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Building Public Support for Reducing Fossil Fuel Subsidies

Evidence across 12 Middle-Income Countries

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Abstract

This study examines which factors influence support for reducing fossil fuel subsidies and what types of information shift people's views through surveying 37,000 respondents across 12 middle-income countries that provided over US$750 billion in explicit and implicit subsidies for fossil fuels in 2022. Respondents were randomly allocated to receive information about the relative cost of fossil fuel subsidies, how they are regressive, or worsen climate change and air pollution. They were then asked about their support for reforms with and without accompanying policies. These treatments, particularly about environmental damage, increased support for reforms in countries that primarily subsidize gasoline and among respondents who perceive themselves to be middle class. Around 30 percent of respondents supported reducing fossil fuel subsidies in isolation, but this share increased to over 95 percent if accompanying policies were implemented. These findings help inform governments about how to build public support for phasing out fossil fuel subsidies.

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Building Public Support for Reducing Fossil Fuel Subsidies: Evidence across 12 Middle-Income Countries*

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1 Introduction

Many governments around the world provide very large subsidies for the consumption of energy sourced from fossil fuels (hereafter "energy subsidies"[1]), even though they accelerate climate change, are generally regressive, and add significant pressure to already stretched public finances. The International Economic Association (IEA) estimates that in 2022 energy subsidies were higher than ever before, directly costing governments over US$1 trillion (IEA 2023); and the International Monetary Fund (IMF), estimates the total cost factoring in negative externalities such as additional greenhouse gas emissions and air pollution, was over US$5 trillion (IMF 2023).[2] These subsidies primarily benefit richer households, as they consume more energy than poorer households (World Bank 2022A); and in many instances, they are a significant share of government expenditure at a time when global public debt is at the highest level in around 50 years (IMF 2021). The complete removal of energy subsidies is projected to limit global warming to less than two degrees Celsius by 2100 (in line with the aim of the Paris Climate Agreement), raise government revenues by 3.6 percent of global gross domestic product (GDP), make government spending more progressive, and prevent 1.6 million deaths per year due to air pollution alone (IMF 2023; IPCC 2023). Despite these clear benefits, many countries have struggled to curtail, much less eliminate, energy subsidies. Recent attempts to reduce energy subsidies have been associated with destabilizing riots in over 40 countries (McCulloch et al. 2022) and the collapse of several political regimes (Moayed et al. 2021).

This study examines how governments in middle-income countries can increase support among their populations for reducing, and ultimately eliminating, energy subsidies. It is

[1]Energy subsidies could refer to a wide range of mechanisms through which the consumer price for energy is lowered below supply costs (which is usually the cost-recovery price for electricity which is domestically produced or the international oil price in the case of gasoline which is traded). They can include subsidies for fossil fuels (coal, natural gas, and oil), electricity, renewable energy sources and biofuels. For the purpose of this paper, energy subsidies primarily refer to the dominant type of energy subsidy in our study countries, which are either liquid fuel or electricity. Electricity is often generated from a diverse range of energy sources, though in our study countries, most of the electricity is generated from fossil fuels.

[2]These estimates provided by the IEA and IMF are widely used approximations of the direct and indirect cost of fossil fuel subsidies; however, they may not perfectly capture the exact circumstances in each country over time.

based on a large-scale, cross-country survey that investigates how people think about these subsidies and what other policy measures they would prefer. The survey includes a randomized experiment whereby respondents receive information treatments highlighting one of the three common arguments against energy subsidies—that they are an inefficient use of government resources (efficiency argument), that they benefit the rich more than the poor (equity argument), or that they damage the environment (environment argument). Specifically, respondents are randomly allocated into four groups; each of the first three groups is provided with information treatments about the negative impact of subsidies on efficiency, equity, or the environment, and the final group receives no information (the control group). These information treatments present recent country-specific data from the IEA and other international organizations. Before receiving the treatments, respondents provide background information on themselves, including their household energy consumption, knowledge of energy subsidies, and views about how much the government can be trusted. After the treatments, respondents were asked a series of questions about their support for subsidy reform, both in the absence of any other policy (unconditional support) and if accompanying policies such as cash transfers were immediately implemented (conditional support). Heterogeneous treatment effects are examined based on respondents' prior beliefs ("priors"), such as their perception of their relative income; they are also examined between subsets of countries based on the main type of energy source that is subsidized. Additional analysis leveraging experimental variation is conducted to examine whether support for reform is influenced by the existing level of subsidies within countries and the level of the potential price increase from reducing subsidies.

The survey was conducted in all middle-income countries where at least 1 percent of GDP was provided in energy subsidies in 2022, at least 5 million adults have access to the internet, and fiscal incidence analysis exists based on recent estimates about the distribution of energy subsidies. The 12 countries that meet these criteria—Angola, Argentina, Bangladesh, Bolivia, Ecuador, Egypt,[3] Ghana, Indonesia, Kazakhstan, Nigeria, Pakistan, and Vietnam—are

[3]The Arab Republic of Egypt is referred to as "Egypt" for brevity throughout the rest of document.

spread across Asia, Africa, the Middle East, and Latin America and have a gross national income (GNI) per person (Atlas method) ranging from US$1,710 to US$9,960 (World Bank 2023A).[4] According to the latest available data, they were collectively responsible for spending almost US$200 billion on explicit energy subsidies in 2022 (and more than US$550 billion on implicit energy subsidies), which is around a quarter of all energy subsidies provided by middle-income countries (IMF 2023). On average, they provide 4 percent of GDP in energy subsidies (IEA 2023), which is equal to or larger than health spending in 10 of the 12 countries. The IMF (2023) estimates that on average the negative externalities in terms of climate change and air pollution alone have an indirect cost of another 7 percent of GDP. Further, the richest 20 percent of households in these countries receive on average around 11 times more in energy subsidies than the poorest 20 percent of households. The sample of survey respondents is broadly representative of the population with internet access, and the data were collected by a leading global online research firm (this is a similar approach to that in seminal work by Alesina et al. [2018]). Results are produced for the sample of respondents (i.e., the sample average treatment effects); moreover, to maximize generalizability, survey weights are applied to match the general population in each country (i.e., the weighted average treatment effects).

The results of the survey reveal that respondents have limited knowledge about energy subsidies and are far more supportive of reducing energy subsidies if accompanying policies are immediately implemented. Just over half of respondents were aware that energy subsidies existed in their country; and even after being informed of their existence, less than half of respondents were aware that energy subsidies have a negative impact on efficiency, equity, or the environment (only around one-third of respondents in the case of the environment). In the control group, around 30 percent of respondents were supportive of energy subsidies being reduced without accompanying policies (i.e., respondents expressed unconditional support); less than a quarter were supportive of energy subsidies being eliminated without

[4]Several countries that provide substantial energy subsidies, such as Iran and India, could not be included due to an absence of data about the distribution of energy subsidies.

accompanying policies. However, levels of support for energy subsidy reform rose to over 95 percent of respondents if these funds were used to immediately implement accompanying policies (i.e., respondents expressed conditional support). The most popular accompanying policy was improvements in the quality of schools, hospitals, and roads (almost four out of five respondents selected this option) and this was followed by more reliable access to energy and investments to improve the environment. Even the least popular policy option that respondents could choose from, cash transfers for all households, generated almost twice as much support for a reduction in subsidies than when no accompanying policies were offered. Both unconditional support and conditional support for energy subsidy reform were positively associated with respondents expressing trust in the government and perceiving themselves to be relatively rich. However, most respondents in each country who do not trust the government and who perceive themselves to be relatively poor or middle class still expressed conditional support for energy subsidy reform. In addition, respondents provided qualitative answers that were consistent with the main findings of the survey, as education and health were viewed as the most important policy priorities for governments.

The experimental results show that levels of support for energy subsidy reform can be raised by increasing respondents' knowledge about the negative impacts of subsidies, particularly the damage subsidies cause to the environment. The results pooled across countries show that the information treatments increased unconditional support for reduction or elimination of energy subsidies, and the environment treatment also increased conditional support for energy subsidy reforms across most accompanying policy options. The order of magnitude of the treatment effect on unconditional support is noteworthy, particularly for the environment treatment, which typically increased support around 10 percent higher than the control group. There were no significant differences between the treatments in terms of unconditional support, but in terms of conditional support the environment treatment had a larger (positive and significant) impact than the equity treatment, while the efficiency treatment effect was indistinguishable from zero. These cross-country results are almost entirely driven by respondents who perceive themselves to be middle class (that is, perceive

their household to be in the middle quintile of the national income distribution) and live in countries that mainly subsidize fuel (results in the countries that primarily or exclusively subsidize electricity and/or gas were insignificant). Interestingly, the experimental results did not vary substantially across countries based on other prior beliefs of respondents, such as whether they believe they benefit from energy subsidies or trust the government, or based on respondents' characteristics, such as the actual income level of their household. In other words, the treatments increased support for energy subsidy reforms across respondents with a diverse range of backgrounds and existing views.

The descriptive and experimental results of the survey experiment provide valuable insights into people's support for energy subsidy reform and have several important implications. First, this survey identifies a key stylized fact: levels of conditional support for energy subsidy reforms are vastly higher than levels of unconditional support. It is striking that in each country more than 9 out of 10 respondents would support reductions in energy subsidies if accompanying policy measures were implemented at the same time. Second, the survey illustrates the types of accompanying policy measures that can gather the most public support for energy subsidy reform: in each country, the most popular measure is better schools, hospitals, and roads, and the least popular is cash transfers for all households. This result suggests that most people would prefer policy makers to prioritize better service delivery in exchange for reductions in energy subsidies. Third, the experiment illustrates that there are large knowledge gaps about the negative consequences of energy subsidies in terms of efficiency, equity, and the environment, and that it is possible to increase public support for energy subsidy reform by communicating this information. In particular, the findings imply that providing information about the negative impact of energy subsidies on the environment has been somewhat underexploited (Vagliasindi 2012; Yemtsov and Moubarak 2018) and could play a pivotal role in generating greater public support for reforms across middle-income countries. Finally, this study also identifies several misconceptions about public support for energy subsidy reform that may undermine the appetite of policy makers to tackle this challenging issue. For example, contrary to prevailing wisdom, it shows that

respondents who have the most to lose from energy subsidy reforms (e.g., those who use subsidized energy sources) are just as likely to increase their support for reforms in response to information about the negative impacts of energy subsidies as those who have little to lose from reforms. Collectively, the findings from this study provide useful guidance for policy makers to consider as they try to steer their countries away from energy subsidies. There appears to be value in broad-based "reform" campaigns that inform the general population about the negative impacts of energy subsidies and that implement credible alternative policies.

This study contributes to the existing knowledge base in at least two ways. First, this is the largest cross-country survey examining attitudes toward energy subsidy reforms, and it provides novel insights into the similarities (and differences) in levels of support for reform, as well as the characteristics and beliefs associated with support across middle-income countries. There is an absence of standardized, cross-country evidence as prior research has typically involved detailed case studies in specific countries (e.g., Inchauste and Victor 2017), and survey work examining public support for reforms has been limited; some examples of surveys include Aklin et al. (2015) for India; Pradiptyo et al. (2016) for Indonesia; and McCulloch et al. (2021) for Nigeria. Two very recent cross-country surveys have begun to fill this knowledge gap. One study across five middle-income countries involving a brief survey showed that levels of public support for energy subsidy removal were similar to levels of support for carbon taxation (Harring et al. 2023). The other study focused on Latin American countries (Vieites et al. 2023) and found a lack of knowledge about subsidies and low levels of support for reform. The current study builds on this prior work by systematically studying support for energy subsidy reform in more detail and across a much larger number and more diverse set of countries, thereby generating novel evidence that is likely to have considerable external validity in other settings and over time. For example, the survey has been designed to illustrate how people's support for subsidy reform varies based on the main type of energy subsidized in their country, and the types of accompanying policies that people prefer (e.g., cash transfers, tax cuts, or better services). Further, the anatomy of

public support for a reduction in energy subsidies across countries is unpacked by examining heterogeneity between respondents based on their prior knowledge and beliefs, such as their perception of their relative income.

Second, this large-scale, online randomized survey experiment adds to the growing body of work using this approach to understand how people reason and how their knowledge and beliefs influence their policy preferences. Seminal work along these lines using large-scale, randomized survey experiments has been conducted in recent years in the United States and Western Europe to examine a range of topics, such as inequality (Kuziemko et al. 2015), social mobility (Alesina et al. 2018), and immigration (Alesina et al. 2023). Two of the latest works using this methodology involved testing the impact of information about climate change on public support for policies in high- and middle-income countries (Dechezleprêtre et al. 2022; Dabla-Norris et al. 2023), but these studies did not examine energy subsidies. The current study extends this literature in several ways. It examines public support for energy subsidy reform, which is somewhat distinct from many other topics, as there is a notable lack of awareness about the existence of subsidies (as opposed to incorrect beliefs or misperceptions), the implications of removing energy subsidies are very tangible (i.e., higher energy prices) and there is a unique legacy of sensitivity around this topic (e.g., riots in many countries as a response to removal of subsidies). It also is designed with several layers of both experimental and nonexperimental variation, which allows for a deep understanding of what drives support for reform, in part by exploiting natural variation across countries (such as variation in the main type of energy subsidized). Finally, this is one of the largest randomized survey experiments in middle-income countries in this literature, and it incorporates best practices for the design of randomized survey experiments from cross-country research in high-income countries.

The paper is structured as follows. Section 2 provides background information about the related literature, hypotheses for this study, and the countries that are included. Section 3 describes the survey methodology in detail, including survey design, data collection, determination of sample sizes, and empirical analysis. Section 4 presents the descriptive findings

of the survey, and Section 5 shows the experimental results. Section 6 includes a discussion of the findings and the policy implications.

2 Background

2.1 Related literature

In their simplest form, energy subsidies can be summarized as follows (see McCulloch [2023] for details). Governments provide subsidies to make it cheaper for consumers to use energy. In most instances, the more a consumer uses energy, the more they benefit from the subsidies. The transfers of resources by governments almost always take place before purchases by the end consumer (e.g., subsidies are paid directly to suppliers). Thus, consumers do not necessarily need to be aware of the existence of subsidies to benefit from them; they simply pay the prevailing energy price, and may interpret the cost to be influenced by any number of factors. It is important to note that subsidies impact fuel prices differently from how they impact electricity and gas prices.[5] Often electricity and gas subsidies involve a more complex tariff structure, whereby consumption is subsidized up to a certain threshold. In contrast, subsidies of fuel tend to follow a linear pricing structure, whereby there is no reduction in subsidization, even at high levels of consumption.

The typical energy subsidy design has at least three widely accepted, undesirable properties, even though subsidies can be implemented with aspirational objectives, such as protecting the poor from high energy prices (Rentschler and Bazilian 2017). First, they often require vast public resources that crowd out other productive spending, such as spending

[5]The incidence of electricity subsidies at the household level is usually calculated by estimating the difference between prevailing electricity prices and supply costs. Electricity prices are often set in the form of block tariffs, but the specific design varies across countries; including the existence of lifeline tariffs in some cases (e.g., Ghana). In the case of fuel subsidies, the incidence often includes estimates of direct and indirect effects. The latter captures indirect consumption subsidies to the extent that subsidized fuel is an input into the production of other goods and services provided to consumers. The indirect effect can be quite substantial and even larger than the direct effect.

to improve the quality of education, health care, and infrastructure (Mahdavi et al. 2022). Second, they disproportionally benefit richer citizens, who consume more energy than poorer citizens (Coady et al. 2015).[6] Third, they lead to the overuse of energy, which has negative environmental externalities, harming the quality of life of citizens today and significantly speeding up climate change (Erickson et al. 2020).

Existing research has identified two main explanations for why, despite their significant shortcomings, energy subsidies are common and reform efforts have been challenging to implement and sustain over time. The most obvious explanation for the widespread use of energy subsidies is that they reduce the energy costs of households and firms, which is thought to appeal to the self-interest of the general population (Cheon et al. 2013; Mahdavi et al. 2022). A related point is that many people are not aware of the existence of subsidies, let alone the negative impacts of subsidies, and unsurprisingly they are not supportive of increases in energy prices, which reduce their purchasing power. Another explanation is that a weak "social contract" between citizens and the government exists in many countries, and this undermines reform efforts in several ways. People may not trust that governments will effectively redirect spending away from energy subsidies and toward beneficial public spending (McCulloch 2023). They may also believe that subsidies are one of only a few ways that governments can tangibly assist households with the cost of living (e.g., governments may lack the capacity to implement more sophisticated forms of assistance like targeted cash transfers) (Calvo-Gonzalez et al. 2017). A further explanation that is particularly prevalent in energy-producing countries is that citizens may see subsidized fossil fuels as an entitlement; this perception limits the willingness of policy makers to allow markets to set consumer prices (Burgess et al. 2020; Chelminski 2018).

Past subsidy reforms illustrate the complexity of this policy challenge and draw attention to the importance of tackling the political economy issues involved. Reviews of past energy subsidy reforms indicate that the need for fiscal space was the most common driver of reforms

[6]For some sources of energy, such as Kerosene, subsidies tend to be progressive. However, these energy sources are not considered in this study.

(Vagliasindi 2012), but the role of social and environmental objectives is rising (Yemtsov and Moubarak 2018). Different countries have had differing and often contrasting experiences of the processes that led to changes in energy subsidies (Inchauste and Victor 2017; Pradiptyo et al. 2016). For example, there are mixed views on whether political leaders can bring about sustained reductions in subsidies (Martinez-Alvarez et al. 2022). However, there are common patterns to success stories. One finding is that public awareness campaigns about the need to reduce energy subsidies appear to be crucial in ensuring a smooth reform process, as a lack of consultation and inadequate communication with the public has often led to destabilizing riots (McCulloch et al. 2022). A second finding is that efforts to compensate losers from reforms, particularly poorer households, are likely to play an essential role in determining the longevity of reforms. For example, multiple case studies have shown subsidy reforms that also involved cash transfers were more likely to be sustained over time (Inchauste and Victor 2017). Third, according to McCulloch (2023), effective energy subsidy reform efforts require reinvestment of savings to enhance growth and/or equity in a way that projects a better future or vision for the country. Fourth, there is some suggestive evidence that slowly phasing out subsidies over time through staggered increases in energy prices is more likely to result in a successful reform (Ross et al. 2017). While these lessons are derived from specific energy subsidy reform episodes, there remains a large gap in understanding what determines successful subsidy reforms, and what could shift public opinion across countries.

2.2 Hypotheses

The existing literature provides valuable guidance for formulating the hypotheses that this survey can examine and the dimensions in which heterogeneity can be expected. The following hypotheses were included in the pre-analysis plan for this study and were the basis for the design of the survey instrument. First, the level of support for energy subsidy reform among respondents is likely to vary based on whether, and what type of, accompanying policies are implemented. Evidence from case studies of past energy subsidy reforms suggests that the

immediate implementation of accompanying policies (like cash transfers) is associated with the longevity of reforms (Inchauste and Victor 2017). To be precise, these accompanying policies offset some of the utility loss from an increase in energy prices. Accordingly, support for reducing energy subsidies is expected to be higher if these funds are used to immediately implement accompanying policies. This leads to the first hypothesis (H1) of this study, which is shown below.

H1: Conditional support for subsidy reform will be higher than unconditional support for subsidy reform

Second, it is expected that respondents have limited knowledge about energy subsidies (consistent with Vieites et al. 2023) and that being informed about the negative impact of these subsidies will increase their level of support for reform. Previous research has documented extensively how energy subsidies tend to be an inefficient use of government resources, are regressive and harm the environment (McCulloch 2023). Being provided with this information is expected to lower respondents' acceptance of the status quo and consequently make them more supportive of reform. This expectation is based on the existing literature's suggestion that a nontrivial share of the population cares about the opportunity cost of government spending, fiscal redistribution, and/or the environment (e.g., see Alesina et al. [2018]; Dechezleprêtre et al. [2022]). Ex ante, it is not clear which, if any, of these shortcomings of energy subsidies will impact respondents' support for reform. Some studies have shown that policy makers typically focus on an efficiency argument for subsidy reform, and to a lesser extent on an equity argument (Vagliasindi 2012; Yemtsov and Moubarak 2018), but there may be other issues that concern the general population. Thus the second hypothesis (H2) for this study, which is summarized below, does not take a stand on which type of information will shift support the most; rather, it states that information will increase support for reform.

H2: Information about the negative impact of energy subsidies will increase respondents' support for reform

Third, heterogeneity in the levels of support for reform and the elasticity of preferences in response to information is explored across the broad dimensions that previous research has suggested for why support for subsidy reform may be limited. Ex ante, it is more straightforward to consider the direction of how prior beliefs and characteristics of respondents may relate to policy preferences in the control group (i.e., without information), as the existing literature about randomized survey experiments has shown there can be somewhat unpredictable differences between how subgroups of respondents react to information treatments (e.g., see Alesina et al. [2020]; Nyhan and Reifler [2010]). The two main dimensions of heterogeneity highlighted in earlier work are self-interest and the strength of the social contract (McCulloch 2023). Self-interest is expected to influence people's support for reform, as higher energy prices are likely to negatively impact household purchasing power. Specifically, people are expected to be more likely to support reforms if they do not rely heavily on electricity or gas for cooking (or heating where necessary) or on fuel for transport, or if they do not believe their household has benefited from subsidies. Furthermore, there is reason to believe that respondents' support for energy subsidies is likely to vary based on their actual and perceived income, as this is likely to influence whether they believe they can pay higher energy prices and whether they think they have relatively more or less to lose. The second dimension of heterogeneity, a weak social contract between citizens and their government, is also expected to undermine support for energy subsidy reform. While the concept of a social contract is multifaceted, at least three specific aspects are relevant to subsidy reform and are explored in this study: trust in the government, beliefs about the government's capacity to help households with the cost of living, and beliefs about whether one's household is entitled to receive subsidies. Finally, the study also explores heterogeneity based on respondents' knowledge of energy subsidies and levels of education, as these factors may influence whether respondents change their views after receiving additional information.

2.3 Setting

The 12 middle-income countries included in this study were selected based on three key criteria: the share of GDP that is spent on energy subsidies, the number of adults with internet access, and the availability of recent fiscal incidence analysis based on detailed household survey data. The starting point for the selection process was the complete set of low- and middle-countries that spent at least 1 percent of GDP on energy subsidies for consumers in the most recently available country-level data. Given that this is an online study with a large sample size, it was also necessary to restrict the set of countries to those with at least 5 million people aged 18 years or older with internet access (this threshold is based on previous experience collecting similar sample sizes online, such as Hoy [2022]). Finally, in order to include an information treatment about the degree of regressivity of energy subsidies, it was necessary to focus on countries where fiscal incidence analysis has been conducted using recent household survey data that broadly reflect the current distribution of energy subsidies in that country (this led to the elimination of several large countries, including India and Iran where such analysis was not available).[7] Collectively, the final 12 countries' spending on fossil fuel subsidies was almost US$200 billion—around a quarter of all fossil fuel subsidies in middle-income countries in 2022.

The 12 countries fall into two groups based on the main energy source that is subsidized (see Table 1). In seven of the countries (Angola, Argentina, Bolivia, Ecuador, Indonesia, Kazakhstan, and Nigeria), fuel is the main energy source that is subsidized (IMF 2023; IEA 2023). In the remaining countries (Bangladesh, Egypt, Ghana, Pakistan, and Vietnam), electricity is the main energy source that is subsidized (IMF 2023; IEA 2023). While this distinction between groups of countries is an important one, there is notable variation within these groups across multiple dimensions, such as whether they are a net exporter or importer

[7]The study thus provides respondents with the best available insight into the distribution of energy subsidies in their own country, as opposed to providing generic information that energy subsidies tend to be regressive across countries. Information tailored to specific country circumstances was expected to be more likely to influence respondents' preferences, and it was deemed important for ethical reasons to provide accurate information.

of crude or refined oil. However, as noted again later, most of these variations did not lead to any clearly distinguishable pattern in the results. In addition, each country has its own unique legacy of energy subsidies, history of reform efforts, and composition of subsidies across energy sources. For example, 10 of the 12 countries have subsidies for different combinations of electricity, fuel, and/or gas (IMF 2023; IEA 2023). Table 1 provides more details about the different types of energy subsidies that exist in each country. The negative impacts of these subsidies on efficiency, equity, and the environment are discussed throughout the rest of this subsection (see Appendix C for more details).

[Insert Table 1]

Energy subsidies make up a sizable share of government spending in these 12 countries, and the basis for the efficiency argument for reducing energy subsidies is that they are often considered an inefficient use of limited public resources. Comparing government spending on health care to that on energy subsidies is instructive. In 10 of the 12 countries, government spending on energy subsidies is equal to or larger than what is spent on health care. In fact, in seven of the countries (Angola, Bangladesh, Egypt, Indonesia, Kazakhstan, Nigeria, and Pakistan), spending on energy subsidies is considerably higher than spending on health care (see Figure C1 in Appendix C). Even in the two countries where health care spending is larger than spending on energy subsidies (Argentina and Ecuador), energy subsidies still account for more than 2 percent of GDP, which is roughly 10 percent of all government spending.

Energy subsidies disproportionally benefit richer households in these 12 countries, and this is the basis for the equity argument for reducing energy subsidies. Ultimately, subsidies result in higher levels of inequality: in these 12 countries, the richer a household is, the greater the share of government spending on energy subsidies it receives (see Figure C2 in

Appendix C).[8] In the most extreme cases, the richest quintile receives around 30 times as much as the poorest quintile; and even in those countries where energy subsidies are the least regressive, the richest quintile still receives twice as much as the poorest quintile.

Energy subsidies contribute to environmental damage in these 12 countries, particularly by contributing to climate change and air pollution, and this is the basis for the environment argument for reducing subsidies. The IMF (2023) produces estimates of the implicit costs of energy subsidies (i.e., costs beyond the actual costs paid by the government) and finds that on average in the 12 study countries, the cost of climate change and air pollution is 3.6 percent of GDP and 3.7 percent of GDP, respectively (see Figure C3 in Appendix C). These estimates vary considerably across countries and in terms of the relative share of the cost due to climate change and air pollution. The most extreme cases are the cost of air pollution in Egypt, which is estimated to be almost 20 percent of GDP, and the cost of climate change in Kazakhstan, which is over 10 percent of GDP. Even in the two countries where environmental costs as a share of GDP are lowest (Ghana and Nigeria), the absolute monetary value is still nontrivial.

[8]These are calculated based on the distributional incidence of the predominant energy subsidy (either fuel or electricity) by income quintile in each country. Estimates are from Amjad, Carrasco and Meyer (2023) for Pakistan; Faizuddin et al (2013) for Bangladesh; World Bank (2022B) for Indonesia; Ladronis, Lopez de la Valle, and Martinez (2019) for Argentina; Paz Arauco, Jimenez and Yanez (2020) for Bolivia; Lara Ibarra et al (2019) for Egypt and World Bank (2023B) for Angola. The estimates for the following countries were produced by Bank staff: Ecuador (using Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales 2011 (ENIGHUR)), Ghana (using the 2017 Ghana Living Standard Survey-7), Kazakhstan (using the 2021 Household Income and Expenditure Survey), Nigeria (using the 2015/16 Nigeria General Household Survey), and Vietnam (using the 2018 Vietnam Household Living Standards Survey (VHLSS)). In countries where fuel (or electricity) is the predominant type of subsidized energy, the distributional incidence was estimated for fuel (or electricity) subsidies.

3 Methodology

3.1 Survey design and information treatments

3.1.1 Measuring the characteristics, knowledge, and beliefs of respondents

The survey has three sections, with the main information treatments provided between the second and third. The first section (Q1–Q12) collected respondents' background characteristics, including standard demographic information (age, sex, education level, location, household size, and income) and information about household energy consumption. The questions about energy consumption are based on what was asked by Dechezleprêtre et al. (2022) in their recent cross-country survey experiment about attitudes toward climate change. They indicate whether respondents relied heavily on electricity/gas for cooking (and heating where applicable) or fuel for transport. Respondents were also asked to state where they perceived their household to be in the national income distribution; this is similar to questions in existing studies such as Hoy and Mager (2021). In addition, respondents were asked their views about the government, including their beliefs about government's capacity to help households deal with the cost of living and their level of trust in the government. The former is a modified version of a question about the government's capacity that has been used multiple times by Stantcheva and co-authors (e.g., see Stantcheva [2021]), and the latter is identical to what was asked by Dechezleprêtre et al. (2022).

The second section of the survey (Q13–Q18) introduced respondents to the concept of an energy subsidy and collected information about their knowledge of and beliefs about energy subsidies. Initially, all respondents were provided with a basic summary of energy subsidies, like that in Vieites et al. (2023), which indicated that subsidies reduce the cost of electricity, fuel, or gas. Respondents were then asked about whether they believe energy subsidies exist in their country; this question is similar to questions by Stantcheva and co-authors (e.g., see Stantcheva [2021]) that aim to capture people's knowledge about policies. Respondents were then informed that energy subsidies do exist in their country. They were

then asked about how much their household benefits from subsidies and the extent to which they believe their household has a right to receive subsidies. The former question is very similar to what was used by Hoy (2022) to capture people's prior beliefs about government transfers more broadly, and the latter is similar to questions by Stantcheva and co-authors (e.g., see Stantcheva [2021]). Finally, respondents were asked to exit the survey if they were unwilling to complete the remaining six questions; the goal was to minimize attrition once respondents began the main survey experiment (this is identical to the approach used by Hoy [2022]).

Questions in these sections of the survey capture respondents' priors about the two main dimensions where heterogeneity in preferences for energy subsidy reform was expected—self-interest and the strength of the social contract. Self-interest is measured based on respondents' answers to questions about their household energy consumption, about whether they believe their household benefits from energy subsidies, and about their perceived level of household income, as well as their actual household income. Measuring the broad concept of a social contract between respondents and the government is far more challenging, and only three specific aspects are focused on. The relevant questions are on respondents' trust in the government, beliefs about the government's capacity to help households with the cost of living, and beliefs about whether their households have a right to receive subsidies.

3.1.2 Measuring respondents' support for energy subsidy reform

The third section (Q20-28) of the survey primarily captured respondents' unconditional and conditional support for energy subsidy reform, which are the main outcomes of interest for this study. Immediately following the treatments and before the main outcome questions, respondents were asked a question to measure the "first stage" of the treatment. This involved asking respondents in each treatment group the extent to which they agreed with a statement that mirrors the text provided in the treatment (e.g., respondents who received information about the regressivity of energy subsidies were asked the extent of their agreement with the statement, "Richer households receive more energy subsidies than poorer households").

As a point of comparison, respondents in the control group were randomly allocated to be asked one first-stage question that was identical to a question asked in a corresponding treatment group. The first stage treatment effects are measured by comparing the answers between the subset of respondents in the control group who received the same question as the corresponding treatment group. Importantly, even though the first-stage questions are based on the treatment, they are still framed neutrally to minimize the likelihood that they prime respondents in the control group.

Unconditional support for reform of energy subsidies is measured by asking respondents their views about reducing or eliminating energy subsidies as well as by asking about their support for a reform that resulted in a specific increase in energy prices.[9] The first two of these questions indicate people's unconditional support for energy subsidy reform in general and were based on similar questions asked by Dechezleprêtre et al. (2022) about respondents' support for policies addressing climate change, such as carbon taxes. The final unconditional support question measures levels of support for a specific increase in energy prices that is due to a reduction in energy subsidies; this question is somewhat similar to questions asked by Dechezleprêtre et al. (2022) about respondents' support for policies addressing climate change.

Conditional support for subsidy reform is measured by providing respondents with a list of seven policies that could be immediately funded with the resources saved from reducing subsidies, and then asking respondents which they would support; and by an open-ended question allowing respondents to propose what accompanying policies could be funded. The former question lists policies that are commonly implemented in conjunction with subsidy reforms (e.g., cash transfers), and have been referred to in related studies (e.g., see Dechezleprêtre et al. [2022] and Vieites et al. [2023]). Importantly, the ordering of the specific accompanying policy options was randomized to minimize the risk of respondent fatigue impacting the overall results. The open-ended question provides qualitative insights into the

[9]The answers to these questions are self-reported, and the possibility exists that survey responses may not reflect real world behavior. However, this limitation exists across most studies that rely on survey experiments (Stantcheva 2022).

types of accompanying policies that respondents would be interested in, as it allows them to suggest that the government spend the resources saved from reducing subsidies on any policy they see fit. The design of these two questions about conditional support for subsidy reform is identical to the unconditional support question asked immediately beforehand, which asks about support for energy subsidy reform that results in a specific energy price rise. Thus, there is a clear point of comparison for these questions about unconditional and conditional support for subsidy reform.

3.1.3 Information treatments

The information treatments included in this randomized survey experiment aimed to increase respondents' knowledge about the negative impacts of energy subsidies on equity, efficiency, or the environment. Following the second section of the survey, respondents were randomly allocated to one of four groups: Group A received information about government spending on energy subsidies (efficiency treatment), Group B received information about the regressivity of energy subsidies (equity treatment), Group C received information about the negative environmental consequences of energy subsidies (environment treatment), and Group D received no information (the control group). All three treatments begin with the same information about the amount of money (in local currency units) that is spent by the government on subsidies each year in their country (sourced from the IEA [2023]), and the subsequent information is then tailored to each treatment.

The information that is shared with participants about the efficiency, equity, and environmental arguments in favor of reducing fossil fuel subsidies is similar to what is presented in the background section of this paper. The efficiency treatment provided respondents with information about the size of government spending on energy subsidies compared to spending in the health sector in their country (this information is sourced from World Bank [2023A] and is based on the latest available year for all countries, which is 2019). This information was selected to illustrate the relative cost of subsidies compared to another type of spending that many people are expected to care about. The equity treatment provided respondents

with recent information about the distribution of energy subsidies between the richest and poorest quintiles, estimated using detailed Household Income and Expenditure Survey in their country. This information was selected as a very simple way to illustrate the regressivity of energy subsidies, as it was expected that even respondents with very low levels of education would be able to understand it. The environment treatment provided respondents with information about the amount of money (in local currency units) that energy subsidies cost their country due to their contribution to air pollution and climate change (based on IMF [2023]). This number was complemented by a generic figure across countries highlighting some of the likely consequences of climate change, specifically extreme temperatures, floods, droughts (according to IPCC [2023]), and air pollution (which is identified as a key environmental externality in the IMF [2023] estimates of the implicit costs of subsidies). Examples of each of these information treatments for Indonesia are shown in Figure 1 below.

[Insert Figure 1]

3.1.4 Additional design features

The survey included two additional layers of randomization to test whether there were any differences between the amount of information provided to respondents about subsidies in their country and the level of energy price rises that would occur from the removal of energy subsidies. The first additional layer of randomization occurred in the second section of the survey, where respondents were informed that energy subsidies do exist in their country. Half of the respondents were randomly allocated to be informed about the share of energy prices that the government effectively pays on their behalf (the average subsidization rate that is presented in IEA [2023]) and the other half were informed only about the existence of subsidies (i.e., they were not told the amount of subsidization). The second additional layer of randomization occurred in the third section of the survey, where respondents were asked about their levels of support for a reduction in energy subsidies that would result in a specific

increase in energy prices. Respondents were randomly allocated to be asked about either a 10 percent or 20 percent energy price increase. Further information about these additional layers of randomization and the results are presented in Appendix A. Importantly, these additional layers of randomization were embedded within the main randomized experiment, which means respondents were evenly balanced across the main treatment and control groups.

