A collage of typical climate and weather-related events: floods, heatwaves, drought, hurricanes, wildfires and loss of glacial ice. (NOAA)

ASIA AND PACIFIC DEPARTMENT

Public Perceptions of Climate Mitigation Policies: Evidence from Cross Country Surveys

Era Dabla-Norris and Giacomo Magistretti

with Salma Khalid, Hibah Khan, Alexandre Sollaci, Thomas Helbling, and Krishna Srinivasan

IMF-STI LAUNCH

FEBRUARY 10, 2023

The challenge of climate mitigation

- Urgent need to narrow gaps in climate mitigation **ambitions** and **policy**
- Growing public awareness of climate threat, but doesn't always translate into actions
- High energy prices could further complicate mitigation efforts

This paper: understand drivers of public perceptions of climate change and support for climate policies

- Novel surveys for 28 advanced and emerging market economies; run *July 5 - Aug 11, 2022*
- Related studies: OECD (Dechezleprete et al., 2022), UNDP (2021), Leiserowitz et al. (2021)

Survey structure

Representative surveys on more than 28,000 respondents (>1000 per country)

Background of Respondent: Socio-economic Characteristics, Political views and Habits
Gender, age, income, employment status, education, family situation, views on trust and role of government, source of news, ownership of cars and transport used…

Climate Risk Perceptions and Knowledge: Understanding of Urgency and Impact and Policy Awareness
How serious a problem is climate change, who is it impacting, what has your government done, have you heard about specific climate policies…

Open Ended Question
What should a good climate policy aim to achieve?

Views on Climate Policies: Carbon Tax, Emissions Trading, Subsidies and Regulations (priming/ self interest)
Effectiveness, who will gain or lose, distributional impact, perceived fairness, views on co-benefits, support and opposition for specific policies

Control:
No new information

Treatment:
Specific information given regarding climate policy effectiveness

International Dimension and Willingness to Change Behavior:
Who should pay and effectiveness of collective action; your behavior vs. community's behavior

- Standardized surveys run by YouGov (translated into local language as needed); online representative only in many emerging market countries.

Roadmap

Climate Risk Perceptions

- Drivers of climate risk perceptions

Support for Emission-Reducing Policies

- Prior knowledge and key concerns
- Drivers of support for carbon pricing

Information Treatments and International Burden Sharing

Policy Implications and Conclusions

Roadmap

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Information Treatments and International Burden Sharing

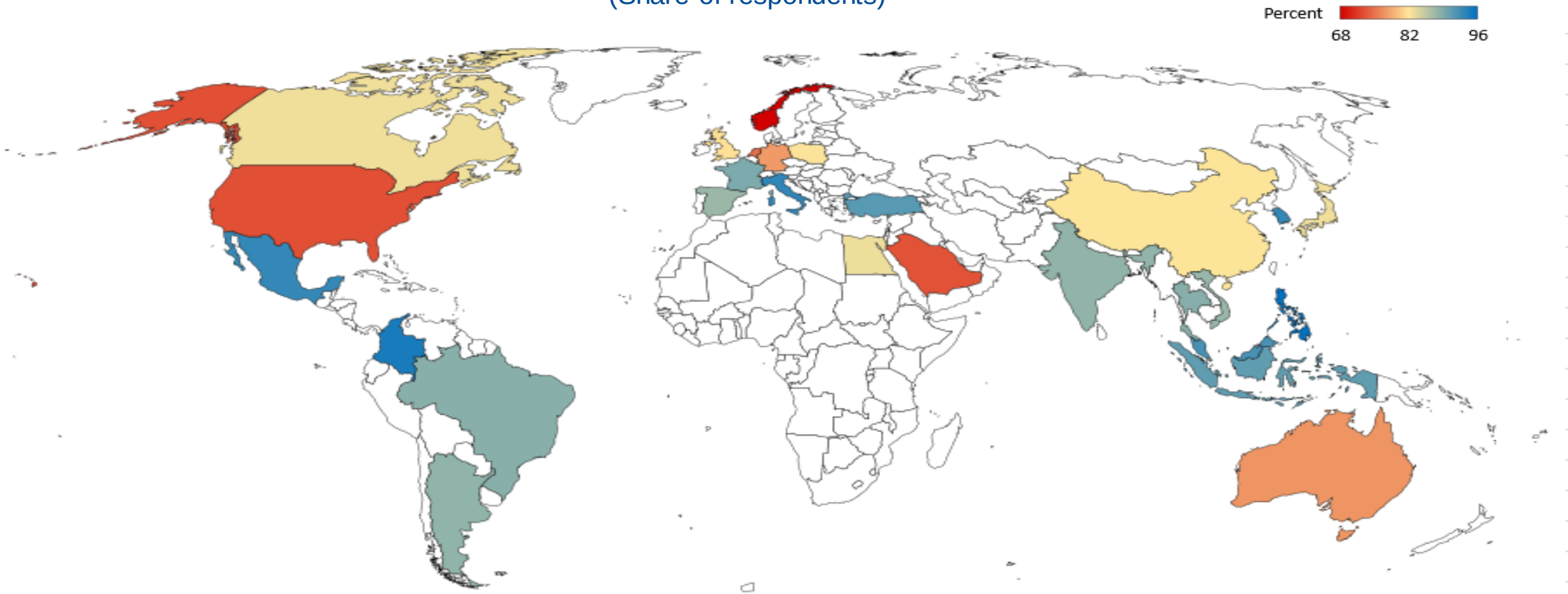
Policy Implications and Conclusions

Majority agree climate change is serious problem

Recognition presents compelling call for decision-makers to step up on ambition

Climate change is a serious problem

(Share of respondents)

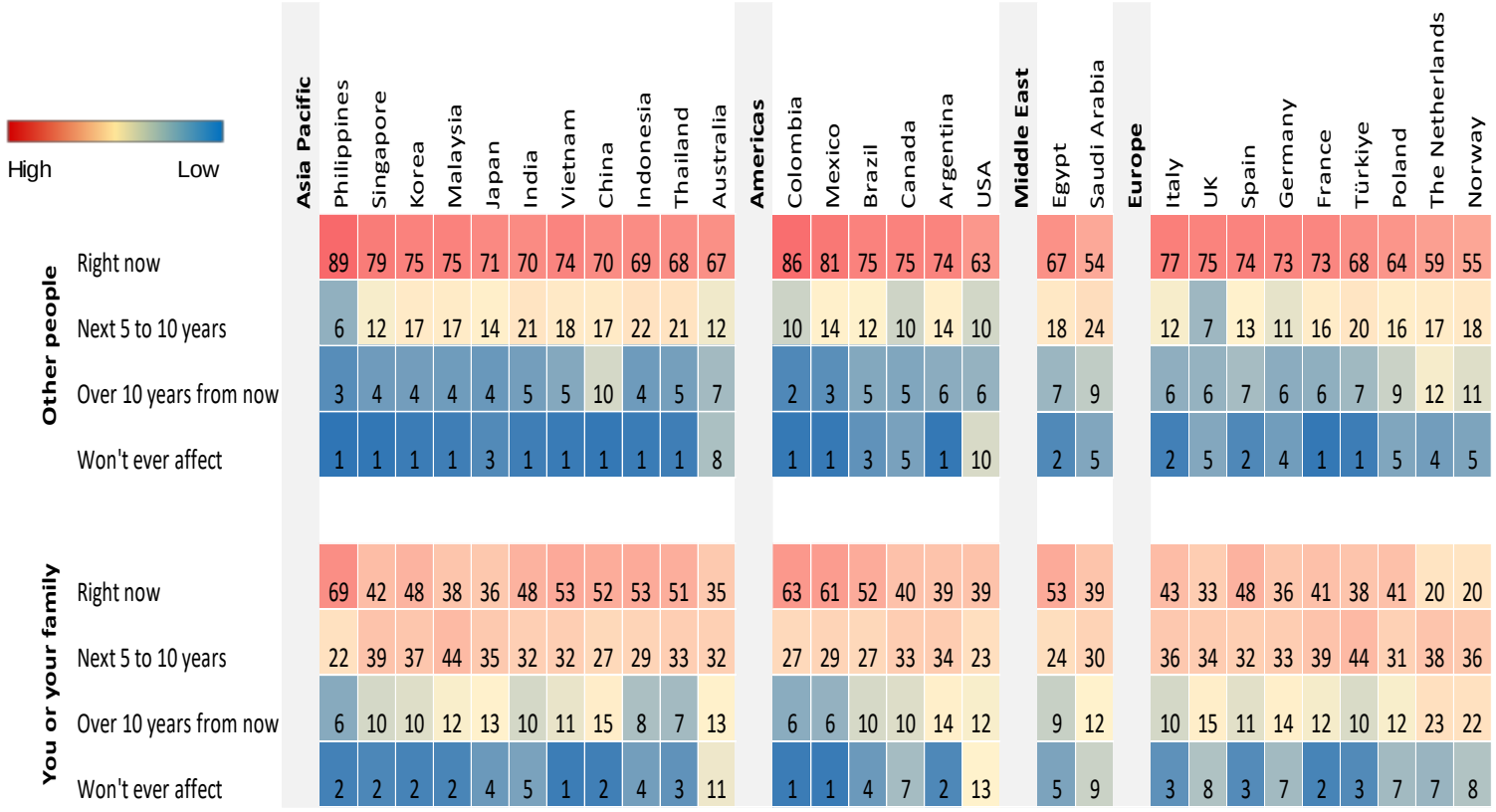


Note: This figure shows the share of people in each country who answered the question "*In your view, how serious of a problem is climate change?*" with "a very serious problem" or "a fairly serious problem".

