industries in our states our vital to our nation's economy... We refuse to allow the federal government to pick our industries as losers..."³⁰ This debate sparked dueling comments on Twitter. From the Right: "Pursuing a radical climate agenda that... discriminates against lenders to energy firms and punishes the fossil energy sector with new financial regulations will destroy jobs and undermine American energy independence."³¹ From the left: "Big banks must stop throwing money at dirty fossil fuel projects in order for us to reduce emissions and combat climate change."³²

Despite the prevalence of the emitting/non-emitting industries frame, discussion that large firms will find it easier to adjust to green regulations than small firms is also widespread. Straight news articles regularly have focused on disagreement between large and small businesses. "The move to pull the United States out [of the Paris Agreement]... has opened up a fissure between smaller companies and some of the biggest names in business."³³ "There's only so many hours in a day for a small company like ours..." is how one small

July 29th.

²⁵MacCallum, Martha et al. 2021. Coal Industry Struggling To Hire As Demand Spikes. Fox News Network. October 19th.

²⁶Diaz, Alexa. 2019. EPA to Roll Back Regulations on Methane Leaks; Trump's Latest Bid to End Obama-era Rules is Criticized by Some Major Oil and Gas Companies. Los Angeles Times. August 30th.

²⁷Whitehouse, Sheldon. 2017. Fossil-Fuel Bullies vs. Republicans. The Washington Post. January 11th.

²⁸Sanders, Bernie. 2022. Prepared Remarks: Sanders Gives Floor Remarks on Climate Disasters and the Mountain Valley Pipeline. Bernie Sanders U.S. Senator for Vermont. September 8th.

²⁹Buck, Ken. [@RepKenBuck]. 2021. At this rate, the Biden Administration will regulate fossil fuels out of existence. [Tweet]. Twitter. January 24th.

³⁰Moore, Riley, John McMillan, Kimberley Yee, Dennis Milligan, Julie A. Ellsworth, Allison Ball, David McRae, et al. 2021. State Treasurer Letter to Kerry. State of West Virginia. May 24th.

³¹Barr, Andy. [@RepAndyBarr]. 2021. Pursuing a radical climate agenda that politicizes allocation of capital, discriminates against lenders to energy firms and punishes the fossil energy sector with new financial regulations will destroy jobs and undermine American energy independence. [Tweet]. Twitter. February 15th.

³²Markey, Ed. [@SenMarkey]. 2021. Big banks must stop throwing money at dirty fossil fuel projects in order for us to reduce emissions and combat climate change. The Fossil Free Finance Act will ensure we hold our financial institutions accountable for contributing to fossil fuel emissions. [Tweet]. Twitter. November 5th.

³³Thomas Jr., Landon. 2017. Small Businesses Cheer 'New Sheriff in Town' After Climate Pact Exit. New

business-owner described the difficulties of complying with climate regulation;³⁴ another described how the Paris Agreement “...heightens the divide between big business and small business...”³⁵ In mirror fashion, many news articles describe the conversion of large firms to pro-climate positions e.g. in the headline “Big business backs key climate change regulations”.³⁶ Competing headlines from environmental-focused media highlight the divide: “Survey: Big business increasingly confident climate projects benefit their bottom line”³⁷ and “Survey: small businesses face recurring barriers to carbon reduction.”³⁸

The firm size frame is also common in editorials. “Another reason Big Business may support domestic and international climate regulations is that it disproportionately hurts smaller businesses. Climate regulations are one of many problematic policies harming small business growth...”³⁹ On the SEC’s 2022 proposed climate disclosure plan: “While larger companies gave the climate proposal mixed reviews, with some welcoming it and others focusing on technical hurdles to compliance, small businesses’ responses had a tone closer to existential dread.”⁴⁰ Examples we found in editorials strikingly echo theoretical mechanisms emphasized in the academic literature. Explaining why “Big Business Loves Climate Regulation” the National Interest argued that

“...Big Business knows that when the deal’s going down, you’ve got to grab a seat at the table... [with] job-killing, growth-stunting regulations: sitting at the table, you can make sure they’re crafted in a way that will damage your competitors – domestic and international – at least as much as they wound you... Big businesses... can negotiate for exemptions and exclusions.”⁴¹

In less florid language, The Hill described small federal contractors’ concerns about climate disclosures in terms very similar to the ‘marginal costs’ argument described in the literature: “These rules would place a very costly burden on [contractors]... many of which are small businesses with small enough margins that simply cannot absorb these new costs.”⁴²

Associations and political groups have also tried to define the stakes of climate change regulation in terms of firm size. Most prominent is the National Federation of Independent Business. After the Biden

York Times. June 2nd.