This survey also included several features that are in line with best practices in the literature (e.g., see Stantcheva [2022]). First, to ensure respondents provided their full attention, the survey was very focused and brief, with the median respondent completing the entire survey in less than 10 minutes. This helped ensure that respondent fatigue was not significantly impacting the quality of the answers collected, especially toward the end of the survey. By including an attention check question before the treatments, respondents were also encouraged to focus on the remaining six outcome questions. As mentioned above, this question also aimed to minimize attrition during the survey experiment. Second, to maximize the likelihood that respondents provided honest answers, respondents were informed at the start of the survey that the answers they provided would be used solely for research purposes and that respondents would remain anonymous. Ensuring respondent anonymity was an essential part of the study, given the political sensitivity of the topic. This meant that no identifying information was collected. Third, respondents were invited to provide feedback on the survey, both specifically about whether they perceived it to be biased and more broadly about any aspect of the survey that they wished to comment on. Answers to these questions were analyzed to examine if there were systematic differences in responses provided throughout the survey related to whether people held views about the survey being biased or any other issues they raised. Finally, the survey instrument was translated into the main languages in each country, and these translations went through multiple steps to ensure the content of each question was presented accurately.

To ensure that respondents were likely to trust the content of the treatments without inducing experimenter demand effects, the survey used an approach similar to that in seminal work by Alesina et al. (2018). For example, respondents were told that the information they

were provided with had recently become available from international organizations, such as the IEA. In addition, respondents were asked about their beliefs about energy subsidies before the information treatment; this arrangement somewhat naturally concealed the purpose of the treatment because it could be seen as feedback on whether the respondents' beliefs were accurate (Haaland et al. 2023). Further, given the extensive analysis in prior work to illustrate that experimenter demand effects are not likely to be present in this type of randomized survey experiment (e.g., see Kuziemko et al. [2015] on a related topic), it is unlikely to be an issue in this study.[10] Indeed, experimenter demand effects are not likely to be a concern in experiments like this one, where respondents are anonymous, the survey is online, no information is provided about the research hypotheses, the treatments are framed in a matter-of-fact way, and the analysis is between subjects (Haaland et al. 2023; de Quidt et al. 2018). To address any concerns that experimenter demand effects may still exist, additional robustness checks were conducted based on respondents' answers to questions about their views on whether the survey is biased.

The complete survey instrument (including the information treatments) for Indonesia is provided in English in Appendix B. The survey instrument was translated into the following languages: Spanish (for use in Argentina, Bolivia, and Ecuador), Arabic (for use in Egypt), Bahasa (for use in Indonesia), Vietnamese (for use in Vietnam), Russian (for use in Kazakhstan), Kazakh (for use in Kazakhstan), Bengali (for use in Bangladesh), Urdu (for use in Pakistan, where the English version was also offered), and Continental Portuguese (for use in Angola). Before the full launch of the study, the survey instrument was piloted sequentially in Ghana, Nigeria, and then Indonesia (see Appendix A for details about the piloting process).

[10]Some of the earlier studies using randomized survey experiments provided follow-up surveys to respondents to address concerns about experimenter demand effects and to check on the persistence of treatment effects (e.g., see Kuziemko et al. [2015]). They typically found that treatment effects existed in follow-up surveys, so many of the more recent studies do not take this step (Haaland et al. 2023; Stantcheva 2022).

3.2 Sample size and data collection

3.2.1 Sample size

In each country, around 3,000 respondents completed the survey. This number of survey respondents was determined by examining the sample size of other cross-country randomized survey experiments in this field and conducting statistical power calculations (see Appendix A for details). The split between the control and treatment groups was not even, as the control group received a higher share of respondents (40 percent in the control group and 20 percent in each of the three treatment groups). This arrangement ensured greater statistical power for the analysis because the treatment groups were pooled together for a lot of the analysis (see the following subsection for more details).[11] Specifically, in each country, there were at least 1,200 respondents in the control group and 600 respondents in each of the three treatment groups (1,800 in total). Seminal cross-country randomized survey experiments by Alesina et al. (2018, 2023) also had around 900 to 1,000 respondents in each treatment group in each country. Other studies in this field have had smaller sample sizes (Cruces et al. 2013; Karadja et al. 2017) and have still detected significant heterogeneous treatment effects based on prior beliefs. Furthermore, Haaland et al. (2023) summarize best practices in online randomized survey experiments that provide information interventions, and they suggest that having in the order of 700 respondents per treatment/control group should provide adequate power to detect an effect that is commonly observed in the literature.

3.2.2 Data collection

The sample of respondents was collected via an online survey. Online surveys are a convenient way of collecting information rapidly, allowing for the use of visual stimuli and reducing the risk of experimenter demand and social desirability effects (Stantcheva 2022). However, there are challenges with representativeness in middle-income countries that need to be

[11] If respondents had been randomly allocated into the four groups equally (25 percent into each group), there would have been 750 respondents per country, which would have resulted in slightly lower statistical power to detect effects between the control group (i.e., 750 respondents per country) and the combined treatment groups (2,250 respondents per country) (25 percent control versus 75 percent any treatment).

recognized. While internet access is nearly universal in high-income countries, the share of the total population with internet access in the study countries varies from 25 percent to 86 percent (see Table 1). Thus, it is necessary to be cautious when inferring how the results of an online survey would relate to the sizable share of the population without internet access. At best, online surveys can be broadly representative of the internet-using population, and survey responses can be weighted to match the characteristics of the general population (e.g., older people are less likely to access the internet, and survey weights can be applied to somewhat compensate for this issue). The following subsection provides more information about how and when weights are applied.

A leading global research firm was engaged to collect the sample of respondents for this study by drawing on a panel of survey participants who are broadly representative of the population with internet access in each country. While alternative sampling strategies exist for online surveys (see Appendix A), this approach of drawing respondents from a pre-registered pool was determined to be the most suitable for this study: it is a very reliable and quick way to access a broadly representative sample of respondents with internet access, and it allows incentives to be provided in order to maximize completion rates.[12] Recent examples of seminal studies using an identical sampling strategy for online cross-country surveys include studies testing the impact of information about climate change on public support for policies in high- and middle-income countries (Dechezleprêtre et al. 2022; Dabla-Norris et al. 2023). The survey firm that was used, YouGov, regularly runs online surveys to reach a pre-registered pool of people in these countries who already have experience taking part in surveys on different topics for compensation (e.g., phone credit). YouGov ensures that respondents have a track record of being attentive during the surveys (e.g., they exclude respondents who regularly rush through surveys or only partly complete surveys); this approach is particularly valuable for this type of survey, which includes questions about

[12] As respondents were somewhat familiar with online surveys and received an incentive for completing the survey, it is likely they were more attentive than a typical internet user in their country. For this reason, the results might differ if the treatments were provided to an alternative set of internet users, such as those found through advertisements on social media.

respondents' preferences among different policy trade-offs (e.g., if energy subsidies are removed should people be compensated via cash transfers or tax cuts). Importantly, survey participants remain completely anonymous, and for this reason are more likely to provide honest answers to questions related to subsidy reform, which may be perceived as sensitive.

In general, the final sample of survey respondents was broadly representative of the internet-using population across countries, at least in terms of age and gender. In Angola and Bangladesh, the final sample was younger and disproportionally male, but in the remaining countries the age and gender breakdown of respondents was fairly similar to the internet-using population (see Table 2). On average, 57 percent of the final sample of respondents were male and 28 percent were between the ages of 18 and 24, while 54 percent of the internet-using population is male and 24 percent between the ages of 18 and 24 years. However, it is possible that survey respondents are not representative of the internet-using population across other dimensions. For example, survey respondents likely have higher levels of literacy than typical internet users in these countries, as they are regularly compensated for adequately completing surveys. Furthermore, the internet-using population tends to have higher levels of education and income and is disproportionally based in urban areas compared to the general adult population; this is also the case among survey respondents (see Appendix A).

[Insert Table 2]

3.3 Empirical analysis

3.3.1 Descriptive analysis

The descriptive findings of the survey, in and of themselves, provide novel cross-country insights about respondents' degree of support for energy subsidy reform and how this is associated with their characteristics, knowledge, and beliefs. Levels of unconditional and conditional support are presented individually for each country and pooled across countries.

This allows evaluation of the first hypothesis for this study (H1), which is that levels of conditional support for subsidy reform will be higher than levels of unconditional support. Multivariate regression analysis is conducted to illustrate the strength of the association between support for reform and respondents' characteristics, knowledge, and beliefs. While the associations between these variables are not causal, they still provide valuable information about the patterns of public support across countries. To maximize the generalizability of the descriptive findings, survey weights are applied that adjust the results to match the general population in terms of age, sex, location, income, and education level. Specifically, raking is used to construct weights based on the actual distribution of sex, age, location, education level, and household income in the national population in each country. To correct for outliers, these raked weights are winsorized at the 1st and 99th percentiles of the weight distribution in each country. The unweighted findings show qualitatively similar patterns.

3.3.2 Experimental analysis

The main analysis in this study involves the use of a randomized survey experiment to examine what information shifts public support for subsidy reform across 12 middle-income countries. Randomization allows for the impact of the information treatments to be determined by comparing differences in mean outcomes between the control group and treatment groups. The randomization process was stratified by the age group and gender of respondents to ensure balance across these characteristics. A balance table (Table C1) is provided in Appendix C for all answers before experimental variation was introduced into the survey (Q1–Q14), including measures of both individual and joint significance (i.e., both t-statistics for every variable and an f-statistic across all variables within a given country). As outlined in the discussion regarding the sample size, the experiment is designed so that there will be adequate statistical power (with the conventional levels of type I and type II errors of 0.05 and 0.2 respectively) to detect a meaningful effect from the treatments if it exists. This approach is based on the sample average treatment effect where survey weights are not applied (i.e., each respondent is treated equally), and as a robustness check, the weighted average

treatment effects are presented in Appendix C.

The main outcomes of interest in the randomized survey experiment relate to respondents' support for subsidy reform. This is measured individually for each of the outcome questions and collectively by aggregating the results for the questions about unconditional and conditional support into two indexes (unconditional support index and conditional support index). Specifically, using an approach similar to that used in related randomized survey experiments by Alesina et al. (2018) and Karadja et al. (2017), indexes are created that are an unweighted average of the z-scores of the outcome variables, oriented so that a higher index means more support for reform. The answers to each outcome question and the unconditional and conditional indexes are presented in Tables 4, and 5.

Three main types of experimental analysis are conducted. The first tests H2 by examining if providing any information (i.e., pooling all three treatments) about the negative aspects of energy subsidies shifts support for reform (across all countries). This is examined by conducting pooled (across treatments and countries) Ordinary Least Squares (OLS) regressions with country-fixed effects with a dummy variable that takes on the value of 1 if the respondent belongs to any treatment group and the value of 0 if the respondent belongs to the control group. This approach is in line with what was undertaken by Alesina et al. (2018, 2022). This analysis can be expressed formally as follows:

$$Y_{ij} \quad = \quad \beta_0 + \beta_1 T + X_i \gamma + \theta_j + \epsilon_{ij} \tag{1}$$

where i denotes individuals, j denotes countries, and β_1 captures the average difference between respondents in any treatment group (T) and the control group about the outcome of interest (Y). Further, X_i is a vector of variables that controls for potential imbalances in background characteristics (age, sex, location, income, education level, perceived relative income, actual income, energy consumption, trust in government, belief in government capacity, knowledge of subsidies) between treatment and control groups, θ_j captures country fixed effects, ϵ_{ij} is the model error term (clustered at the country level), and β_0 is the

intercept.

The second main experimental analysis also tests Hypothesis H2 by examining how the different types of information about the negative aspects of energy subsidies (i.e., their impacts on equity, efficiency, and the environment) impact support for reform. This is examined by conducting OLS regressions with country-fixed effects, similar to what was presented in Equation 1 but with a separate dummy variable for each treatment group. This can be expressed formally as follows:

$$Y_{ij} = \alpha_0 + \alpha_1 T_A + \alpha_2 T_B + \alpha_3 T_C + X_i\gamma + \theta_j + \epsilon_{ij} \quad (2)$$

where i denotes individuals, j denotes countries, α_1 captures the average difference between respondents in the efficiency treatment group (T_A) and the control group about the outcome of interest (Y), α_2 captures the average difference between respondents in the equity treatment group (T_B) and the control group about the outcome of interest (Y), and α_3 captures the average difference between respondents in the environment treatment group (T_C) and the control group about the outcome of interest (Y). Further, X_i is a vector of variables that controls for potential imbalances in background characteristics (age, sex, location, income, education level, perceived relative income, actual income, energy consumption, trust in government, belief in government capacity, knowledge of subsidies) between treatment and control groups, θ_j captures country fixed effects, ϵ_{ij} is the model error term (clustered at the country level), and β_0 is the intercept.

These first two types of analysis are also conducted for each country individually and for subsets of countries. Specifically, the analysis in Equations 1 and 2 is reproduced for all countries separately (i.e., without pooling data across countries and not using country fixed effects) and for subsets of countries based on the main type of energy that is subsidized.

The third main experimental analysis examines heterogeneous treatment effects based on respondents' answers provided prior to the main experiment. The main dimensions in which heterogeneity was explored related to respondents' self-interest and the strength of

their social contract with the government. The analysis was conducted in an equivalent way to Equation (1) above, i.e., by conducting pooled (across treatments and countries) OLS regressions with country fixed effects, but with an interaction between respondents' priors and the treatment. A dummy variable for each of the respondents' priors is created ($PRIOR$) that takes on the value of 1 if a respondent has a particular prior (e.g., trusts government) and a value of 0 otherwise (e.g., does not trust government) (see Table 5). This can be expressed formally as follows:

$$Y_{ij} = \pi_0 + \pi_1 T + \pi_2 PRIOR + \pi_3 T \times PRIOR + X_i\gamma + \theta_j + \epsilon_{ij} \quad (3)$$

where i denotes individuals, j denotes countries, π_1 captures the average difference between respondents without a prior in any treatment group (T) and the control group about the outcome of interest (Y), π_2 captures the average difference in the outcome of interest (Y) between respondents in the control group with and without a given prior ($PRIOR$), and π_3 captures the interaction between the treatment variable (T) and the prior variable ($PRIOR$) for the outcome of interest (Y). Further, X_i is a vector of variables that controls for potential imbalances in background characteristics (age, sex, location, income, education level, perceived relative income, actual income, energy consumption, trust in government, belief in government capacity, knowledge of subsidies) between treatment and control groups; θ_j captures country fixed effects; ϵ_{ij} is the model error term (clustered at the country level); and β_0 is the intercept.

4 Descriptive findings

This section presents descriptive findings from the cross-country survey about respondents' knowledge of and beliefs about energy subsidies and support for energy subsidy reform.

4.1 Knowledge and beliefs about energy subsidies

4.1.1 Awareness of energy subsidies

Only just over half of the respondents were aware that subsidies existed in their country. Awareness of the existence of subsidies varied dramatically across countries from 26.3 percent in Ghana to 82.6 percent in Indonesia (see Figure 2).[13] Respondents who lived in large urban areas were more likely to be aware that subsidies existed, whereas people who lived in a household in the bottom two quintiles of the income distribution or perceived themselves to be poor or middle class were less likely to be aware of subsidies (see Appendix C for details).

[Insert Figure 2]

4.1.2 Beliefs about who benefits and whether energy subsidies are a right

Less than 40 percent of respondents stated that their household benefited moderately, a lot, or a great deal from energy subsidies. Before respondents were asked about the extent to which they benefited, they received a "primer" informing them that subsidies for electricity, fuel, and/or gas existed in their country. The share of respondents who believed they benefited from subsidies also varied considerably across countries from as low as 17.7 percent in Angola to 68.3 percent in Egypt (see Figure 2). Respondents who used subsidized energy sources were more likely to state they benefited from energy subsidies, whereas people who lived in a household in the bottom two quintiles of the income distribution or perceived themselves to be poor or middle class were less likely to believe they benefited (see Appendix C for details). The existence of a relationship between people's perceived position in the national income distribution and their beliefs and policy preferences has also been well documented in previous studies on related topics (e.g., see Hoy and Mager [2021]).

[13] In general, respondents who are aware that subsidies exist were more likely to state that they benefit from subsidies and have a right to receive subsidies.

Only just over one-third of respondents stated they think their household has a right to receive energy subsidies. The share holding this belief varied across countries from 14.5 percent in Vietnam to 65.1 percent in Egypt (see Figure 2). Interestingly, there was no clear pattern in terms of the relationship between the levels of belief about having a right to receive energy subsidies and the energy production capacity within countries. This is despite existing research suggesting that in countries with substantial domestic energy production, the general population feels more entitled to subsidies (Burgess et al. 2020; Chelminski 2018). There is also no clear association between the characteristics of respondents and a belief that their household has a right to receive subsidies; the one exception is that respondents who perceived themselves to be middle class were less likely to believe they have a right to receive subsidies (see Appendix C for details).

4.1.3 Awareness of the negative impact of energy subsidies

Levels of awareness about energy subsidies' negative impact, especially on the environment, were relative low in each country. On average, 48.5 percent of respondents were aware that energy subsidies cost the government more than health care;[14] 42.7 percent of respondents were aware that energy subsidies mainly benefited richer households; and only 34.2 percent of respondents were aware that energy subsidies contributed to environmental damage (see Figure 3). Trust in the government was very strongly associated with having higher levels of awareness about the negative impact of subsidies. On average, awareness of negative impacts was much more prevalent—some 16 percentage points higher—among respondents who stated they trusted the government than among those who did not trust the government. In addition, respondents who self-identified as middle class were much less likely to be aware of the negative impact of energy subsidies (see Appendix C for details).

[Insert Figure 3]

[14] In Argentina and Ecuador, respondents were asked whether spending on energy subsidies amounted to half as much as spending on health care (which is what the treatment stated in these countries).

4.2 Support for energy subsidy reform

4.2.1 Unconditional support for energy subsidy reform

On average, in the absence of any other policy, less than half of respondents were supportive of a reduction in energy subsidies, and only around a quarter were supportive of their elimination. A similar pattern held across most countries, in which the share of respondents supportive of eliminating subsidies was around half the share supportive of reducing them (see Figure 4). Across countries, around 30 percent of respondents stated they would support a reduction in subsidies that resulted in an energy price increase. Thus, the share of respondents supporting a reduction that increased energy prices was below the share who would support a reduction without a specified price increase, but higher than the share who would support an elimination of energy subsidies. Multivariate regression analysis shows that these measures of unconditional support for subsidy reform were most positively associated with trusting the government and knowing that energy subsidies existed, and they were most negatively associated with respondents' perceiving themselves to be either middle class or relatively poor and believing their household had a right to receive subsidies (see Figure 5).

[Insert Figure 4]

[Insert Figure 5]

4.2.2 Conditional support for energy subsidy reform

Over 95 percent of respondents in each country supported a reduction in energy subsidies that increased energy prices if accompanying policies were implemented. This figure was determined by examining the share of respondents who selected at least one of the seven policy measures proposed to accompany energy subsidy reforms (see Figure 6) or who themselves proposed accompanying policies that would lead them to support reform (see following subsection). The most popular policy measure to be implemented with the savings from re-

ducing energy subsidies was for governments to provide better schools, hospitals, and roads (see Figure 6). Almost four out of five respondents in each country selected this policy option (see Appendix C for details). The second most popular policy measures selected by respondents was for governments to ensure more reliable access to energy sources and/or to invest the savings on the environment such as to improve air pollution. Even the least popular policy option selected by respondents, cash transfers for all households, attracted almost twice as much support as a reduction in subsidies in the absence of any accompanying policy. Respondents who trusted in the government were far more likely to conditionally support a reduction in energy subsidies, while respondents who self-identified as being poor or middle class had lower levels of conditional support (see Figure 7). These patterns came out strongly even when controlling for other characteristics of respondents through multivariate regressions (see Appendix C).

[Insert Figure 6]

[Insert Figure 7]

Almost two-thirds of respondents in each country would support reducing energy subsidies only if accompanying policies were implemented (i.e., they expressed conditional but not unconditional support). This can be seen in Figure 8, which shows the cumulative share of respondents who unconditionally support reforms, only conditionally support reforms (where the most popular policy measure is separated from the rest), and do not support reforms. This middle group that would support reforms only conditionally is potentially most relevant for policy makers, as members of this group can be won over through accompanying policies. Higher levels of conditional support among these respondents (i.e., those who did not have unconditional support) were positively associated with trusting the government and believing the government had capacity to help households with the cost of living, and negatively associated with self-identifying as being poor or middle class (see Appendix C for details).

[Insert Figure 8]

4.2.3 Accompanying policies proposed by respondents

Respondents were provided an opportunity to qualitatively identify accompanying policy measures that would lead them to support a reduction in subsidies that increased energy prices, and their answers reinforced the quantitative results showing that improvements in education and health care were top priorities. Over 60 percent of respondents identified a policy measure that would lead them to support a reduction in subsidies. From this group of respondents, it was possible to categorize around 90 percent of responses into 410 keywords and 25 themes using a similar approach to that of Ferrario and Stantcheva (2022); the results are presented across countries in a word cloud in Figure 9 (Appendix D provides details about the methodology and additional results). Around 40 percent of responses across countries referred to education or health care, and these were typically the most common keywords in each country (see Appendix D for details). Other popular keywords suggested support for the creation of employment and jobs, support for environmental policies (such as green energy alternatives like solar power), and support for policies that aim to assist poorer households (e.g., assisting with the cost of food). There were also broad suggestions about improvements in living standards, with one in six responses indicating a desire to see the government work "on the country," "on the economy" or "for the people."

[Insert Figure 9]

The qualitative suggestions made by respondents who had only conditional support for subsidy reform differed substantially from the suggestions of those who had unconditional support. Keyness analysis[15] was conducted by examining the relative frequency of themes

[15]Keyness analysis is a corpus-based procedure that identifies the frequency of terms across two groups. Keyness analysis uses a Chi-Squared value to consider both the size and statistical significance of the frequency difference. It compares the difference between the actual frequencies observed in the corpus and the frequencies we would expect if no factor other than chance had been operating to affect the frequencies.

in responses provided by respondents in these two groups (Appendix D provides details about the methodology and additional results). Results are shown in Figure 10. Employment creation, health, community and social spaces, poverty reduction, and price controls were much more likely to be suggested by respondents who conditionally supported subsidy reforms than by those who supported them unconditionally. Employment creation was a particularly common theme among respondents who had only conditional support in each country. There were smaller but still statistically significant differences between these two groups for many other themes, including support for child and elderly care (which was cited by female respondents in particular). Collectively, the diversity of answers provided by respondents who had only conditional support for subsidy reform illustrates that this group has a relatively larger variety of policy preferences. The only theme that was statistically significantly more common among respondents who had unconditional support for subsidy reforms was directly related to their preferences about access to and quality of energy sources.

[Insert Figure 10]

5 Experimental results

This section presents the results of the main randomized survey experiment and shows the heterogeneous treatment effects across countries and between respondents.

5.1 Results of the main randomized survey experiment

5.1.1 First-stage treatment effects

The information treatments about the negative impact of energy subsidies considerably increased the share of respondents who agreed that energy subsidies are inefficient, inequitable, and harmful to the environment. Immediately following each treatment, respondents were asked a first-stage question about their level of agreement with a statement summarizing

the main message of the treatment they received.[16] Respondents in the control group were randomly allocated to be asked one of the first-stage questions so that a first-stage treatment effect could be determined. Each treatment's first-stage effects on the corresponding question about the negative impact of subsidies are shown in Table 3. On average, the equity and environment treatments increased the share of respondents agreeing with the corresponding statement about the negative impact of energy subsidies by around 11 percentage points (which is 22.3 and 32.1 percent higher than the control mean respectively). The efficiency treatment increased the share of respondents agreeing with the statement by only 7.5 percentage points on average (which is 17.4 percent higher than the control mean), but this figure is affected by a large negative first-stage treatment effect in Angola (see Appendix C for country-level first-stage treatment effects). Excluding Angola, the average impact of the efficiency treatment on the first-stage treatment effect in the remaining 11 countries is an increase of over nine percentage points (which is over 20 percent higher than the control mean). In Angola, it is likely there was an issue with the translation and interpretation of the efficiency treatment; consequently, respondents in this treatment group were discarded from the subsequent analysis. All other first-stage treatment effects were positive in every country.

[Insert Table 3]

The treatments also influenced the qualitative answers provided by respondents about the types of accompanying policies that would lead them to support a reduction in energy subsidies, and these answers provide further evidence of first-stage treatment effects. Specifically, respondents in the efficiency treatment group (who received information about government spending on energy subsidies relative to spending on health care) were more likely to cite a health-related policy measure, respondents in the equity treatment group were more likely to cite a policy measure related to assisting the poor, and respondents in the environment

[16] For example, respondents who received the equity treatment were asked about their agreement with the statement, "Richer households receive more electricity, fuel, and/or gas subsidies than poorer households."

treatment group were more likely to cite a policy measure related to protecting the environment (see Appendix D for details). Collectively, the quantitative and qualitative first-stage treatment effects provide strong assurance that the information treatments were successful in shifting people's understanding of the negative consequences of subsidies. The next section examines if this shift translated into support for reforms.

5.1.2 Treatment effects on unconditional support for energy subsidy reform

Respondents who received an information treatment were substantially more likely to express unconditional support for subsidy reform. Respondents in the treatment groups were more likely to support a reduction in subsidies, the elimination of subsidies, and a reduction in subsidies that resulted in an energy price increase (see Table 4). The effects of the environment treatment are larger than the effects of the efficiency treatment, which in turn are larger than the effects of the equity treatment. However, the differences between treatments are not significant, and all three treatments had a significant impact on the unconditional support index (which is an unweighted average of z-scores across each of the outcomes). The order of magnitude of the effect varies between the treatments and outcomes, but in most instances, the treatments increase support beyond the control mean in the order of 8–10 percent. The effect from the environment treatment is as high as a 14 percent shift in support for the elimination of subsidies.

[Insert Table 4]

5.1.3 Treatment effects on conditional support for energy subsidy reform

The overall treatment effect on conditional support for subsidy reform is relatively modest, and it was primarily driven by the environment treatment. Respondents in the environment and equity treatment groups were more likely to support a reduction in energy subsidies if it was accompanied by one of the following policies: income tax cuts; improvements in schools,

hospitals, and roads; and improvements in the quality and access of energy sources (Table 5). In addition, these respondents were more likely to suggest their own policy option that would lead them to support a reduction in energy subsidies. Unsurprisingly, the environment treatment also led respondents to be more supportive of investments in improving the environment. The effects of the environment treatment are much larger than the effects of the other two treatments (and these differences are statistically significant); in addition, the efficiency treatment has a slightly negative impact[17] on some outcomes. The order of magnitude of the effect of the environment treatment varies from effectively zero up to 5 percent beyond the control mean, while the effects of the other two treatments are even smaller.

[Insert Table 5]

5.2 Heterogeneous effects from the treatments across countries and between respondents

In keeping with the pre-analysis plan, heterogeneous treatment effects across countries and between respondents were examined. Heterogeneous treatment effects existed in two dimensions: in relation to the main type of energy that is subsidized in each country, and in relation to respondents' perceived position in the national income distribution. There was little variation between alternative groupings of countries such as by income level, whether they export or import crude or refined oil, and size of subsidies. There was also very limited heterogeneity in treatment effects between respondents based on other dimensions, such as respondents' self-interest in keeping subsidies, the strength of the social contract with the government, and knowledge about energy subsidies. Heterogeneous treatment effects across each of these other dimensions are shown in Appendix C.

[17] This may be the case because the respondents receiving this treatment were made to be particularly conscious about how government funds are used and some policy measures are viewed as relatively inefficient.

5.2.1 Heterogeneous treatment effects across countries based on the type of energy subsidized

The overall effect of the treatments on unconditional support for reform is large and significant in most countries with fuel subsidies, but indistinguishable from zero in countries with primarily electricity and gas subsidies. The treatment effects on the unconditional support index in each country are presented in Figure 11a, and countries are divided based on the main type of energy source subsidized. The overall impact of the treatments is significant at a p-value of 0.05 in Argentina, Ecuador, Bolivia, Indonesia, and Kazakhstan, all of which primarily have fuel subsidies. There is still a moderate point estimate in Angola and Nigeria (the other two fuel subsidy countries), which is larger than that in all the electricity subsidy countries except Vietnam. In the case of Vietnam, the point estimate is slightly larger than in Nigeria, but the effect is insignificant at conventional levels. The disparity of the treatment effect across countries is much less prevalent in the case of conditional support (see Figure 11b), as the overall treatment effects are smaller and most of the country-level results are insignificant.

[Insert Figure 11]

The contrast in treatment effects between countries with primarily fuel subsidies and those with primarily electricity and/or gas subsidies is even more stark when focusing on the environment treatment, which has the largest effect on both unconditional and conditional support for energy subsidy reform. Across countries that primarily subsidize fuel, the environment treatment increased unconditional support for energy subsidy reform beyond the control mean in the order of 12–23 percent, while on average the environment treatment had no impact in countries that primarily subsidize electricity and/or gas. There are very large and significant effects from the environment treatment in the five countries with fuel subsidies that are discussed above for the overall effect—that is, Argentina, Ecuador, Bo-

livia, Indonesia, and Kazakhstan; but on average the environment treatment has no effect in the electricity and gas subsidy countries (see Figure 12a). In the extreme cases of Egypt, Ghana, and Pakistan, the point estimates from the environment treatment are negative. The exceptions to these trends are Angola and Vietnam: there is no positive impact from the environment treatment in the former, while there is a significant and positive impact in the latter. There is also a large, albeit relatively smaller, difference between countries that mainly subsidize fuel and those that mainly subsidize gas/electricity in terms of the impact of the environment treatment on conditional support for energy subsidy reform (see Figure 12b). The main difference between the results for unconditional and conditional support for the environment treatment is that there was not a positive impact on conditional support (but there was on unconditional support) in Indonesia.

[Insert Figure 12]

5.2.2 Heterogeneous treatment effects based on perceived position in the income distribution

Treatment effects show a large heterogeneity based on respondents' perceived position in the national income distribution. Support for energy subsidy reform is far more elastic to information about the negative impact of subsidies among respondents who self-identify as belonging to the middle quintile of the income distribution.[18] This result can be seen most clearly when considering the impact of the environment treatment on the unconditional and conditional support indexes (see Figure 13). The treatment effect among respondents who perceive themselves to be in the middle quintile is substantially and statistically significantly larger than the treatment effect on respondents who perceive themselves to be either relatively poor (in the bottom two quintiles) or relatively rich (in the top two quintiles). In

[18]Most respondents identify themselves as being in the middle quintile (about 70 percent on average across the 12 countries).

fact, the effect of the environment treatment on support for subsidy reform is statistically significant only at a p-value of 0.05 for respondents who perceive themselves to be in the middle quintile.

[Insert Figure 13]

The respondents who perceived themselves to be middle class had lower levels of unconditional support for energy subsidy reforms in the absence of information (as discussed in the descriptive results) than other respondents, but the environment treatment almost entirely closed this gap (see Figure 14). Across each of the outcome variables, the environment treatment substantially increased support among respondents who perceived themselves to be in the middle quintile, but there were no significant effects on other respondents. Multivariate regression analysis shows these individuals who perceive themselves to be in the middle quintile are more likely to have completed university education, to actually be in the middle quintile or top two quintiles of the actual income distribution, to use subsidized energy sources, and to believe the government can assist households; and they are less likely to trust the government and believe they have a right to receive subsidies (see Appendix C).

[Insert Figure 14]

5.3 Robustness checks

Listed below are several robustness checks that were conducted to illustrate the strength of the results of the randomized survey experiment.

5.3.1 Weighting

The sample of respondents to this survey experiment are broadly representative of the internet population in each country, but they are not representative of the general population (see Appendix A). The results are reweighted to investigate the extent to which the findings might differ if the characteristics of the sample better matched the general population. Appendix C shows that this reweighting process does not substantially change the results in the body of the paper.

5.3.2 Attrition

There were very low levels of attrition in the survey experiment, and no evidence of differential attrition between the treatment and control groups. In total, only 1.8 percent of respondents who were exposed to the treatments did not complete the questions about support for energy subsidy reform. The survey included several features aimed at minimizing attrition. Immediately before the treatments, respondents were asked if they were willing to fully complete the survey, and they were excluded if they did not confirm that they were. Further, at this point in the survey they were told that only six questions were left, and this information was expected to reduce attrition. In addition, respondents had already illustrated their commitment to completing the survey by completing the 18 questions before the main treatments.

5.3.3 Alternative econometric specifications

As discussed in the methodology section, the main analysis is based on OLS regressions, and for completeness the analysis also examined whether using alternative statistical models would have a material impact on the findings. Specifically, the main analysis was rerun with a logit regression. As in previous studies, these alternative statistical models did not substantively change the results.

5.3.4 Experimenter demand effects

As discussed in the methodology section, the survey was designed to substantially reduce the risk of experimenter demand effects. To illustrate this point further, the analysis investigated if the treatments made respondents more likely to say that the survey was biased (Q30); it also included a qualitative examination of answers to the final question of the survey, which invites respondents to provide feedback on the survey (Q31). The analysis found no meaningful evidence to suggest respondents thought the survey was biased. Respondents who had received a treatment and those who had not were equally likely to say the survey was biased (see Appendix C). Almost all of the qualitative responses suggested the survey was well understood (see Appendix D). For example, only 0.68 percent of respondents stated they thought the survey was biased, and only 0.38 percent stated they had difficulty understanding the questions and/or treatments.

5.3.5 Data quality checks

To reduce the risk that some respondents did not devote their full attention to the survey, and in keeping with Alesina et al. (2018), an explicit data quality check was included. Specifically, respondents were prompted in order to regain their full attention before beginning the main experiment. In addition, the analysis excluding respondents who took too short or long a time to complete the survey was rerun. This did not have a substantial impact on the results.

6 Discussion and conclusion

This study has identified four valuable insights into public support for reducing energy subsidies that can inform policy makers' efforts to phase out the use of these subsidies. First, the survey shows that public support for energy subsidy reform can effectively double, or even triple in some instances, if the savings will be immediately used to fund alternative policies (i.e., there are very high levels of conditional support). This finding provides an

order of magnitude around the prevailing policy discourse, which suggests that for energy subsidy reforms to be supported by the general population, policy makers need to articulate a better "vision" for the role of the government in society (this is helpfully summarized by McCulloch [2023]).[19] The experiment results show that governments seeking to win over the population should seriously consider implementing credible, alternative policies alongside energy subsidy reforms. This step may require some form of "commitment device" to help the public trust that the government will follow through on its promises and that energy subsidy reforms will leave the country better off.[20]

Second, the descriptive results show that respondents in each country had a clear preference for their government to prioritize better service delivery in exchange for reductions in energy subsidies. The survey included both quantitative and qualitative responses showing that better schools, hospitals, and roads were the most popular alternative policy to energy subsidies in each country, and that cash transfers for all households were the least popular.[21] This finding about alternative policy preferences is particularly noteworthy, as case studies of energy subsidy reform episodes have repeatedly emphasized the value of implementing cash transfers for all households (e.g., see Inchauste and Victor [2017]). According to this finding, policy makers need not assume that energy subsidies should be replaced solely with cash transfers to gather public support for reform, as they have often done in the past. Rather, cash transfers could be considered the starting point, not the end point, of a series of alternative policies to coincide with a reduction in energy subsidies.

Third, the survey experiment illustrates that most respondents lack knowledge about energy subsidies' negative consequences for efficiency, equity, and the environment, and that it is possible to increase support for reform by communicating relevant information. In partic-

[19] A simple example of this could be governments' communicating that to further improve the quality of citizens' lives (e.g., through health and education programs), they need to redirect funds away from simply lowering the cost of fuel, electricity, and/or gas.

[20] An interesting example of this is the case of energy subsidy reform in Iran in 2010, whereby the government provided a near-universal household cash transfer *prior* to reducing energy subsidies to minimize public backlash and to commit itself to the reform (Guillaume et al. 2011).

[21] However, the survey still shows that providing cash transfers for all households is substantially more popular than reducing energy subsidies without implementing any alternative policy.

ular, there were relatively low levels of knowledge about the negative impact of energy subsidies on the environment, and providing information about this increased both unconditional and conditional support for reform. These findings highlight the merit of communicating to the public the environmental impacts of energy subsidies in both the immediate term (air pollution) and in the short to medium term (from climate change). To date, emphasizing the environmental costs of energy subsidies has been somewhat underexploited, as policy makers in middle-income countries have typically focused more on the efficiency argument and (to a lesser extent) the equity argument for reforms (Vagliasindi 2012; Yemtsov and Moubarak 2018).