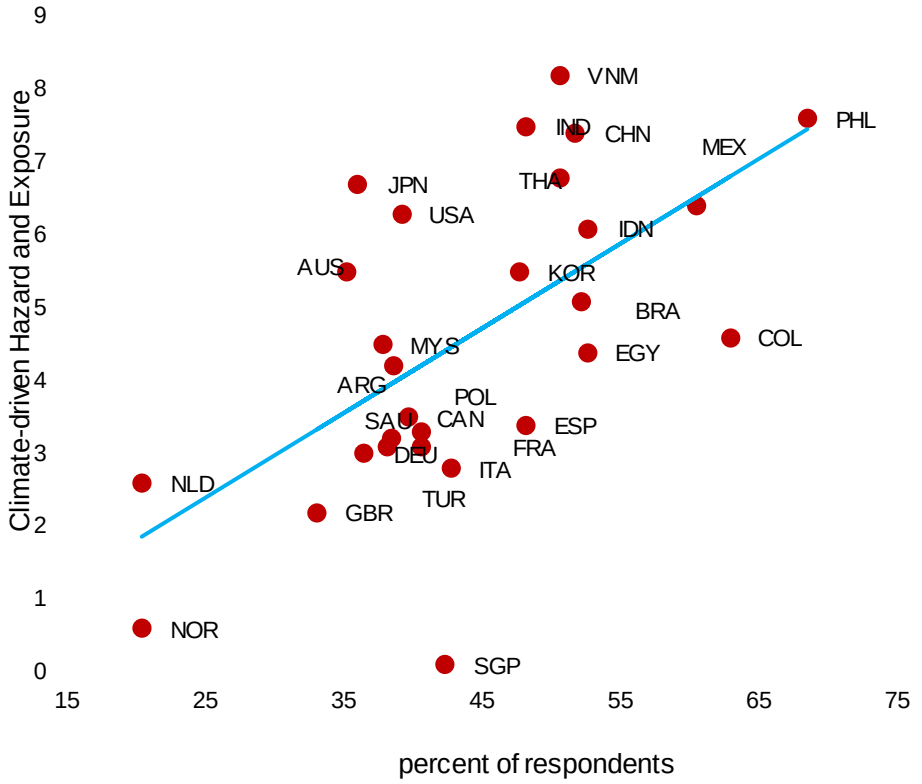
Climate risk perceptions higher in emerging markets

Imminence varies, correlated with country climate change exposure

When will climate change affect other people vs. your family?
(share of responses)



Correlation between IMF's INFORM index and climate change happening now

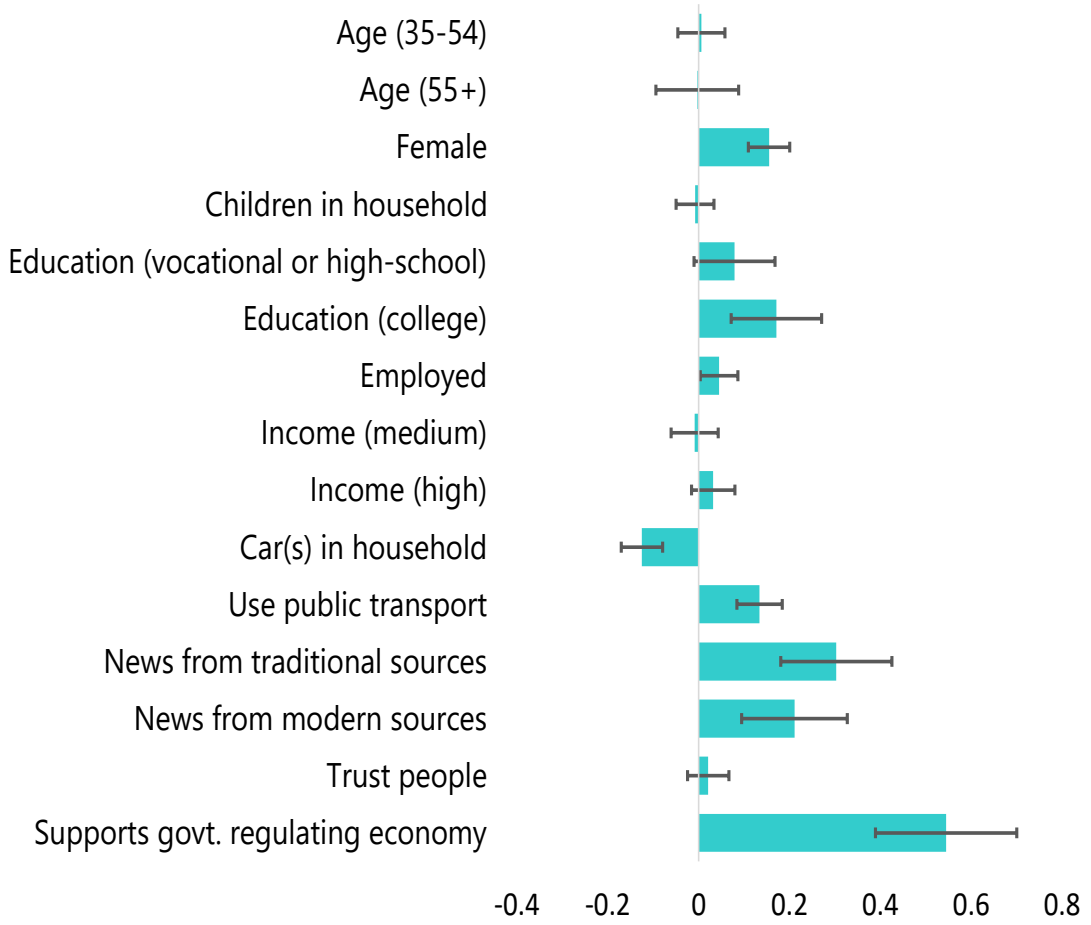


Note: LHS figure shows average responses to the questions: "*Which of the following comes closest to your view of how climate change is affecting people around the world?*" and *"Which of the following comes closest to your view of how climate change will affect you or your family?"*. RHS figure shows average responses to the question "Climate change is affecting me or my family right now" (horizontal axis) and the Climate-driven Hazard and Exposure component of the IMF's INFORM Risk in 2022.

What explains risk perceptions? Role of individual characteristics

Important role for gender, education, energy usage, information, ideology, but cross-country variation

Regression coefficients & 95% CIs
(How serious of a problem is climate change?)



Note: OLS regression of z-scores of the dependent variable (seriousness of climate change). Include country fixed effects.

Cross-country heterogeneity

Climate risk perception higher for:

- **Females** in Japan, but not in India
- More **educated** respondents in Australia, Indonesia but not in Korea
- People who **follow the news** in Europe and the Americas, but generally not in Asia

Cross-country results

Roadmap

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Information Treatments and International Burden Sharing

Policy Implications and Conclusions

Prior knowledge of climate mitigation policies varies

Public more informed about subsidies for green technologies/renewables and regulations

Awareness of commitments

Baseline awareness of different climate policies
(share of responses)

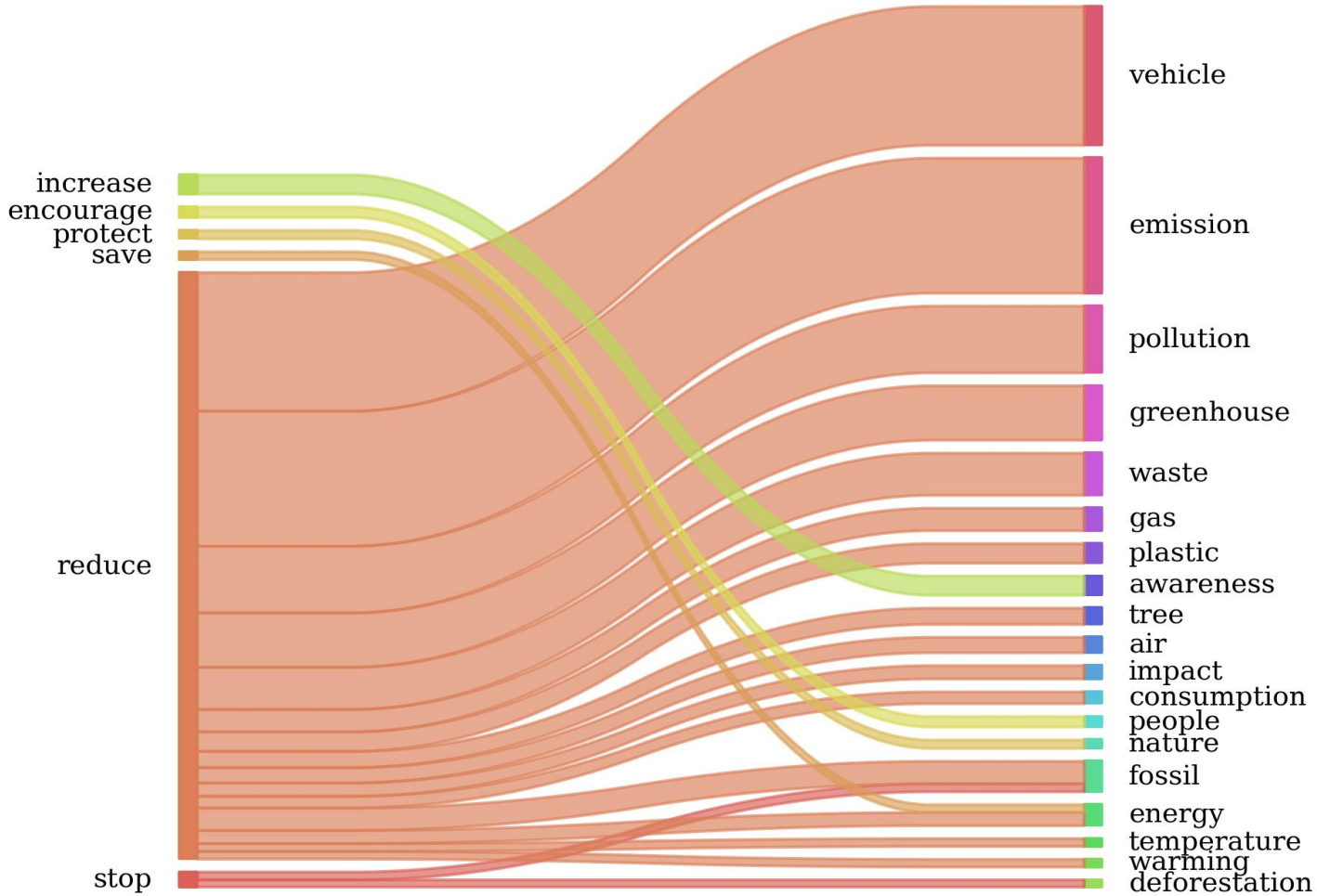
High — Low

	Asia Pacific	Australia	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	Korea	Thailand	Vietnam	**Americas**	Argentina	Brazil	Canada	Colombia	Mexico	USA	**Middle East**	Egypt	Saudi Arabia	**Europe**	France	Germany	Italy	Netherlands	Norway	Poland	Spain	Turkey	UK
Carbon tax		65	34	28	19	34	36	21	63	58	23	29		15	22	70	21	16	45		12	16		61	23	43	26	31	34	38	21	57
Cap and trade or emissions trading systems		45	43	26	21	20	27	27	33	40	30	31		16	34	42	22	18	40		13	17		25	25	16	21	41	44	33	24	36
Law and regulations limiting carbon emissions		70	75	61	68	63	70	70	74	71	58	71		48	63	71	64	61	69		43	50		64	64	65	72	62	63	70	57	76
Subsidising renewable energy sources		76	71	62	55	63	70	66	70	59	67	69		56	61	70	62	64	69		68	66		65	71	74	67	63	76	75	75	79

Note: This figure shows distribution of "Yes" responses to the question *"Which, if any, of the following ways of reducing climate change have you previously heard of? Please select all that apply"* for each policy. Blue denotes higher share; red denotes lower share.

"What should a climate policy aim to achieve?"

Text analysis shows reducing emissions, pollution, use of cars are first-order considerations



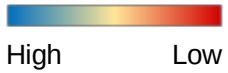
Note: Sankey chart shows verb and noun combinations that appear in the text analysis for the open-ended question , with each pair in the figure appearing at least 50 times.