³⁴Johnson, Keith. 2013. Businesses Weigh Response to Possible New EPA Rules. Wall Street Journal. February 11th.

³⁵Thomas Jr., Landon. 2017. Small Businesses Cheer ‘New Sheriff in Town’ After Climate Pact Exit. New York Times. June 2nd.

³⁶Harder, Amy. 2021. Big Business Backs Key Climate Change Regulations. Axios. January 21st.

³⁷Keating, Cecilia. 2021. Survey: Big Business Increasingly Confident Climate Projects Benefit Their Bottom Line. Business Green. October 28th.

³⁸Flood, Elizabeth. 2023. SMEs Fall Behind on Addressing Climate Change. CFO Dive. January 20th.

³⁹Loris, Nicolas. 2015. Why Big Business Loves Climate Change Regulations. The National Interest. November 3rd.

⁴⁰Vanderford, Richard. 2022. Small Businesses Plead With SEC to Show Restraint on Climate Rules. The Wall Street Journal. June 22nd.

⁴¹Loris, Nicolas. 2015. Why Big Business Loves Climate Change Regulations. The National Interest. November 3rd.

⁴²Kochan, Donald. 2013. Lost in Space: Backdoor Climate Regulation of Federal Contractors Violates Statutory Limits. The Hill. January 12th.

Administration sought to enhance climate reporting by federal contractors, the NFIB responded that the administration has “no legal authority to impose the proposed rule...”⁴³ “Small and independent businesses cannot afford the experts, accountants and lawyers needed to comply with complex government reporting regimes.”⁴⁴ Polluting firms and industries have often attempted to frame their hostility to climate regulation as concern for the fate of small businesses.⁴⁵ Reacting to new limits on methane emissions from oil wells, the American Petroleum Institute argued that the limits would have “a disproportionate effect on small businesses... A lot of mom-and-pops would have their wells shut in...”⁴⁶ Green advocates have tried to push back: “...the E.P.A. is proceeding in a very measured way... focusing as they should on the biggest sources like power plants and not small businesses.”⁴⁷ Supporters of climate action describe ameliorating capacity gaps among small firms as a key aim: “too many... small business suppliers and customers lack the means to collect and report accurate data on their emissions, waste, energy use and environmental impact.. [L]arger businesses must support their suppliers in making the switch.”⁴⁸ When regulators have tried to leave small firms out of climate regulations, precisely to avoid concerns about burdens on small companies, polluting industries have fought to bring them back in: “The question is – is [exempting small firms] legal?” asked a spokesman for the National Mining Association.⁴⁹

Politicians have also cast the climate fight in terms of differential effects on small and large businesses, whether sincerely or for political effect. Republican opposition to using the Clean Air Act to regulate GHGs during the Obama administration took this tack, particularly after an Office of Management and Budget policy analysis leaked which argued that doing so “is likely to have serious economic consequences for regulated entities throughout the U.S. economy, including small businesses and small communities.” House Speaker John Boehner said the memo “suggests that a political decision was made to put special interests ahead of middle-class families and small businesses struggling in this recession.”⁵⁰ On the same Memo: “Senator John Barrasso... called it a ‘smoking gun’... This will be a disaster for the small businesses that drive America.”⁵¹ Later, Republican members of Congress repeated a talking point that small businesses

⁴³Joselow, Maxine and Vanessa Montalbano. 2023. Biden is Pushing Contractors to Cut Emissions: They’re Pushing Back. The Washington Post. February 13th.

⁴⁴Vanderford, Richard. 2022. Small Businesses Plead With SEC to Show Restraint on Climate Rules. The Wall Street Journal. June 22nd.

⁴⁵Joselow, Maxine and Vanessa Montalbano. 2023. Biden is Pushing Contractors to Cut Emissions: They’re Pushing Back. The Washington Post. February 13th.