Fourth, this study shows that misconceptions about public support for energy subsidy reform exist, which may undermine policy makers' willingness to tackle this challenging issue. In keeping with prevailing wisdom (e.g., see Mahdavi et al. [2022]), this study shows that levels of unconditional support for energy subsidy reform vary somewhat based on respondents' self-interest and their social contract with the government. However, these patterns do not exist to the same extent for conditional support or once information about the negative consequences of energy subsidies is provided. For example, respondents who believed their household had a right to receive energy subsidies were less likely to express unconditional support for reform, but their levels of conditional support for reform were similar to those of other respondents, and they were just as likely to respond positively to the treatments. The implication is that people's preferences about energy subsidy reforms, including those of people who hold strong beliefs about their entitlement to these subsidies, are more malleable than is often supposed. Therefore, broad-based reform campaigns—where the general population is informed about the negative impacts of energy subsidies and where credible alternative policies that most people prefer are implemented—would appear to be a promising way for policy makers to garner the support of the public.

The overall effect of the information treatments were mainly driven by two subgroups of respondents. In accordance with the pre-analysis plan, the experiment examined heterogeneity of the information treatments' effects based on prior beliefs and characteristics

of respondents[22] and on subgroups of countries.[23] The first dimension where heterogeneity existed was respondents' perception of their relative income: respondents who perceived themselves to be middle class were much more likely to respond to the treatments than other respondents. Members of the former group were typically the least supportive of energy subsidy reforms in the absence of information. However, the experimental results show that these respondents are the most likely to increase their support for energy subsidy reforms in response to information. For example, the environment treatment almost entirely closes the gap in levels of unconditional support for energy subsidy reform between respondents who perceive themselves to be middle class and those who do not. Communicating the negative impacts of energy subsidies, then, appears capable of somewhat pacifying more hostile subgroups of the population. An important point to emphasize about these findings is that in keeping with prior work (e.g., see Hoy and Mager [2021]), more than half of respondents in each country perceived themselves to be middle class (rather than relatively rich or poor). Therefore, these results do not relate solely to those respondents who are actually middle class but rather extend to the bulk of respondents, after excluding those who consider themselves to be relatively rich or poor.

The second dimension where heterogeneity existed was the main type of energy subsidized—i.e., fuel versus gas/electricity. Analysis showed that respondents in countries that mainly subsidize fuel were almost exclusively driving the overall cross-country effects. This was particularly the case for the environment treatment, where there were large effects on unconditional support for energy subsidy reform in these countries, and no significant effects in the countries that mainly or exclusively subsidize electricity and/or gas. For example, support for eliminating energy subsidies increased by 23 percent beyond the control mean in countries that mainly subsidize fuel. The absence of an effect from the environment treatment in countries that primarily or exclusively subsidize electricity and/or gas may be due

[22] As discussed in Section 2.2, the experiment explored two main dimensions of heterogeneity that were highlighted in earlier work: respondents' self-interest and the strength of their social contract with the government.

[23] This includes different groupings of countries such as by income level, status as exporter or importer of crude or refined oil, and size of subsidies.

to people's limited understanding of how these types of energy are produced and the structure of tariffs. Fuel is a much more standardized product, with greater price transparency (e.g., unit price per liter/gallon), and there are often decentralized retail markets (e.g., fuel stations are spread across major road networks). By contrast, electricity and gas consumption can vary considerably between similar households; these energy sources can be accessed via on-grid or off-grid means; and they typically have very few retail providers (and are commonly partly owned by the government).[24] The particularly large differences from the environment treatment between countries that mainly subsidize fuel and those that mainly subsidize gas/electricity provide some suggestive evidence that the treatment information was seen as more credible in countries that mainly subsidize fuel. After all, in contrast to fuel, renewable sources of electricity do not significantly worsen climate change and air pollution.

This study has several limitations that future research can aim to overcome. First, the survey is conducted online and is representative of just the internet-using population in each country. This substantially limits the generalizability of the findings, and future surveys could try alternative data collection strategies, such as via phone and face to face, to obtain a more representative sample of the general population. At a minimum, there may be value in replicating this study online with respondents recruited via alternative sampling strategies, such as social media advertisements. Second, more work could be done to explore how people's views about subsidies vary depending on the type of energy that is subsidized. This survey raises interesting questions along these lines by identifying clear differences in the experimental findings between countries that predominantly have fuel subsidies versus electricity/gas subsidies. Further research could unpack how well people comprehend the impact of energy subsidies on prices, and if there is variation across types of energy (especially given the complexity of pricing electricity relative to fuel). Third, more

[24]There are additional complexities around electricity consumption; for example, electricity generators are used by a nontrivial share of households and fuel is used to produce electricity in these instances. Further, while all countries in this study have domestic electricity production capacity, some of the countries are net fuel importers, and views about subsidies have been linked to domestic energy production (Burgess et al. 2020).

analysis could clarify what is required to change the incentives of policy makers and build support for energy subsidy reform among vested interest groups, such as energy suppliers or industry groups, as these groups could be roadblocks to reform even when there is support among most of the general population. An interesting example of possible future work would be to directly survey policy makers about their understanding of public support for energy subsidies and then provide the results of this study to see whether and how they change the appetite for reform.

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Tables and Figures

Table 1: Background information about energy subsidies in these 12 countries

	Cost % GDP	Size of Subsidy (%)	Subsidy per capita (US$)	Internet access (% pop)	Internet pop 18yrs+ (mil)	Main energy subsidized	Other subsidized energy sources
Angola	2.6	70	96	36.0	6.6	Fuel	Electricity
Argentina	2.7	41	338	85.5	29.6	Fuel	Electricity
Bangladesh	5.6	34	45	24.8	30.3	Electricity	Gas
Bolivia	4.6	28	106	59.9	4.9	Fuel	Electricity
Ecuador	1.7	15	85	70.7	9.1	Fuel	Electricity
Egypt	9.7	56	259	71.9	51.6	Electricity	Fuel
Ghana	1.0	10	17	58.0	11.7	Electricity	N/A
Indonesia	2.7	32	89	53.7	108.5	Fuel	Electricity
Kazakhstan	5.7	52	627	85.9	11.4	Fuel	Electricity, Gas
Nigeria	1.1	28	25	35.5	41.8	Fuel	Electricity
Pakistan	3.3	21	37	25.0	35.6	Electricity	Gas
Vietnam	2.3	11	46	70.3	52.5	Electricity	N/A

Note: This table provides background information about energy subsidies in the 12 study countries. The size of subsidy is the weighted average discount provided across all types of energy due to subsidies. Sources: IEA 2023 (for cost of subsidy, subsidization rate, and subsidy per capita; World Bank 2023A (for internet access and internet population 18+); IMF 2023 (types of energy subsidized).

Table 2: Characteristics of respondents relative to internet and adult population by country

	SURVEY SAMPLE		INTERNET POPULATION		ADULT POPULATION	
	Male	18-24	Male	18-24	Male	18-24
Angola	0.79	0.50	0.57	0.36	0.47	0.27
Argentina	0.45	0.11	0.50	0.17	0.47	0.15
Bangladesh	0.71	0.40	0.58	0.24	0.48	0.19
Bolivia	0.59	0.24	0.52	0.23	0.48	0.18
Ecuador	0.49	0.23	0.5	0.20	0.48	0.19
Egypt	0.51	0.29	0.51	0.22	0.50	0.18
Ghana	0.57	0.33	0.57	0.31	0.46	0.23
Indonesia	0.51	0.27	0.52	0.23	0.50	0.16
Kazakhstan	0.50	0.17	0.51	0.14	0.44	0.12
Nigeria	0.58	0.34	0.57	0.36	0.48	0.22
Pakistan	0.64	0.34	0.63	0.27	0.48	0.25
Vietnam	0.51	0.19	0.52	0.16	0.48	0.12
AVERAGE	0.57	0.28	0.54	0.24	0.48	0.19

Note: This table compares the share of the survey sample by age and sex, with the internet-using population and general population in each country. Sources: ITU (2023); Household Income and Expenditure Surveys.

Table 3: First-stage treatment effects

	Efficiency b/se/p	Equity b/se/p	Environment b/se/p
Efficiency treatment	0.075** (0.02) 0.011		
Equity treatment		0.111*** (0.02) 0.000	
Environment treatment			0.114*** (0.02) 0.000
Control Mean	0.430	0.496	0.355
Observations	12068	11960	12084

Note: This table shows the first-stage effect of the treatments on respondents' views about whether there is a negative impact from energy subsidies on efficiency, equity and the environment. The regression analysis is based on Equation (1), except each column of the table corresponds with a single treatment and the outcome variable varies based on the first-stage question that was asked. Robust standard errors are in parenthesis and p-values are presented below the standard errors. *Efficiency:* See Q20a, which asks about whether they agree that spending on electricity and fuel subsidies is greater than spending on health care. The variable takes on the value of 1 if the respondent selects strongly agree or agree, 0 otherwise. *Equity:* See Q20b, which asks about whether they agree that richer households receive more electricity and fuel subsidies than poorer households. The variable takes on the value of 1 if the respondent selects strongly agree or agree, 0 otherwise. *Environment:* See Q20c, which asks about whether they agree that energy subsidies have large negative impacts on the environment. The variable takes on the value of 1 if the respondent selects strongly agree or agree, 0 otherwise.

Table 4: Main treatment effects on unconditional support

	Reduce b/se/p	Eliminate b/se/p	Cost b/se/p	Index b/se/p
Any treatment	0.017*	0.029***	0.026***	0.051***
	(0.01)	(0.01)	(0.01)	(0.01)
	0.076	0.001	0.003	0.002
Efficiency treatment	0.019**	0.025**	0.027**	0.051**
	(0.01)	(0.01)	(0.01)	(0.02)
	0.027	0.019	0.030	0.015
Equity treatment	0.012	0.023***	0.019**	0.039***
	(0.01)	(0.00)	(0.01)	(0.01)
	0.180	0.000	0.013	0.000
Environment treatment	0.020	0.038**	0.030**	0.062**
	(0.02)	(0.01)	(0.01)	(0.02)
	0.220	0.012	0.011	0.024
p-value (Eff vs Equ)	0.345	0.811	0.529	0.470
p-value (Eff vs Env)	0.975	0.284	0.741	0.598
p-value (Equ vs Env)	0.545	0.307	0.389	0.350
Control Mean	0.443	0.270	0.313	
Observations	37036	37036	37036	

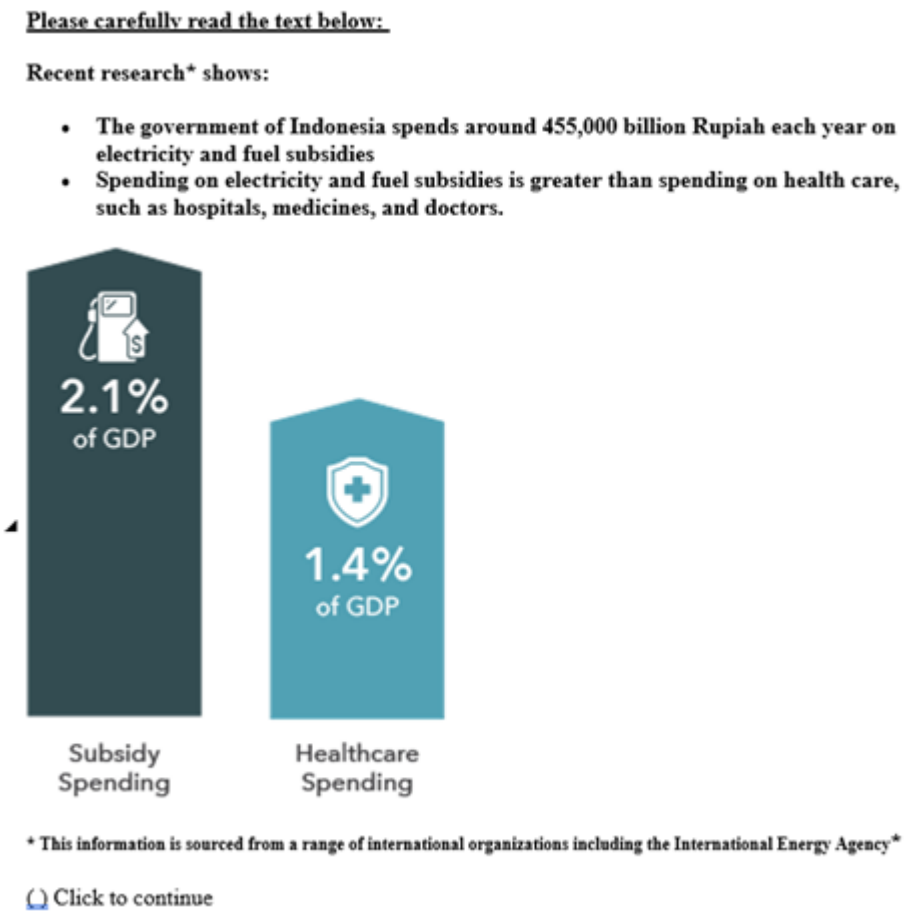
Note: This table shows the overall impact of the treatments on respondents' unconditional support for subsidy reform. The regression analysis is based on Equations (1) and (2). Robust standard errors are in parenthesis and p-values of each treatment coefficient are presented below the standard errors. In addition, the table includes p-values comparing differences between the coefficients of the treatments. *Reduce:* See Q21, which asks about support for a reduction in energy subsidies. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Eliminate:* See Q22, which asks about support for an elimination of energy subsidies. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Cost:* See Q24, which asks about support for a reduction in energy subsidies if this led to a price increase. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Index:* An unweighted average of the z-scores of the unconditional support outcome variables, oriented so that a higher index means more support.

Table 5: Main treatment effects on conditional support

	Cash all	Cash poor	Tax cuts	Spend	Debt	Environ	Quality	Other	Index
	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p
Any treatment	-0.006	-0.003	0.015**	0.005*	0.015*	0.002	0.014**	0.014***	0.016*
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
	0.301	0.582	0.026	0.051	0.076	0.610	0.022	0.004	0.058
Efficiency treatment	-0.019**	-0.012*	-0.005	-0.002	-0.002	-0.017***	0.001	0.008	-0.013
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
	0.021	0.073	0.579	0.583	0.843	0.004	0.877	0.112	0.139
Equity treatment	-0.006	-0.000	0.018***	0.007*	0.016	0.000	0.016**	0.016**	0.019***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.389	0.935	0.004	0.088	0.100	0.976	0.020	0.016	0.008
Environment treatment	0.004	0.004	0.029***	0.010	0.029**	0.022**	0.023***	0.018**	0.038**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.552	0.573	0.006	0.158	0.020	0.011	0.009	0.027	0.016
p-value (Eff vs Equ)	0.103	0.070	0.002	0.142	0.084	0.010	0.080	0.204	0.003
p-value (Eff vs Env)	0.013	0.103	0.003	0.133	0.012	0.000	0.020	0.283	0.003
p-value (Equ vs Env)	0.014	0.526	0.221	0.691	0.187	0.004	0.232	0.864	0.073
Control Mean	0.570	0.662	0.663	0.812	0.645	0.729	0.735	0.626	
Observations	37036	37036	37036	37036	37036	37036	37036	37036	

This table shows the overall impact of the treatments on respondents' conditional support for subsidy reform. The regression analysis is based on Equations (1) and (2). Robust standard errors are in parenthesis and p-values of each treatment coefficient are presented below the standard errors. In addition, the table includes p-values comparing differences between the coefficients of the treatments. *Cash all:* See Q25a, which asks about support for a reduction in energy subsidies, if cash transfers were provided to all households. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Cash poor:* See Q25b, which asks about support for a reduction in energy subsidies, if cash transfers were provided to poor households. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Tax cut:* See Q25c, which asks about support for a reduction in energy subsidies, if income taxes were reduced. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Spend:* See Q25d, which asks about support for a reduction in energy subsidies, if resources were spent on better-quality schools, hospitals and roads. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Debt:* See Q25e, which asks about support for a reduction in energy subsidies, if resources were used to reduce public debt. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Environ:* See Q25f, which asks about support for a reduction in energy subsidies, if resources were used to invest in the environment. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Quality:* See Q25g, which asks about support for a reduction in energy subsidies, if resources were used to improve quality and access to energy. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Other:* See Q26, which asks about support for a reduction in energy subsidies, if resources were used for any policy option. The variable takes on the value of 1 if the respondent answers yes, 0 otherwise. *Index:* An unweighted average of the z-scores of the conditional support outcome variables, oriented so that a higher index means more support.

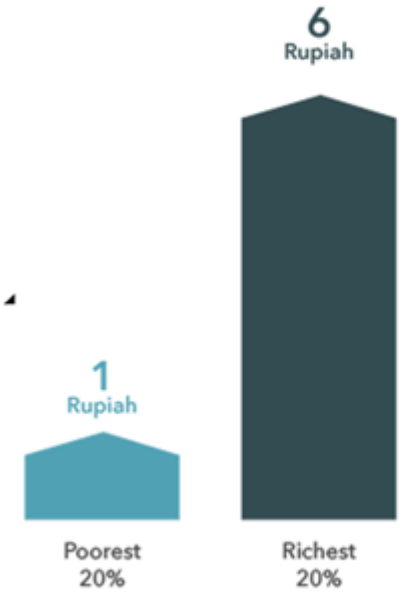
FIGURE 1: Efficiency, Equity and Environment information treatments in Indonesia



Please carefully read the text below:

Recent research* shows:

- **The government of Indonesia spends around 455,000 billion Rupiah each year on electricity and fuel subsidies**
- **The Richest 20% of households received around 6 times as many electricity and fuel subsidies as the Poorest 20% of households.**



*** This information is sourced from a range of international organizations including the International Energy Agency***

Click to continue

Please carefully read the text below:

Recent research* shows:

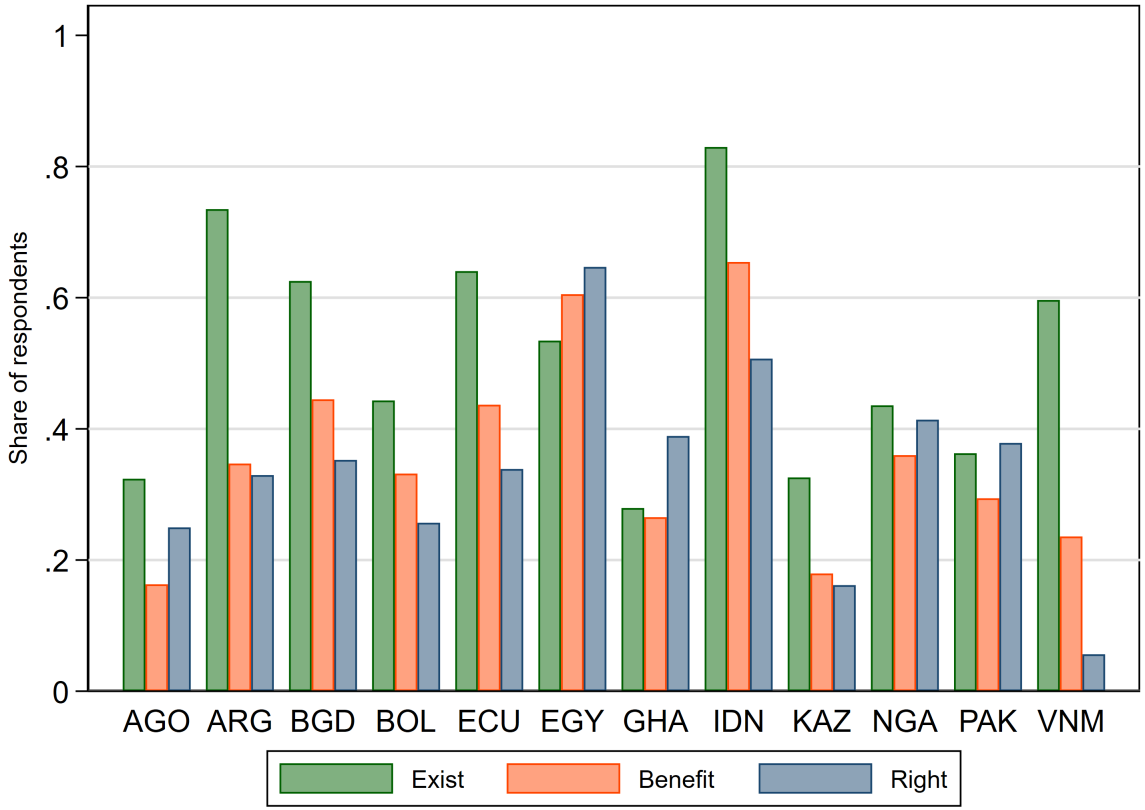
- **The government of Indonesia spends around 455,000 billion Rupiah each year on electricity and fuel subsidies**
- **Electricity and fuel subsidies lead to 1,300,000 billion Rupiah in environmental damage in Indonesia each year by promoting the overuse of electricity and fuel.**

*** This information is sourced from a range of international organizations including the International Energy Agency***

( ) Click to continue

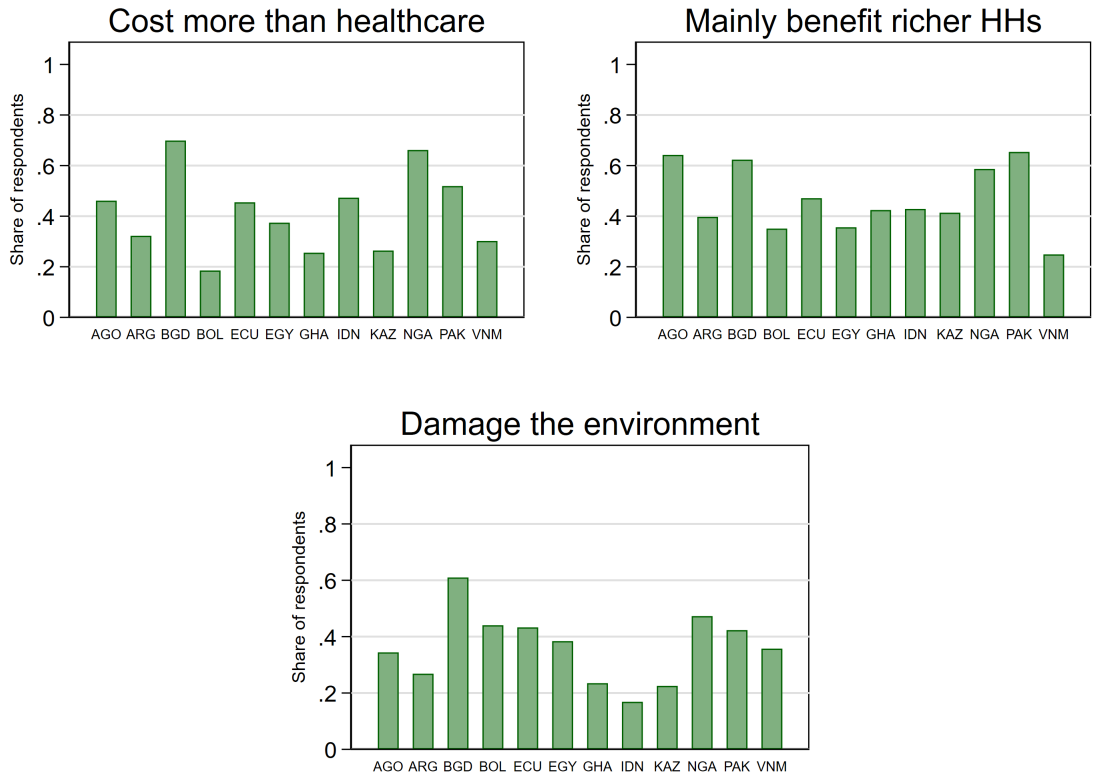
Note: This figure shows examples of the Efficiency, Equity, and Environment information treatments based on what was provided in Indonesia.

FIGURE 2: Respondents' knowledge and beliefs about energy subsidies, by country



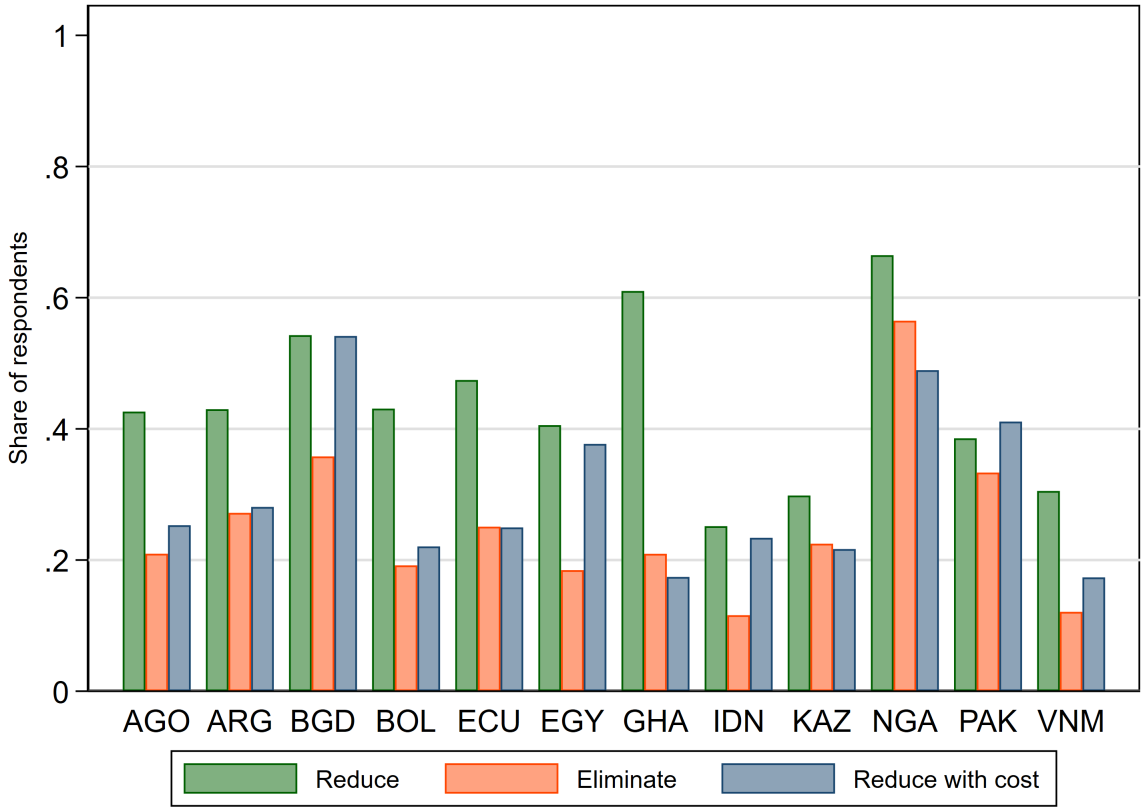
Note: This figure shows the share of respondents in each country who believed energy subsidies existed in their country, believed their household benefited from energy subsidies and believed their household had a right to receive energy subsidies. *AGO:* Angola. *ARG:* Argentina. *BGD:* Bangladesh. *BOL:* Bolivia. *ECU:* Ecuador. *EGY:* Egypt. *GHA:* Ghana. *IDN:* Indonesia. *KAZ:* Kazakhstan. *NGA:* Nigeria. *PAK:* Pakistan. *VNM:* Vietnam.

FIGURE 3: Respondents' knowledge about the negative impact of energy subsidies, by country



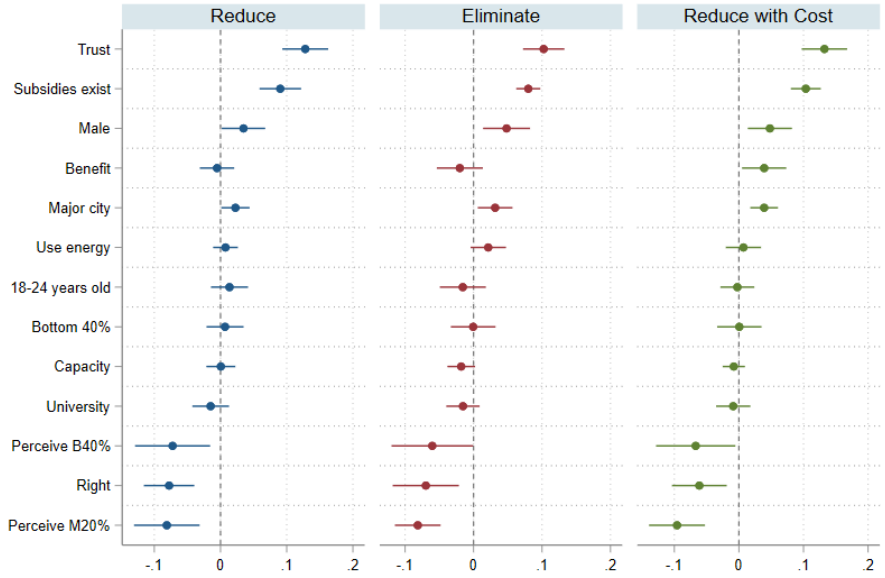
Note: This figure shows the share of respondents in each country that agreed energy subsidies cost more than health care, mainly benefit richer households, and contribute to environmental damage. *AGO:* Angola. *ARG:* Argentina. *BGD:* Bangladesh. *BOL:* Bolivia. *ECU:* Ecuador. *EGY:* Egypt. *GHA:* Ghana. *IDN:* Indonesia. *KAZ:* Kazakhstan. *NGA:* Nigeria. *PAK:* Pakistan. *VNM:* Vietnam.

FIGURE 4: Levels of unconditional support for energy subsidy reform in each country



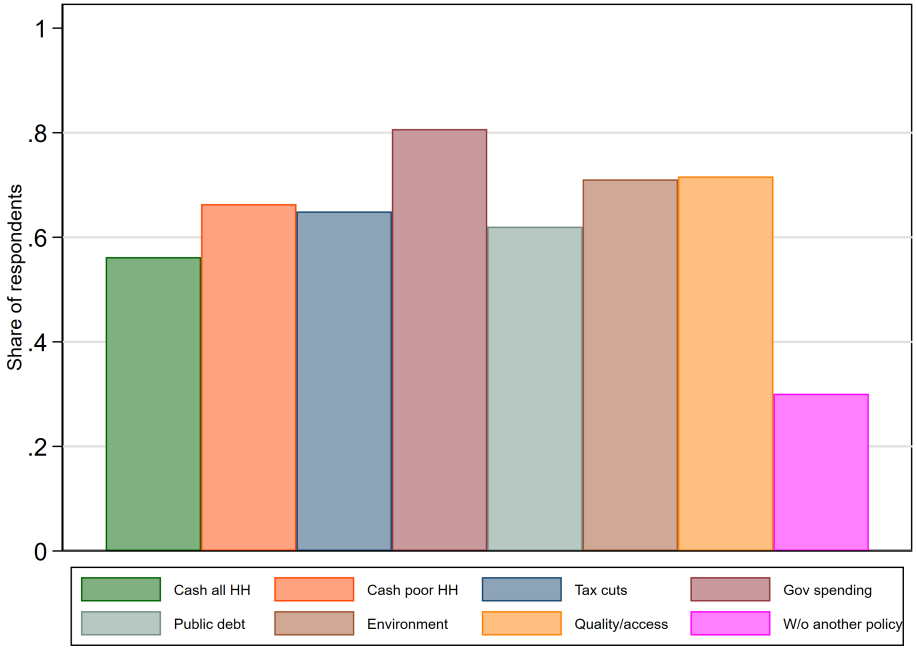
Note: This figure shows the share of respondents in each country who were supportive of a reduction in energy subsidies, the elimination of energy subsidies, and a reduction in energy subsidies that resulted in higher energy prices. *AGO:* Angola. *ARG:* Argentina. *BGD:* Bangladesh. *BOL:* Bolivia. *ECU:* Ecuador. *EGY:* Egypt. *GHA:* Ghana. *IDN:* Indonesia. *KAZ:* Kazakhstan. *NGA:* Nigeria. *PAK:* Pakistan. *VNM:* Vietnam. *Reduce:* See Q21, which asks about support for a reduction in energy subsidies. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Eliminate:* See Q22, which asks about support for an elimination of energy subsidies. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Reduce with cost:* See Q24, which asks about support for a reduction in energy subsidies if this led to a price increase. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise.

FIGURE 5: Characteristics associated with unconditional support for energy subsidy reform



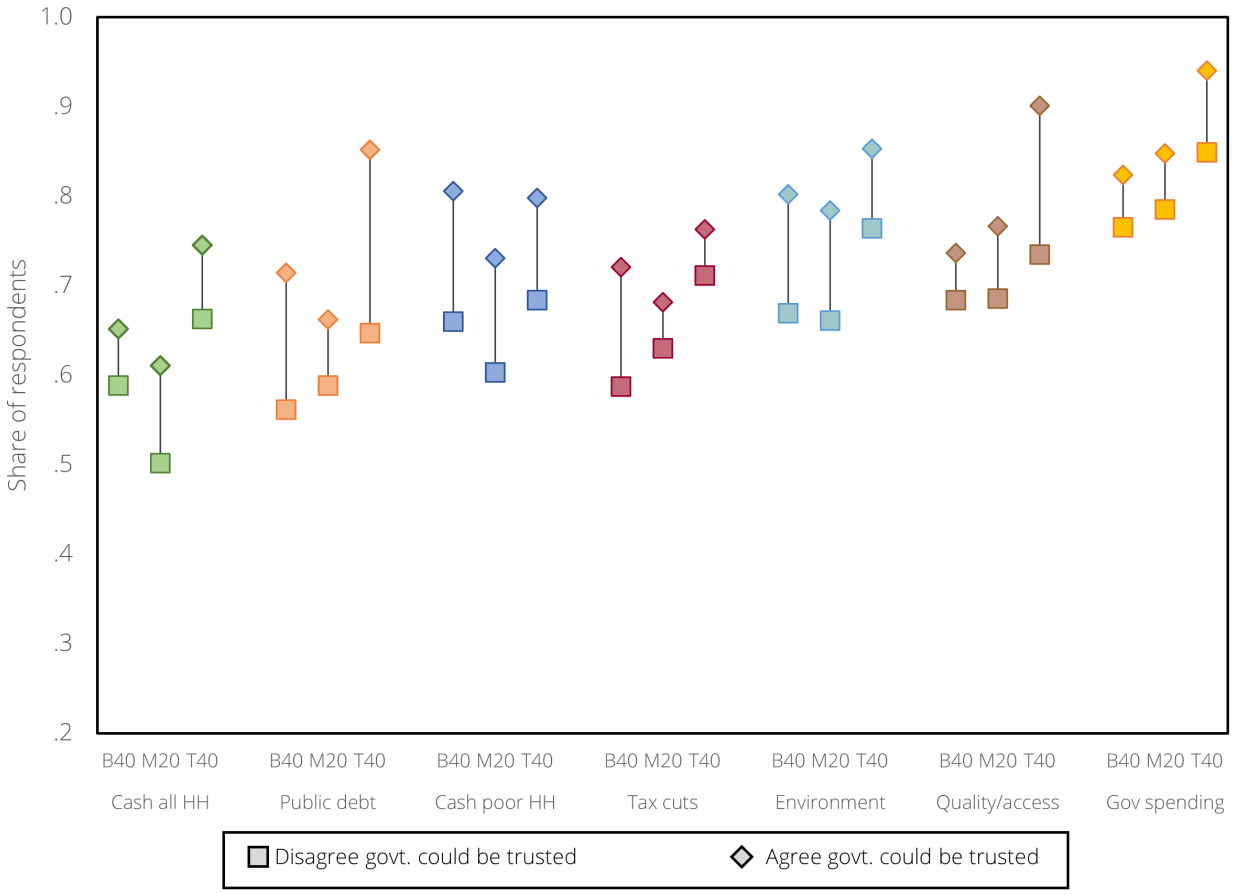
Note: This figure shows the characteristics of respondents associated with unconditional support for energy subsidy reform. Specifically, it shows the results of an OLS regression where the dependent variable takes on the value of 1 if the respondent supports energy subsidies being reduced, eliminated, or reduced with higher energy prices, 0 otherwise (see Q21, Q22 and Q24). *Trust:* See Q12, which asks respondents' if they believe the government can be trusted to do what is right. The variable takes on the value of 1 if the respondent selects strongly agree or agree, 0 otherwise. *Subsidies exist:* See Q14, which asks respondents' if they believe energy subsidies exist in their country. The variable takes on the value of 1 if the respondent selects yes, 0 otherwise. *Male:* See Q2. *Major city:* See Q4. *Benefit:* See Q16, which asks respondents' how much they perceive they have benefited from energy subsidies. The variable takes on the value of 1 if the respondent selects a great deal, a lot or moderately, 0 otherwise. *18-24 years old:* See Q1. *Bottom 40%:* See Q7, which asks respondents about their household monthly income. The variable takes on the value of 1 if the respondent is from a household in the poorest 40 percent of the income distribution, 0 otherwise. *Capable:* See Q11, which asks respondents how much they believe their government can do to assist households with the cost of living. The variable takes on the value of 1 if the respondent selects a lot or some things, 0 otherwise. *University:* See Q3. *Use energy:* See Q8 and Q9, which ask respondents about the energy type they use for electricity and the most common type of transport used by their household. The variable takes on the value of 1 if the respondent selects an energy type that is subsidized in their country, 0 otherwise. See notes to Figure C1. *Right:* See Q17, which asks respondents about how much they believe they are entitled to receive energy subsidies. The variable takes on the value of 1 if the respondent selects a great deal, a lot, or moderately, 0 otherwise. *Perceive B40%:* See Q6, which asks respondents their perceived relative income. The variable takes on the value of 1 if the respondent selects the bottom or second bottom quintile, 0 otherwise. *Perceive M20%:* See Q6, which asks respondents their perceived relative income. The variable takes on the value of 1 if the respondent selects the middle quintile, 0 otherwise.