AEs vs. EMs

Support for emission reducing policies

Subsidies for low-carbon technology/renewables are universally the most favored policy

(share of responses)



	Asia Pacific	Australia	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	Korea	Thailand	Vietnam	**Americas**	Argentina	Brazil	Canada	Colombia	Mexico	USA	**Middle East**	Egypt	Saudi Arabia	**Europe**	France	Germany	Italy	Netherlands	Norway	Poland	Spain	Turkey	UK
Carbon Pricing		52	55	67	46	39	58	68	58	60	60	74		41	62	50	53	58	44		43	46		44	29	45	40	32	29	44	56	41
Subsidies to low carbon technologies/renewables		65	65	66	62	45	66	73	68	61	69	71		56	65	62	69	69	53		55	57		58	54	65	55	50	60	65	61	62
Regulations limiting emissions		52	50	64	44	31	53	60	48	52	56	64		48	50	50	54	56	43		35	41		44	35	40	38	34	33	43	48	44

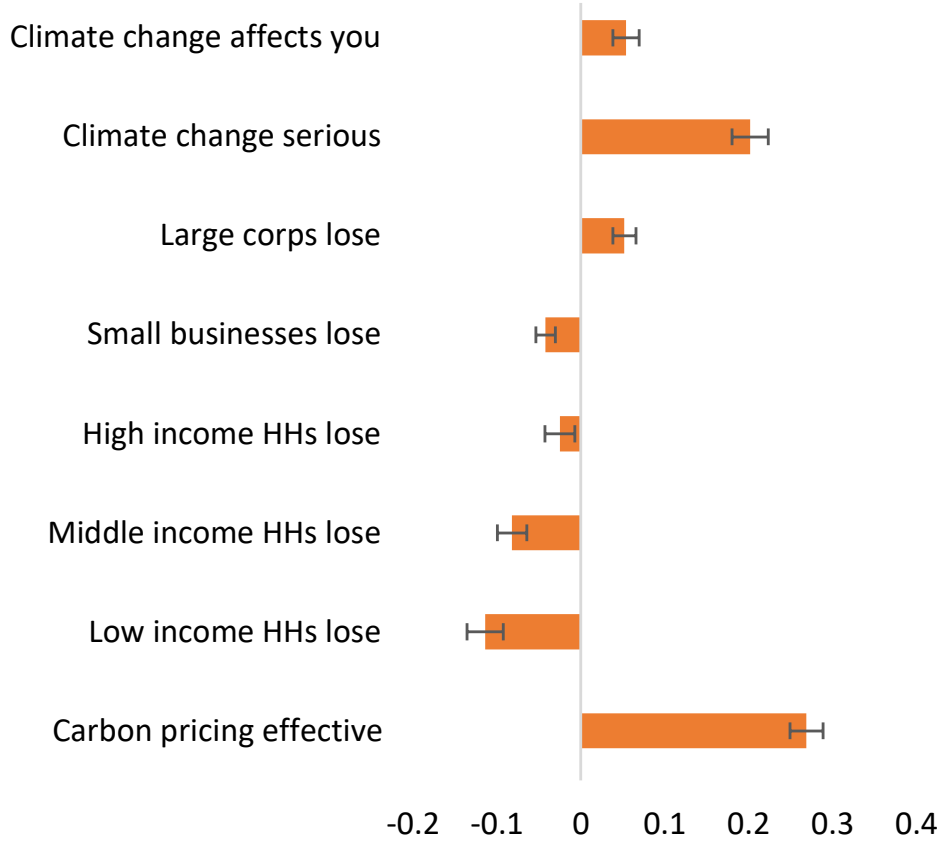
Note: This figure shows the share of favorable responses (in percentage points) to the questions "*Thinking about all of the impacts of a carbon pricing policy, to what extent do you support or oppose such a policy in your country*?", "*Thinking about all of the impacts of a subsidy to renewable energy, to what extent do you support or oppose this policy in your country*?", and "*Thinking about all of the impacts of regulation, to what extent do you support or oppose this policy in your country*?". Responses shown are only for the control group that did not receive additional information.

Drivers of support for carbon pricing

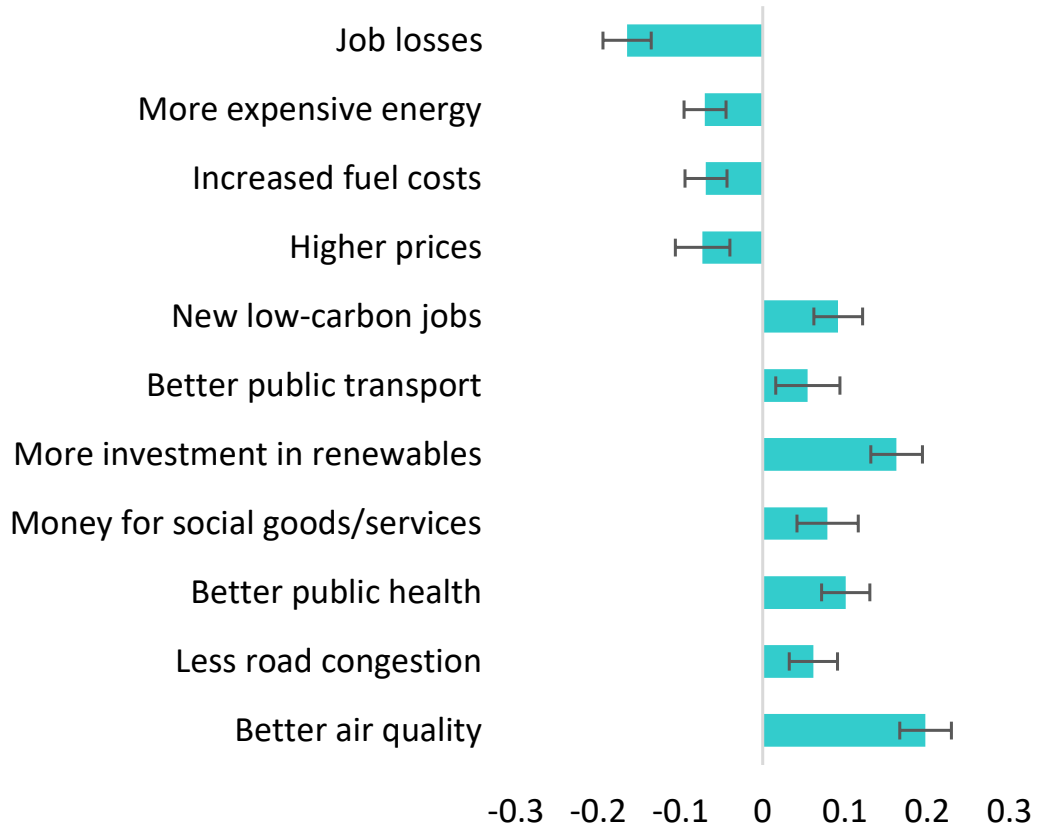
Climate risk perceptions, policy effectiveness, and distributional considerations matter

Country responses
Non-support

Perceptions, efficacy and inequality Concerns
(coefficient estimates and 95% CI)



Costs and benefits
(coefficient estimates and 95% CI)

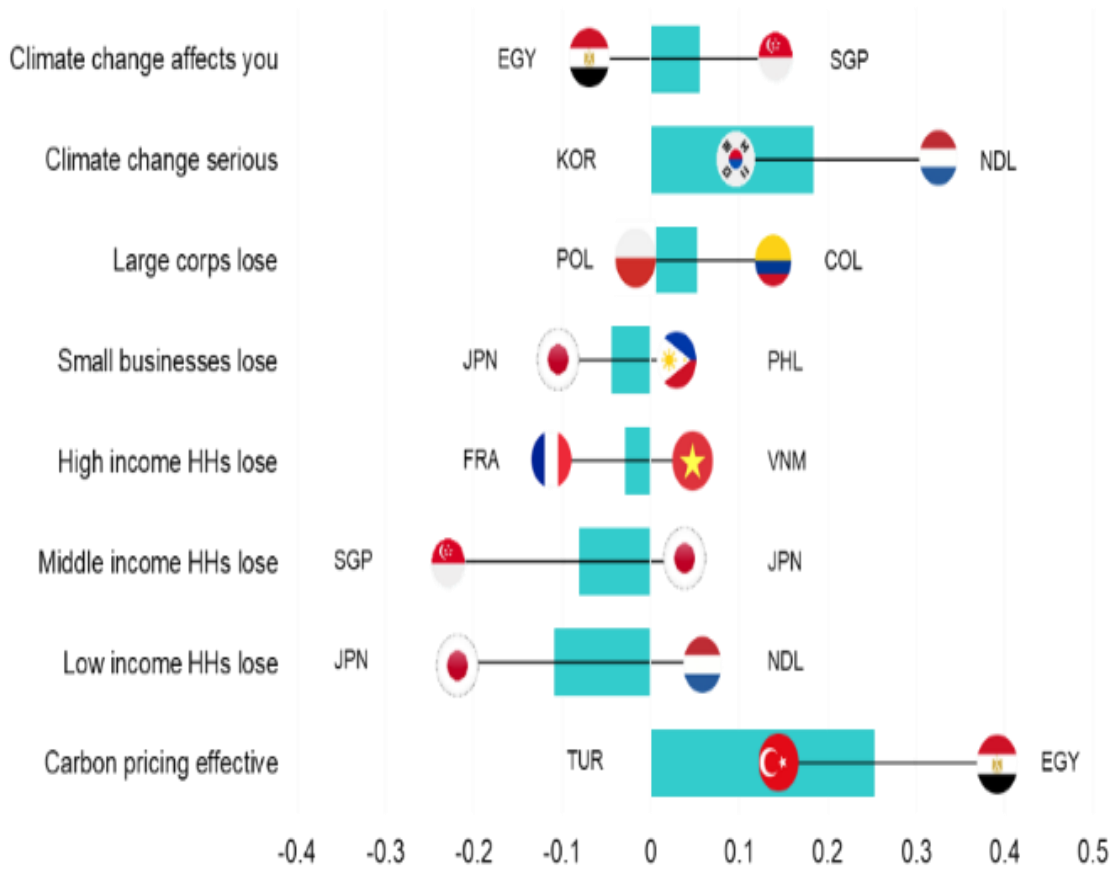


Note: OLS regression on z-scores of the dependent variable (support for carbon pricing); controlling for demographic characteristics, other beliefs, and country fixed effects. The 95 percent confidence intervals are computed using robust standard errors clustered by country. Variables in both figures are from the same multivariate regression.