⁴⁶Diaz, Alexa. 2019. EPA to Roll Back Regulations on Methane Leaks; Trump’s Latest Bid to End Obama-era Rules is Criticized by Some Major Oil and Gas Companies. Los Angeles Times. August 30th.

⁴⁷Broder, John M. 2010. E.P.A. Plans To Phase In Regulation Of Emissions. The New York Times. February 22nd.

⁴⁸Al-Saleh, Henadi. 2023. Why Big Business Must Support SMEs to Achieve Economic Growth and Get to Net Zero. World Economic Forum. January 6th.

⁴⁹Hughes, Siobhan and Ian Talley. 2009. EPA Proposes Tough Greenhouse-Gas Rules for Big Industries. The Wall Street Journal. October 1st.

⁵⁰Power, Stephen and Siobhan Hughes. 2009. House Democrats Reach Accord on a Climate Bill – Legislation Lowers Targets for Cutting Emissions and Gives Breaks to Utilities, Auto Makers, Other Industries. The Wall Street Journal. May 13th.

⁵¹Broder, John M. 2009. EPA’s Greenhouse Gas Proposal Critiqued. New York Times. May 12th.

were threatened by the ‘Green New Deal’: “Biden’s plan props up the Green New Deal with \$630 billion at the expense of small businesses”⁵² and “Democrats’ radical package will prioritize the Green New Deal over small businesses.”⁵³ On the other hand, big corporations would benefit: ‘...the Democrats’ tax-and-spending spree... provides Green New Deal subsidies to the wealthy and the largest corporations.”⁵⁴ The Republican Party’s opposition to effective climate regulation has often put it at loggerheads with corporate America as the “Business-GOP Alliance Crumbles over Climate”: “...Conservatives and big business are no longer singing from the same hymnal — on environmental rules, or much else. ‘There’s definitely been a split between big corporate interests and the GOP’...”⁵⁵

⁵²United States House of Representatives Republican Conference. [@HouseGOP]. 2021. Biden’s plan props up the Green New Deal with \$630 billion at the expense of small businesses. [Tweet]. Twitter. October 5th.

⁵³Stefanik, Elise. [@RepStefanik]. 2021. Democrats’ radical package will prioritize the Green New Deal over small businesses. [Tweet]. Twitter. October 25th.

⁵⁴Hill, French. [@RepFrenchHill]. 2021. Small businesses are the backbone of central Arkansas. Unfortunately, the Democrats’ tax-and-spending spree includes \$420 billion in tax increases on small business owners while providing Green New Deal subsidies to the wealthy and the largest corporations. [Tweet]. Twitter. November 2nd.

⁵⁵Chemnick, Jean. 2022. Business-GOP Alliance Crumbles Over Climate. E&E News. April 6th.

Observational and experimental surveys' demographic questions

YouGov asks the collects the following demographic questions which we plan to use as controls in regression-based models. We describe our coding rules after presenting the question text:

In what year were you born? (We will treat the answer to this as a numeric variable.)

Are you male or female? (Male, Female. We will treat female as the reference category.)

What racial or ethnic group best describes you? (White, Black, Hispanic/Latino, Asian, Native American, Middle Eastern, Mixed Race, Other) – We plan to collapse this response into five categories: White; Black or African American; Latino; AAPI; and Other non-white using White as the reference category.

What is the highest level of education you have completed? (No high school degree, High school graduate, Some college, but no degree (yet), 2-year college degree, 4-year college degree, Postgraduate degree) – We will convert this to a 2-point numeric score for comparing those with at least some college against all others.

Thinking back over the last year, what was your family's annual income? (Less than \$10,000, \$10,000 - \$19,999, \$20,000 - \$29,999, \$30,000 - \$39,999, \$40,000 - \$49,999, \$50,000 - \$59,999, \$60,000 - \$69,999, \$70,000 - \$79,999, \$80,000 - \$99,999, \$100,000 - \$119,999, \$120,000 - \$149,999, \$150,000 - \$199,999, \$200,000 - \$249,999, \$250,000 - \$349,999, \$350,000 - \$499,999, \$500,000 or more, Prefer not to say) – We will convert this to a 16-point numeric score for analysis. Those who respond “prefer not to say” will be treated as NA's and dropped from analyses only when this variable is included in a specification.