FIGURE 6: Levels of conditional support for subsidy reform



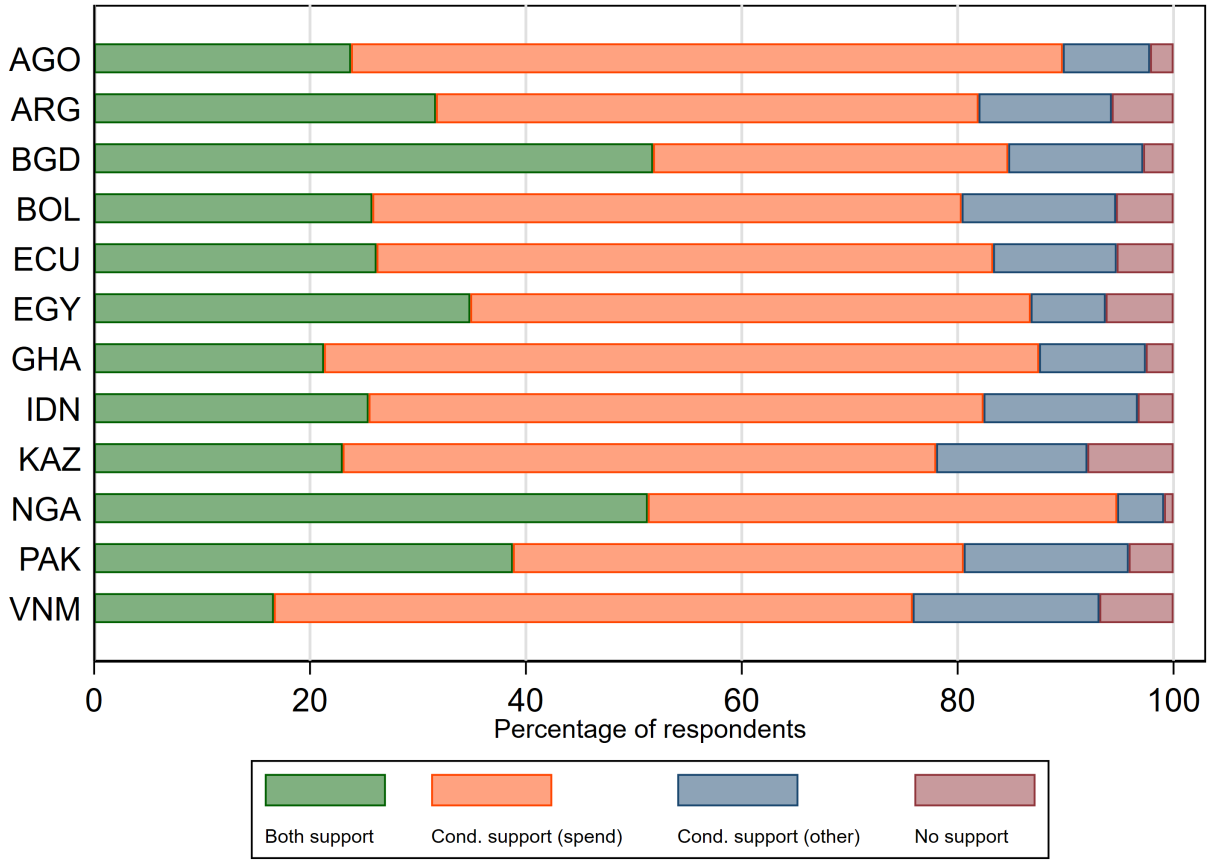
Note: This figure shows the share of respondents in each country who were supportive of a reduction in energy subsidies alongside the implementation of an alternative policy. *Cash all:* See Q25a, which asks about support for a reduction in energy subsidies, if cash transfers were provided to all households. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Cash poor:* See Q25b, which asks about support for a reduction in energy subsidies, if cash transfers were provided to poor households. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Tax cut:* See Q25c, which asks about support for a reduction in energy subsidies, if income taxes were reduced. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Spend:* See Q25d, which asks about support for a reduction in energy subsidies, if resources were spent on better-quality schools, hospitals and roads. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Debt:* See Q25e, which asks about support for a reduction in energy subsidies, if resources were used to reduce public debt. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Environ:* See Q25f, which asks about support for a reduction in energy subsidies, if resources were used to invest in the environment. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *Quality:* See Q25g, which asks about support for a reduction in energy subsidies, if resources were used to improve quality and access to energy. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise. *W/o another policy:* See Q24, which asks about support for a reduction in energy subsidies if this led to a price increase. The variable takes on the value of 1 if the respondent selects strongly support or support, 0 otherwise.

FIGURE 7: Conditional support for energy subsidy reform, by respondent's perceived position in income distribution and level of trust in the government



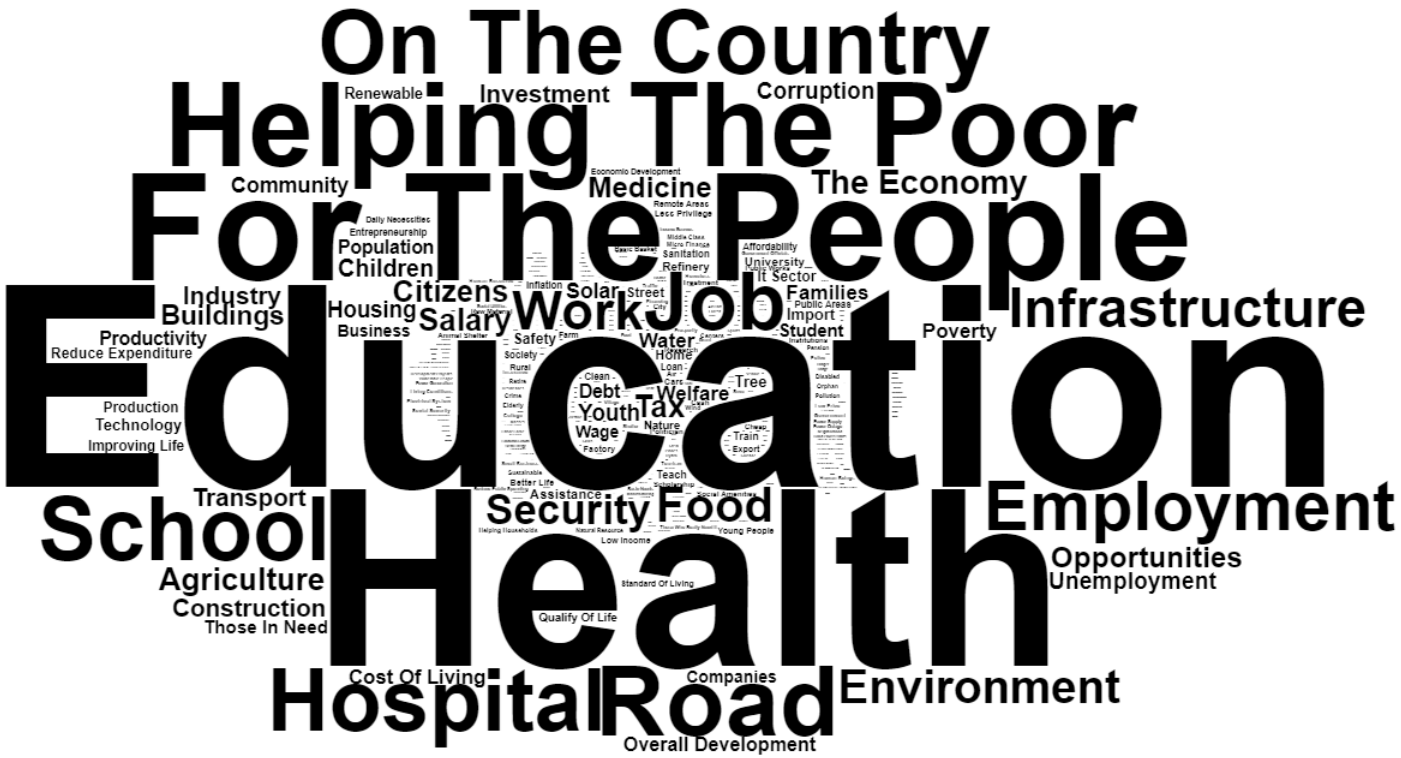
Note: This figure shows the share of respondents who express conditional support, disaggregated by their perceived position in the income distribution and their level of trust in the government. See notes to Figures 5 and 6 for further details.

FIGURE 8: Levels of unconditional and conditional support for energy subsidy reform in each country



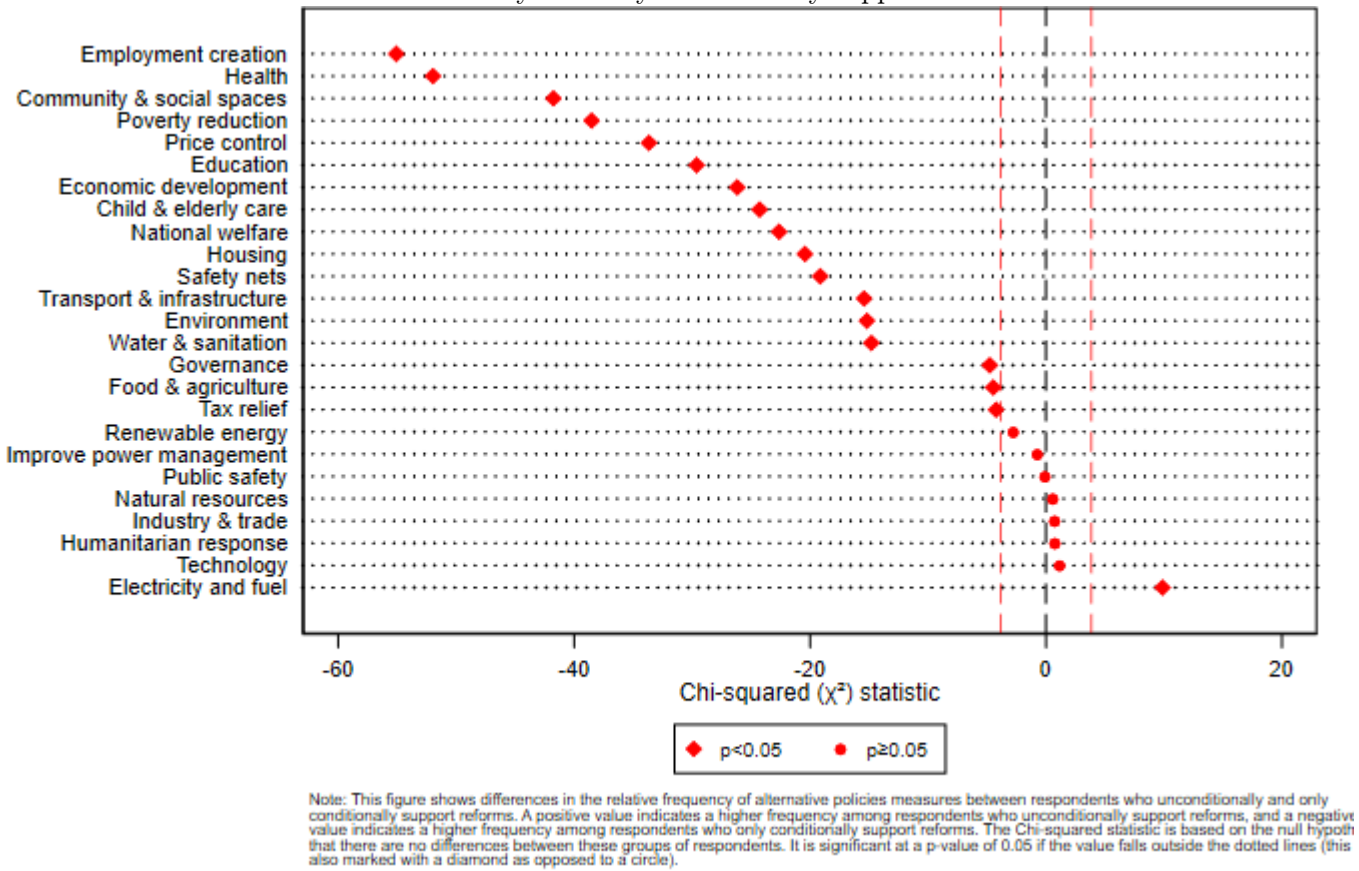
Note: This figure shows the cumulative share of respondents in each country who expressed unconditional support (Both support), conditional support if the accompanying policy was better schools, hospitals, and roads, (Cond. support (spend)), conditional support for another policy (Cond. support (other)), and neither unconditional nor conditional support (No support). *AGO:* Angola. *ARG:* Argentina. *BGD:* Bangladesh. *BOL:* Bolivia. *ECU:* Ecuador. *EGY:* Egypt. *GHA:* Ghana. *IDN:* Indonesia. *KAZ:* Kazakhstan. *NGA:* Nigeria. *PAK:* Pakistan. *VNM:* Vietnam.

FIGURE 9: Respondents' suggestions for the types of alternative policies that would lead them to support a reduction in energy subsidies



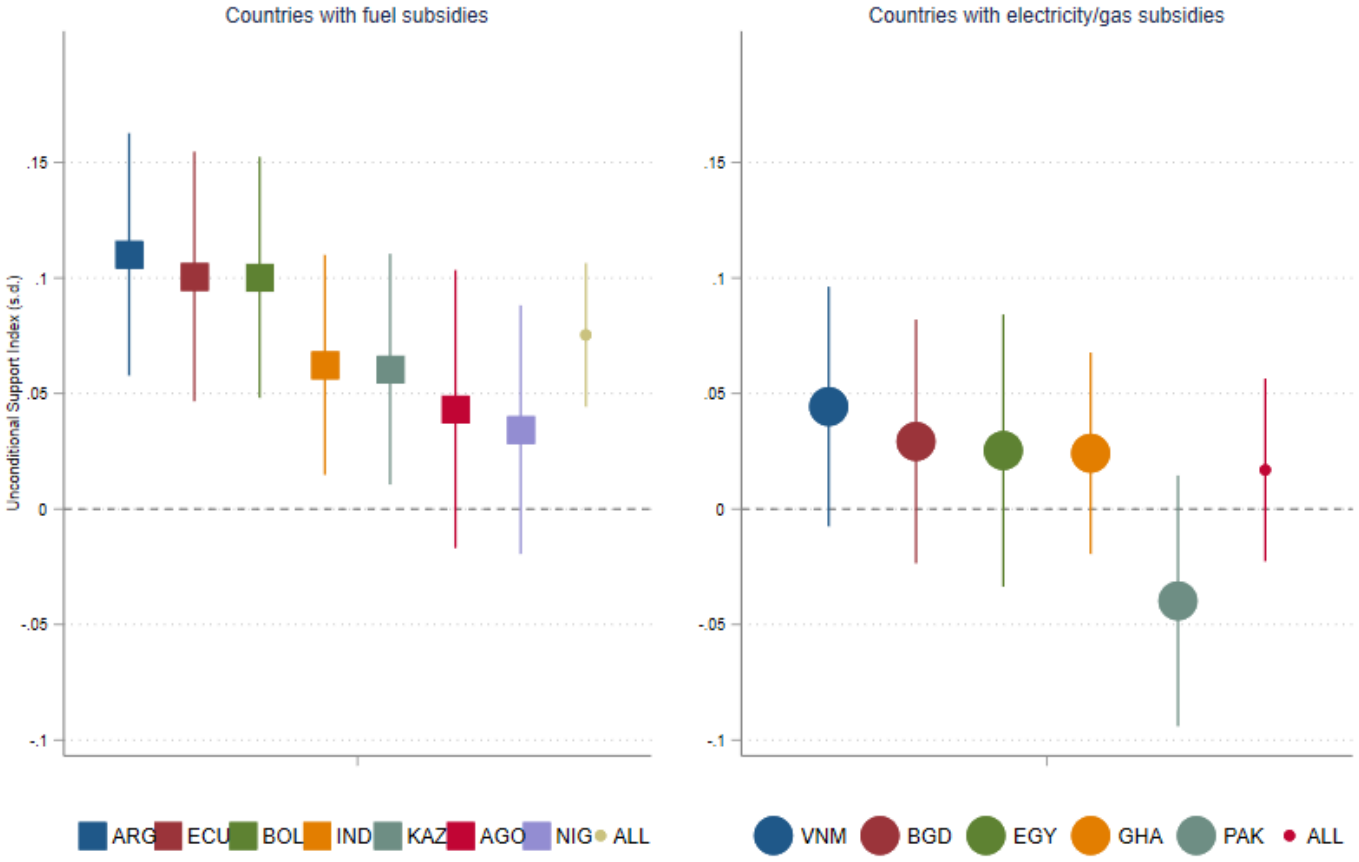
Note: This figure shows a word cloud of the alternative policies that respondents stated would lead them to support a reduction in energy subsidies. The larger the font size, the more frequently suggested the policy was.

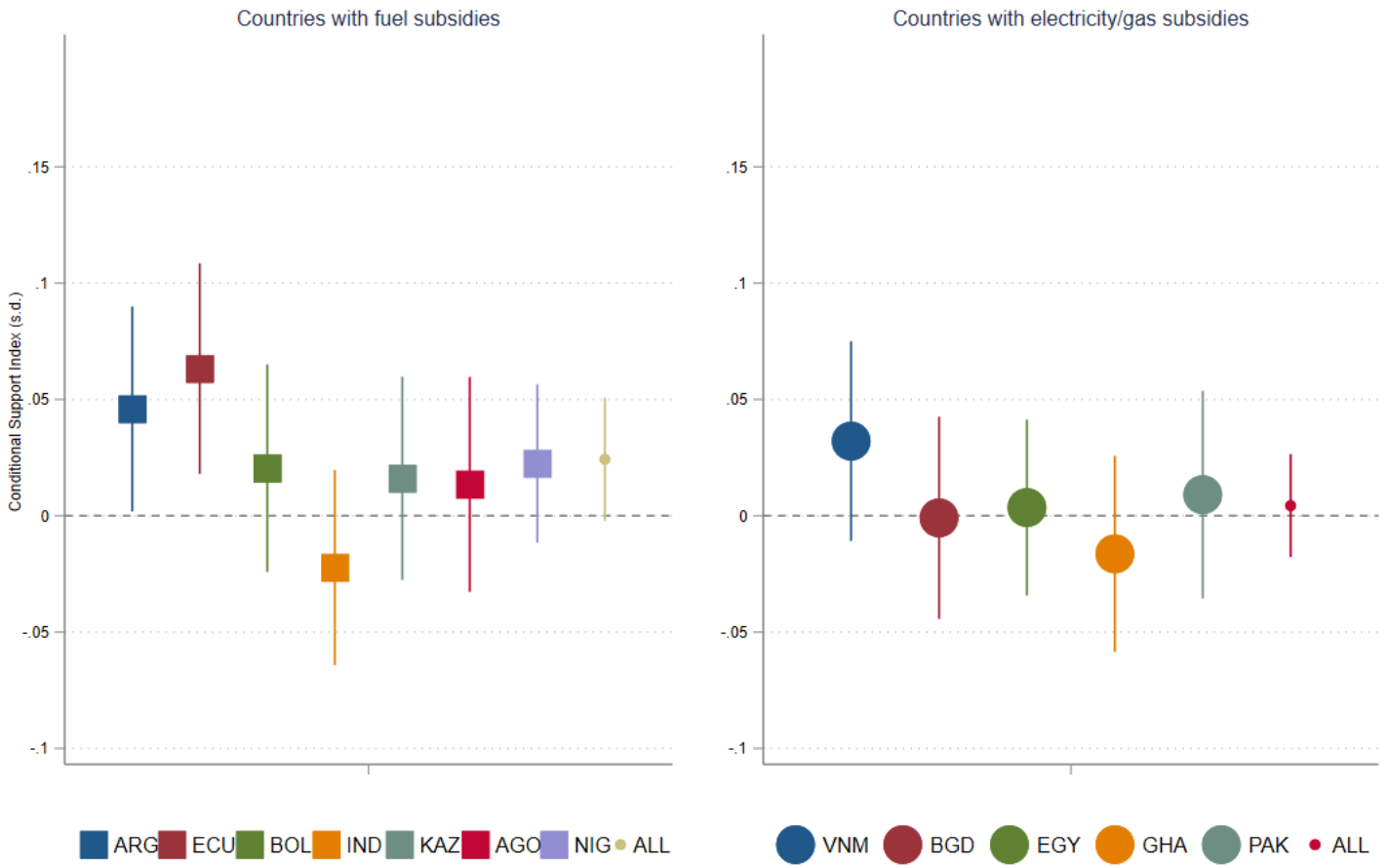
FIGURE 10: Keyness analysis comparing the relative frequency of alternative policy measures between respondents who unconditionally and only conditionally support reforms



Note: This figure shows differences in the relative frequency of alternative policies measures between respondents who unconditionally and only conditionally support reforms. A positive value indicates a higher frequency among respondents who unconditionally support reforms, and a negative value indicates a higher frequency among respondents who only conditionally support reforms. The Chi-squared statistic is based on the null hypothesis that there are no differences between these groups of respondents. It is significant at a p-value of 0.05 if the value falls outside the dotted lines (this is also marked with a diamond as opposed to a circle).

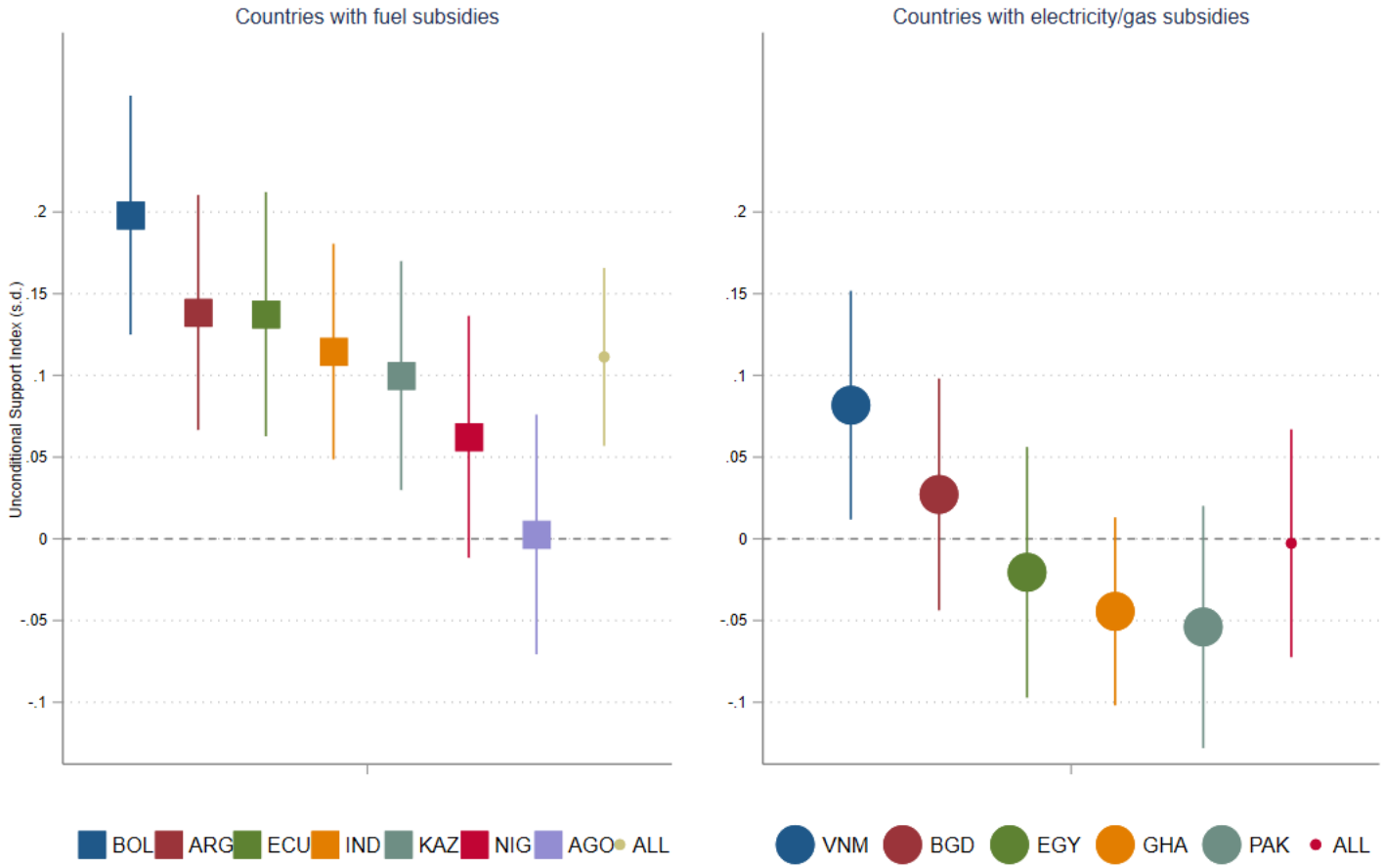
FIGURE 11: Overall treatment effect on unconditional and conditional support, by country

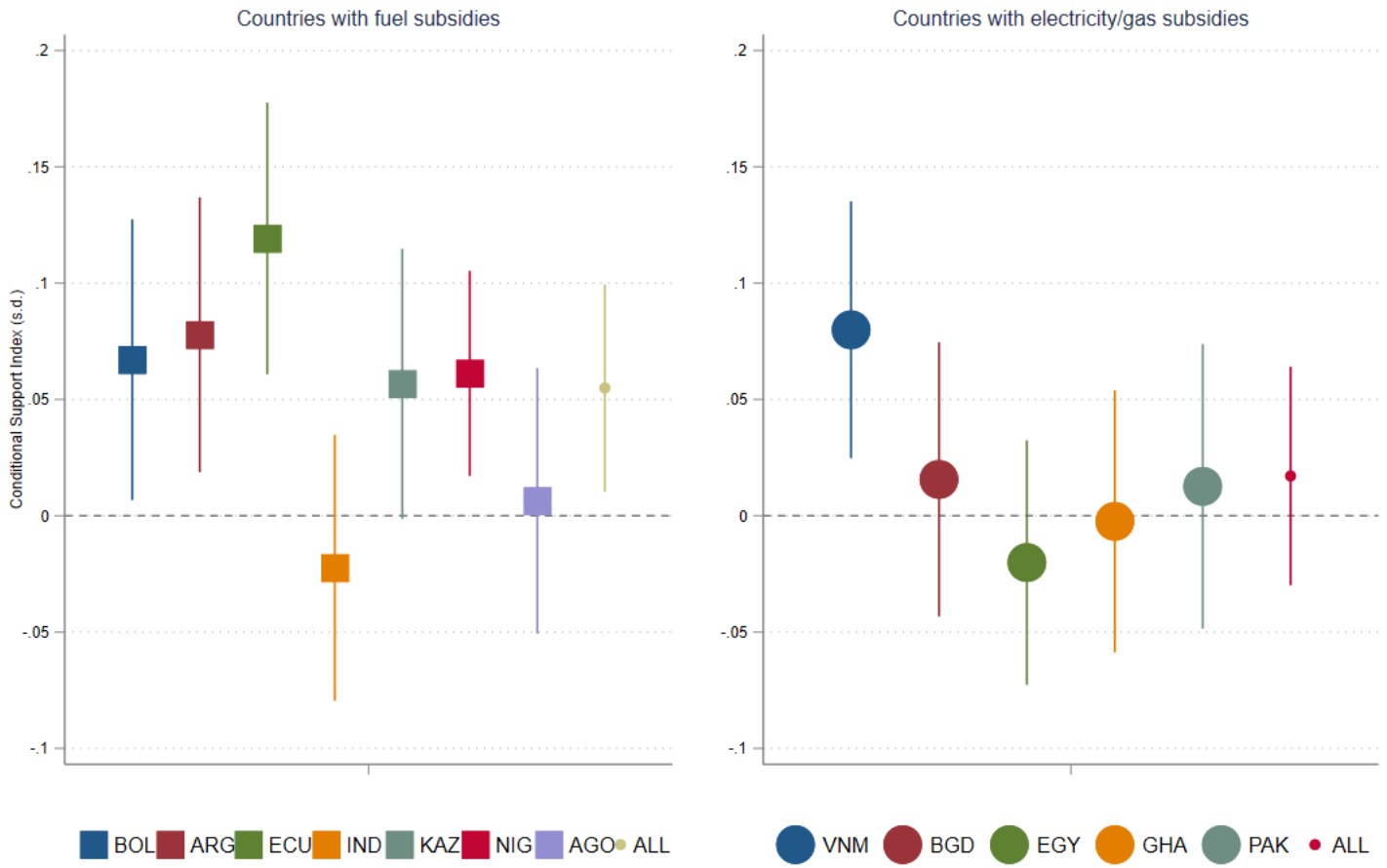




Note: This figure shows the overall impact of the treatments on unconditional and conditional support for reform in each country. The regression analysis is based on Equation (1); however country fixed effects are not included. This figure displays 90 percent confidence intervals. *AGO:* Angola. *ARG:* Argentina. *BGD:* Bangladesh. *BOL:* Bolivia. *ECU:* Ecuador. *EGY:* Egypt. *GHA:* Ghana. *IDN:* Indonesia. *KAZ:* Kazakhstan. *NGA:* Nigeria. *PAK:* Pakistan. *VNM:* Vietnam. *Index:* An unweighted average of the z-scores of the unconditional support outcome variables, oriented so that a higher index means more support.

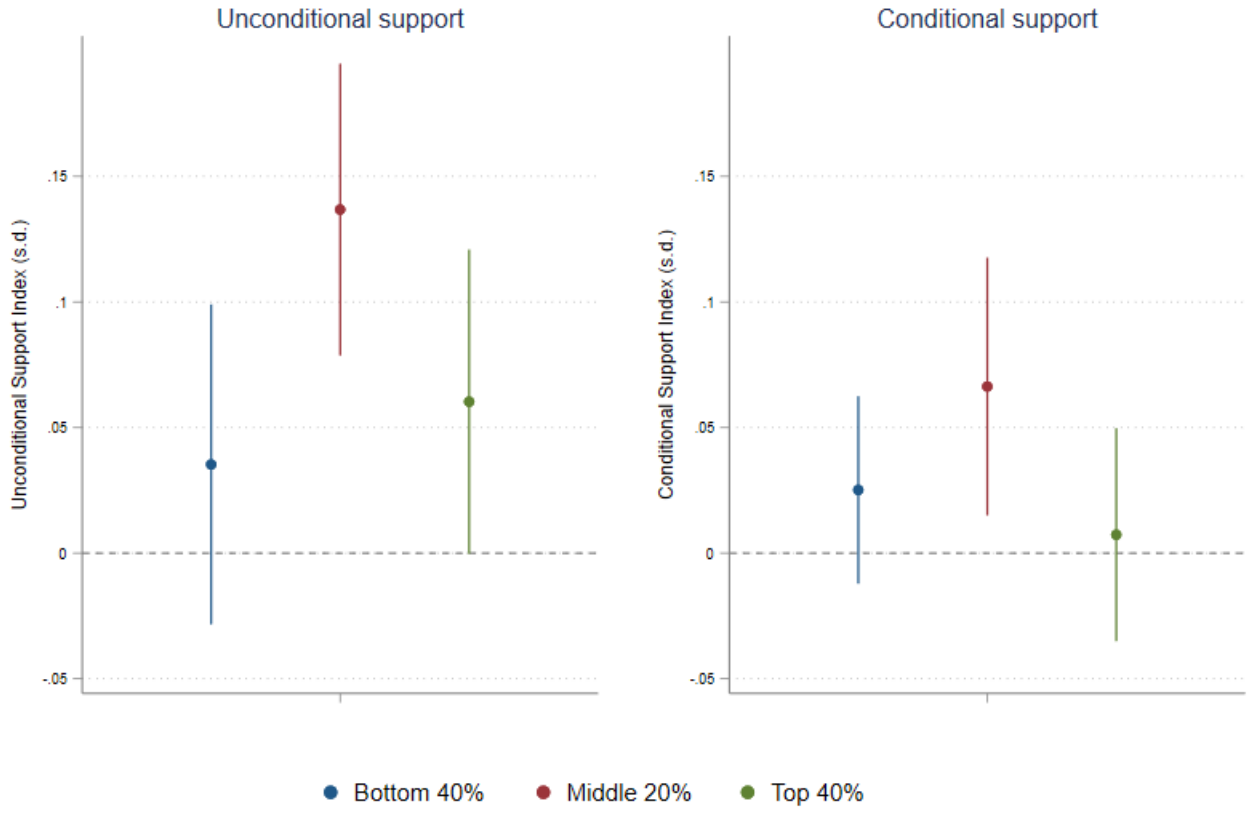
FIGURE 12: Environment treatment effect on unconditional and conditional support, by country





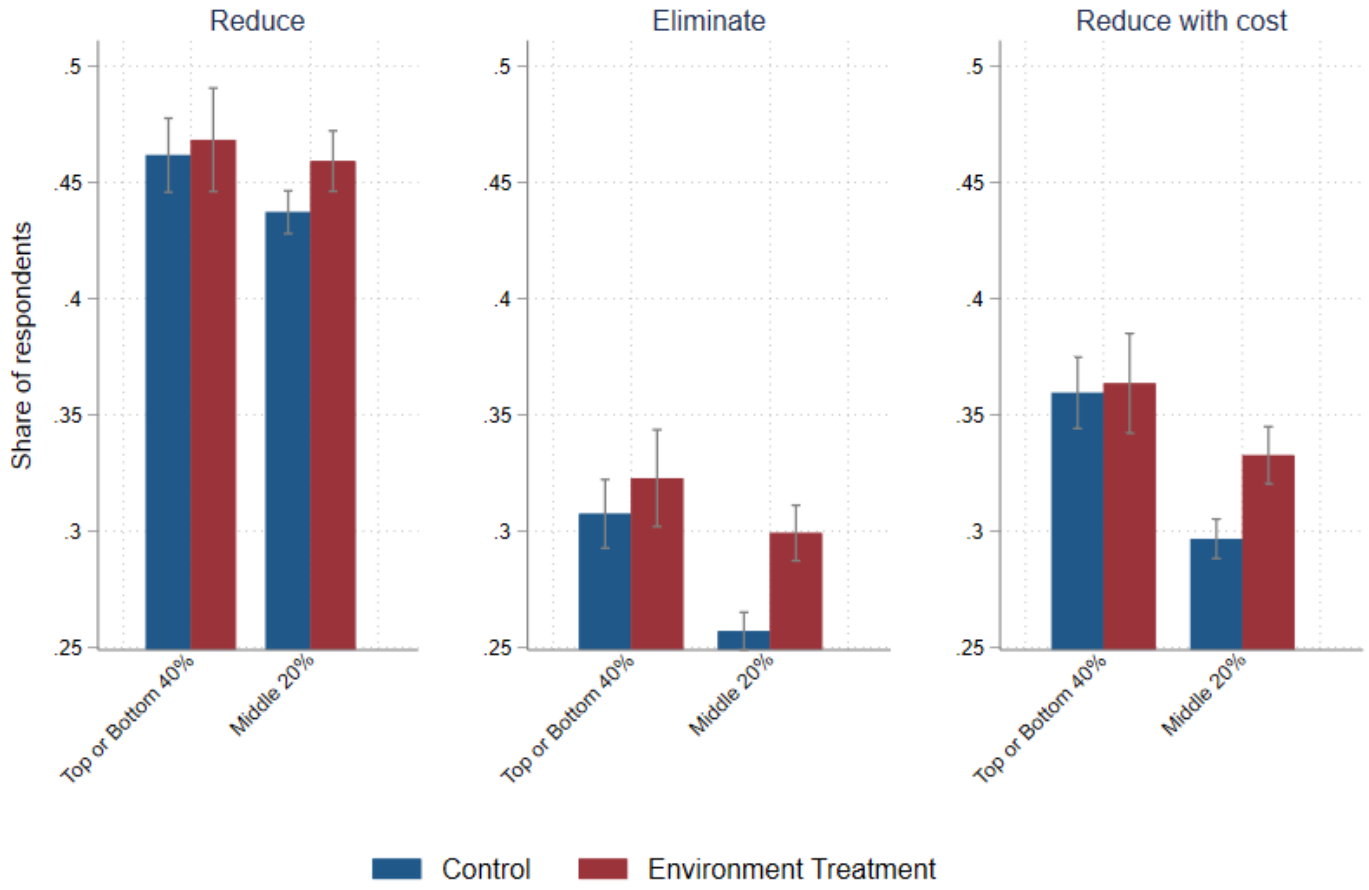
Note: This figure shows the impact of the environment treatment on unconditional and conditional support for reform in each country. The regression analysis is based on Equation (1), however only the environment treatment and the control groups are included in the analysis, and country fixed effects are not included. This figure displays 90 percent confidence intervals. *AGO:* Angola. *ARG:* Argentina. *BGD:* Bangladesh. *BOL:* Bolivia. *ECU:* Ecuador. *EGY:* Egypt. *GHA:* Ghana. *IDN:* Indonesia. *KAZ:* Kazakhstan. *NGA:* Nigeria. *PAK:* Pakistan. *VNM:* Vietnam. *Index:* An unweighted average of the z-scores of the unconditional support outcome variables, oriented so that a higher index means more support.