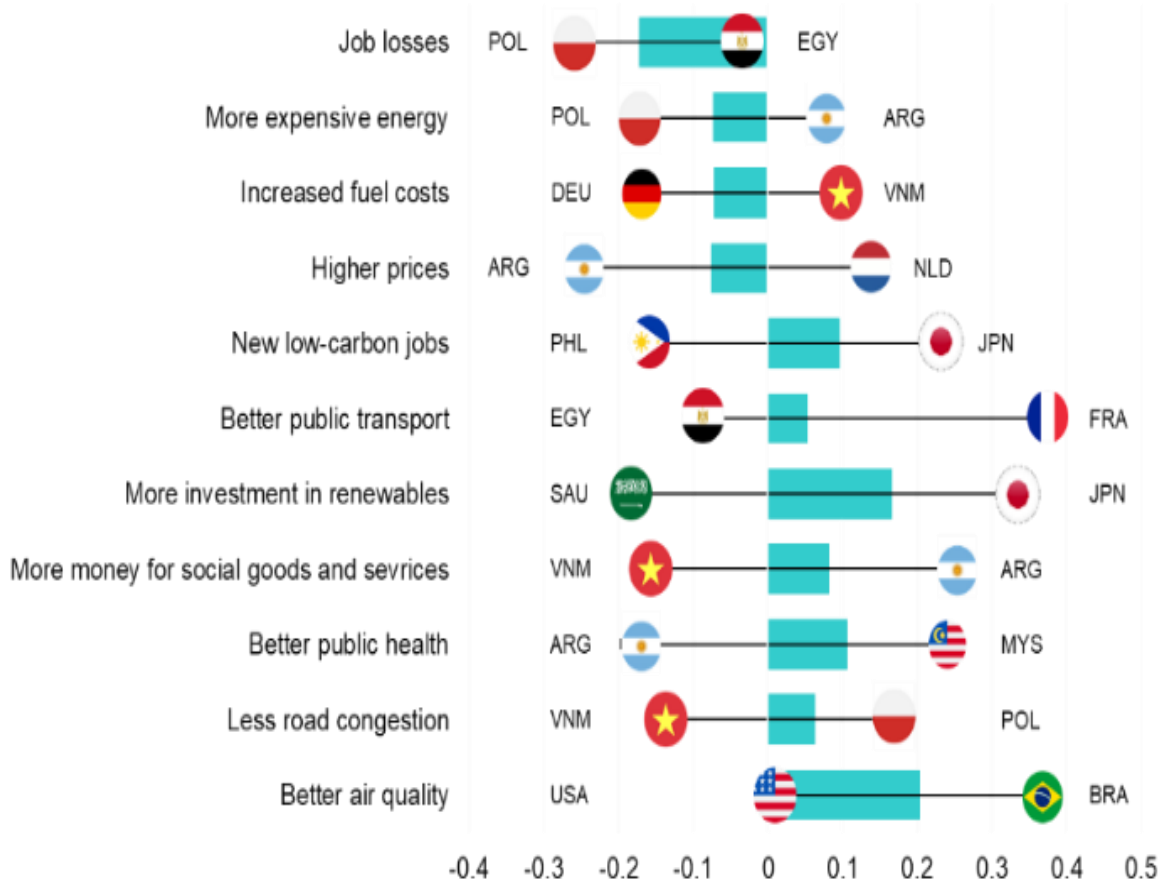
Heterogeneity across countries in drivers of support

Country-level differences call for tailored policy design and communication

Risk perceptions, efficacy and inequality concerns
(coefficient estimates)



Costs and benefits
(coefficient estimates)

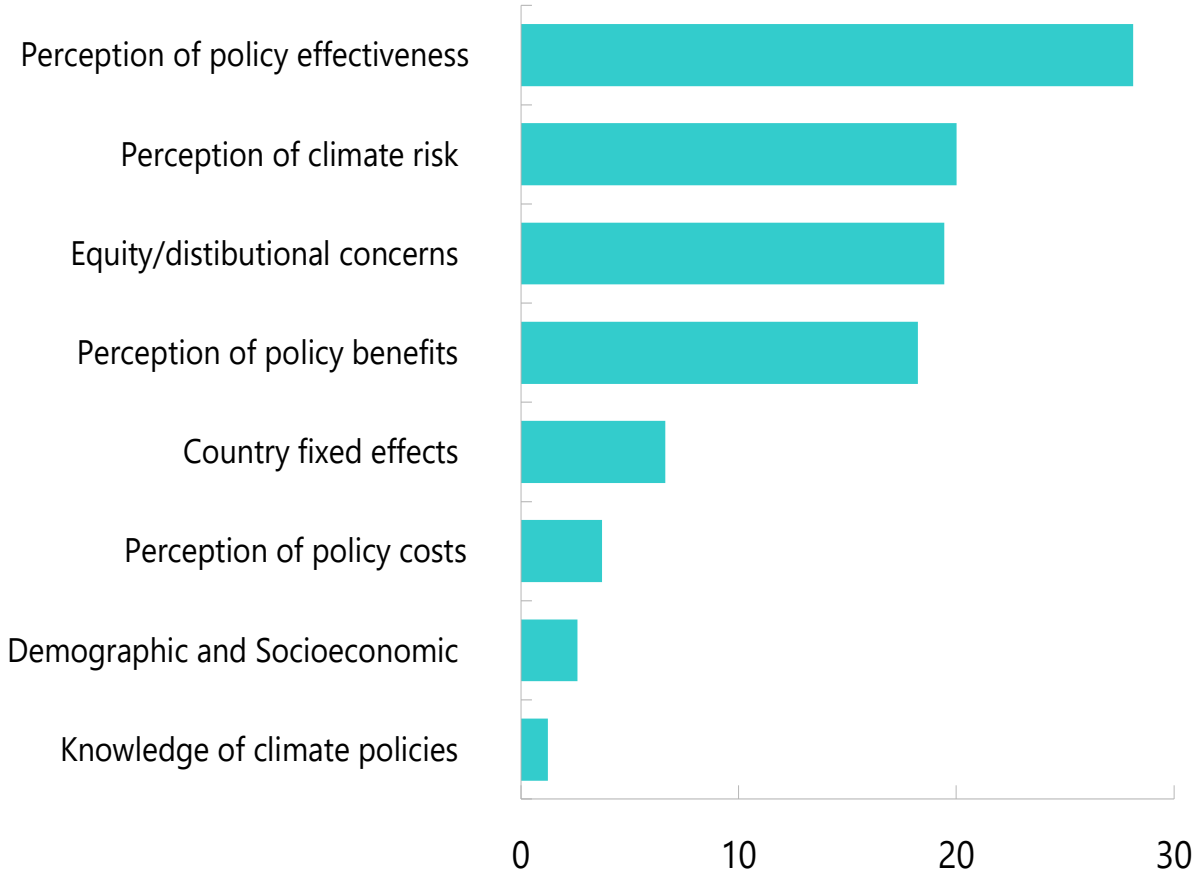


Note: Country-level OLS regressions on z-scores of the dependent variable (support for carbon pricing) will the full set of socio-economic controls. Bars represent estimates of differences in beliefs from cross-country regressions. End points represent the smallest and largest coefficients from the regressions.

Policy attributes drive support for carbon pricing

Climate risk perceptions, policy effectiveness, and distributional considerations matter

Share of variation in support for carbon pricing explained by different covariates



Note: The chart shows the share of the variation in support for carbon pricing that is explained by each group of variables in an OLS regression on z-scores of the dependent variable.

Revenue recycling increases support for carbon pricing

People care about policy progressivity and its distributional implications

Demographics

How should revenues from carbon pricing be recycled?

(multiple answers possible)

	Asia Pacific	Australia	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	Korea	Thailand	Vietnam	Americas	Argentina	Brazil	Canada	Colombia	Mexico	USA	Middle East	Egypt	Saudi Arabia	Europe	France	Germany	Italy	The Netherlands	Norway	Poland	Spain	Türkiye	UK
Helping low-income households		54	51	37	48	36	55	42	61	48	51	47		34	46	52	43	38	43		42	43		38	43	49	51	41	39	45	42	54
Climate projects (renewables/ green technology)		43	44	41	40	28	45	51	43	46	40	43		40	38	37	54	52	32		29	31		39	37	42	37	30	41	43	40	41
Social services (health care/ education)		39	38	34	46	30	37	44	37	28	38	41		40	38	40	51	43	30		32	31		31	30	29	39	31	37	43	32	41
Reducing taxes on individuals		29	37	33	24	38	39	29	41	42	38	32		27	30	37	20	28	24		28	31		36	28	36	28	29	32	31	29	27

Note: This figure shows the distribution of responses (in percentage points) to the question "*A carbon pricing policy that charges companies for their emissions would also raise the amount of money the government is able to collect and spend. Which, if any, of the following would increase your support for the policy? Please select up to three". Excluding open ended response, don't know and none of the above*. Blue denotes higher share of responses.

Roadmap

Climate Risk Perceptions

- Drivers of climate risk perceptions

Support for Emission-Reducing Policies

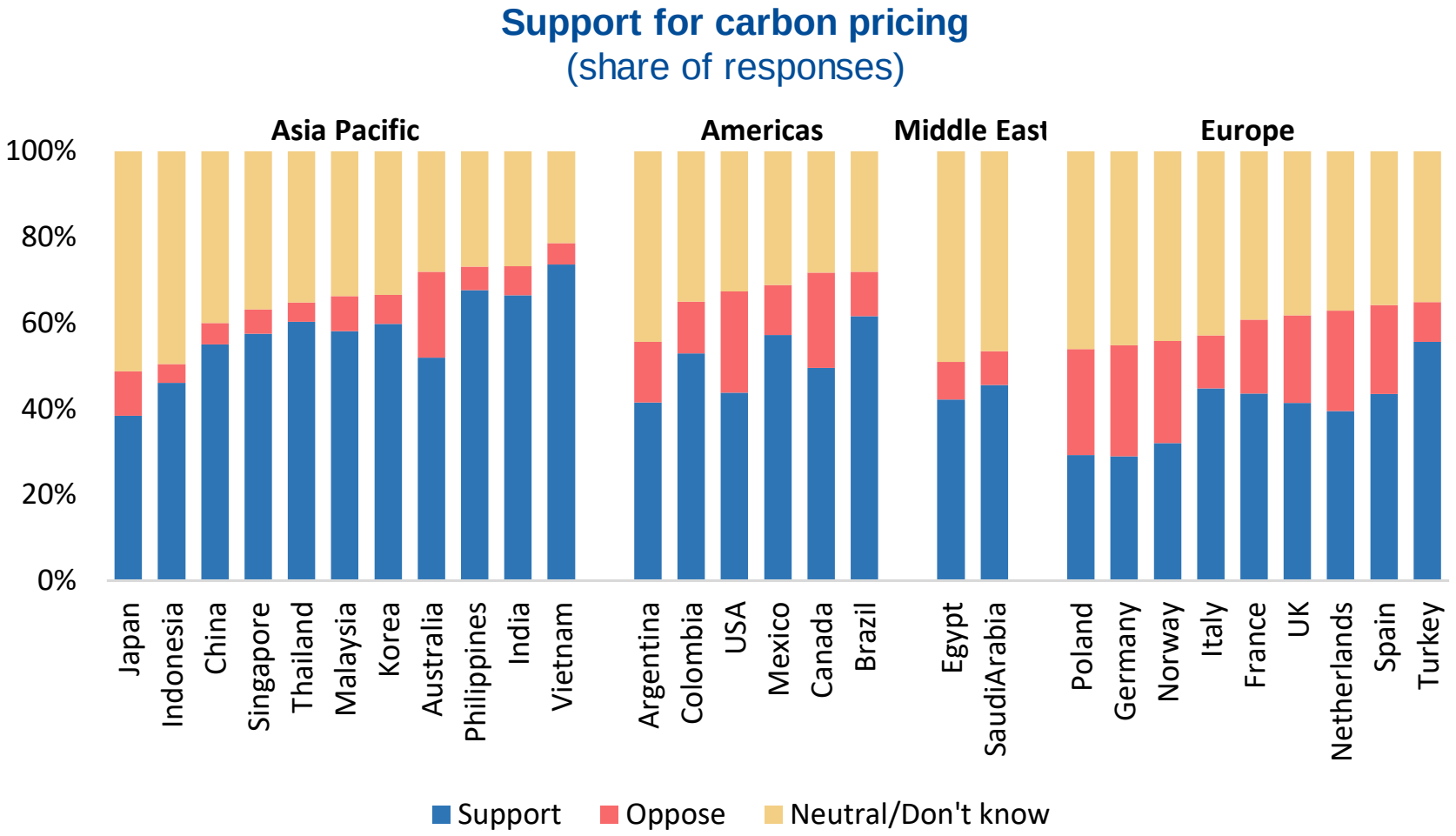
- Prior knowledge and key concerns
- Drivers of support for carbon pricing

Information Treatments and International Burden Sharing

Policy Implications and Conclusions

Large information gaps exist about policies

Sizable share in many countries have no clear opinion about carbon pricing



Note: This figure shows the share of favorable responses (in percentage points) to the questions "*Thinking about all of the impacts of a carbon pricing policy, to what extent do you support or oppose such a policy in your country*?