Which of the following best describes your current employment status? (Working full time now, Working part time now, Temporarily laid off, Unemployed, Retired, Permanently disabled, Taking care of home or family, Student, Other) – We will collapse this variable into three categories: Employed; Unemployed; and Retired/Student/Disabled/Other.

Generally speaking, do you think of yourself as a ...? (Strong Democrat, Not very strong Democrat, Lean Democrat, Independent, Lean Republican, Not very strong Republican, Strong Republican, Not sure) – We will convert this to a 7-point numeric score for analysis. Those who respond “not sure” will be treated as NA's and dropped from analyses only when this variable is included in a specification.

In general, how would you describe your own political viewpoint? (Very liberal, Liberal, Moderate, Conservative, Very conservative, Not sure) – We will convert this to a 5-point numeric score for analysis. Those who respond “not sure” will be treated as NA's and dropped from analyses only when this variable is included in a specification.

We constructed a variable from the following two question to gauge potential material impacts of climate regulation on job security.

Which of the following best describes the sector of your current or most recent employment? If you are a

business owner or otherwise self-employed, please provide the sector of your business. (Agriculture, Mining, Utilities or electricity generation, Manufacturing, Transportation and warehousing, Other (e.g. health care, government, military, law, hospitality, food service, arts, education, real estate, finance, other professions), I have never been employed).

The following subquestions branch off of this initial question using this common preamble:

Which of the following best describes the industry of your current or most recent employment? We have only listed some industries so please answer “Other” if you do not see your industry listed.

If Agriculture, the answers provided are: Grain or oilseed farming, Support activities for crop production, Other.

If Mining, the answers provided are: Oil and gas extraction, Coal mining, Metal ore mining, Nonmetallic mineral mining and quarrying (e.g. stone, sand, clay, chemicals), Support activities for mining.

If Utilities or electricity generation, the answers provided are: Coal, gas, or oil electric power generation, Electric power transmission, Steam, heat, or air-conditioning supply, Other.

If Manufacturing, the answers provided are: Food, fabric, or apparel manufacturing, Wood product or paper manufacturing, Chemicals, petroleum and coal products, or plastics/rubber manufacturing, Cement, lime, or gypsum manufacturing or clay building materials or glass container manufacturing, Metal, metal products, or machinery manufacturing, Computer, electronic product, electrical equipment, or appliances manufacturing, Transportation equipment manufacturing, Other.

If Transportation and warehousing, the answers provided are: Air, water, truck, or passenger transportation, Pipeline transportation of oil or gas, Support activities for transportation (airport/port operations, cargo, towing, transportation arrangement), Other.

If Other, the answers provided are: Renting or leasing of cars and trucks, consumer goods, or machinery, Education, Other.

Note that the specific industries broken out represent all NAICS 3-,4-, or 6-digit industries (as described in emissions data and practical for purposes of question clarity) that fall above the 90th percentile of direct emissions intensity or the 95th percentile of either upstream or downstream intensity as described in (?). We code a respondent as working in a “Highly emitting” industry if they answer anything but “Other” to one of the subquestions.

Finally, we use the respondent’s zip code (supplied by the survey company) to construct a measure of vulnerability to climate change-related weather risks. To do so, we average the Risk Index Score from FEMA’s National Risk Index from six forms of climate change-related weather: wildfire (WFIR_RISKS), tornado (TRND_RISKS), hurricane (HRCN_RISKS), heat wave (HWAV_RISKS), drought (DRGT_RISKS), coastal flooding (CFLD_RISKS). We use the “All Counties - County-level detail (Table)” available from <https://hazards.fema.gov/nri/data-resources>.

Additional experimental survey questions

Treatment I

Research suggests that international trade has many benefits, but also costs for some groups in the United States. In particular, increased openness to international trade is likely to **benefit large and very large American companies**. However, trade is likely to **harm small and medium sized American companies**.

Given these effects of trade on companies, would you favor or oppose the U.S. becoming more open to international trade?

- Favor a great deal
- Favor somewhat
- Neither favor nor oppose
- Oppose somewhat
- Oppose a great deal

Given these effects of trade on companies, would you favor or oppose the U.S. making free trade agreements with other countries?