FIGURE 13: Heterogeneous effects of the environment treatment based on respondents' perceived income quintile



Note: This figure shows how the impact of the environment treatment in countries with fuel subsidies varies based on respondents' perceived quintile in the national income distribution. The regression analysis is based on Equation (1); however, only the environment treatment and the control groups are included in the analysis. This figure displays 90 percent confidence intervals. *Bottom 40%:* See Q6, which asks respondents about their perceived quintile in the national income distribution. The variable takes on the value of 1 if the respondent selects the poorest or second poorest quintile, 0 otherwise. *Middle 20%:* See Q6, which asks respondents about their perceived quintile in the national income distribution. The variable takes on the value of 1 if the respondent selects the middle quintile, 0 otherwise. *Top 40%:* See Q6, which asks respondents about their perceived quintile in the national income distribution. The variable takes on the value of 1 if the respondent selects the richest or second richest quintile, 0 otherwise.

FIGURE 14: Impact of the environment treatment on unconditional support between respondents' who perceived themselves to be in the middle quintile vs. elsewhere in the distribution



Note: This figure shows differences in the effects of the environment treatment on unconditional support between respondents' who perceived themselves to be in the middle quintile and those who perceived themselves to be elsewhere in the distribution. See notes to Table 4 and Figure 13.

Appendix A

A1. Additional layers of randomization

A1.1 Detailed design of survey experiment including additional layers of randomization

This survey included several layers of randomization beyond the main information treatment experiment discussed in the body of the paper. Specifically, respondents were randomly allocated to receive different types of information about energy subsidies in their country (see Section A1.2) and to be asked questions about different levels of potential price increases (see Section A1.3); respondents in the control group were randomly allocated to be asked different first-stage treatment effects (see Section 5.1). These additional layers of randomization combined with the main information treatment resulted in 28 distinct "information branches" that respondents were allocated to (see Figure A1). In addition, the randomization process was stratified by four age/sex respondent categories, so there were 28 distinct branches within each category (e.g., among male respondents ages 18–24 years). A key advantage of having a single randomization process (as opposed to multiple randomizations within the survey) is that this ensures there are no substantial imbalances between respondents across the layers of randomization (e.g., respondents who received the equity treatment were just as likely to be asked about different levels of potential energy price increases). Thus, responses across the additional layers of randomization can be aggregated when examining the main treatment effects (e.g., respondents in

branches 1–8 and 15–23 can be combined to form the control group). The "realized" allocations for each branch under each age/sex category were very similar to the target allocations, as can be seen in Table A1.

FIGURE A1: Distinct information branches in the survey

	Layer of randomization	PRIMER	MAIN EXPERIMENT	FIRST STAGE	PRICE RISE	
Branches	Split	50%/50%	40%/20%/20%/20%	10%/30%/30%/30%	50%/50%	Target allocation
1	Age/sex Category	Partial primer	CONTROL	No first stage	10%	1%
2					20%	1%
3				Q20A	10%	3%
4					20%	3%
5				Q20B	10%	3%
6					20%	3%
7				Q20C	10%	3%
8					20%	3%
9			EFFECIENCY	Q20A	10%	5%
10					20%	5%
11			EQUITY	Q20B	10%	5%
12					20%	5%
13			ENVIROMENT	Q20C	10%	5%
14					20%	5%
15		Full primer	CONTROL	No first stage	10%	1%
16					20%	1%
17				Q20A	10%	3%
18					20%	3%
19				Q20B	10%	3%
20					20%	3%
21				Q20C	10%	3%
22					20%	3%
23			EFFECIENCY	Q20A	10%	5%
24					20%	5%
25			EQUITY	Q20B	10%	5%
26					20%	5%
27			ENVIROMENT	Q20C	10%	5%
28					20%	5%

Note: This figure shows the 28 distinct information branches within each age/sex category in the survey along with the target allocation of respondents.

Table A1 : Realized allocations of respondents across each information branch within each age/sex category

	Female		Male	
	25 years and older	18-24 years old	25 years and older	18-24 years old
Branch 1	1.03	0.97	0.97	1.02
Branch 2	1.10	0.99	1.02	1.09
Branch 3	2.96	3.00	3.02	2.82
Branch 4	2.97	3.09	2.78	3.02
Branch 5	3.34	3.09	2.72	3.39
Branch 6	3.17	2.73	2.80	2.94
Branch 7	2.98	2.73	2.92	2.92
Branch 8	2.75	3.24	2.91	2.68
Branch 9	4.71	5.11	5.21	4.78
Branch 10	5.38	5.14	4.93	5.12
Branch 11	4.91	5.29	4.96	4.85
Branch 12	4.86	5.03	5.09	5.10
Branch 13	4.96	4.81	5.22	5.05
Branch 14	4.80	4.61	5.10	5.18
Branch 15	0.95	0.97	0.94	1.07
Branch 16	0.99	0.99	1.07	1.11
Branch 17	3.01	2.91	3.05	3.02
Branch 18	3.04	3.15	3.08	2.82
Branch 19	2.94	2.80	2.79	2.97
Branch 20	2.93	2.89	3.19	2.80
Branch 21	2.98	3.35	2.90	2.94
Branch 22	3.33	2.84	3.16	3.15
Branch 23	5.01	4.98	4.94	5.35
Branch 24	4.72	4.92	5.08	5.40
Branch 25	4.85	5.53	4.81	4.95
Branch 26	5.28	4.37	4.99	4.95
Branch 27	5.33	5.05	5.20	4.31
Branch 28	4.73	5.42	5.18	5.18

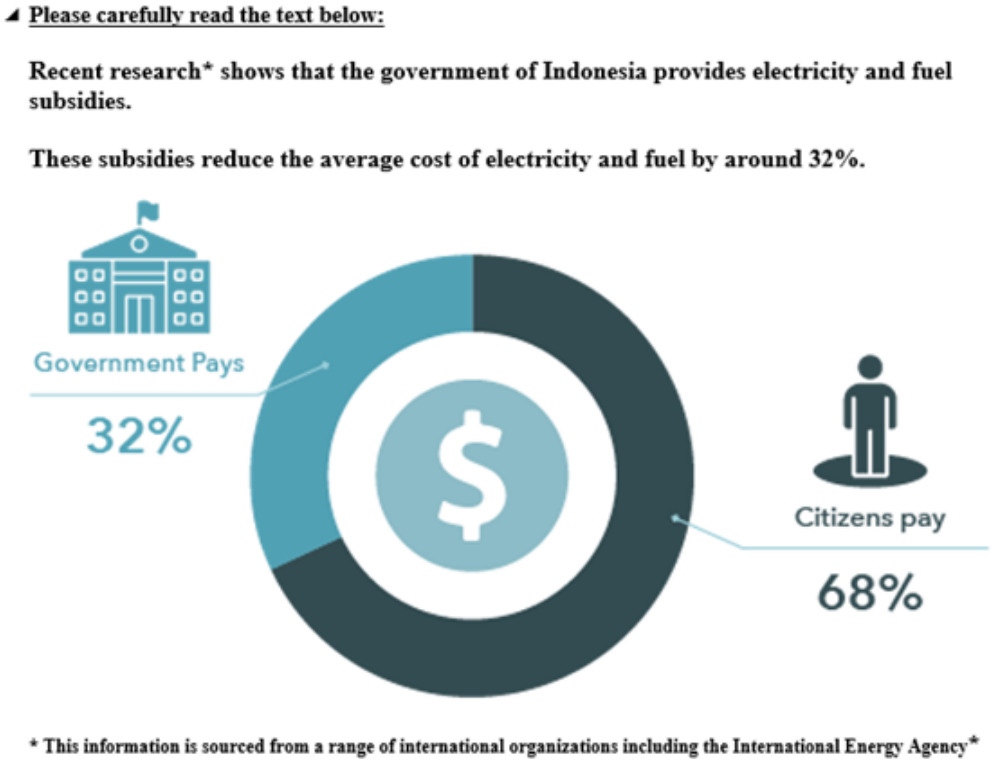
Note: This table shows the realized allocation of respondents across the 28 distinct information branches within each age/sex category in the survey.

A1.2 Randomization of information about energy subsidies

Prior to the main survey experiment, equal numbers of respondents were randomly allocated to receive either a partial or full primer about energy subsidies in their country. The purpose of the partial primer was to ensure that all respondents were made aware of the existence of energy

subsidies so that they could then provide more thoughtful answers to the subsequent questions about their support for the reform of subsidies in their country. The full primer included the same information as the partial primer along with additional information about the share of energy prices paid by the government through energy subsidies in their countries (along with an image portraying this). An example of the full primer (which includes the text for the partial primer) in Indonesia is shown in Figure A2. The text for these primers is similar to what was provided in a recent cross-country experiment by Vieites et al. (2023), and the information about the average subsidization rate is sourced from IEA (2023). The full primer was professionally designed and was piloted in three countries.

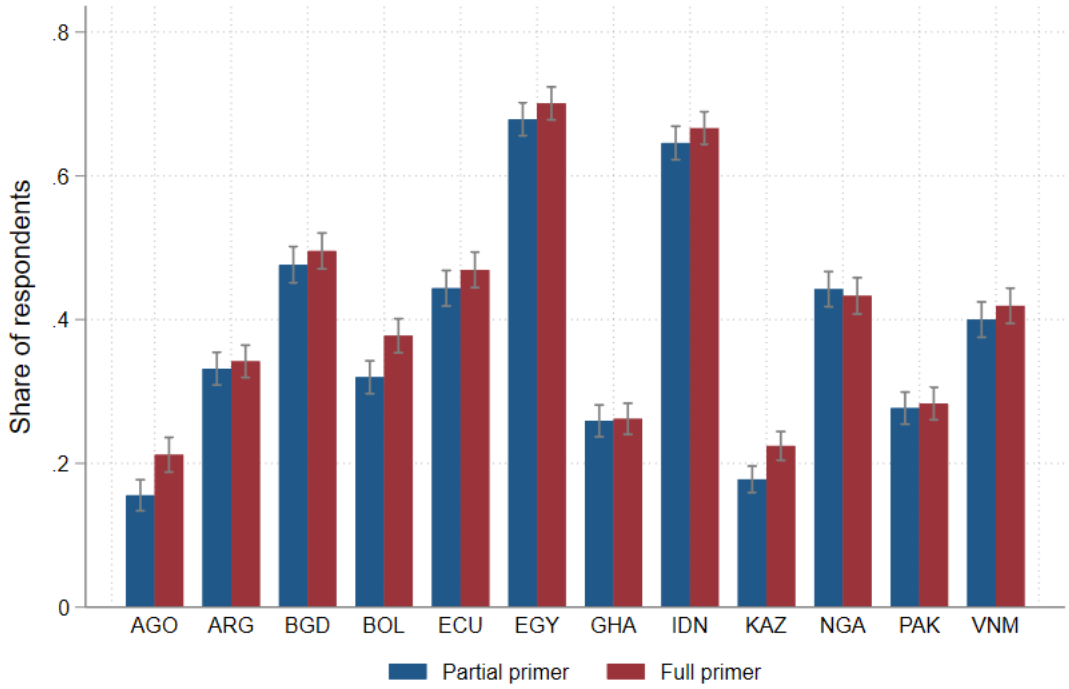
FIGURE A2: Example of a full primer in Indonesia



Note: This figure shows an example of the full primer that was shown to a randomly selected subgroup of respondents in Indonesia.

There were no substantial differences in respondents' support for energy subsidy reform based on which primer they received (full or partial). Analysis was conducted as it was for Equation 3 in the body of the paper, with pooled (across treatments and countries) OLS regressions with country fixed effects, except the interaction term is based on whether a respondent was randomly allocated to receive the full or partial primer. This analysis did not show any significant differences in support for energy subsidy reform. The only noteworthy result was that in most countries, the full primer led respondents to be slightly more likely to state they benefited from subsidies (see Figure A3). Given the lack of relationship between respondents' beliefs about whether they benefit from energy subsidies and their views on energy subsidy reform, it is unsurprising that even though the full primer slightly shifted beliefs, this did not translate into changes in preferences. In fact, the tendency of information to shift beliefs but not policy preferences has been well documented in the existing literature about randomized survey experiments (see Stantcheva [2022]).

FIGURE A3: Relationship between type of primer and respondents' beliefs



Note: This figure shows the share of respondents in each country who believed their household benefited from energy subsidies, disaggregated by type of primer. *AGO:* Angola. *ARG:* Argentina. *BGD:* Bangladesh. *BOL:* Bolivia. *ECU:* Ecuador. *EGY:* Egypt. *GHA:* Ghana. *IDN:* Indonesia. *KAZ:* Kazakhstan. *NGA:* Nigeria. *PAK:* Pakistan. *VNM:* Vietnam.

A1.3 Randomization of the level of energy price rise

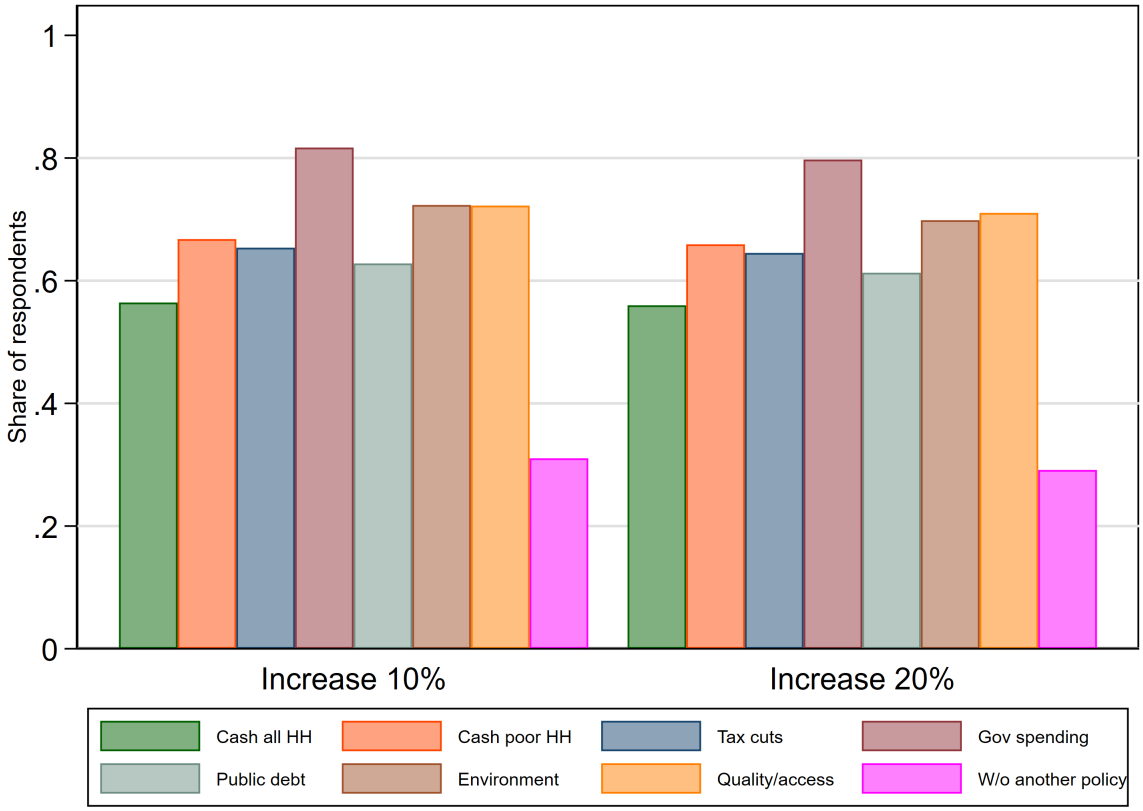
The survey was designed to go beyond existing studies on this topic by rigorously examining how the level of energy price change from a subsidy reform impacts public support. Specifically, respondents were randomly allocated to be asked about their support for a reduction in energy subsidies that resulted in either a 10 percent or 20 percent energy price increase (Q24, Q25, and Q26 of the survey). Importantly,

the 10 percent or 20 percent increase in energy prices was asked in the same way in each country to maximize the cross-country comparability of answers to this question, even though it would likely correspond with the complete removal of energy subsidies in some countries (e.g., Vietnam) and with only a moderate reduction in the overall size of energy subsidies in other countries (e.g., Angola). This order of magnitude of potential energy price increase was deemed appropriate ex ante, as it would be unrealistic to include a higher price increase in the countries where energy subsidies are relatively low, and the aim was to ask about the same order of magnitude of energy price increases in each country.

Public support for energy subsidy reform did not vary significantly based on whether a 10 percent or 20 percent increase in energy prices would occur. Analysis was conducted as it was for Equation 3 in the body of the paper, with pooled (across treatments and countries) OLS regressions with country fixed effects, except the interaction term is based on whether a respondent was randomly allocated to be asked about a 10 percent or 20 percent increase in energy prices. This analysis did not show any significant differences in support for energy subsidy reform. Figure A4 shows how the level of conditional support did not vary substantially based on the size of the energy price increase. This result is somewhat unexpected, as the higher the energy price a respondent must pay, the lower the household's purchasing power, which in turn was expected to impact their support for energy subsidy reform. However, the difference between a 10 percent and 20 percent energy price rise is relatively small, and apparently not large enough to induce a downward sloping demand curve across respondents. Subsequent research could explore larger energy

price differences to provide insights into the price point at which substantial changes in support for reforms can be observed.

FIGURE A4: Relationship between the level of energy price rise and conditional support



Note: This figure shows the relationship between the level of energy price rise and conditional support for energy subsidy reform. See notes to Figure 6.

A2. Pilot data

This study went through an extensive review process within the World Bank prior to being piloted sequentially in three countries (Ghana, Nigeria, and Indonesia) in May and early June 2022. Among other things, the internal review process identified ways in which the survey instrument could reflect best practices in the literature (e.g., avoiding ceiling effects on the outcome variables by phrasing questions to ensure greater variation of responses across a Likert scale). Reviewers also emphasized that during the piloting process, it would be crucial to examine whether respondents adequately comprehended the treatments and the questions. Thus, the primary focus of the piloting was to ensure that the collected responses indicated that the respondents understood the survey instrument. In addition, piloting provided an opportunity to identify ways in which the experiment could be implemented so as to minimize attrition, ensure the survey was accurately programmed, and verify the assumptions made about the size of the treatment effects in the statistical power calculations.

The pilot consisted of three phases, and each phase incorporated the lessons learned from the previous phase. The first phase involved trialing the use of social media advertisements to recruit respondents to the survey in Ghana. It quickly became clear that this approach was not a feasible option for recruiting the number of required respondents in a timely manner, and that it would introduce substantial attrition into the survey. Specifically, social media advertisements were shown to over 12,000 users in Ghana over a one-week period, and only 396 users clicked on the advertisement to participate in the survey. Of the social media users who clicked

on the advertisement, almost 20 percent did not begin the survey; and the attrition rate among those who did start the survey was over 50 percent (146 respondents completed the survey). These challenges existed despite engaging a marketing firm with extensive experience in producing high-quality social media advertisements and despite adopting many of the best practices in the literature to minimize attrition in online surveys, including offering incentives (Stantcheva 2022). In light of these challenges, this sampling approach was abandoned, as ultimately it would not have been possible to implement the intended study continuing along these lines.

The second phase involved engaging an experienced marketing research firm, YouGov, to collect 454 responses to the survey in Nigeria by recruiting from the firm's existing panel of survey participants. This revised sampling strategy allowed for very quick data collection (within 24 hours) and a very low rate of attrition (432 respondents completed the survey). In addition, the data suggested that the survey was relatively well understood by respondents; importantly, the thresholds used for the income question performed very well—that is, it was possible to match respondents' answers with existing household survey data. In addition, almost 90 percent of respondents stated that they did not think the survey was biased, and the feedback that was provided at the end of the survey was overwhelmingly positive. However, a programming issue arose, and the platform hosting the survey, Alchemer, did not correctly implement the randomization process. This was discovered ex post and was addressed by ensuring that respondents were randomly allocated to groups with whole number percentages (i.e., 12 percent, not 12.5 percent). This issue with the programming ultimately meant it was not possible to conduct an

accurate causal analysis of the treatment effects in Nigeria. Before the next phase of the piloting process, the percentage of respondents randomly allocated across groups was adjusted.

The third phase of the pilot involved adopting the same approach to the survey as the second phase, but implementing it in Indonesia with the programming challenges addressed. Using YouGov's existing panel, 494 respondents were recruited to take part in the pilot, and 474 completed the survey. Importantly, only three respondents dropped out once the main survey experiment started, which means there was no meaningful differential attrition observed throughout the piloting process. The results of this phase of the piloting process showed that the statistical power calculations on which the sample sizes were based were more than adequate. There were substantial first-stage effects from the treatments, which indicated respondents must have understood and to some extent believed the information they were provided with. The point estimates of the main treatment effects on support for subsidy reform were also quite promising, as they indicated variation between respondents in the treatment and control groups of an order of magnitude that the experiment would be powered to detect at standard levels (i.e., an alpha of 0.05 and beta of 0.2) when the full sample of respondents is reached. The direction of the treatment effects was also in line with the hypotheses, but these pilot results were only very preliminary indications.

A3. Statistical power calculations

Three broad scenarios were considered when determining the appropriate sample size for this study based on statistical power calculations. The first was to consider the minimum effect that would be detectable (with the standard probability of type I and type II errors of 0.05 and 0.2) from receiving any of the main treatments (i.e., the equity, efficiency, or environment treatments) on a single binary outcome (using the example of collapsing a five-point scale into a dummy variable that takes the value of 1 for strongly support or support, and 0 otherwise). This corresponds with testing hypothesis H2 in one country. The survey experiment would be able to detect an effect in the order of five percentage points based on the conservative assumption of 50 percent of the control group supporting the statement in the question. The second scenario considered the minimum effect that would be detectable (with the standard probability of type I and type II errors of 0.05 and 0.2) from a single treatment on a single binary outcome (using the example of collapsing a five-point scale into a dummy variable that takes the value of 1 for strongly support or support, and 0 otherwise). This is similar to the first scenario, but instead of combining all three treatment groups, they are treated separately. The survey experiment would be able to detect an effect in the order of seven percentage points based on the conservative assumption of 50 percent of the control group supporting the statement in the question. The third scenario considered the minimum effect that would be detectable in a subset of respondents from receiving any of the main treatments on a single binary outcome. This corresponds with examining heterogeneous treatment effects in one country. In this case, the underlying sample size in each of the treatment and control

groups would shrink based on the prior beliefs and preferences of respondents (e.g., whether they believe their household benefits from energy subsidies). Three examples are considered, the first covering 75 percent of all respondents, the second covering 50 percent of all respondents, and the third covering 25 percent of all respondents. The effect size that could be detected with these smaller sample sizes ranged from 6 to 11 percentage points, once again based on the conservative assumption of 50 percent of the control group supporting the statement in the question.

There are at least three reasons to believe that the randomized survey experiment could have much higher statistical power to detect effects than what is discussed above. First, where the mean in the control group for a binary outcome is higher or lower than 0.5, the minimum detectable effect will be smaller. Second, pooling data across countries (with country fixed effects) creates substantially more power to detect an impact from the treatments, although it is hard to quantify this ex ante since it depends on variation between countries. Third, indexes are created across the outcome variables, and it is easier to detect an effect on an index than on a single outcome. However, the extent to which this is the case will vary depending on how consistent the treatment effects are across each of the outcomes.

A4. Data collection

Ideally, face-to-face surveys—in which data are collected from a representative sample of the general population using an existing sampling frame, such as a recent census—would have been conducted in each of the countries in this study. However, the costs involved in such surveys are prohibitive; in addition, issues can arise

when face-to-face surveys ask about politically sensitive topics. While phone surveys present a popular alternative, they are not an appropriate format for a survey like the one in this experiment. The treatments are designed to be visual in nature, and it is not possible to communicate these messages fully via a phone call.

Online surveys are a convenient way of collecting information rapidly, allowing for the use of visual stimuli and reducing the risk of experimenter demand and social desirability effects (Stantcheva 2022). There are challenges with representativeness in low- and middle-income countries that need to be recognized, but these can be overcome to some extent. Unlike high-income countries where internet access is nearly universal, the share of the total population with internet access in the countries in this study varies from 25 percent to 86 percent (World Bank 2023). It is therefore necessary to be cautious in applying the results of an online survey to the sizable share of the population without internet access. At best, online surveys can be broadly representative of the internet-using population in a given country, and as a robustness check survey responses can be weighted to match the characteristics of the general population (e.g., older people are less likely to access the internet, and survey weights can be applied to somewhat compensate for this issue).

Put simply, there are three broad approaches to implementing online surveys in low- and middle-income countries. First, a panel approach involves using online survey infrastructure that is already in place before a survey is designed. For example, market research firms (e.g., Gallup, YouGov, IPSOS) regularly run online opinion polls to reach a pre-registered pool of respondents. These people have been pre-screened and have already agreed to take part in many surveys on different top-

ics for compensation (e.g., phone credit). These pre-registered online respondents are recruited by market research firms from a range of sources, including existing registration lists for phone and in-person surveys as well as online advertisements, such as on social media. The panel approach to conducting online surveys has been used extensively since the early 2000s. Recent examples include studies testing the impact of information about climate change on public support for policies in high- and middle-income countries (Dechezleprêtre et al. 2022; Dabla-Norris et al. 2023).

Second, an opt-in approach involves inviting people to take part in a one-off online survey. The most common way of reaching potential respondents using this approach is through social media ads, which may explicitly incentivize participation (e.g., by highlighting that participants have a chance to win a prize if they complete a survey). Another example of this approach is sending an SMS message to an existing list of people that invites them to complete an online survey. Recent examples using this approach include surveys about vaccine hesitancy (e.g., see Bidani et al. [2022]; Hoy et al. [2022]).

Third, an opt-out approach involves redirecting internet users to a survey "by chance." For example, the survey firm RIWI uses proprietary Random Domain Intercept Technology to direct internet users who incidentally access expired links to a website where they are prompted to take a survey. Another example of this opt-out approach involves prompting people to complete a survey to access or continue using a website or application that typically requires some form of a fee (e.g., to read another newspaper article or make progress in a game). A recent example using this approach includes a study about support for progressive taxes (Hoy 2022).

As discussed in the body of the paper, the first approach is used in this study.[1] This results in a sample of respondents that is broadly representative of the internet-using population (at least across the dimensions of age and gender), but far from representative of the general population. On average, respondents are disproportionally male, younger, richer, and more likely to live in a major city and to have received higher levels of education (see Table A2 for details).

[1]There are some weaknesses with this approach that cannot be avoided. On average, respondents may have higher literacy rates than the typical internet user as they are paid based on satisfactorily understanding and completing the survey. These respondents have also opted into completing online surveys for compensation, which may mean they have more time and a greater desire for additional sources of income than a typical internet user. However the incentive that is offered is relatively small, which means this may not be a major issue.

Table A2: Differences between the sample of respondents and the general population in each country

	AGO		ARG		BGD		BOL		ECU		EGY	
	Sample	Pop	Sample	Pop	Sample	Pop	Sample	Pop	Sample	Pop	Sample	Pop
Male	0.79	0.47	0.45	0.47	0.70	0.48	0.59	0.48	0.49	0.48	0.51	0.5
18-24 years old	0.50	0.27	0.11	0.15	0.40	0.19	0.24	0.18	0.23	0.19	0.29	0.18
Major cities	0.70	0.308	0.64	0.62	0.52	0.24	0.67	0.54	0.69	0.40	0.79	0.20
University	0.36	0.07	0.35	0.37	0.69	0.042	0.67	0.30	0.57	0.23	0.85	0.26
Bottom 40%	0.49	0.4	0.51	0.4	0.36	0.4	0.51	0.4	0.39	0.4	0.23	0.4

	GHA		IDN		KAZ		NGA		PAK		VNM	
	Sample	Pop	Sample	Pop	Sample	Pop	Sample	Pop	Sample	Pop	Sample	Pop
Male	0.57	0.46	0.51	0.5	0.40	0.44	0.58	0.48	0.64	0.48	0.51	0.48
18-24 years old	0.33	0.23	0.27	0.16	0.17	0.12	0.34	0.22	0.34	0.25	0.19	0.12
Major cities	0.61	0.18	0.45	0.23	0.49	0.30	0.57	0.10	0.85	0.79	0.81	0.18
University	0.65	0.12	0.47	0.14	0.45	0.30	0.73	0.16	0.70	0.15	0.78	0.05
Bottom 40%	0.45	0.4	0.42	0.4	0.27	0.4	0.31	0.4	0.35	0.4	0.12	0.4

Note: This table compares characteristics of the survey sample and general population (Pop) in each country. These characteristics are sex (male vs. female), age (18-24 years vs. 25 years plus), location (major cities vs. rest of country), education (university educated vs. below university) and income (bottom 40 percent of income distribution vs. top 60 percent of income distribution). *AGO:* Angola. *ARG:* Argentina. *BGD:* Bangladesh. *BOL:* Bolivia. *ECU:* Ecuador. *EGY:* Egypt. *GHA:* Ghana. *IDN:* Indonesia. *KAZ:* Kazakhstan. *NGA:* Nigeria. *PAK:* Pakistan. *VNM:* Vietnam. Source: Household Income and Expenditure Surveys in each country.

APPENDIX B – Example of Survey

Q0. Thank you for your interest in this short survey which has been commissioned to YouGov by the International Bank for Reconstruction and Development. Your responses will be kept confidential and only be used for research purposes. Your personal data will not be shared with third parties without your consent. All the analysis will be based on an anonymized dataset. Your participation in this survey is completely voluntary and you may decline to take part without providing an explanation. If there are any questions that you do not wish to answer, you can choose not to answer them and exit the survey. The survey will take about 10 minutes.

Do you agree to participate?*

( ) Yes, I will complete the survey

( ) No, thanks

Q1. What is your age?*

( ) Under 18 years

( ) 18-24 years

( ) 25-34 years

( ) 35 years or older

Q2. What is your gender?*

( ) Male

( ) Female

Q3. What is the highest level of education you have completed? *

( ) No education

( ) Primary

( ) Secondary

( ) Higher than secondary but not university

( ) University

Q4. Where do you live?*

( ) Jakarta

( ) Rest of West Java

( ) Rest of the country

Q5. Imagine the total population of Indonesia is divided into 5 income groups from poorest to richest, each with the same number of people. In which of these income groups do you place your household?
*****

( ) Poorest group

( ) 2nd poorest group

( ) Middle group

( ) 2nd richest group

( ) Richest group

Q6. Including yourself, how many people live in your home?
*****

( ) 1

( ) 2

( ) 3

( ) 4

( ) 5

( ) 6

( ) 7

( ) 8+

Q7_1. What was your total household income in a typical month in 2022 (include all sources of income, in thousands of Rupiah)?

*****

( ) 600 or less

( ) 601-850

( ) 851-1,200

( ) 1,201-1,700

( ) 1,701 and more

Q7_2. What was your total household income in a typical month in 2022 (include all sources of income, in thousands of Rupiah)?*

( ) Below 1,201

( ) 1,201-1,700

( ) 1,701-2,400

( ) 2,401-3,400

( ) 3,401 and more

Q7_3. What was your total household income in a typical month in 2022 (include all sources of income, in thousands of Rupiah)?*

( ) Below 1,801

( ) 1,801-2,550

( ) 2,551-3,600

( ) 3,601-5,100

( ) 5,101 and more

Q7_4. What was your total household income in a typical month in 2022 (include all sources of income, in thousands of Rupiah)?*

( ) Below 2,401

( ) 2,401-3,400

( ) 3,401-4,800

( ) 4,801-6,800

( ) 6,801 and more

Q7_5. What was your total household income in a typical month in 2022 (include all sources of income, in thousands of Rupiah)?*

( ) Below 3,001

( ) 3,001-4,250

( ) 4,251-6,000

( ) 6,001-8,500

( ) 8,501 and more

Q7_6. What was your total household income in a typical month in 2022 (include all sources of income, in thousands of Rupiah)?*

( ) Below 3,601

( ) 3,601-5,100

( ) 5,101-7,200

( ) 7,201-10,200

( ) 10,201 and more

Q7_7. What was your total household income in a typical month in 2022 (include all sources of income, in thousands of Rupiah)?*

( ) Below 4,201

( ) 4,201-5,950

( ) 5,951-8,400

( ) 8,401-11,900

( ) 11,901 and more

Q7_8. What was your total household income in a typical month in 2022 (include all sources of income, in thousands of Rupiah)?*

( ) Below 4,801

( ) 4,801-6,800

( ) 6,801-9,600

( ) 9,601-13,600

( ) 13,601 and more

Q8A. Which of the following does your household mainly use to cook food? *

( ) Electricity

( ) Gas (e.g., LPG)

( ) Coal / Charcoal / Wood

( ) Kerosene

( ) Other

Q8B. What is the main way you heat your home?*

( ) Electricity

( ) Gas (e.g., LPG)

( ) Heating oil

( ) Coal / Charcoal / Wood

( ) Solar / geothermal / heat pump

( ) No heating

( ) Other

Q9. Which of the following is the main type of transport members of your household use?*

( ) Motor vehicle (e.g., car)

( ) Motorbike

( ) Shared Transport (e.g., van, tuk tuk)

( ) Public Transport (e.g., bus, train)

( ) Walking or Cycling

( ) Other

Q10. To the best of your knowledge, in a typical month how much does your household spend on... (optional)
(please only enter numbers in Rupiah)

Electricity: _____

Gas (e.g., LPG): _____

Fuel (e.g., petrol or diesel): _____

Other energy sources (e.g., Kerosene):
_____

Q11. To assist households with the cost of living, the government of Indonesia has the ability and the tools to do:*

( ) Nothing at all

( ) Not much

( ) Some things

( ) A lot

( ) Prefer not to say

Q12. Do you agree or disagree with the following:

Over the last decade, the government in Indonesia could generally be trusted to do what is right.*

( ) Strongly agree

( ) Agree

( ) Neither

( ) Disagree

( ) Strongly disagree

( ) Prefer not to say

<u>Please carefully read the text below:</u>

Electricity and fuel subsidies are when the government REDUCES the price of electricity and fuel by paying a share of the cost.