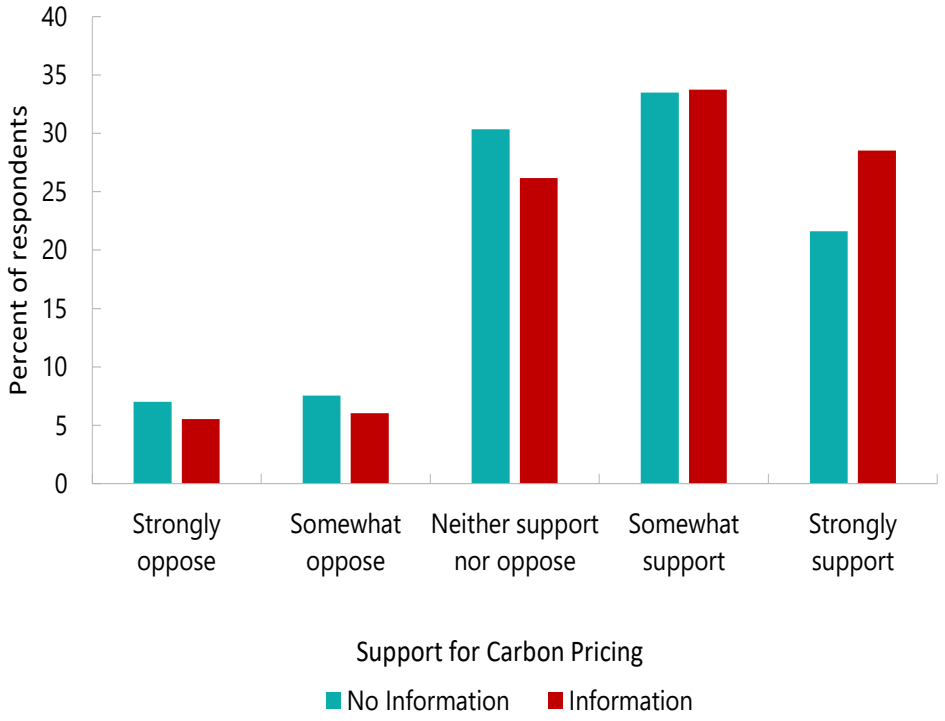
Information interventions

Providing information on policy efficacy and cost of living impacts alters preferences

Heterogeneity by prior knowledge

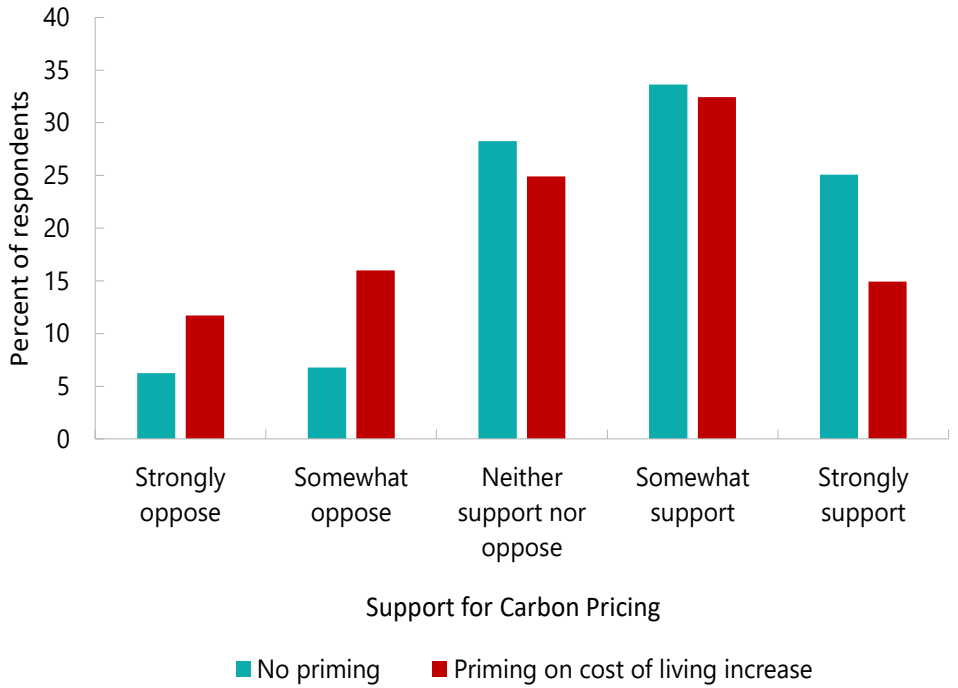
Policy efficacy treatment

Carbon pricing provides correct incentives to decarbonize, can encourage innovation, and revenues can be recycled



Cost of living increase treatment

Carbon pricing reduces greenhouse gases but also increases cost of living

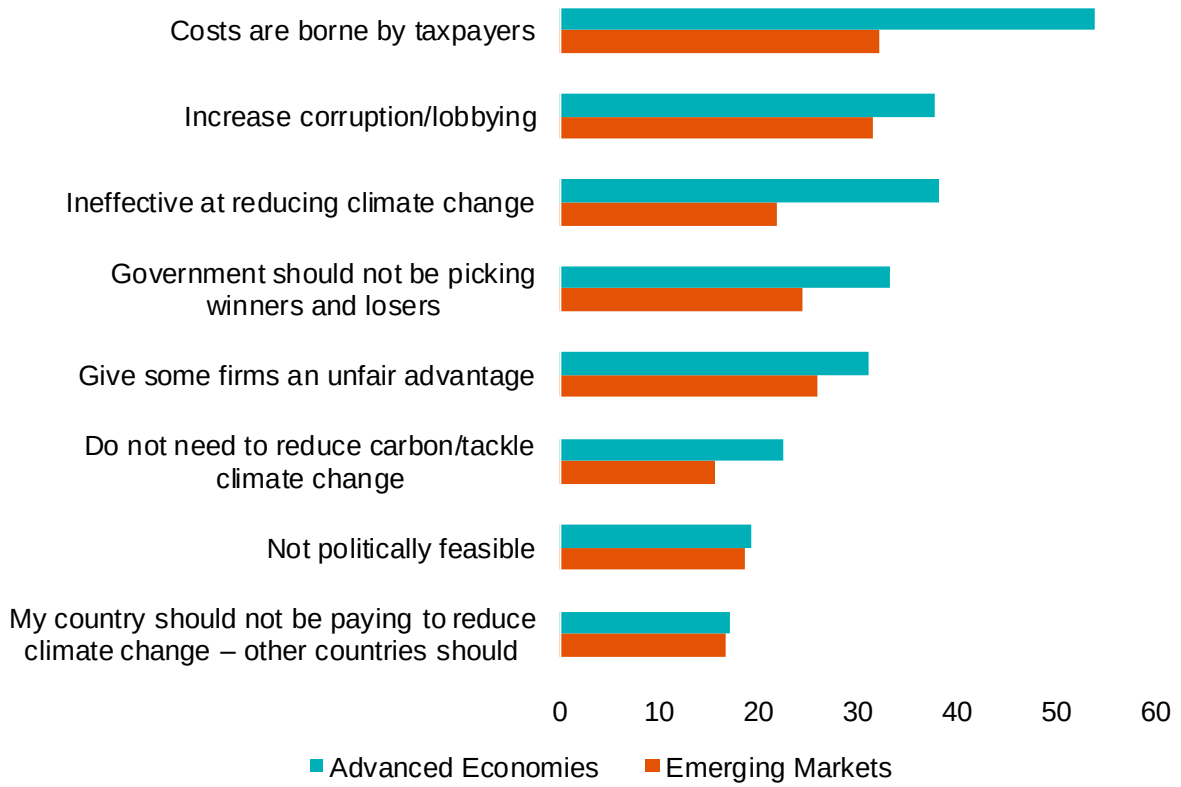


Note: LHS figure shows the shift in the frequency distribution from a randomized treatment where a random sample is told that carbon pricing provides correct incentives to decarbonize, can encourage innovation, and revenues can be recycled. The effect of the information treatment is statistically significant. RHS figure show shift in the frequency distribution from providing additional information on the cost of living impacts of the policy.

Opposition to subsidies for green technologies/renewables

Costs, corruption, efficacy are key concerns

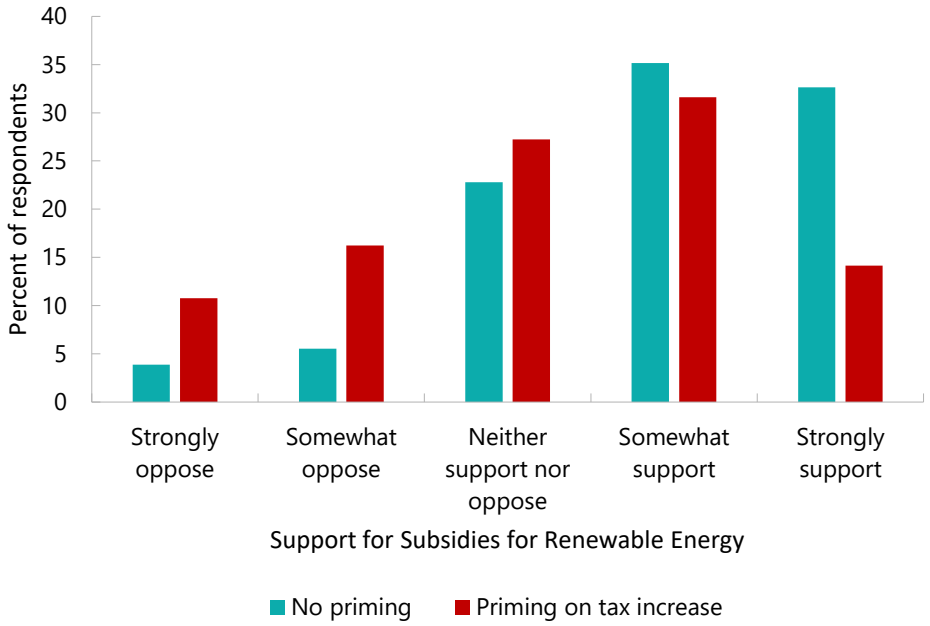
Determinants of lack of support for subsidies



Note: This figure shows the distribution of responses (in percentage points) to the question *"Why do you oppose subsidies for renewable energy or low-carbon technology in your country? Please select all that apply".* Differences between AEs and EMs are significant at 1 percent level.