- Favor a great deal
- Favor somewhat
- Neither favor nor oppose
- Oppose somewhat
- Oppose a great deal

Treatment II

Research suggests that international trade has many benefits, but also costs for some groups in the United States. In particular, increased openness to international trade is likely to **benefit American companies in industries that sell their products outside the US**. However, trade is likely to **harm American companies in industries that compete domestically with products made overseas**.

[This treatment is followed by the same questions as above.]

We ask the following questions for our subgroup analyses to evaluate heterogeneous treatment effects. Specifically, to identify individuals who might have hold negative sentiments toward big businesses in general, we use the following feeling thermometer question (with the six items presented in random order):

We would like to learn about your feelings toward different groups listed below. Please position each one on a feeling scale/thermometer. The higher the number, the warmer feelings you have toward this group. For instance, a ranking of 0-49 means that you feel negative/cold feelings toward the group. A ranking of 51-100 means that you feel positive feelings toward the group. If your feelings are neutral, please select exactly 50.

- ⊖ The US Congress (Senate and House of Representatives)
- ⊖ Corporate America (aka “Big Business” or the Fortune 500)
- ⊖ The Entertainment Industry (aka “Hollywood”)
- ⊖ The Catholic Church
- ⊖ The World Health Organization (WHO)
- ⊖ The National Football League (NFL)

Note that we only use the ‘Corporate America’ thermometer in the analysis. We constructed both a continuous and binary version of this variable. The continuous version utilized the raw feeling thermometer scores. For the binary measure, individuals who provided a thermometer rating below the sample median are coded 0 (negative sentiments toward corporate America) and 1 otherwise.

To get at the respondent’s employment status we asked them the following question: Please indicate your current employment status

- ⊖ Employed full time
- ⊖ Employed part time
- ⊖ Unemployed looking for work
- ⊖ Unemployed not looking for work
- ⊖ Retired
- ⊖ Student
- ⊖ Disabled

[We collapsed this variable into three categories: Employed; Unemployed; and Retired/Student/Disabled.]

To examine whether treatment effects might be driven by feelings of job insecurity, resulting from the size of the firm an individual works at, we ask respondents to report their firm’s size:

Roughly how many employees would you say work at the company, business, or organization where you are currently employed? If you work at a company with more than one location or branch, please try to answer for the company as a whole, not just your location or branch. If you work at multiple companies, please answer for the company that is your main source of income.

- ⊖ 1-5
- ⊖ 6-19
- ⊖ 20-49
- ⊖ 50-199
- ⊖ 200-999
- ⊖ 1,000-9,999
- ⊖ More than 10,000

For respondents who previously answered that they were not employed, we provide a reworded question asking them to answer the above for the last place where they worked, and providing an additional response: “I have never been employed”.

Individuals who reported working at a firm whose size is below the sample median are coded 0 (small firm) and 1 otherwise. Respondents who answer “I have never been employed” are treated as NA’s and dropped from this subgroup analysis.

All observational models

Table A1: Support for climate treaty and attitudes on which businesses find it easy to adjust to climate regulations