Therefore, electricity and fuel subsidies make it CHEAPER for households and businesses to use electricity and fuel.*

( ) Click to continue

Q14. Do you think there are any electricity and fuel subsidies in Indonesia?*

( ) Yes

( ) No

( ) Unsure

PARTIAL PRIMER

Please carefully read the text below:

Recent research* shows that the government of Indonesia provides electricity and fuel subsidies.

*** This information is sourced from a range of international organizations including the International Energy Agency***

( ) Click to continue

FULL PRIMER

Please carefully read the text below:

Recent research* shows that the government of Indonesia provides electricity and fuel subsidies.

These subsidies reduce the average cost of electricity and fuel by around 32%.

*** This information is sourced from a range of international organizations including the International Energy Agency***

( ) Click to continue

Q16. How much has your household benefited from electricity and fuel subsidies over the last 12 months?*

( ) Not at all

( ) A little

( ) Moderately

( ) A lot

( ) A great deal

Q17. How much do you think that your household has a right to receive electricity and fuel subsidies?*

( ) Not at all

( ) A little

( ) Moderately

( ) A lot

( ) A great deal

Q18. Before proceeding, please confirm that you are willing to answer the final 6 questions of the survey. If you cannot answer the final 6 questions, please indicate so below.*

( ) Yes, I will complete the remaining 6 questions in the survey

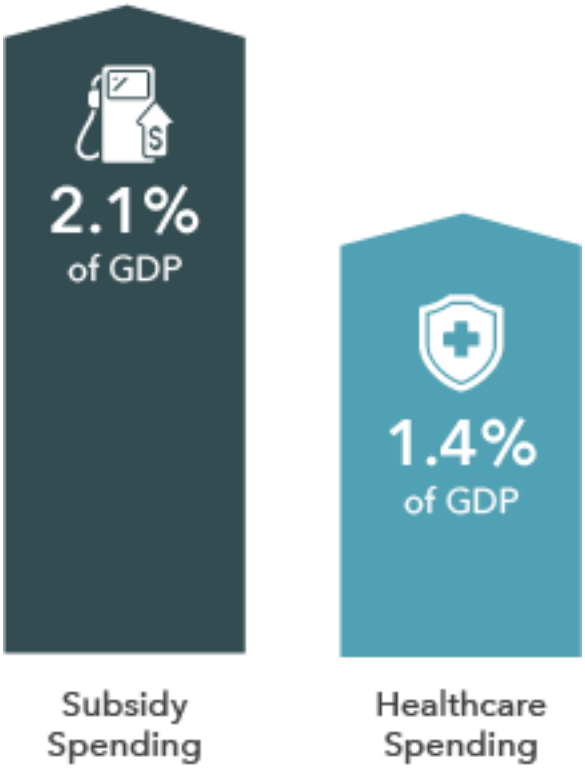
( ) No thanks

EFFICIENCY TREATMENT

<u>Please carefully read the text below:</u>

Recent research* shows:

- **The government of Indonesia spends around 455,000 billion Rupiah each year on electricity and fuel subsidies**
- **Spending on electricity and fuel subsidies is greater than spending on health care, such as hospitals, medicines, and doctors.**



*** This information is sourced from a range of international organizations including the International Energy Agency***

( ) Click to continue

Q20A. Do you agree or disagree with the following:

Spending on electricity and fuel subsidies is greater than spending on health care in Indonesia*

( ) Strongly agree

( ) Agree

( ) Neither

( ) Disagree

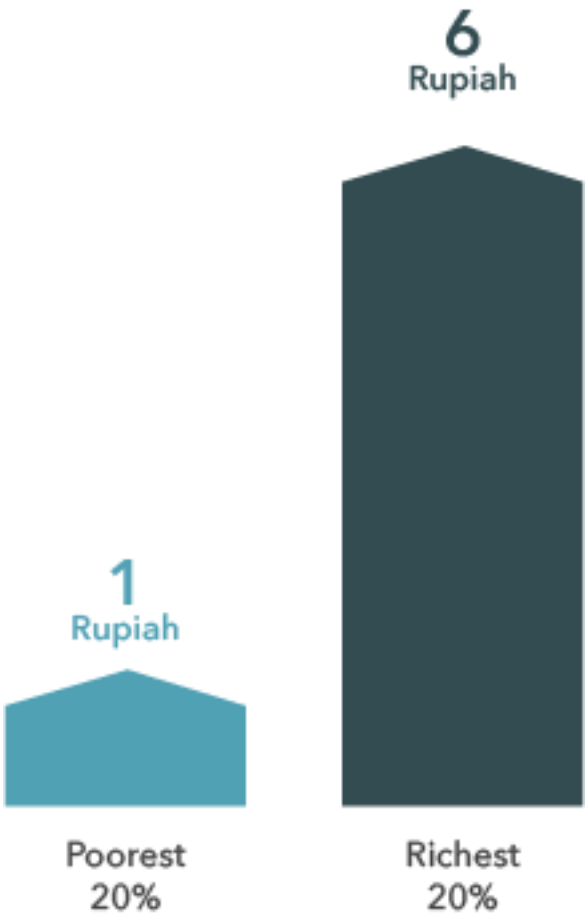
( ) Strongly disagree

EQUITY TREATMENT

<u>Please carefully read the text below:</u>

Recent research* shows:

- **The government of Indonesia spends around 455,000 billion Rupiah each year on electricity and fuel subsidies**
- **The Richest 20% of households received around 6 times as many electricity and fuel subsidies as the Poorest 20% of households.**



*** This information is sourced from a range of international organizations including the International Energy Agency***

( ) Click to continue

Q20B. Do you agree or disagree with the following:

Richer households receive more electricity and fuel subsidies than poorer households in Indonesia*

( ) Strongly agree

( ) Agree

( ) Neither

( ) Disagree

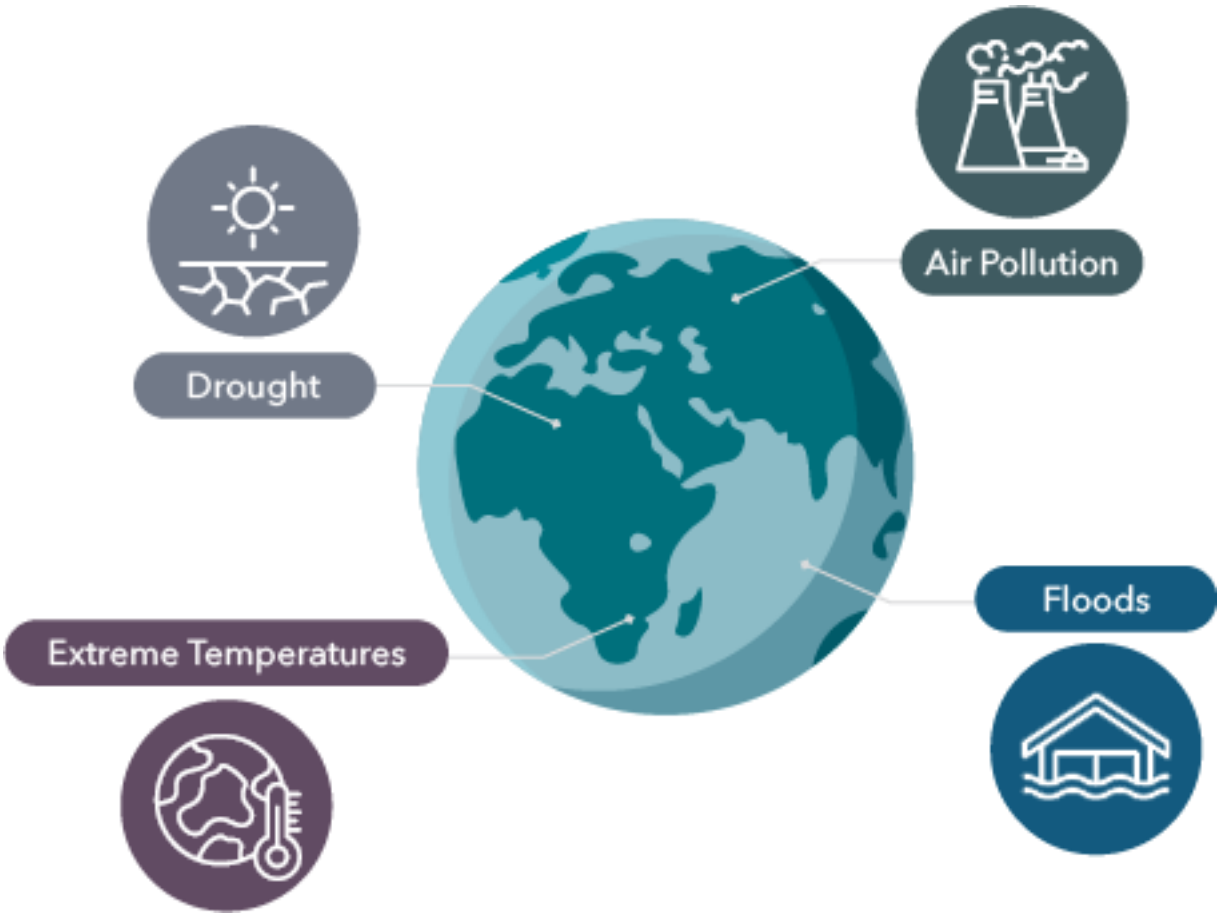
( ) Strongly disagree

ENVIRONMENT TREATMENT

<u>Please carefully read the text below:</u>

Recent research* shows:

- **The government of Indonesia spends around 455,000 billion Rupiah each year on electricity and fuel subsidies**
- **Electricity and fuel subsidies lead to 1,300,000 billion Rupiah in environmental damage in Indonesia each year by promoting the overuse of electricity and fuel.**



*** This information is sourced from a range of international organizations including the International Energy Agency***

( ) Click to continue

Q20C. Do you agree or disagree with the following:

Electricity and fuel subsidies have large negative impacts on the environment in Indonesia*

( ) Strongly agree
( ) Agree
( ) Neither
( ) Disagree
( ) Strongly disagree

Q21. Do you support or oppose the following:

The government of Indonesia REDUCING electricity and fuel subsidies*

( ) Strongly support
( ) Somewhat support
( ) Neither support nor oppose
( ) Somewhat oppose
( ) Strongly oppose

Q22. Do you support or oppose the following:

The government of Indonesia ELIMINATING all electricity and fuel subsidies*

( ) Strongly support
( ) Somewhat support
( ) Neither support nor oppose
( ) Somewhat oppose
( ) Strongly oppose

Q23. Do you support or oppose the following:

The government of Indonesia KEEPING electricity and fuel subsidies at current levels*

( ) Strongly support

( ) Somewhat support

( ) Neither support nor oppose

( ) Somewhat oppose

( ) Strongly oppose

Q24_10. Do you support or oppose the following:

The government of Indonesia REDUCING electricity and fuel subsidies and this leading to electricity and fuel prices INCREASING by 10%.*

( ) Strongly support

( ) Somewhat support

( ) Neither support nor oppose

( ) Somewhat oppose

( ) Strongly oppose

Q25_10. For the following questions, consider the situation where the government of Indonesia REDUCES electricity and fuel subsidies and this leads to electricity and fuel prices INCREASING by 10%.

Would you support or oppose this situation IF the government of Indonesia used the resources previously spent on electricity and fuel subsidies to immediately fund…*

	Strongly support	**Somewhat support**	**Neither support nor oppose**	**Somewhat oppose**	**Strongly oppose**
A. Cash transfers to all households	( )	( )	( )	( )	( )
B. Cash transfers to poor households	( )	( )	( )	( )	( )
C. A reduction in income taxes	( )	( )	( )	( )	( )
D. Better schools, hospitals, and roads	( )	( )	( )	( )	( )
E. A reduction in the public debt	( )	( )	( )	( )	( )
F. Investments to improve the environment (like improving air quality)	( )	( )	( )	( )	( )
G. More reliable access to electricity and fuel	( )	( )	( )	( )	( )

Q26A_10. Is there anything else the government of Indonesia could immediately fund that would lead you to support a reduction in electricity and fuel subsidies?*

( ) Yes

( ) No

(untitled)

Q26B_10. Please complete the following sentence:
"I would support a reduction in electricity and fuel subsidies if the government immediately spent the resources on …."*

_____

_____

_____

_____

Q24_20. Do you support or oppose the following:

The government of Indonesia REDUCING electricity and fuel subsidies and this leading to electricity and fuel prices INCREASING by 20%.*

( ) Strongly support

( ) Somewhat support

( ) Neither support nor oppose

( ) Somewhat oppose

( ) Strongly oppose

Q25_20. For the following questions, consider the situation where the government of Indonesia REDUCES electricity and fuel subsidies and this leads to electricity and fuel prices INCREASING by 20%.

Would you support or oppose this situation IF the government of Indonesia used the resources previously spent on electricity and fuel subsidies to immediately fund…*

	Strongly support	**Somewhat support**	**Neither support nor oppose**	**Somewhat oppose**	**Strongly oppose**
A. Cash transfers to all households	( )	( )	( )	( )	( )
B. Cash transfers to poor households	( )	( )	( )	( )	( )
C. A reduction in income taxes	( )	( )	( )	( )	( )
D. Better schools, hospitals and roads	( )	( )	( )	( )	( )
E. A reduction in the public debt	( )	( )	( )	( )	( )
F. Investments to improve the environment (like improving air quality)	( )	( )	( )	( )	( )
G. More reliable access to electricity and fuel	( )	( )	( )	( )	( )

Q26A_20. Is there anything else the government of Indonesia could immediately fund that would lead you to support a reduction in electricity and fuel subsidies?*

( ) Yes

( ) No

Q26B_20. Please complete the following sentence:

"I would support a reduction in electricity and fuel subsidies if the government immediately spent the resources on …."*

_____

_____

_____

Q30. Do you feel that this survey was biased? (Optional)

( ) Yes

( ) No

( ) Unsure

Q31. Please feel free to give us any feedback, comments or thoughts you have regarding this survey in the field below. (Optional)

_____

_____

_____

Thank You!

Thank you for taking our survey. Your response is very important to us.

Appendix C

Table C1: Balance table across treatment and control groups

	(1) Control	(2) Efficiency	(3) Equity	(4) Environment	Difference (1)-(2)	Difference (1)-(3)	Difference (1)-(4)	Difference (2)-(3)	Difference (2)-(4)	Difference (3)-(4)
18-24yrs men	0.158	0.162	0.158	0.155	-0.004	0.000	0.003	0.005	0.008	0.003
	[0.003]	[0.004]	[0.004]	[0.004]						
25yrs+ men	0.404	0.410	0.408	0.420	-0.006	-0.004	-0.016**	0.002	-0.010	-0.012
	[0.004]	[0.006]	[0.006]	[0.006]						
18-24yrs women	0.120	0.121	0.122	0.119	-0.000	-0.002	0.002	-0.002	0.002	0.004
	[0.003]	[0.004]	[0.004]	[0.004]						
25yrs+ women	0.317	0.307	0.312	0.307	0.010	0.005	0.011*	-0.005	0.001	0.005
	[0.004]	[0.005]	[0.005]	[0.005]						
University	0.611	0.602	0.600	0.606	0.009	0.011	0.006	0.002	-0.004	-0.006
	[0.004]	[0.006]	[0.006]	[0.006]						
Major city	0.655	0.673	0.653	0.661	-0.017***	0.002	-0.006	0.020***	0.012	-0.008
	[0.004]	[0.005]	[0.006]	[0.005]						
Per bottom 40%	0.166	0.159	0.171	0.169	0.007	-0.004	-0.003	-0.012*	-0.010*	0.001
	[0.003]	[0.004]	[0.004]	[0.004]						
Act bottom 40%	0.368	0.372	0.364	0.366	-0.004	0.004	0.001	0.008	0.005	-0.002
	[0.004]	[0.006]	[0.006]	[0.006]						
Use electricity	0.213	0.213	0.213	0.209	0.001	-0.000	0.004	-0.001	0.003	0.004
	[0.003]	[0.005]	[0.005]	[0.005]						
Pay fuel	0.591	0.584	0.589	0.580	0.007	0.002	0.011	-0.005	0.004	0.009
	[0.004]	[0.006]	[0.006]	[0.006]						
Gov capable	0.534	0.542	0.530	0.551	-0.008	0.004	-0.017**	0.012	-0.009	-0.021**
	[0.004]	[0.006]	[0.006]	[0.006]						
Trust gov	0.364	0.364	0.360	0.360	-0.000	0.003	0.004	0.004	0.004	0.001
	[0.004]	[0.006]	[0.006]	[0.006]						
Subsidies exist	0.551	0.547	0.544	0.549	0.005	0.008	0.002	0.003	-0.003	-0.006
	[0.004]	[0.006]	[0.006]	[0.006]						
Observations	14980	7577	7493	7593						
F-stat					1.336	0.690	1.253	1.262	0.863	1.098

This table shows that the background characteristics of respondents across treatment and control groups is balanced. These characteristics are age and sex (18-24yrs men vs 25yrs+ men vs 18-24yrs women vs 25yrs+ women), education (university educated vs below university), location (major cities vs rest of country), perceived income (perceive bottom 40 percent of income distribution vs perceive top 60 percent of income distribution), actual income (bottom 40 percent of income distribution vs top 60 percent of income distribution), energy use (use electricity vs otherwise, pay fuel vs otherwise), beliefs about government (believe government is capable vs otherwise, trust government vs otherwise) and believe subsidies exist (believe subsidies exist vs otherwise). ***, **, and * indicate whether differences in the means across the groups are significant at the 1, 5, and 10 percent critical level.

Table C2: Weighted treatment effects on unconditional support

	Reduce b/se/p	Eliminate b/se/p	Cost b/se/p	Index b/se/p
Any treatment	0.018*	0.028***	0.025***	0.050***
	(0.01)	(0.01)	(0.01)	(0.01)
	0.085	0.003	0.009	0.005
Efficiency treatment	0.020**	0.027**	0.027**	0.052**
	(0.01)	(0.01)	(0.01)	(0.02)
	0.045	0.013	0.045	0.017
Equity treatment	0.017	0.021***	0.017**	0.039***
	(0.01)	(0.00)	(0.01)	(0.01)
	0.118	0.000	0.049	0.000
Environment treatment	0.018	0.035**	0.031**	0.060*
	(0.02)	(0.01)	(0.01)	(0.03)
	0.316	0.032	0.019	0.051
p-value (Eff vs Equ)	0.740	0.465	0.467	0.449
p-value (Eff vs Env)	0.922	0.554	0.631	0.765
p-value (Equ vs Env)	0.932	0.342	0.302	0.444
Control Mean	0.436	0.264	0.307	
Observations	37036	37036	37036	

This table shows the overall, weighted (to match the age and sex of the general population) impact of the treatments on respondents' unconditional support for subsidy reform. The regression analysis is based on Equations (1) and (2). Robust standard errors are in parenthesis and p-values of each treatment coefficient are presented below the standard errors. In addition, the table includes p-values comparing differences between the coefficients of the treatments. See notes to Table 4.

Table C3: Weighted treatment effects on conditional support

	Cash all b/se/p	Cash poor b/se/p	Tax cuts b/se/p	Spend b/se/p	Debt b/se/p	Environ b/se/p	Quality b/se/p	Other b/se/p	Index b/se/p
Any treatment	-0.004	0.001	0.015**	0.005	0.014	0.005	0.016**	0.016***	0.019**
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
	0.551	0.915	0.019	0.127	0.106	0.250	0.015	0.000	0.035
Efficiency treatment	-0.018**	-0.012*	-0.008	-0.006	-0.005	-0.016***	0.002	0.009*	-0.014
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
	0.049	0.094	0.361	0.271	0.638	0.004	0.826	0.051	0.156
Equity treatment	-0.003	0.004	0.019***	0.007	0.018*	0.005	0.019***	0.020***	0.025***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.689	0.479	0.001	0.136	0.083	0.389	0.009	0.006	0.002
Environment treatment	0.008	0.008	0.031***	0.013	0.028**	0.024***	0.026***	0.018**	0.043**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.328	0.380	0.003	0.101	0.029	0.008	0.005	0.026	0.011
p-value (Eff vs Equ)	0.111	0.049	0.000	0.059	0.046	0.005	0.030	0.150	0.001
p-value (Eff vs Env)	0.013	0.079	0.001	0.052	0.013	0.000	0.012	0.342	0.002
p-value (Equ vs Env)	0.042	0.676	0.168	0.513	0.361	0.038	0.242	0.772	0.145
Control Mean	0.567	0.656	0.663	0.812	0.641	0.723	0.731	0.619	
Observations	37036	37036	37036	37036	37036	37036	37036	37036	

This table shows the overall, weighted (to match the age and sex of the general population) impact of the treatments on respondents' conditional support for subsidy reform. The regression analysis is based on Equations (1) and (2). Robust standard errors are in parenthesis and p-values of each treatment coefficient are presented below the standard errors. In addition, the table includes p-values comparing differences between the coefficients of the treatments. See notes to Table 5.

Table C4: Heterogeneous treatment effects on unconditional support (self interest)

	Reduce	Eliminate	Cost	Index
	b/se/p	b/se/p	b/se/p	b/se/p
Any treatment	0.013	0.027**	0.021**	0.043**
	(0.01)	(0.01)	(0.01)	(0.02)
	0.242	0.010	0.039	0.018
Benefit	-0.021	-0.033*	0.020	-0.024
	(0.02)	(0.02)	(0.01)	(0.03)
	0.184	0.074	0.184	0.418
Any treatment × Benefit	0.011	0.004	0.013	0.019
	(0.01)	(0.01)	(0.01)	(0.02)
	0.360	0.735	0.162	0.317
Any treatment	0.006	0.046***	0.041***	0.067***
	(0.02)	(0.01)	(0.01)	(0.02)
	0.755	0.000	0.001	0.002
Use energy	-0.013	0.024*	0.005	0.013
	(0.01)	(0.01)	(0.01)	(0.02)
	0.310	0.088	0.716	0.580
Any treatment × Use energy	0.016	-0.025*	-0.022	-0.023
	(0.02)	(0.01)	(0.01)	(0.02)
	0.434	0.056	0.136	0.346
Any treatment	0.021**	0.026***	0.025**	0.051***
	(0.01)	(0.01)	(0.01)	(0.02)
	0.036	0.008	0.017	0.008
Bottom 40%	-0.032*	-0.056*	-0.037*	-0.088**
	(0.01)	(0.03)	(0.02)	(0.04)
	0.054	0.058	0.056	0.049
Any treatment × Bottom 40%	-0.011	0.008	0.002	-0.000
	(0.01)	(0.01)	(0.01)	(0.01)
	0.177	0.278	0.781	0.995
Observations	37036	37036	37036	37036

This table shows the heterogeneous treatment effects (in terms of three dimensions of "self interest") on respondents' unconditional support for subsidy reform. The regression analysis is based on Equation (3). See notes to Table 4. *Benefit:* See Question 16, which asks respondents' how much they perceive they have benefited from energy subsidies. The variable takes on the value of 1 if the respondent selects a great deal, a lot or moderately, 0 otherwise. *Use energy:* See Questions 8 and 9, which asks respondents about the energy type they use for electricity and the most common type of transport used by their household. The variable takes on the value of 1 if the respondent selects an energy type that is subsidized in their country, 0 otherwise. *Bottom 40%:* See Question 7, which asks respondents about their households monthly income. The variable takes on the value of 1 if the respondent is from a household in the poorest 40 percent of the income distribution, 0 otherwise.

Table C5: Heterogeneous treatment effects on conditional support (Self interest)

	Cash all	Cash poor	Tax cut	Spend	Debt	Environ	Quality	Other	Index
	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p
Any treatment	-0.012	-0.006	0.017*	0.006	0.011	0.005	0.015*	0.012**	0.013
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.214	0.432	0.065	0.254	0.201	0.518	0.053	0.036	0.135
Benefit	-0.030**	-0.016	-0.014	-0.005	0.005	0.006	-0.007	-0.002	-0.017
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
	0.025	0.287	0.134	0.612	0.698	0.540	0.611	0.850	0.373
Any treatment × Benefit	0.014	0.008	-0.005	-0.002	0.010	-0.006	-0.003	0.004	0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
	0.225	0.585	0.652	0.849	0.512	0.586	0.774	0.702	0.720
Any treatment	-0.016	-0.003	0.021**	0.004	0.010	0.018**	0.020**	0.014	0.019
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.195	0.715	0.021	0.521	0.295	0.011	0.049	0.101	0.126
Use energy	0.009	0.012	0.002	-0.018	-0.017	0.014	-0.004	-0.003	-0.002
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
	0.485	0.418	0.894	0.101	0.295	0.231	0.584	0.862	0.912
Any treatment × Use energy	0.013	0.001	-0.008	0.001	0.006	-0.022*	-0.009	0.001	-0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.342	0.933	0.462	0.897	0.670	0.065	0.400	0.940	0.727
Any treatment	-0.012**	-0.007	0.016*	0.004	0.016	0.005	0.011**	0.020***	0.014
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
	0.028	0.169	0.072	0.286	0.150	0.461	0.046	0.001	0.110
Bottom 40%	-0.045*	-0.039	-0.018	-0.027*	-0.035	-0.027	-0.026	0.016	-0.056
	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)	(0.04)
	0.071	0.133	0.394	0.072	0.256	0.147	0.286	0.357	0.190
Any treatment × Bottom 40%	0.016	0.013*	-0.002	0.004	-0.002	-0.007	0.008	-0.017	0.004
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.115	0.076	0.875	0.549	0.781	0.485	0.353	0.114	0.748
Observations	37036	37036	37036	37036	37036	37036	37036	37036	37036

This table shows the heterogeneous treatment effects (in terms of three dimensions of "self interest") on respondents' conditional support for subsidy reform. The regression analysis is based on Equation (3). See notes to Tables 5 and C4.

Table C6: Heterogeneous treatment effects on unconditional support (Social contract)

	Reduce	Eliminate	Cost	Index
	b/se/p	b/se/p	b/se/p	b/se/p
Any treatment	0.020*	0.035***	0.028**	0.059***
	(0.01)	(0.01)	(0.01)	(0.02)
	0.093	0.002	0.015	0.006
Trust	0.131***	0.112***	0.141***	0.271***
	(0.02)	(0.02)	(0.02)	(0.03)
	0.000	0.000	0.000	0.000
Any treatment × Trust	-0.009	-0.016	-0.007	-0.022
	(0.01)	(0.01)	(0.01)	(0.02)
	0.519	0.142	0.634	0.359
Any treatment	0.021**	0.026**	0.020*	0.048**
	(0.01)	(0.01)	(0.01)	(0.02)
	0.042	0.022	0.070	0.025
Capable	-0.000	-0.029*	-0.010	-0.029
	(0.01)	(0.01)	(0.01)	(0.02)
	0.987	0.053	0.395	0.227
Any treatment × Capable	-0.008	0.004	0.010	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
	0.245	0.651	0.341	0.769
Any treatment	0.025**	0.030***	0.032***	0.061***
	(0.01)	(0.01)	(0.01)	(0.01)
	0.024	0.001	0.001	0.001
Right	-0.068***	-0.074**	-0.046**	-0.133**
	(0.02)	(0.03)	(0.02)	(0.05)
	0.006	0.018	0.046	0.014
Any treatment × Right	-0.021**	-0.003	-0.018*	-0.029
	(0.01)	(0.01)	(0.01)	(0.02)
	0.039	0.838	0.097	0.131
Observations	37036	37036	37036	37036

This table shows the heterogeneous treatment effects (in terms of three dimensions of the "social contract") on respondents' unconditional support for subsidy reform. The regression analysis is based on Equation (3). See notes to Table 4. *Trust:* See Question 12, which asks respondents' the extent to which they believe the government can be trusted to do what is right. The variable takes on the value of 1 if the respondent selects strongly agree or agree, 0 otherwise. *Capable:* See Question 11, which asks respondents how much they believe their government can do to assist households with the cost of living. The variable takes on the value of 1 if the respondent selects a lot or some things, 0 otherwise. *Right:* See Question 17, which asks respondents about how much they believe they are entitled to receive energy subsidies. The variable takes on the value of 1 if the respondent selects a great deal, a lot or moderately, 0 otherwise.

Table C7: Heterogeneous treatment effects on conditional support (social contract)

	Cash all	Cash poor	Tax cut	Spend	Debt	Environ	Quality	Other	Index
	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p
Any treatment	-0.006	-0.004	0.011	0.007*	0.020**	0.011	0.014*	0.016**	0.019
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.447	0.561	0.183	0.072	0.049	0.110	0.095	0.041	0.127
Trust	0.110***	0.093***	0.065***	0.046***	0.098***	0.099***	0.069***	0.055***	0.172***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)
	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.004	0.000
Any treatment × Trust	0.000	0.004	0.012	-0.004	-0.015	-0.023**	0.001	-0.004	-0.009
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
	0.994	0.744	0.230	0.576	0.237	0.029	0.963	0.756	0.619
Any treatment	-0.001	-0.001	0.018*	0.007	0.018*	-0.002	0.014	0.012*	0.018
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.864	0.946	0.053	0.185	0.060	0.726	0.211	0.053	0.130
Capable	0.007	0.022**	0.014	0.031***	0.030***	0.018**	0.029**	0.021	0.048***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.434	0.045	0.306	0.002	0.006	0.013	0.012	0.127	0.005
Any treatment × Capable	-0.010	-0.004	-0.006	-0.003	-0.006	0.009	-0.001	0.005	-0.004
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.461	0.790	0.617	0.662	0.586	0.230	0.963	0.594	0.767
Any treatment	-0.009	-0.007	0.011	0.003	0.012	0.001	0.010	0.018***	0.011
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
	0.328	0.315	0.113	0.269	0.110	0.850	0.151	0.002	0.290
Right	0.055***	0.036**	0.004	0.001	-0.011	-0.001	0.009	-0.007	0.022
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
	0.007	0.024	0.854	0.968	0.565	0.908	0.525	0.526	0.404
Any treatment × Right	0.006	0.013	0.011	0.006	0.008	0.003	0.012	-0.011	0.013
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
	0.549	0.338	0.430	0.379	0.582	0.823	0.363	0.400	0.508
Observations	37036	37036	37036	37036	37036	37036	37036	37036	37036

This table shows the heterogeneous treatment effects (in terms of three dimensions of the "social contract") on respondents' conditional support for subsidy reform . The regression analysis is based on Equation (3). See notes to Tables 5 and C6.

Table C8: Heterogeneous treatment effects on unconditional support (knowledge)

	Reduce	Eliminate	Cost	Index
	b/se/p	b/se/p	b/se/p	b/se/p
Any treatment	0.006	0.030***	0.022*	0.042**
	(0.01)	(0.01)	(0.01)	(0.02)
	0.658	0.007	0.075	0.038
Subsidies exist	0.077***	0.075***	0.103***	0.180***
	(0.01)	(0.01)	(0.01)	(0.02)
	0.000	0.000	0.000	0.000
Any treatment × Subsidies exist	0.021	-0.003	0.006	0.016
	(0.01)	(0.01)	(0.01)	(0.02)
	0.127	0.724	0.591	0.369
Any treatment	0.017	0.035***	0.032***	0.060***
	(0.01)	(0.01)	(0.01)	(0.01)
	0.117	0.000	0.001	0.000
University	-0.003	-0.000	0.002	-0.000
	(0.02)	(0.01)	(0.01)	(0.03)
	0.849	0.998	0.874	0.988
Any treatment × University	0.000	-0.011	-0.010	-0.015
	(0.01)	(0.01)	(0.01)	(0.02)
	0.990	0.412	0.222	0.501
Any treatment	0.015	0.032***	0.030***	0.055***
	(0.01)	(0.01)	(0.01)	(0.02)
	0.277	0.004	0.004	0.007
Full primer	-0.003	0.001	0.005	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
	0.721	0.936	0.395	0.866
Any treatment × Full primer	0.004	-0.007	-0.009	-0.009
	(0.01)	(0.01)	(0.01)	(0.02)
	0.756	0.554	0.411	0.666
Observations	37036	37036	37036	37036

This table shows the heterogeneous treatment effects (in terms of three dimensions of "knowledge") on respondents' unconditional support for subsidy reform. The regression analysis is based on Equation (3). See notes to Table 4. *Subsidies exist:* See Question 14, which asks respondents' the whether they believe subsidies exist in their country. The variable takes on the value of 1 if the respondent selects yes, 0 otherwise. *University:* See Question 3, which asks respondents the level of education they have completed. The variable takes on the value of 1 if the respondent selects university, 0 otherwise. *Full primer:* See Question 15, which allocates respondents to either receive a full primer or partial primer (see Appendix A for details). The variable takes on the value of 1 if the respondent was allocated to receive a full primer, 0 otherwise.