Cost treatment

Subsidy has to be paid for with an increase in taxes (or decrease in other government spending)



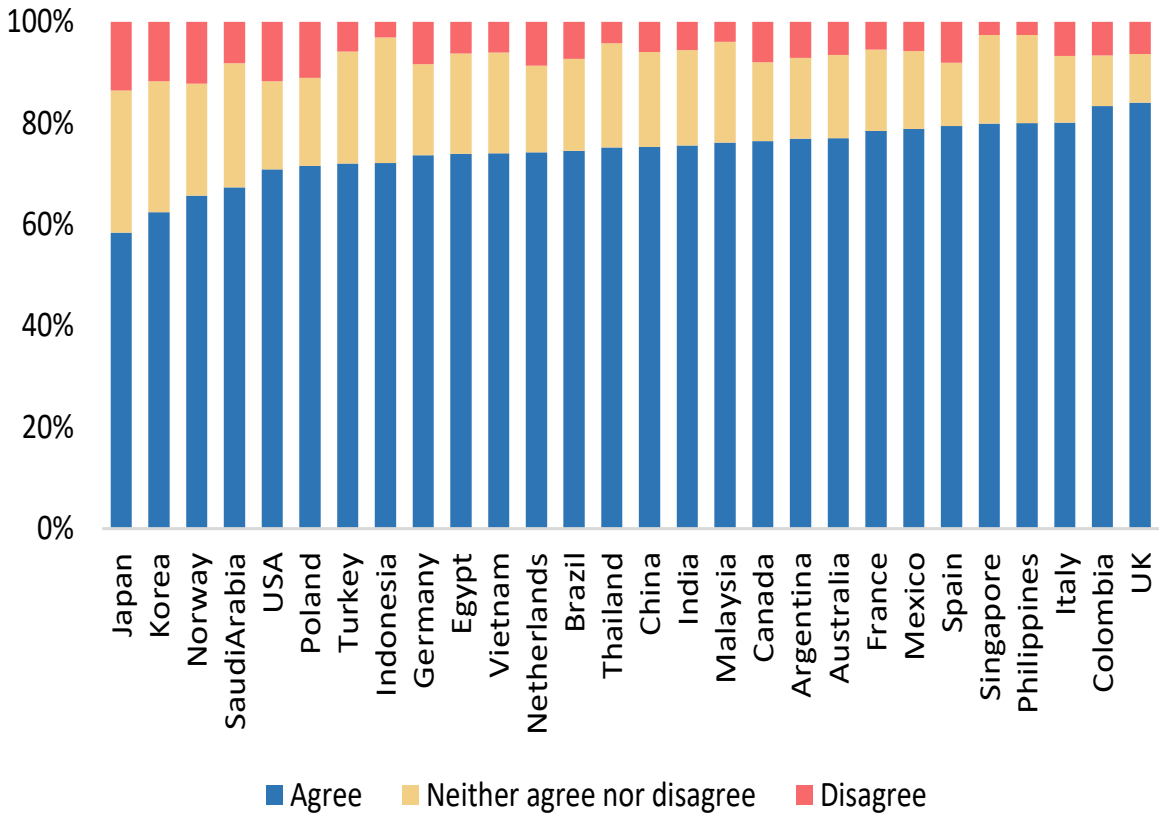
Note: this figure shows the show shift in the frequency distribution from providing additional information on the costs of subsidies for green technologies/renewables.

Broad public support for collective action

People may be more willing to adopt costly policies if other countries do

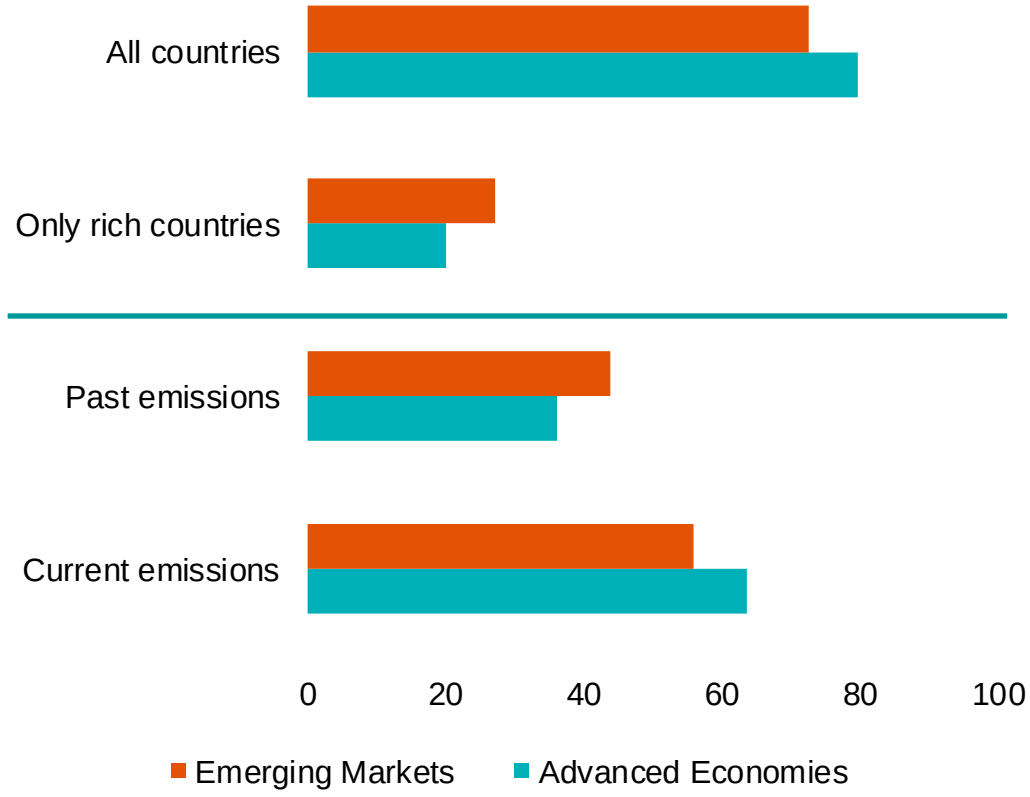
Country responses

Climate change policy will only be effective if most countries adopt measures to reduce emissions



Note: The figure shows the distribution of responses in each country to the statement "*Climate change policy will only be effective if most countries adopt measures to reduce carbon emissions*."

Who should pay?



Note: The figure shows average responses to the question, "*Should countries be paying to reduce carbon emissions based on their current or accumulated historic levels of emissions*?" (top two rows) and "*Which countries do you think should be paying to reduce carbon emissions*?" (last two rows), excluding don't know responses. Differences between AEs and EMs are significant at the 1 percent level.

Roadmap

Climate Risk Perceptions

- Drivers of climate risk perceptions

Support for Emission-Reducing Policies

- Prior knowledge and key concerns
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Information Treatments and International Burden Sharing

Policy Implications and Conclusions

Takeaways and policy implications

➢ Devil *is* in the policy design

- Pre-existing beliefs regarding policy efficacy, costs, and progressivity key drivers of support for carbon pricing
- Scope for improving support for policies with additional information on policy efficacy **and** co-benefits

➢ Address distributional concerns to increase public acceptability

- Preferences for revenue recycling from carbon pricing lean towards household support and investment in green technology
- Highlights need for complementary policies (e.g., strengthened social safety nets, green investment efficiency)

➢ Raising awareness is key

- Ensure continued communication on climate risks, costs of inaction, and concrete policy impacts

➢ Securing international cooperation may foster political support for climate action

Thank You

Appendix

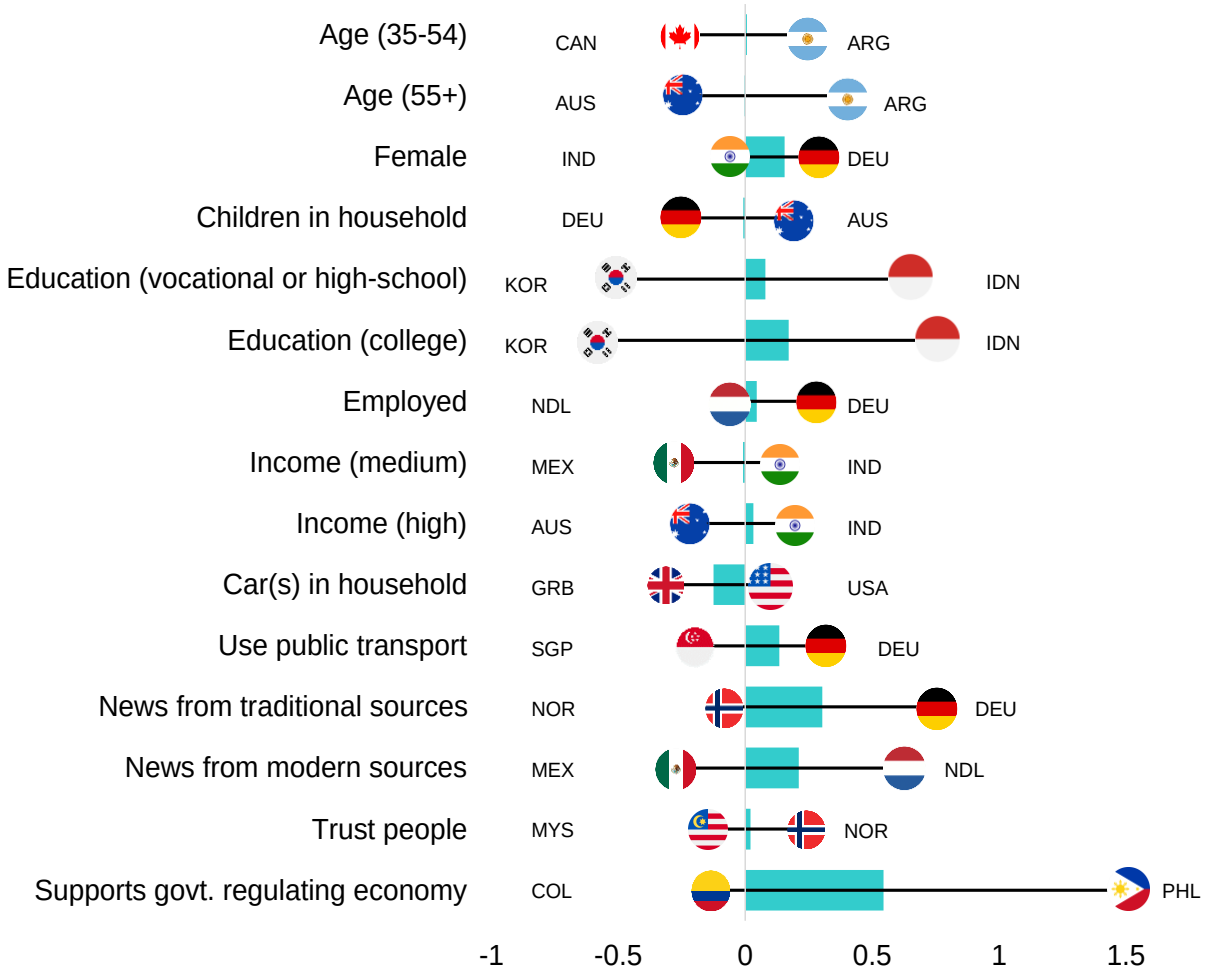
What explains risk perceptions? Role of individual characteristics

Cross-country variation

Back

Regression coefficients in country-level regressions

(How serious of a problem is climate change?)