Model	Support for Climate Treaty: Oppose (1) to Favor (7):				
	1	2	3	4	5
Non-emitters easily adjust versus large and very large firms easily adjust:					
Large firms easily adjust	-0.36** (0.13)	-0.39** (0.13)	-0.37** (0.13)	-0.18 ⁺ (0.11)	-0.18 ⁺ (0.11)
Age		0.01** (0.00)	0.01** (0.00)	0.00 (0.00)	0.00 (0.00)
Male		-0.15 (0.13)	-0.12 (0.13)	-0.13 (0.11)	-0.12 (0.11)
Black		0.32 (0.21)	0.33 (0.21)	-0.22 (0.18)	-0.24 (0.18)
Latino		-0.04 (0.18)	0.08 (0.18)	-0.27 ⁺ (0.16)	-0.27 ⁺ (0.16)
AAPI		0.27 (0.50)	0.32 (0.50)	-0.07 (0.40)	-0.05 (0.40)
Other non-white		-0.08 (0.27)	-0.11 (0.27)	-0.14 (0.23)	-0.15 (0.23)
College-educated			0.46** (0.15)	-0.01 (0.12)	-0.02 (0.12)
Income			-0.04* (0.02)	-0.02 (0.02)	-0.02 (0.02)
Employed			-0.12 (0.16)	-0.01 (0.13)	-0.01 (0.13)
Unemployed			-0.34 (0.23)	-0.06 (0.19)	-0.07 (0.19)
Party (D=1,R=7)				-0.38*** (0.03)	-0.38*** (0.03)
Ideology (L=1,C=7)				-0.49*** (0.06)	-0.49*** (0.06)
Heavily emitting					-0.13 (0.13)
Climate risk exposure					0.12 (0.22)
Intercept	5.08*** (0.09)	-14.06* (7.17)	-17.81* (8.08)	2.47 (6.71)	1.90 (6.73)
N	1009	1009	1009	1009	1009
All firms or non-emitters easily adjust versus other responses:					
Small firms easily adjust	-0.31* (0.15)	-0.37* (0.15)	-0.34* (0.15)	-0.32* (0.13)	-0.30* (0.13)
Large firms easily adjust	-0.41*** (0.12)	-0.43*** (0.12)	-0.41*** (0.12)	-0.26* (0.11)	-0.26* (0.11)
No firms or heavy emitters easily adjust	-1.70*** (0.11)	-1.64*** (0.11)	-1.63*** (0.11)	-1.13*** (0.10)	-1.13*** (0.10)
N	2000	2000	2000	2000	2000

Notes: *p<0.05, **p<0.01, ***p<0.001. All models are WLS with WLS standard errors. In the top panel, 'Large firms easily adjust' is compared relative to 'Non-emitting firms easily adjust'.

Table A2: Support for climate regulations and attitudes on which businesses find it easy to adjust to climate regulations

Model	Support for Climate Treaty: Oppose (1) to Favor (7):				
	1	2	3	4	5
Heavy emitters hard to adjust versus small and medium-sized firms hard to adjust:					
Small firms hard to adjust	-0.69*** (0.13)	-0.68*** (0.13)	-0.67*** (0.13)	-0.25* (0.11)	-0.26* (0.11)
Age		0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Male		-0.27* (0.12)	-0.19 (0.12)	-0.13 (0.10)	-0.12 (0.10)
Black		0.46* (0.19)	0.47* (0.19)	0.10 (0.16)	0.08 (0.16)
Latino		0.04 (0.17)	0.13 (0.18)	-0.09 (0.16)	-0.10 (0.16)
AAPI		-0.26 (0.43)	-0.25 (0.42)	-0.11 (0.35)	-0.04 (0.35)
Other non-white		-0.40 (0.28)	-0.40 (0.28)	-0.26 (0.24)	-0.27 (0.24)
College-educated			0.52*** (0.13)	0.10 (0.11)	0.09 (0.11)
Income			-0.05** (0.02)	-0.04** (0.01)	-0.04** (0.01)
Employed			0.02 (0.15)	0.10 (0.13)	0.08 (0.13)
Unemployed			0.08 (0.22)	0.38* (0.18)	0.36+ (0.18)
Party (D=1,R=7)				-0.32*** (0.03)	-0.32*** (0.03)
Ideology (L=1,C=7)				-0.54*** (0.06)	-0.54*** (0.06)
Heavily emitting					-0.27* (0.11)
Climate risk exposure					0.13 (0.23)
Intercept	5.07*** (0.08)	-4.13 (6.73)	-2.80 (7.65)	16.39* (6.43)	14.64* (6.47)
N	1126	1126	1126	1126	1126
No firms or heavy emitters hard to adjust versus other responses:					
Large firms hard to adjust	-0.11 (0.14)	-0.15 (0.14)	-0.13 (0.14)	-0.11 (0.12)	-0.11 (0.12)
Small firms hard to adjust	-0.60*** (0.12)	-0.58*** (0.12)	-0.56*** (0.12)	-0.20+ (0.10)	-0.21* (0.10)
All firms or non-emitters hard to adjust	-1.75*** (0.12)	-1.66*** (0.12)	-1.65*** (0.12)	-1.01*** (0.11)	-1.02*** (0.11)
N	2000	2000	2000	2000	2000

Notes: *p<0.05, **p<0.01, ***p<0.001. All models are WLS with WLS standard errors. In the top panel, 'Small firms hard to adjust' is compared relative to 'Heavily emitting firms hard to adjust'.