Table C9: Heterogeneous treatment effects on conditional support (knowledge)

	Cash all	Cash poor	Tax cut	Spend	Debt	Environ	Quality	Other	Index
	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p
Any treatment	-0.004	-0.003	0.010	0.005	0.005	0.000	0.013	0.014*	0.011
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.670	0.665	0.265	0.482	0.546	0.991	0.103	0.088	0.179
Subsidies exist	0.046**	0.039*	0.050**	0.054***	0.060***	0.068***	0.061***	0.083***	0.126***
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
	0.039	0.089	0.011	0.001	0.004	0.004	0.002	0.000	0.002
Any treatment × Subsidies exist	-0.004	0.000	0.008	0.000	0.018	0.004	0.001	0.000	0.007
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.727	0.978	0.540	0.968	0.118	0.705	0.916	0.991	0.593
Any treatment	-0.003	0.004	0.006	0.002	0.022*	-0.007	0.014	0.010	0.013
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.691	0.623	0.556	0.741	0.053	0.362	0.128	0.363	0.368
University	-0.030	-0.027	-0.006	0.008	0.012	-0.001	0.014	0.015	-0.003
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.03)
	0.127	0.209	0.739	0.525	0.563	0.941	0.452	0.298	0.921
Any treatment × University	-0.005	-0.010	0.014	0.006	-0.011	0.016	-0.001	0.008	0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.586	0.217	0.239	0.509	0.354	0.191	0.945	0.587	0.738
Any treatment	-0.001	-0.003	0.017**	0.003	0.009	0.001	0.008	0.015**	0.013*
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.887	0.478	0.044	0.509	0.266	0.886	0.167	0.019	0.066
Full primer	-0.005	-0.005	0.001	-0.007	-0.011	-0.001	-0.007	0.010	-0.007
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	0.633	0.560	0.878	0.361	0.142	0.893	0.396	0.144	0.604
Any treatment × Full primer	-0.011	0.002	-0.005	0.005	0.012	0.003	0.011	-0.002	0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
	0.463	0.891	0.654	0.501	0.303	0.730	0.316	0.815	0.793
Observations	37036	37036	37036	37036	37036	37036	37036	37036	37036

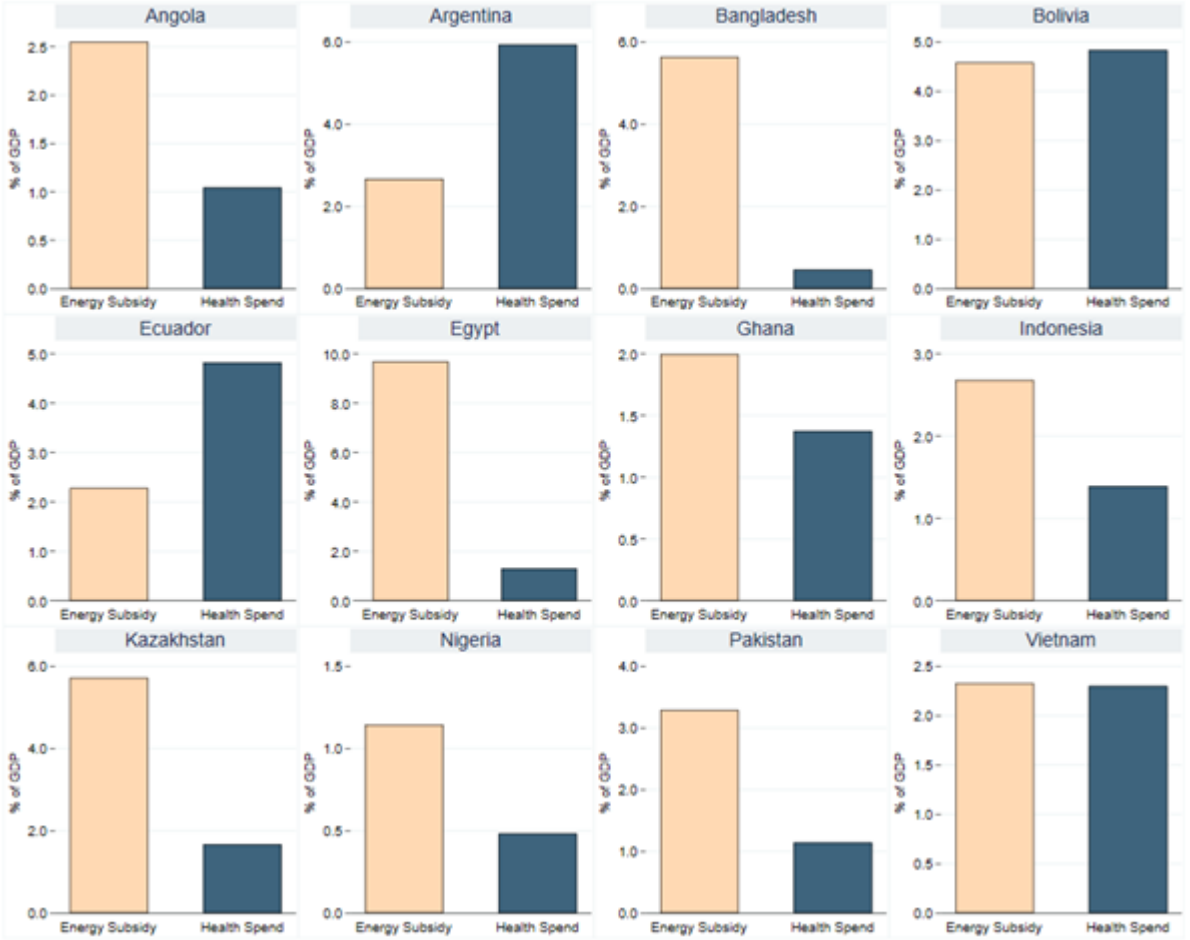
This table shows the heterogeneous treatment effects (in terms of three dimensions of "knowledge") on respondents' conditional support for subsidy reform . The regression analysis is based on Equation (3). See notes to Tables 5 and C8.

Table C10: Treatment impact on respondents' views about the survey being biased

	Bias b/se/p
Any treatment	0.006*
	(0.00)
	0.099
Efficiency treatment	0.002
	(0.00)
	0.664
Equity treatment	0.012*
	(0.01)
	0.071
Environment treatment	0.004
	(0.00)
	0.403
p-value (Eff vs Equ)	0.171
p-value (Eff vs Env)	0.689
p-value (Equ vs Env)	0.316
Control Mean	0.244
Observations	37036

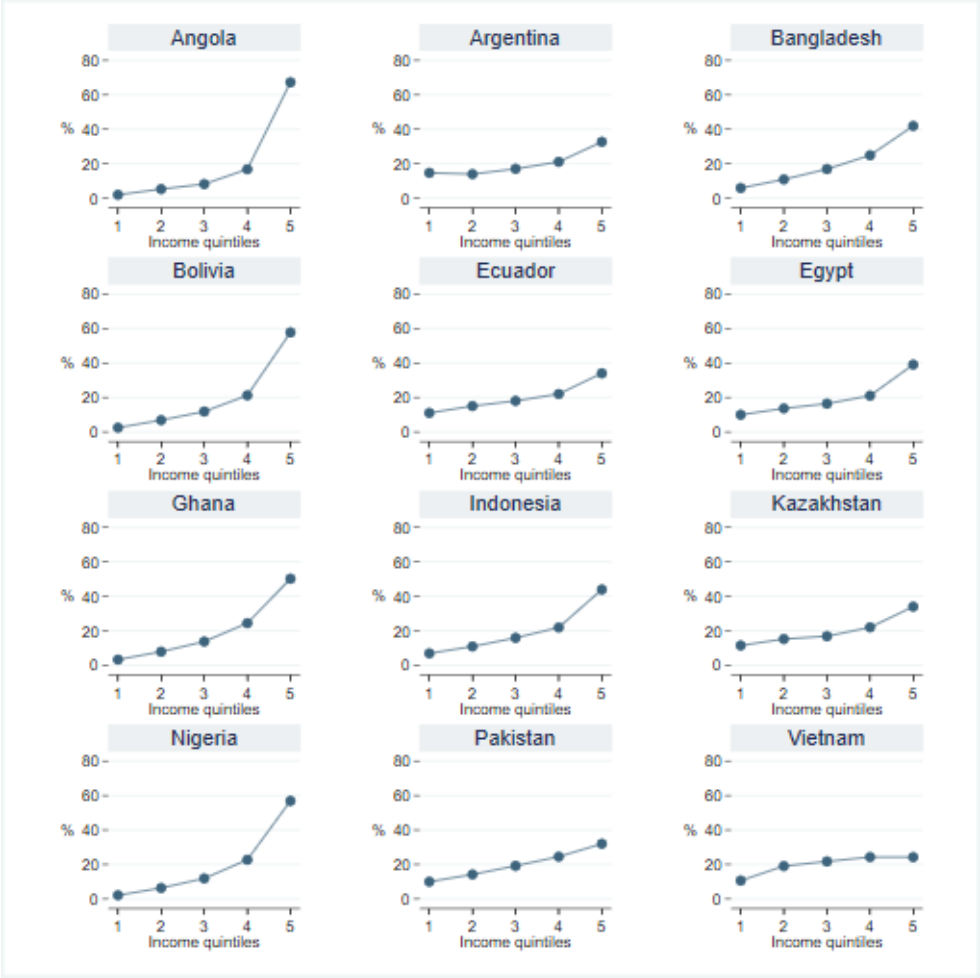
This table shows the impact of the treatments on respondents' views about the survey being biased. The regression analysis is based on Equations (1) and (2). Robust standard errors are in parenthesis and p-values of each treatment coefficient are presented below the standard errors. In addition, the table includes p-values comparing differences between the coefficients of the treatments. See notes to Table 4. *Bias:* See Question 30, which asks respondents' their views about whether the survey is biased. The variable takes on the value of 1 if the respondent selects yes, 0 otherwise.

FIGURE C1: Energy subsidy spending relative to health care spending in these 12 countries



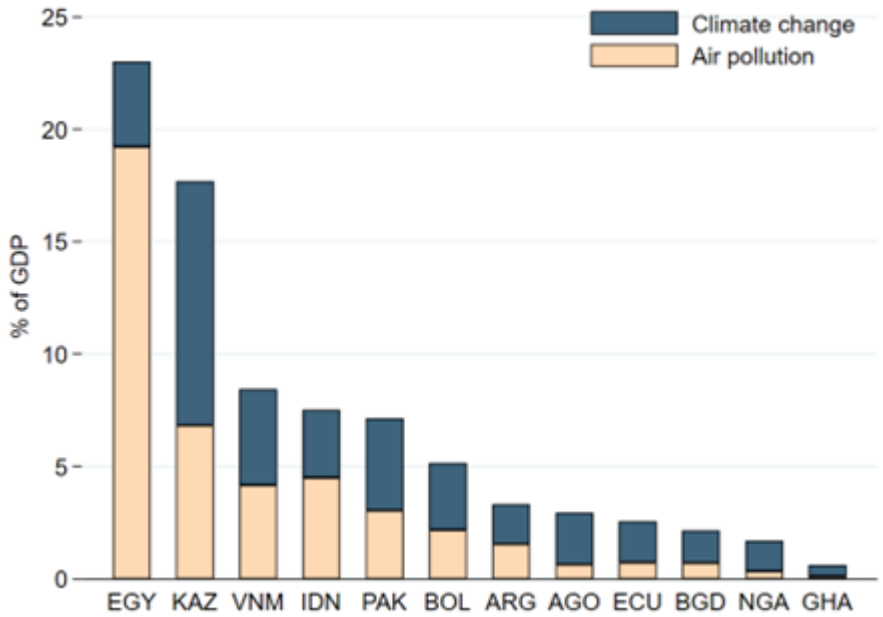
Note: This figure shows the levels of government spending on energy subsidies and health care as a share of GDP. Sourced from IEA (2023) and WDI (2023).

FIGURE C2: Distribution of energy subsidy spending across income quintiles in these 12 countries



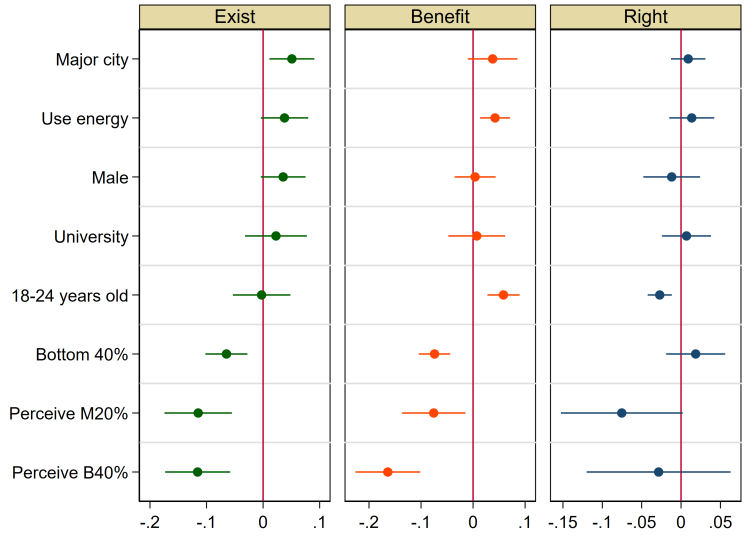
Note: This figure shows the distribution of energy subsidies across income quintiles in six countries where data is publicly available. Quintile 1 is the poorest and Quintile 5 is the richest. Sourced from the most recent Household Income and Expenditure Surveys in these countries.

FIGURE C3: Implicit climate change and air pollution costs from energy subsidies in these 12 countries



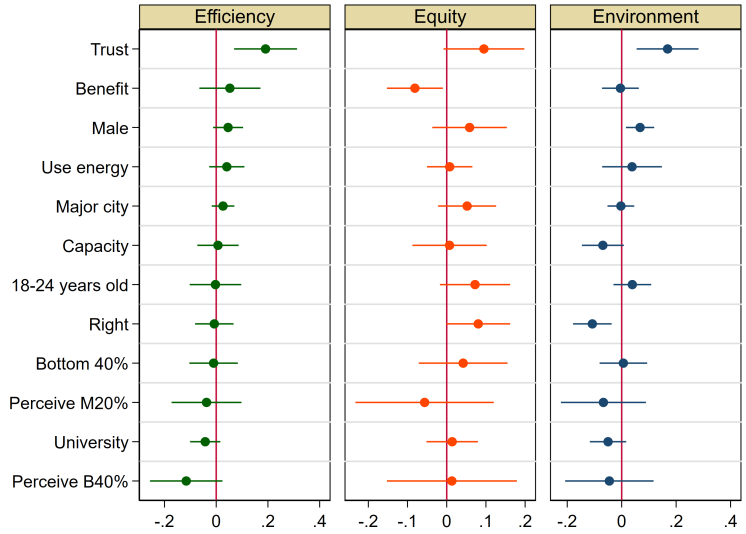
Note: This figure shows the "implicit cost" as a share of GDP of energy subsidies in terms of the negative impact on climate change and air pollution. Sourced from IMF (2021). *ARG:* Argentina. *ECU:* Ecuador. *BOL:* Bolivia. *IDN:* Indonesia. *KAZ:* Kazakhstan. *AGO:* Angola. *NGA:* Nigeria. *VNM:* Vietnam. *BGD:* Bangladesh. *EGY:* Egypt. *GHA:* Ghana. *PAK:* Pakistan.

FIGURE C4: Respondent characteristics associated with believing energy subsidies exist, that their household benefits from these subsidies and their household has a right to receive these subsidies



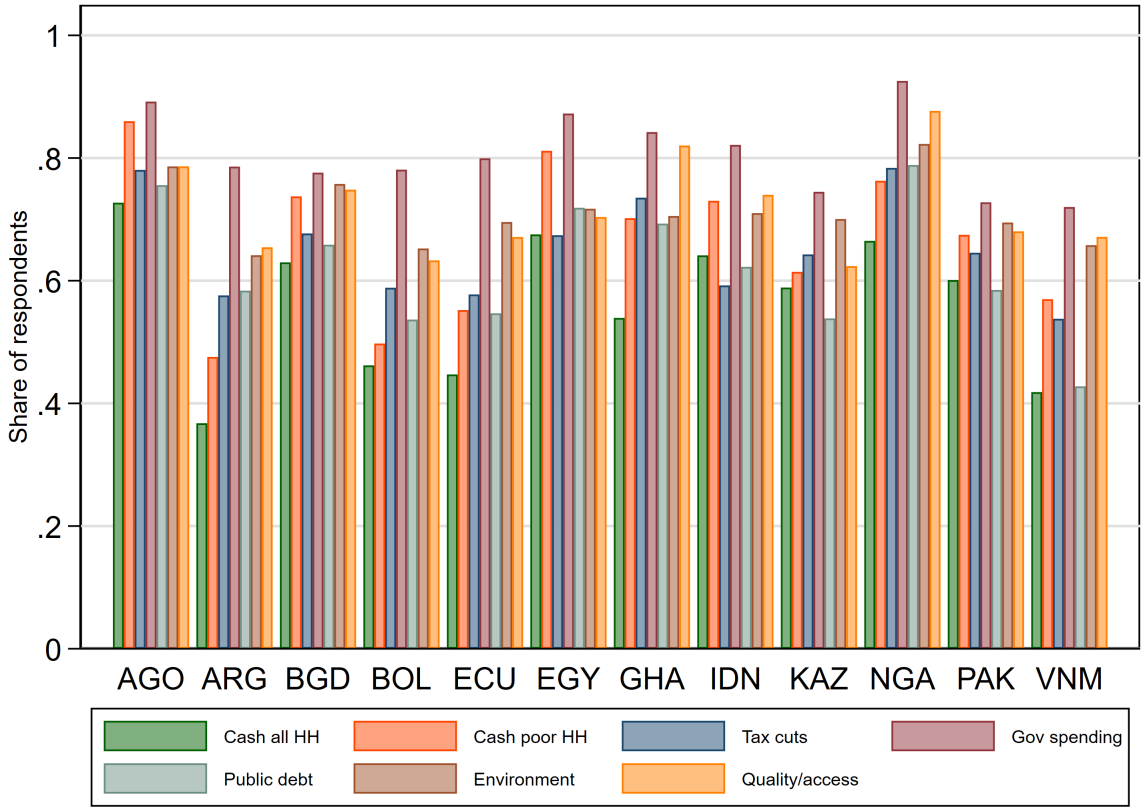
Note: This figure shows the characteristics of respondents associated with believing energy subsidies exist, that their household benefits from these subsidies and their household has a right to receive these subsidies. Specifically, it shows the results of an OLS regression where the dependent variable is a dummy variable taking on the value of 1 if the respondent believes subsidies exist, that their household benefits from these subsidies or their household has a right to receive these subsidies, and 0 otherwise (see Question 14, 16 and 17). The independent variables are dummy variables for the following characteristics of respondents: sex (Male), age (Aged between 18-34 years), location (Lives in Largest city/cities), education (University level education), energy use (Uses subsidized energy source), perceived income (Perceived their HH to be in middle quintile and Perceived their HH to be in bottom 40 percent) and actual income (HH in bottom 40 percent).

FIGURE C5: Characteristics associated with knowledge about the negative impact of energy subsidies



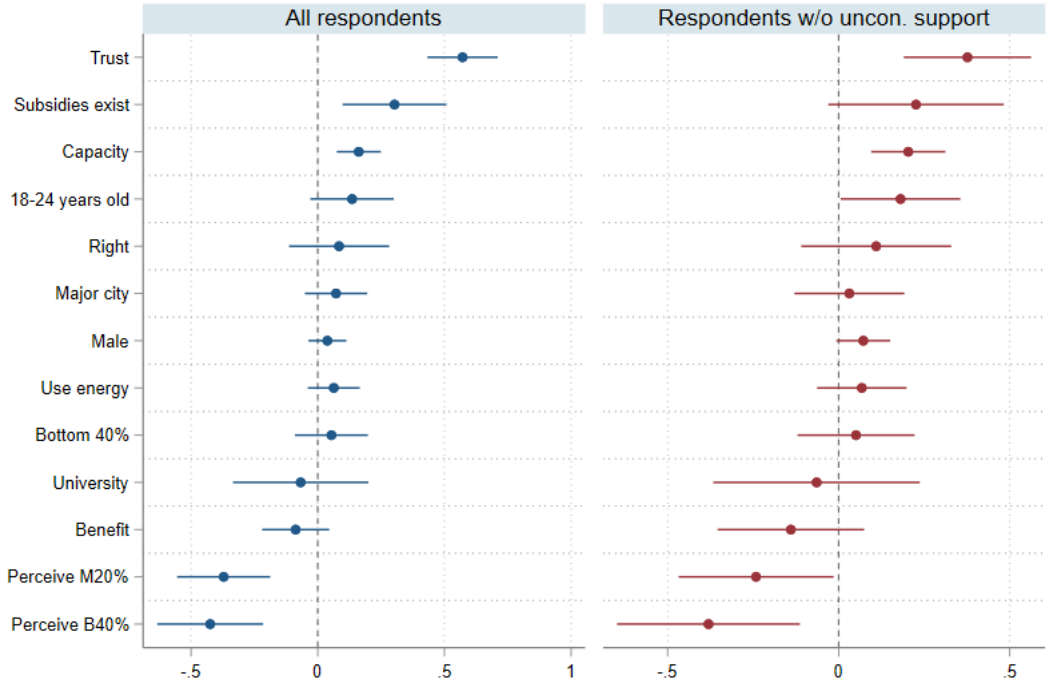
Note: This figure shows the characteristics of respondents associated with knowledge about the negative impact of energy subsidies. It shows the results of an OLS regression where the dependent variable takes on the value of 1 if the respondent believes subsidies cost more than healthcare, mainly go to richer households or damage the environment, and 0 otherwise (see Question 18). *Trust:* See Question 12, which asks respondents' the extent to which they believe the government can be trusted to do what is right. The variable takes on the value of 1 if the respondent selects strongly agree or agree, 0 otherwise. *Benefit:* See Question 16, which asks respondents' how much they perceive they have benefited from energy subsidies. The variable takes on the value of 1 if the respondent selects a great deal, a lot or moderately, 0 otherwise. *Capable:* See Question 11, which asks respondents how much they believe their government can do to assist households with the cost of living. The variable takes on the value of 1 if the respondent selects a lot or some things, 0 otherwise. *Right:* See Question 17, which asks respondents about how much they believe they are entitled to receive energy subsidies. The variable takes on the value of 1 if the respondent selects a great deal, a lot or moderately, 0 otherwise. *Use energy:* See Questions 8 and 9, which asks respondents about the energy type they use for electricity and the most common type of transport used by their household. The variable takes on the value of 1 if the respondent selects an energy type that is subsidized in their country, 0 otherwise. See notes to Figure C4.

FIGURE C6: Levels of conditional support for energy subsidy reform in each country



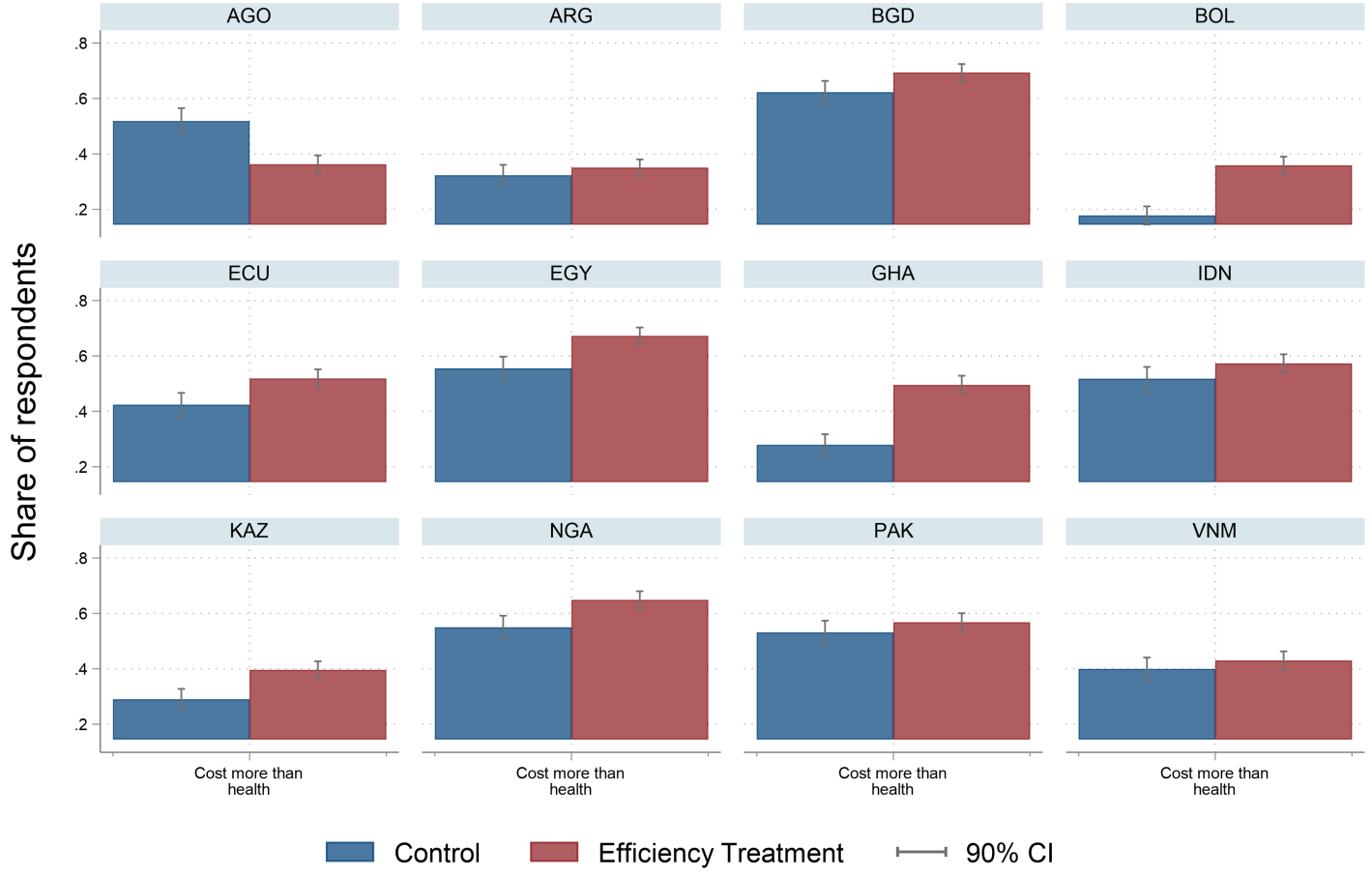
Note: This figure shows the levels of conditional support for energy subsidy reform in each country. *ARG:* Argentina. *ECU:* Ecuador. *BOL:* Bolivia. *IDN:* Indonesia. *KAZ:* Kazakhstan. *AGO:* Angola. *NGA:* Nigeria. *VNM:* Vietnam. *BGD:* Bangladesh. *EGY:* Egypt. *GHA:* Ghana. *PAK:* Pakistan.

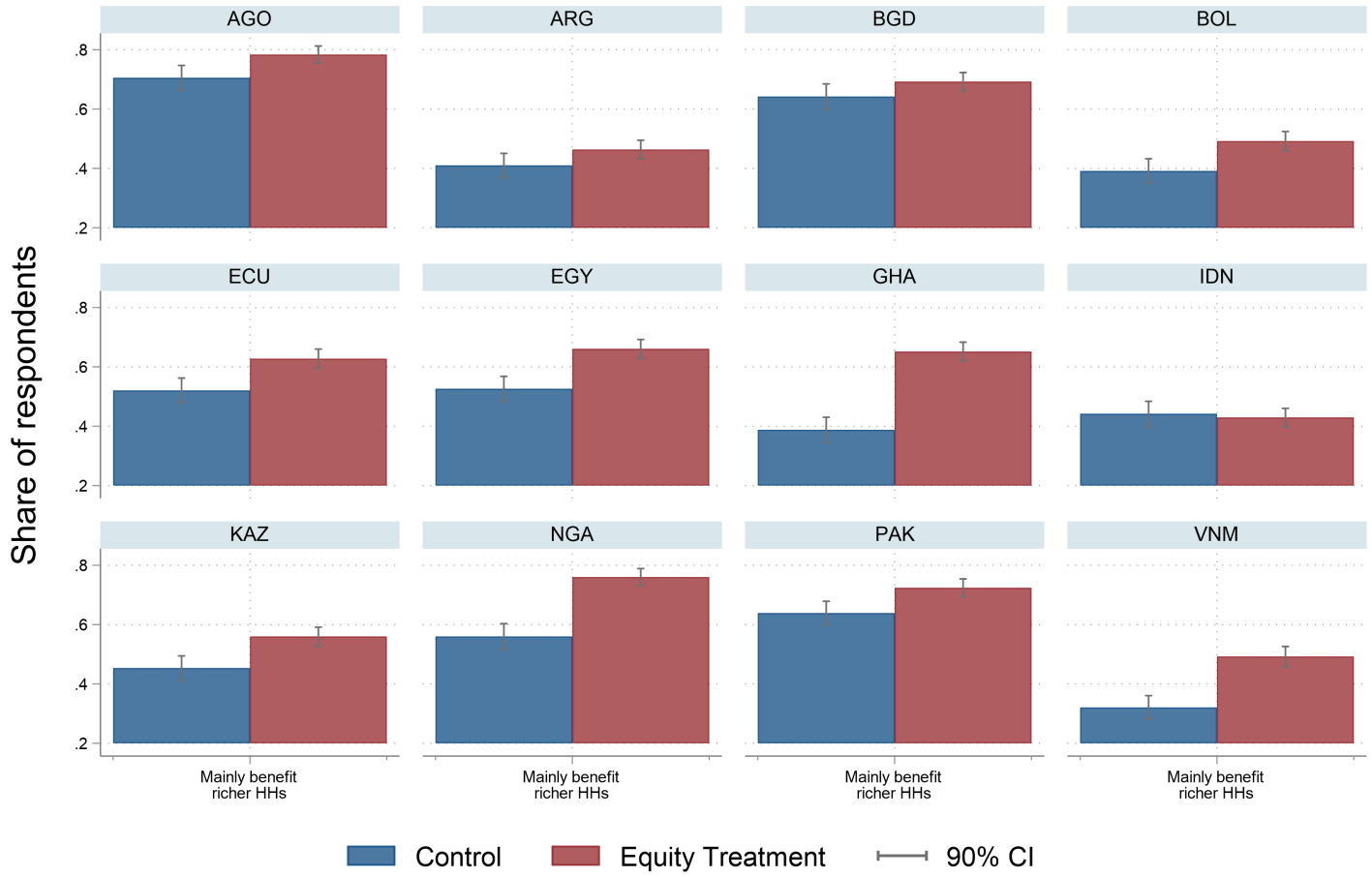
FIGURE C7: Characteristics associated with conditional support for energy subsidy reform

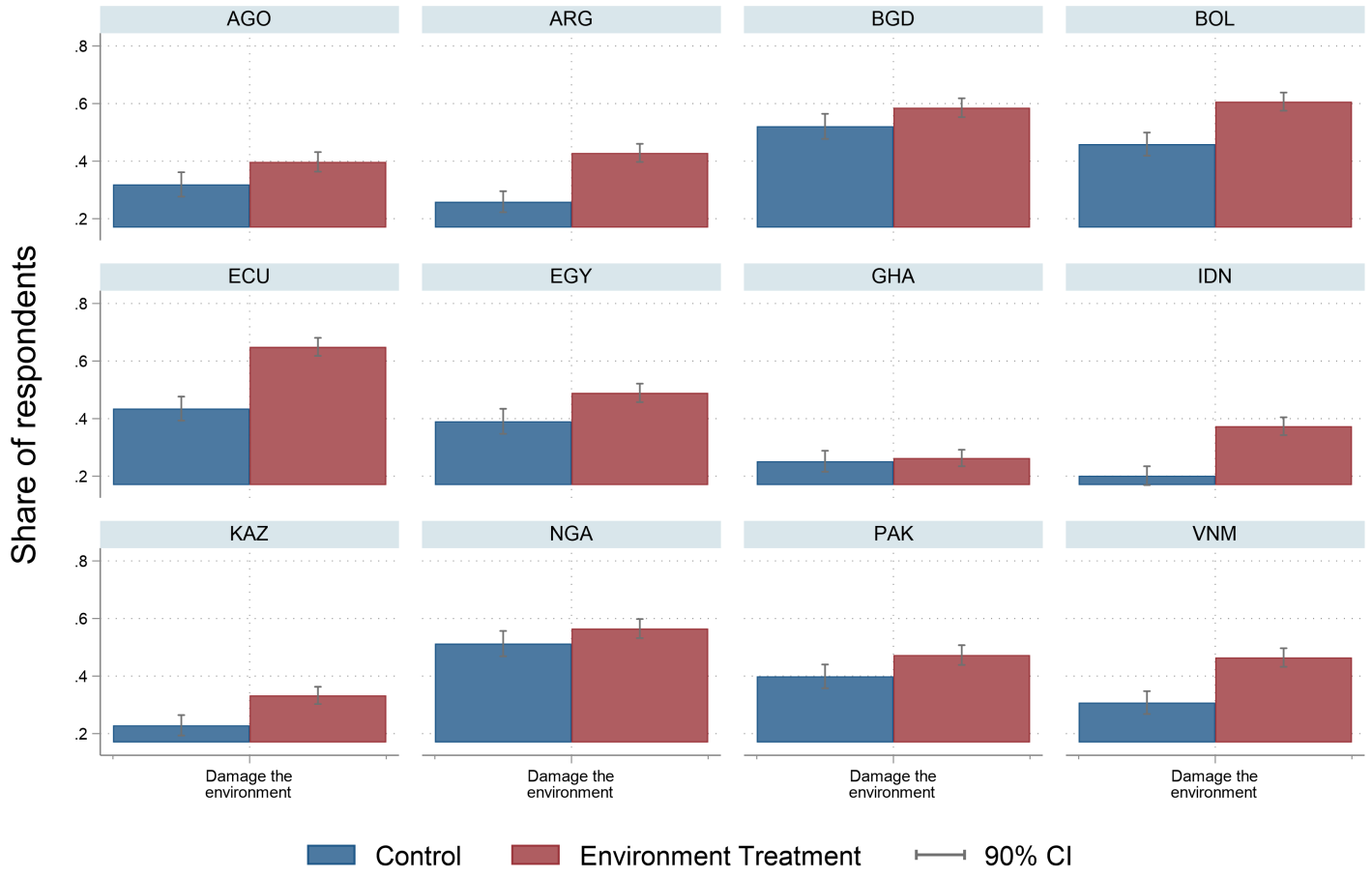


Note: This figure shows the characteristics associated with conditional support for energy subsidy reform for all respondents (Panel A) and respondents that do not have unconditional support (Panel B). Specifically, it shows the results of an OLS regression where the dependent variable is the number of alternative policy measures that respondents selected they would support in Question 25 (on a scale from 0 to 7). See notes to Figures C4 and C5.

FIGURE C8: First-stage treatment effects in each country

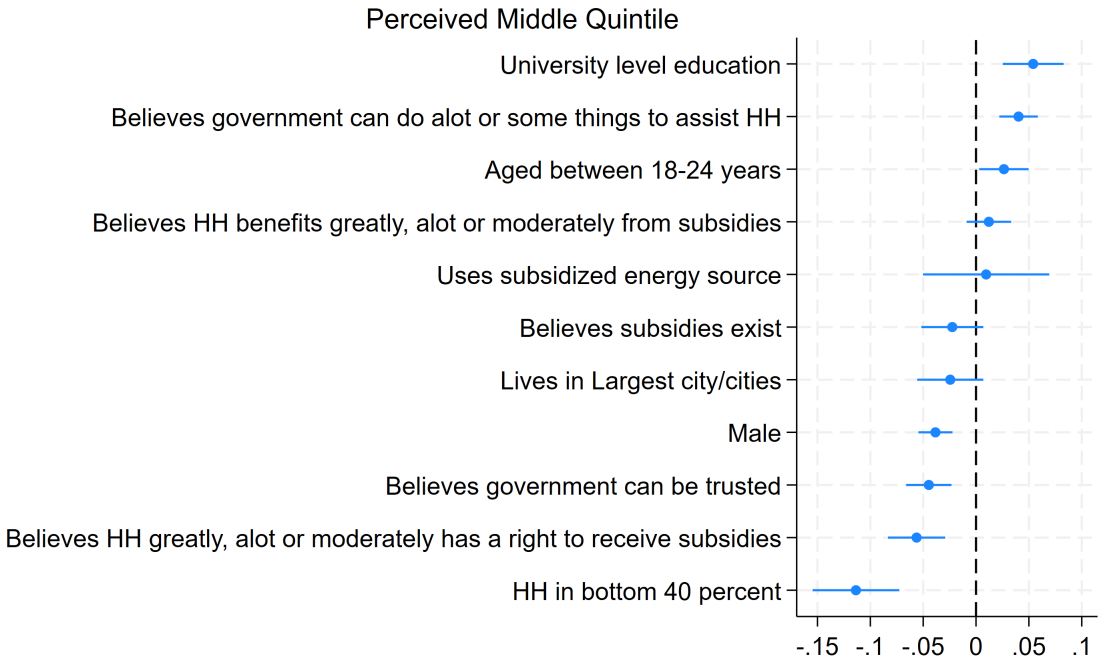



AGO
ARG
BGD
BOL
ECU
EGY
GHA
IDN
KAZ
NGA
PAK
VNM
Share of respondents
.2
.4
.6
.8
Mainly benefit richer HHs
Control
Equity Treatment
90% CI



Note: This figure shows the first stage treatment effects for each treatment in each country. *ARG:* Argentina. *ECU:* Ecuador. *BOL:* Bolivia. *IDN:* Indonesia. *KAZ:* Kazakhstan. *AGO:* Angola. *NGA:* Nigeria. *VNM:* Vietnam. *BGD:* Bangladesh. *EGY:* Egypt. *GHA:* Ghana. *PAK:* Pakistan.