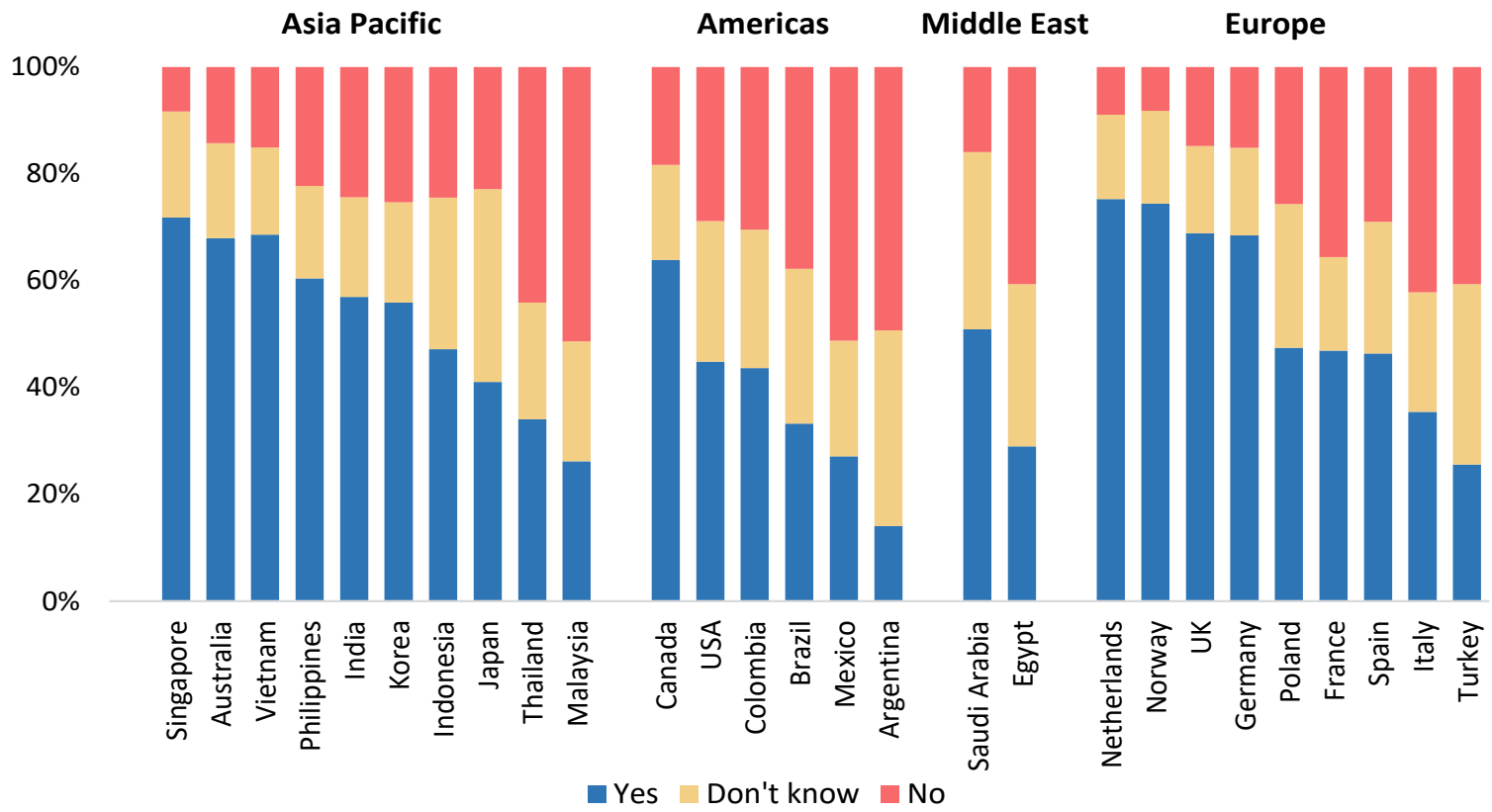


Note: OLS, country-level regressions of z-scores of the dependent variable (seriousness of climate change) with country fixed effects.

Awareness of government's climate commitments

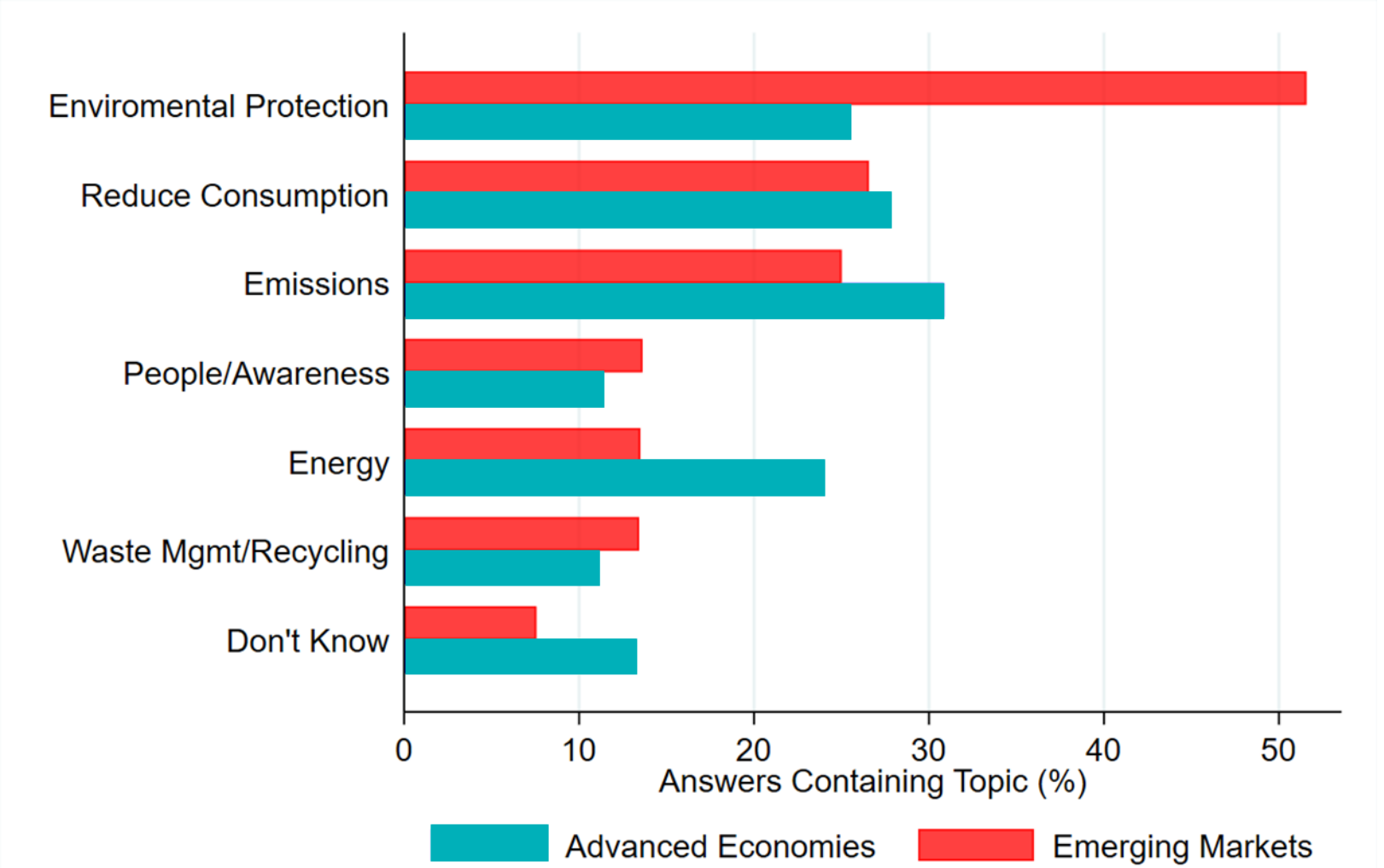
Back

(share of responses)



Note: This figure shows the share of various responses in each country to the question "*As far as you know, has your government made a commitment to take action to reduce climate change*?"

What issues do people care about? AEs vs. EMs



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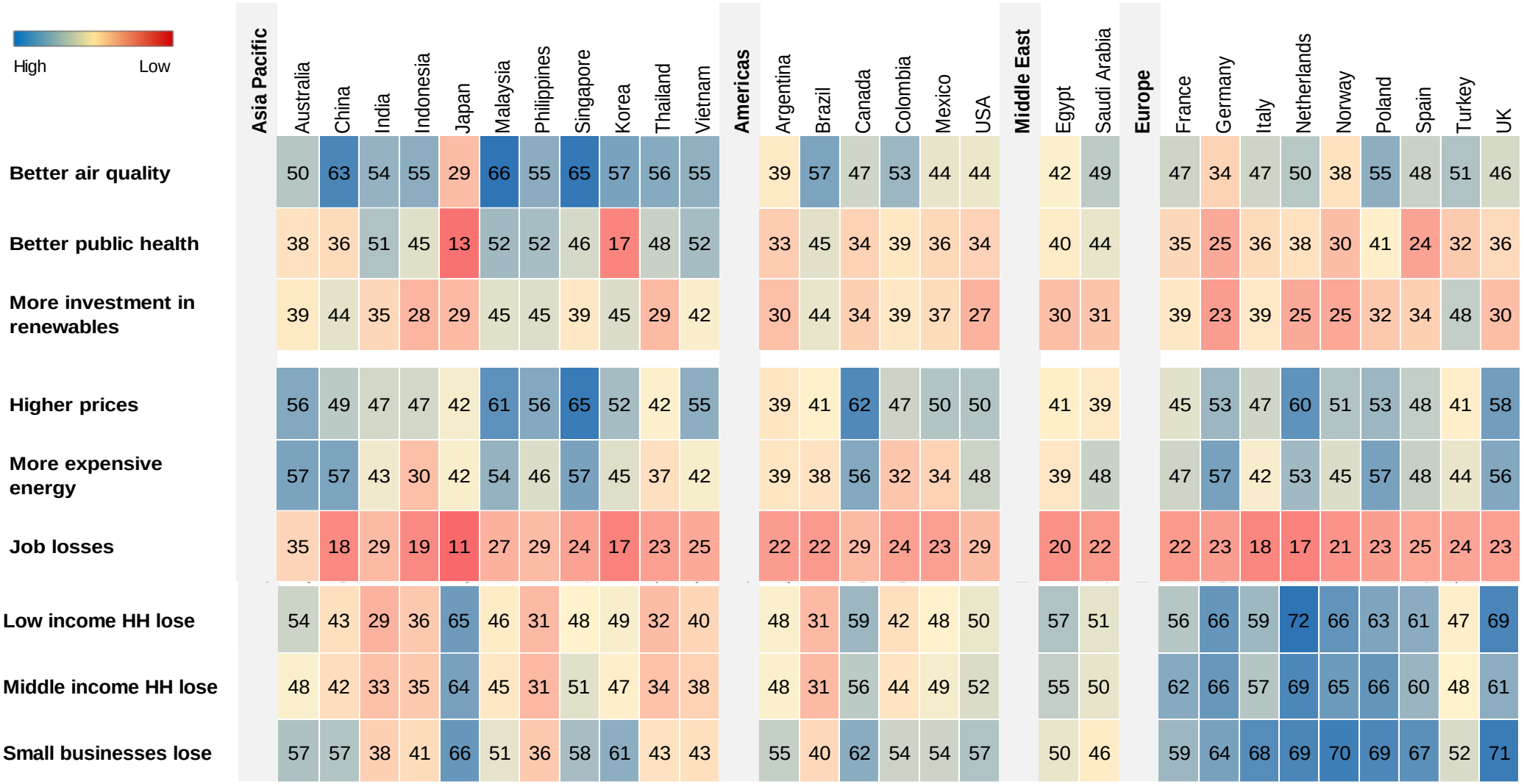
Note: Figure uses the 60 most common words across answers, manually classified into topics', removing some words that do not have a meaning out of context (for example "need" or "well") and words included in the question, and plots the share of answers that mention each topic across countries.