All experimental models

Table A3: Attitudes toward climate regulation and a climate treaty: firm size treatment versus control

Outcome: Attitude towards Climate Regulations, Oppose (1) to Favor (7):					
Average treatment effect	-0.49***	-0.50***	-0.52***	-0.45***	-0.45***
ATE 95% CI	[-.72, -.26]	[-.73, -.27]	[-.75, -.29]	[-.65, -.25]	[-.65, -.25]
N	1600	1600	1600	1600	1600
Outcome: Attitude towards Climate Treaty, Oppose (1) to Favor (7):					
Average treatment effect	-0.16	-0.17	-0.19	-0.11	-0.10
ATE 95% CI	[-.40, .09]	[-.42, .07]	[-.43, .05]	[-.32, .10]	[-.31, .10]
N	1600	1600	1600	1600	1600
Controls employed:					
Demo. controls	No	Yes	Yes	Yes	Yes
Educ./Emp. controls	No	No	Yes	Yes	Yes
Party/ideology controls	No	No	No	Yes	Yes
Climate controls	No	No	No	No	Yes

Notes: *p<0.05, **p<0.01, ***p<0.001. All models are WLS with WLS standard errors. Treated = 1 for large firms find it easy/small firms find it hard; Treated = 0 for the no-text control condition.

Table A4: Attitudes toward climate regulation and a climate treaty: emittingness treatment versus control

Outcome: Attitude towards Climate Regulations, Oppose (1) to Favor (7):					
Average treatment effect	-0.01	0.01	0.01	0.03	0.04
ATE 95% CI	[-.25, .23]	[-.22, .25]	[-.23, .24]	[-.18, .24]	[-.17, .25]
N	1600	1600	1600	1600	1600
Outcome: Attitude towards Climate Treaty, Oppose (1) to Favor (7):					
Average treatment effect	0.03	0.05	0.04	0.07	0.07
ATE 95% CI	[-.22, .29]	[-.21, .30]	[-.22, .29]	[-.14, .28]	[-.14, .29]
N	1600	1600	1600	1600	1600
Controls employed:					
Demo. controls	No	Yes	Yes	Yes	Yes
Educ./Emp. controls	No	No	Yes	Yes	Yes
Party/ideology controls	No	No	No	Yes	Yes
Climate controls	No	No	No	No	Yes

Notes: *p<0.05, **p<0.01, ***p<0.001. All models are WLS with WLS standard errors. Treated = 1 for the firms in non-emitting industries find it easy/firms in heavily emitting industries find it hard text; Treated = 0 for the no-text control condition.

Table A5: Treatment effect heterogeneity with the climate treaty outcome

Outcome: Attitude towards a Climate Treaty, Oppose (1) to Favor (7):

	1	2	3	4
Moderator	Large employer	Heavy emitter	Pos. view corps.	Pos. view fossil fuels
Models without controls:				
Treated	-0.24 (0.15)	-0.22 (0.12)	-0.23 (0.14)	-0.35** (0.13)
Moderator	0.05 (0.15)	-0.10 (0.17)	-0.82*** (0.14)	-1.69*** (0.14)
Treated· Moderator	0.09 (0.22)	0.16 (0.24)	0.18 (0.20)	0.39* (0.19)
N	1600	1600	1600	1600
Models with controls:				
Treated	-0.23 (0.13)	-0.18 (0.10)	-0.33** (0.12)	-0.37** (0.12)
Moderator	-0.02 (0.13)	-0.27 (0.14)	-0.46*** (0.12)	-1.12*** (0.12)
Treated· Moderator	0.11 (0.18)	0.00 (0.20)	0.32 (0.17)	0.40* (0.17)
N	1600	1600	1600	1600

Notes: *p<0.05, **p<0.01, ***p<0.001. All models are WLS with WLS standard errors. Treated = 1 for large firms find it easy/small firms find it hard; Treated = 0 for firms in non-emitting industries find it easy/firms in heavily emitting industries find it hard.