FIGURE C9: Characteristics associated with perceiving oneself to be middle-class



Note: This figure shows the characteristics of respondents associated with perceiving oneself as middle class (defined as selecting the middle quintile in the national income distribution). Specifically, it shows the results of an OLS regression where the dependent variable is a dummy variable taking on the value of 1 if the respondent selected their household belongs to the middle quintile of the national income distribution and 0 otherwise (see Question 24 and Q25). See notes to Figure C1 and C4.

Appendix D - Analysis of Open-Ended Survey Questions

This document summarizes the methodology behind the analysis of the two open-ended questions in the survey (Q26b and Q31) and presents the additional results. The analysis closely follows the suggested approaches by Ferrario and Stantcheva (2022). The exact wording of the two open-ended questions is as follows.

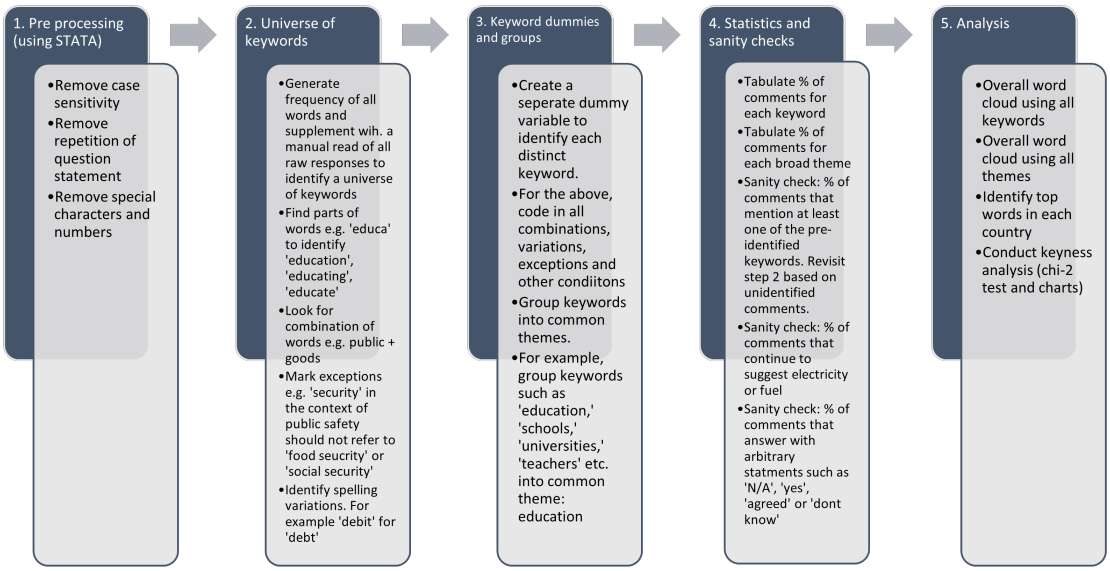
Q26b: Please complete the following sentence: "I would support a reduction in electricity and fuel subsidies if the government immediately spent the resources on"
Q31: Please feel free to give us any feedback, comments, or thoughts you have regarding this survey in the field below

D1. Methodology

D1.1 Overview

For each open-ended question, we aimed to identify relevant keywords from the raw open-ended answers. This was a challenging task as there were tens of thousands of responses across different countries and languages. We approach the task by taking multiple steps, the first of which is to translate all responses into English. This is followed by basic text-cleaning operations with an automated word frequency identification tool to list keywords. We then supplement this step with a careful manual scan of responses. This scan allows us to iteratively improve the quality of keyword identification and better capture the intention of each response. Each of these steps in identifying keywords is shown in Figure D1.

FIGURE D1: Summary of methodology used to analyze open-ended responses



Note: This figure illustrates the process that was used to move from the raw open-ended responses to the results.

D1.2 Linking responses to keywords

Table D1 shows that we were able to successfully link 91 percent of the responses to Q26b to a keyword. A small proportion (3 percent) of these include responses that continued to propose electricity and fuel subsidies as the alternative and about 6 percent of comments also answered with tangential remarks such as "N/A" or other irrelevant responses such as 'I will support' or 'agreed.' These types of answers suggest that respondents did not meaningfully understand the question and consequently, they were discarded. This leaves the vast majority of non-missing responses (81 percent) being able to be linked with keywords and used for further analysis.

Table D1: Success rate of linking responses to keywords for Q26b

	Count	% non-missing obs	% all obs
Linked with at least one keyword	19050	81	51
Keywords that mention energy	800	3	2
Unrelated comments	1557	7	4
Total linked responses	21407	91	57
Total unlinked responses	2238	9	6
Total non-missing responses	23645	100	63
No response to Q26b	13998		37
Total observations	37643		100

This table shows the success rate of linking responses to keywords for Q26b.

Table D2 shows that we were relatively less successful in linking responses to Q31 relative to Q26b. This is in large part due to the more nuanced nature of responses that we observe in the former. In addition, we also observe more digression from the question in Q31. Nevertheless, around three out of four non-missing responses were able to be linked with keywords and used for further analysis.

Table D2: Success rate of linking responses to keywords for Q31

	Count	% non-missing obs	% all obs
Total linked responses	15997	76	42
Total unlinked responses	4932	24	13
Total non-missing responses	20929	100	56
No response to Q31	16714		44
Total observations	37643		100

This table shows the success rate of linking responses to keywords for Q31.

D1.3 From keywords to themes

We were able to identify a total of 423 keywords in Q26b and 208 keywords in Q31, which were subsequently grouped into 25 themes per question. These keywords varied considerably in their scope. Many keywords, while identified distinctly, often hint towards similar ideas. For example, 'hospitals' and 'medicine,' point to a very similar purpose even though they are marked as individual keywords in our sample. Moreover, responses, especially to Q26b, vary greatly in their specificity. They range from specific comments such as 'hospitals' and 'bridges' to very broad responses such as 'on the country' or 'citizens.' Consequently, it made sense to group similar keywords in both questions into common themes. This allows us to conduct aggregated analysis, especially on key-ness tests, without compromising the spirit of the respondents' intentions.

D2. Additional results

D2.1 Word clouds

Figures D2 (and Figure 9 in the body of the paper) show the most mentioned keywords and aggregated themes to Q26b. Responses are dominated by suggestions for investment in human capital, such as health or education. Additionally, there are a considerable number of general remarks on national welfare such as "for the people" or "for the country." Keywords and themes linked to initiatives fostering employment generation and infrastructure investment also feature prominently, followed by intermittent references to environmental concerns and green energy.

FIGURE D2: Main themes identified in responses to Q26b

Note: This figure presents the main themes that were identified in responses to Q26b.

Figures D3 and D4 show the most mentioned keywords and aggregated themes for Q31. In general, the overwhelming majority of responses were positive (shown in green), where the word 'good' used in the context of 'good survey' was a standout. Several other keywords suggesting praise and gratitude were common. Some version of refusal to comment was the most common theme in neutral keywords (highlighted in blue). Keywords that indicated negativity were rare, but of these, there were two overarching themes: the first indicated some presence of bias and the second suggested some improvement to the survey instrument, with the specific comments asking for more questions. These are highlighted in orange.

FIGURE D3: Main keywords identified in responses to Q31

Note: This figure presents the main keywords that were identified in responses to Q31.

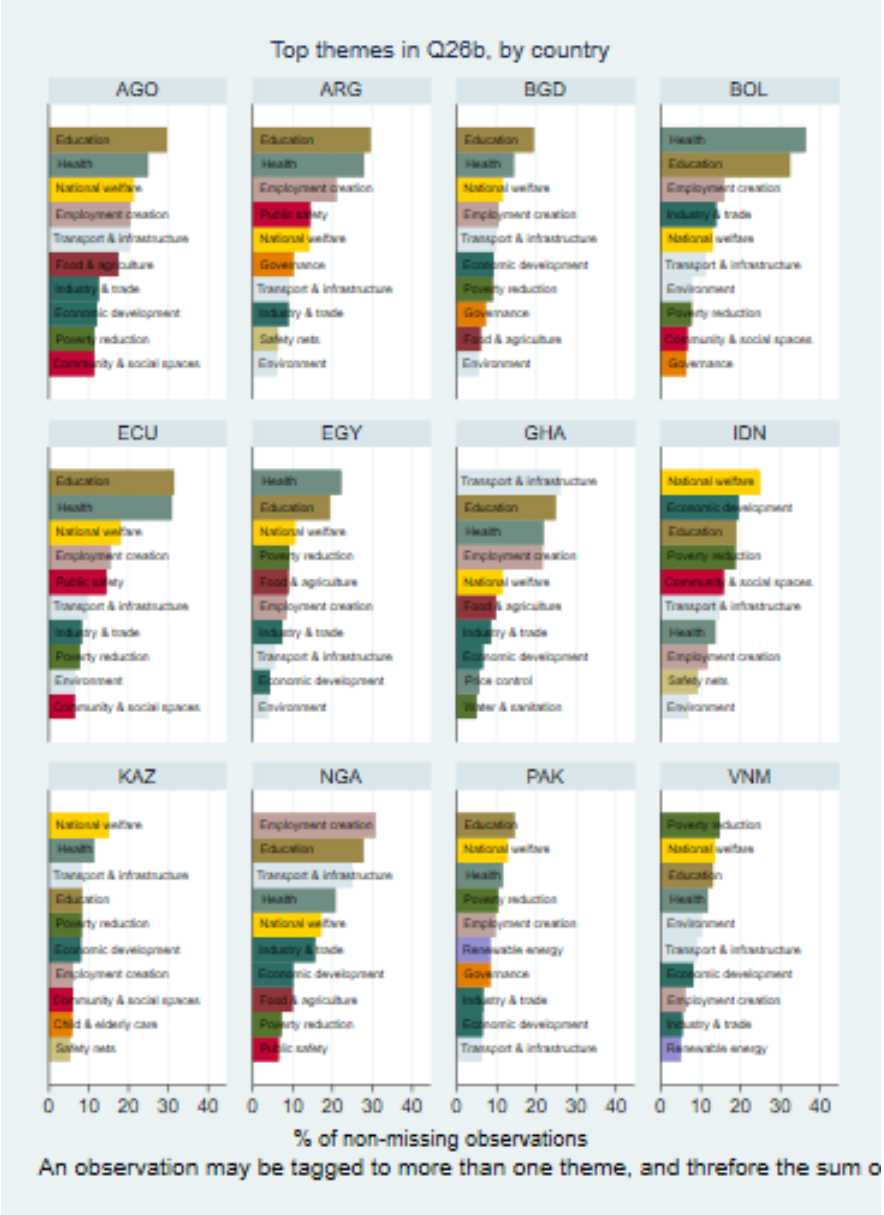
FIGURE D4: Main themes identified in responses to Q31

Note: This figure presents the main themes that were identified in responses to Q31.

D2.2 Topical analysis by country

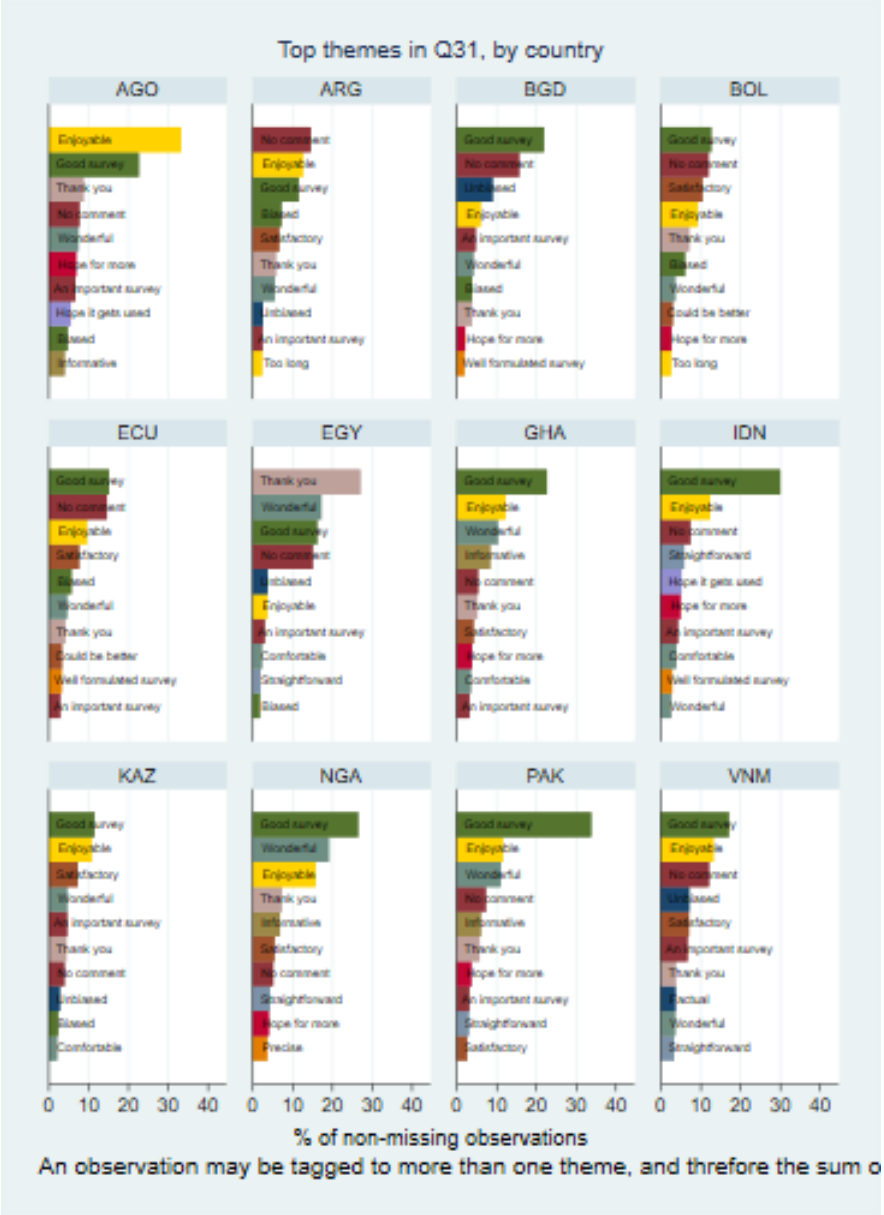
There was little variation in the main ideas in Q26b and Q31 across the countries in our sample. This can be seen in Figure D5, where we analyze the dominant themes in Q26b in each country, revealing shrinking similarities. Education, health, and employment creation feature very prominently in each country. Figure D6 shows there were no major cross-country differences in the main themes of responses to Q31.

FIGURE D5: Main themes identified in responses to Q26b in each country



Note: This figure presents the main themes that were identified in responses to Q26b in each country.

FIGURE D6: Main themes identified in responses to Q31 in each country

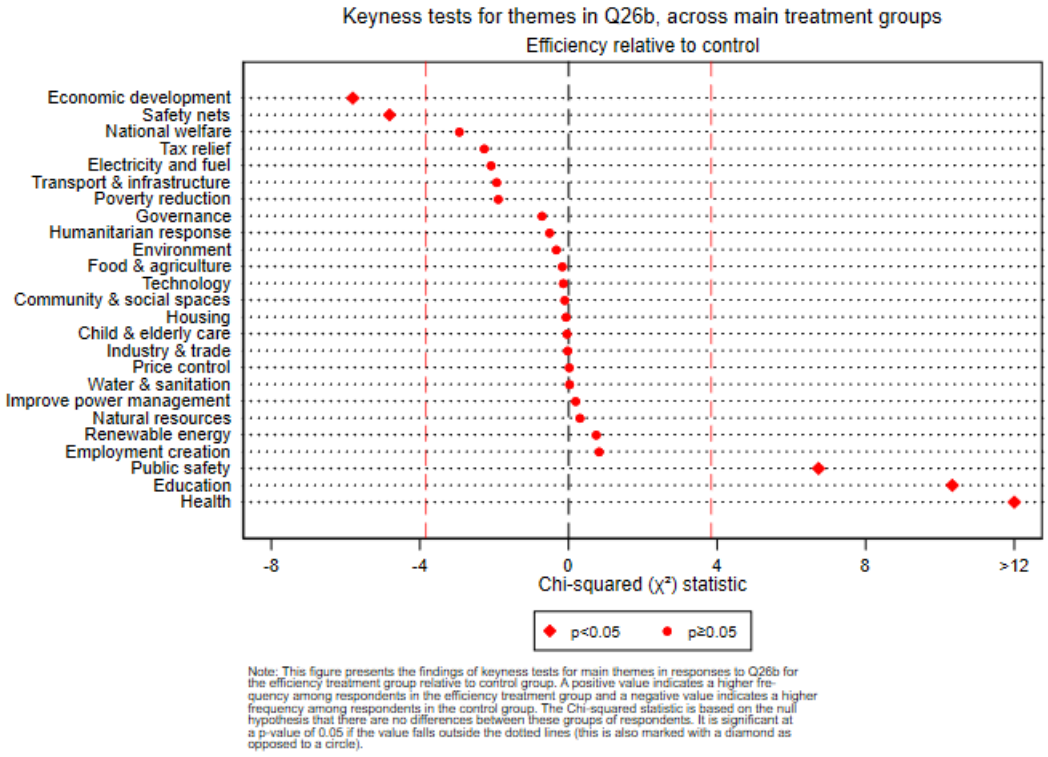


Note: This figure presents the main themes that were identified in responses to Q31 in each country.

D2.3 Keyness Test for Treatment groups relative to Control

We perform keyness (chi-square) tests to examine the variations in main themes across responses assigned to the various treatment groups. We observe that individuals within each of the treatment cohorts exhibit responses to Q26b that illustrate there were "first stage" effects of each treatment. In comparison to the control group, the efficiency treatment group disproportionally highlights healthcare spending as their preferred alternative to electricity and fuel subsidy funds in Q26b (see Figure D7).

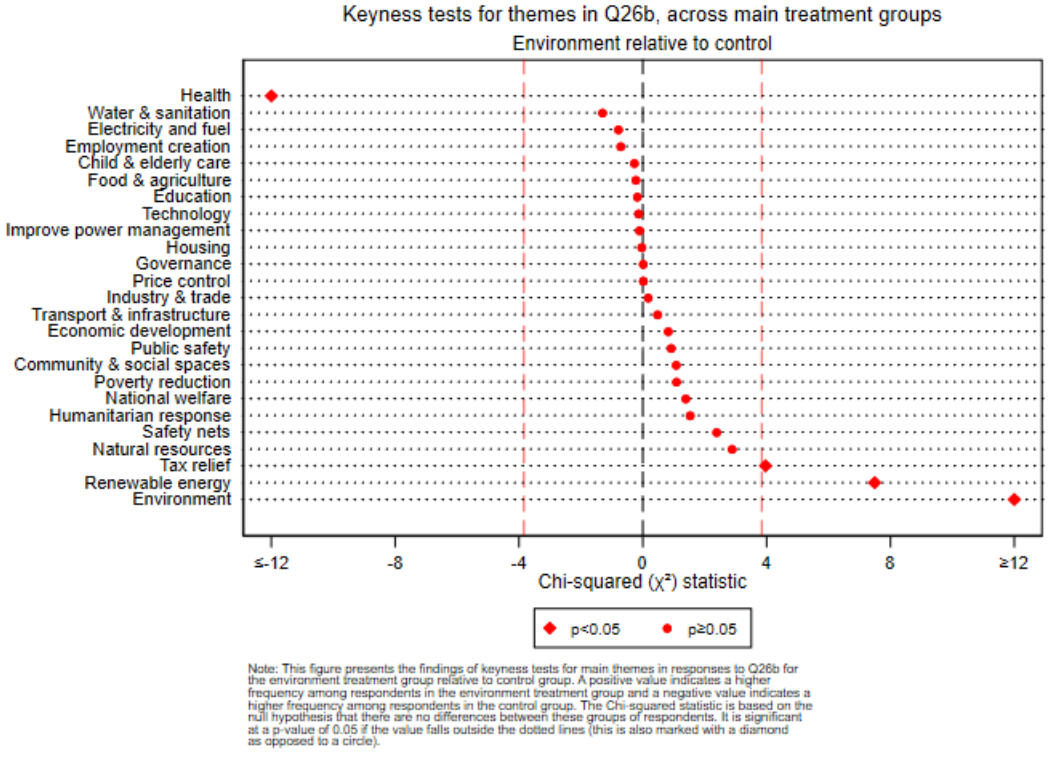
FIGURE D7: Keyness tests for main themes in responses to Q26b for the efficiency treatment group relative to control group



Note: This figure presents the findings of keyness tests for main themes in responses to Q26b for the efficiency treatment group relative to control group. A positive value indicates a higher frequency among respondents in the efficiency treatment group and a negative value indicates a higher frequency among respondents in the control group. The Chi-squared statistic is based on the null hypothesis that there are no differences between these groups of respondents. It is significant at a p-value of 0.05 if the value falls outside the dotted lines (this is also marked with a diamond as opposed to a circle).

In comparison to the control group, the environment treatment group disproportionally highlights the environment (keywords: environment, nature, trees, etc.) and renewable energy (keywords: solar, wind, hydro, etc.) as the most prominent themes in Q26b (see Figure D8).

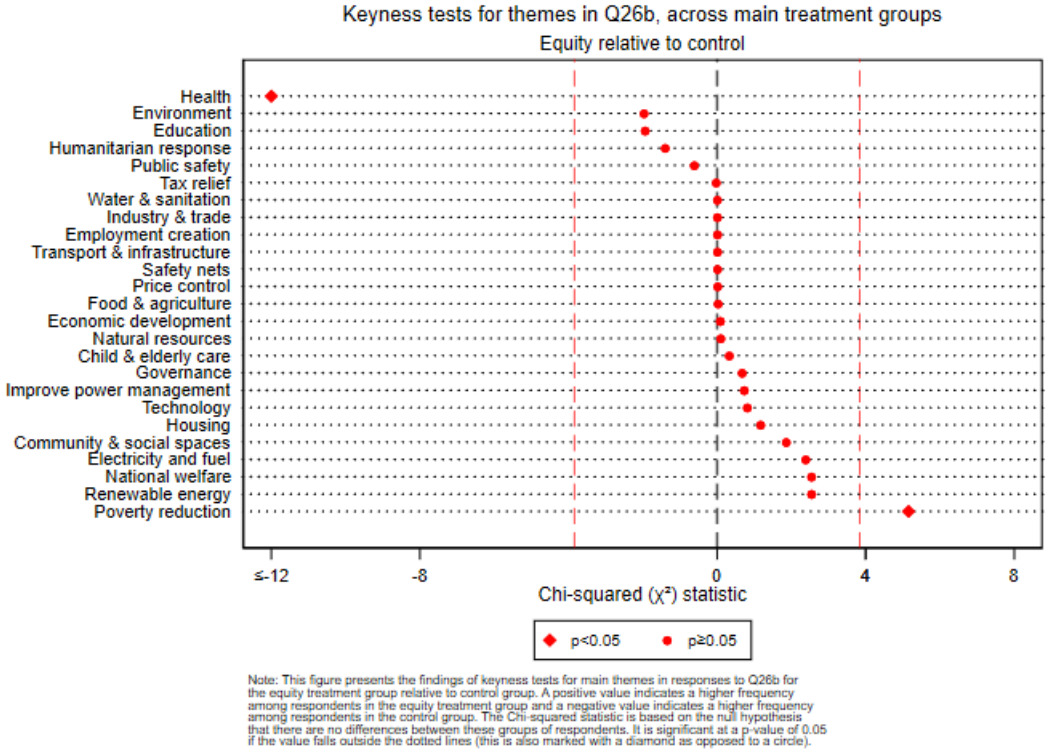
FIGURE D8: Keyness tests for main themes in responses to Q26b for the environment treatment group relative to control group



Note: This figure presents the findings of keyness tests for main themes in responses to Q26b for the environment treatment group relative to control group. A positive value indicates a higher frequency among respondents in the environment treatment group and a negative value indicates a higher frequency among respondents in the control group. The Chi-squared statistic is based on the null hypothesis that there are no differences between these groups of respondents. It is significant at a p-value of 0.05 if the value falls outside the dotted lines (this is also marked with a diamond as opposed to a circle).

In comparison to the control group, the equity treatment group disproportionally highlights keywords related to poverty reduction (e.g., "help the poor", "towards those in need", "those with less privilege") (see Figure D9).

FIGURE D9: Keyness tests for main themes in responses to Q26b for the equity treatment group relative to control group



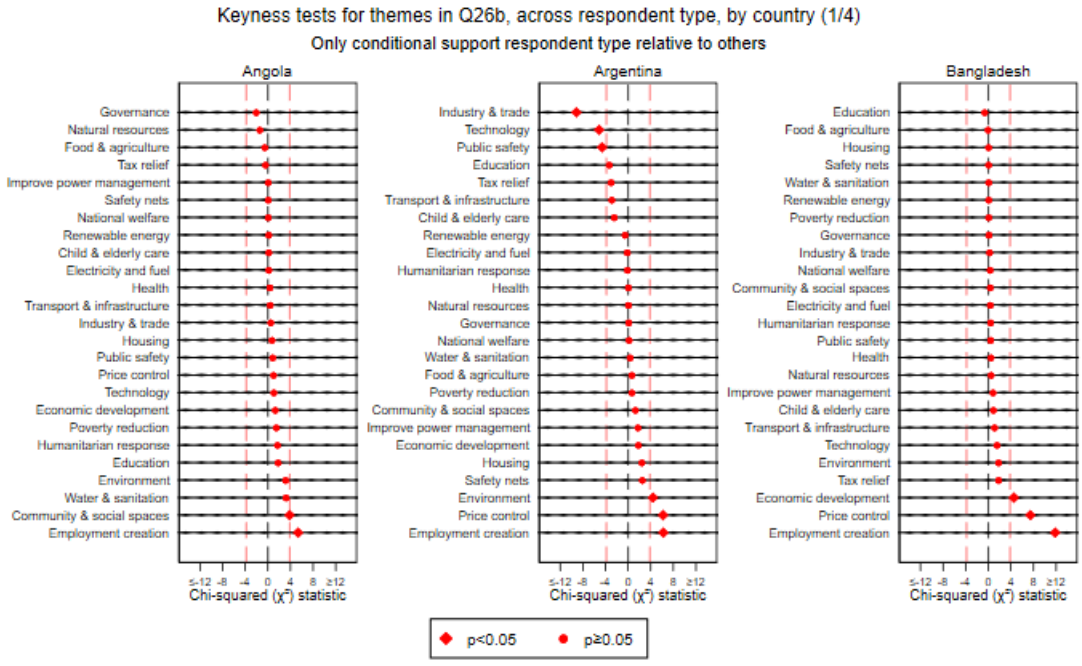
Note: This figure presents the findings of keyness tests for main themes in responses to Q26b for the equity treatment group relative to control group. A positive value indicates a higher frequency among respondents in the equity treatment group and a negative value indicates a higher frequency among respondents in the control group. The Chi-squared statistic is based on the null hypothesis that there are no differences between these groups of respondents. It is significant at a p-value of 0.05 if the value falls outside the dotted lines (this is also marked with a diamond as opposed to a circle).

We find no significant differences across the main treatment groups in terms of main themes of responses to Q31.

D2.4 Keyness Test by respondent type for each country

We perform keyness (chi-square) tests to examine variations in main themes across responses to Q26b based on whether respondents had unconditional or only conditional support for energy subsidy reform. Figure 10 in the body of the paper shows the overall results of this analysis and Figure D10 presents the country-level results.

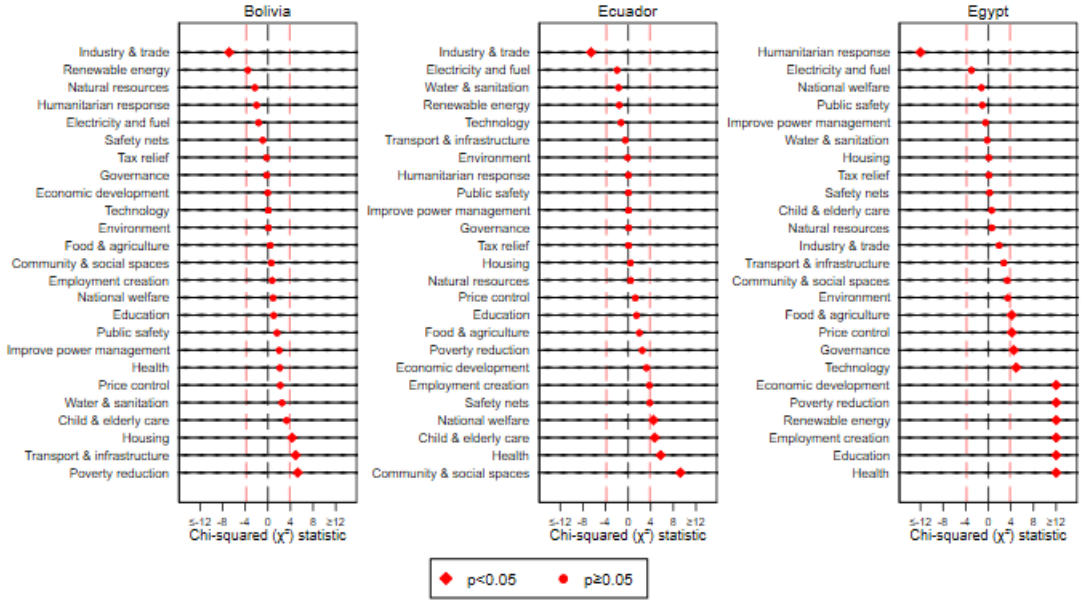
FIGURE D10: Keyness tests for main themes in responses to Q26b for respondents split based on whether they had unconditional or only conditional support for energy subsidy reform in each country



Note: This figure presents the findings of keyness tests for main themes in responses to Q26b for respondents split based on whether they had unconditional or only conditional support for energy subsidy reform in each country. A positive value indicates a higher frequency among respondents that only conditionally support reforms and a negative value indicates a higher frequency among respondents that unconditionally support reforms. The Chi-squared statistic is based on the null hypothesis that there are no differences between these groups of respondents. It is significant at a p-value of 0.05 if the value falls outside the dotted lines (this is also marked with a diamond as opposed to a circle).

Keyness tests for themes in Q26b, across respondent type, by country (2/4)

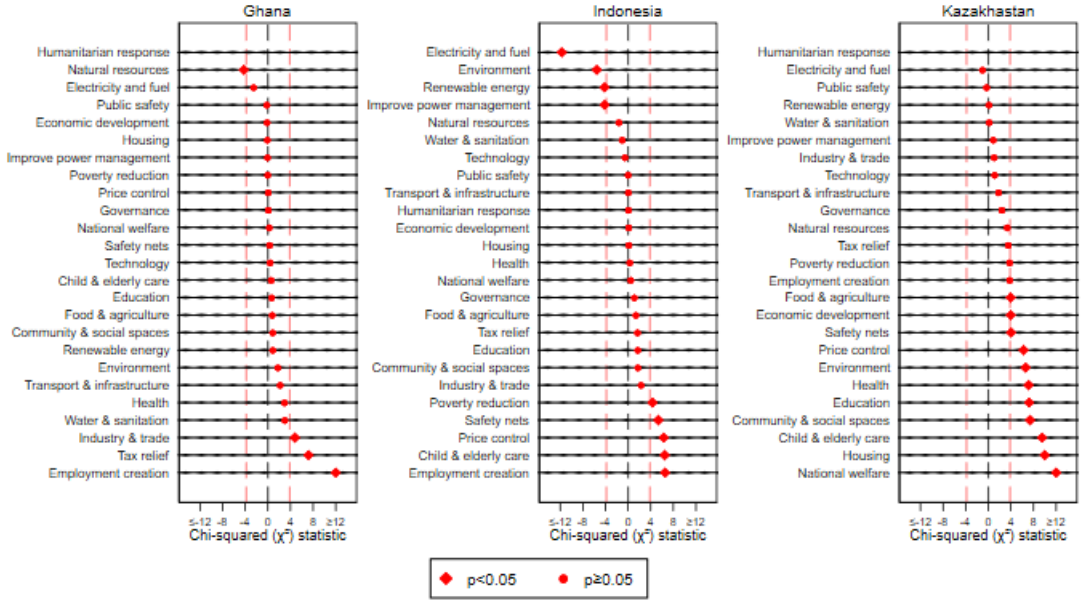
Only conditional support respondent type relative to others



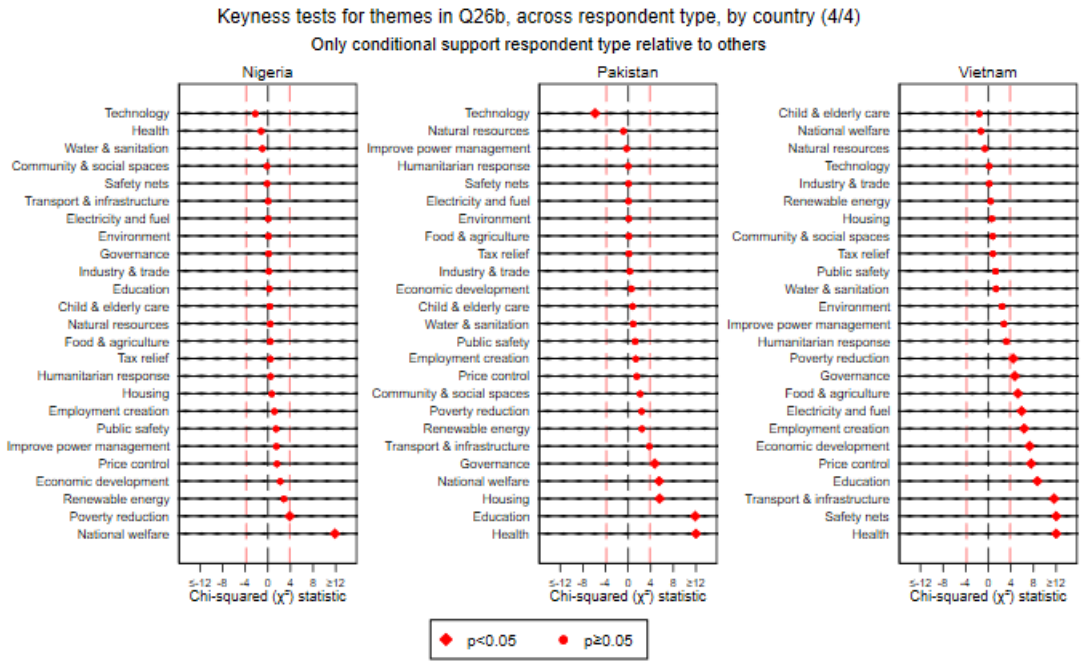
Note: This figure presents the findings of keyness tests for main themes in responses to Q26b for respondents split based on whether they had unconditional or only conditional support for energy subsidy reform in each country. A positive value indicates a higher frequency among respondents that only conditionally support reforms and a negative value indicates a higher frequency among respondents that unconditionally support reforms. The Chi-squared statistic is based on the null hypothesis that there are no differences between these groups of respondents. It is significant at a p-value of 0.05 if the value falls outside the dotted lines (this is also marked with a diamond as opposed to a circle).

Keyness tests for themes in Q26b, across respondent type, by country (3/4)

Only conditional support respondent type relative to others



Note: This figure presents the findings of keyness tests for main themes in responses to Q26b for respondents split based on whether they had unconditional or only conditional support for energy subsidy reform in each country. A positive value indicates a higher frequency among respondents that only conditionally support reforms and a negative value indicates a higher frequency among respondents that unconditionally support reforms. The Chi-squared statistic is based on the null hypothesis that there are no differences between these groups of respondents. It is significant at a p-value of 0.05 if the value falls outside the dotted lines (this is also marked with a diamond as opposed to a circle).



Note: This figure presents the findings of keyness tests for main themes in responses to Q26b for respondents split based on whether they had unconditional or only conditional support for energy subsidy reform in each country. A positive value indicates a higher frequency among respondents that only conditionally support reforms and a negative value indicates a higher frequency among respondents that unconditionally support reforms. The Chi-squared statistic is based on the null hypothesis that there are no differences between these groups of respondents. It is significant at a p-value of 0.05 if the value falls outside the dotted lines (this is also marked with a diamond as opposed to a circle).