Policy perceptions and beliefs about carbon pricing

Back



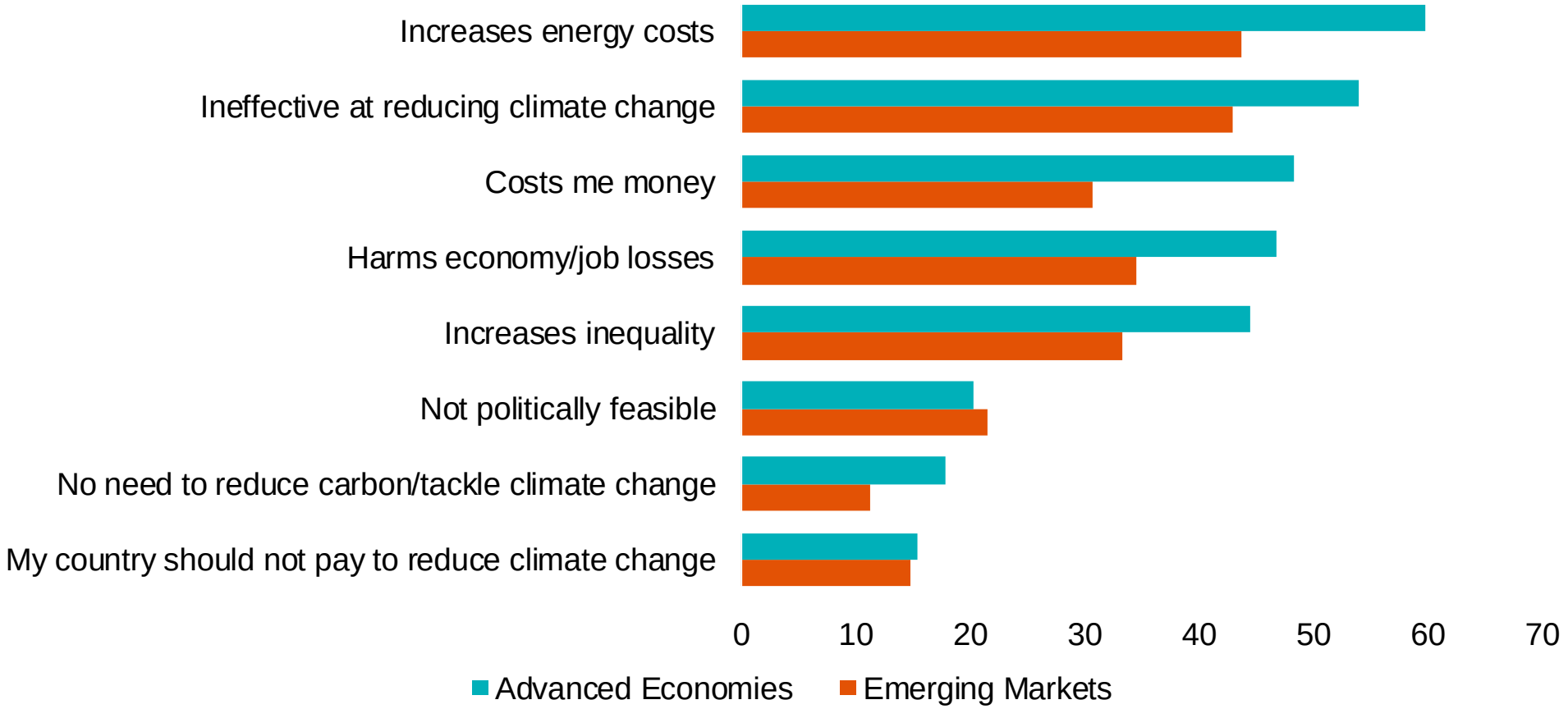
	Asia Pacific	Australia	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	Korea	Thailand	Vietnam	Americas	Argentina	Brazil	Canada	Colombia	Mexico	USA	Middle East	Egypt	Saudi Arabia	Europe	France	Germany	Italy	Netherlands	Norway	Poland	Spain	Turkey	UK
Better air quality		50	63	54	55	29	66	55	65	57	56	55		39	57	47	53	44	44		42	49		47	34	47	50	38	55	48	51	46
Better public health		38	36	51	45	13	52	52	46	17	48	52		33	45	34	39	36	34		40	44		35	25	36	38	30	41	24	32	36
More investment in renewables		39	44	35	28	29	45	45	39	45	29	42		30	44	34	39	37	27		30	31		39	23	39	25	25	32	34	48	30
Higher prices		56	49	47	47	42	61	56	65	52	42	55		39	41	62	47	50	50		41	39		45	53	47	60	51	53	48	41	58
More expensive energy		57	57	43	30	42	54	46	57	45	37	42		39	38	56	32	34	48		39	48		47	57	42	53	45	57	48	44	56
Job losses		35	18	29	19	11	27	29	24	17	23	25		22	22	29	24	23	29		20	22		22	23	18	17	21	23	25	24	23
Low income HH lose		54	43	29	36	65	46	31	48	49	32	40		48	31	59	42	48	50		57	51		56	66	59	72	66	63	61	47	69
Middle income HH lose		48	42	33	35	64	45	31	51	47	34	38		48	31	56	44	49	52		55	50		62	66	57	69	65	66	60	48	61
Small businesses lose		57	57	38	41	66	51	36	58	61	43	43		55	40	62	54	54	57		50	46		59	64	68	69	70	69	67	52	71

Note: This figure shows the distribution of responses in each country to a series of questions about the costs and benefits (top panel. Only the three most cited costs and benefits are reported), and distributional implications of carbon pricing (bottom panel). HH = households.

Reasons for not supporting carbon pricing policies

Policy costs, ineffectiveness, and harm to economy/job losses most important concerns

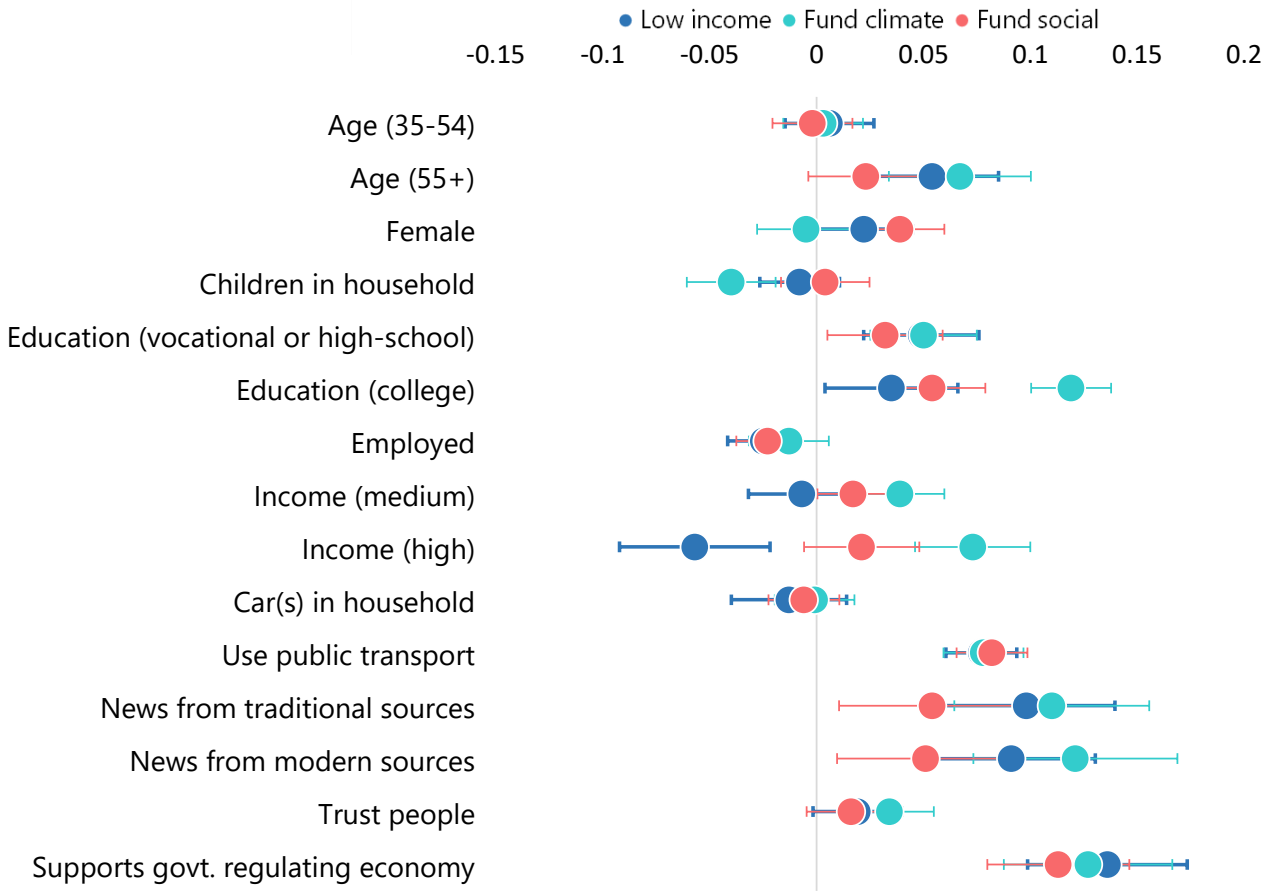
Back



Note: This figure shows the distribution of responses (in percentage points) to the questions "*A carbon pricing policy that charges companies for their emissions would also raise the amount of money the government is able to collect and spend. Which, if any, of the following would increase your support for the policy? Please select up to three*". *Differences between AEs and EMs are statistically significant at the 1 percent level for all reasons reported.*

Revenue recycling and demographic characteristics

What should revenues be used for?



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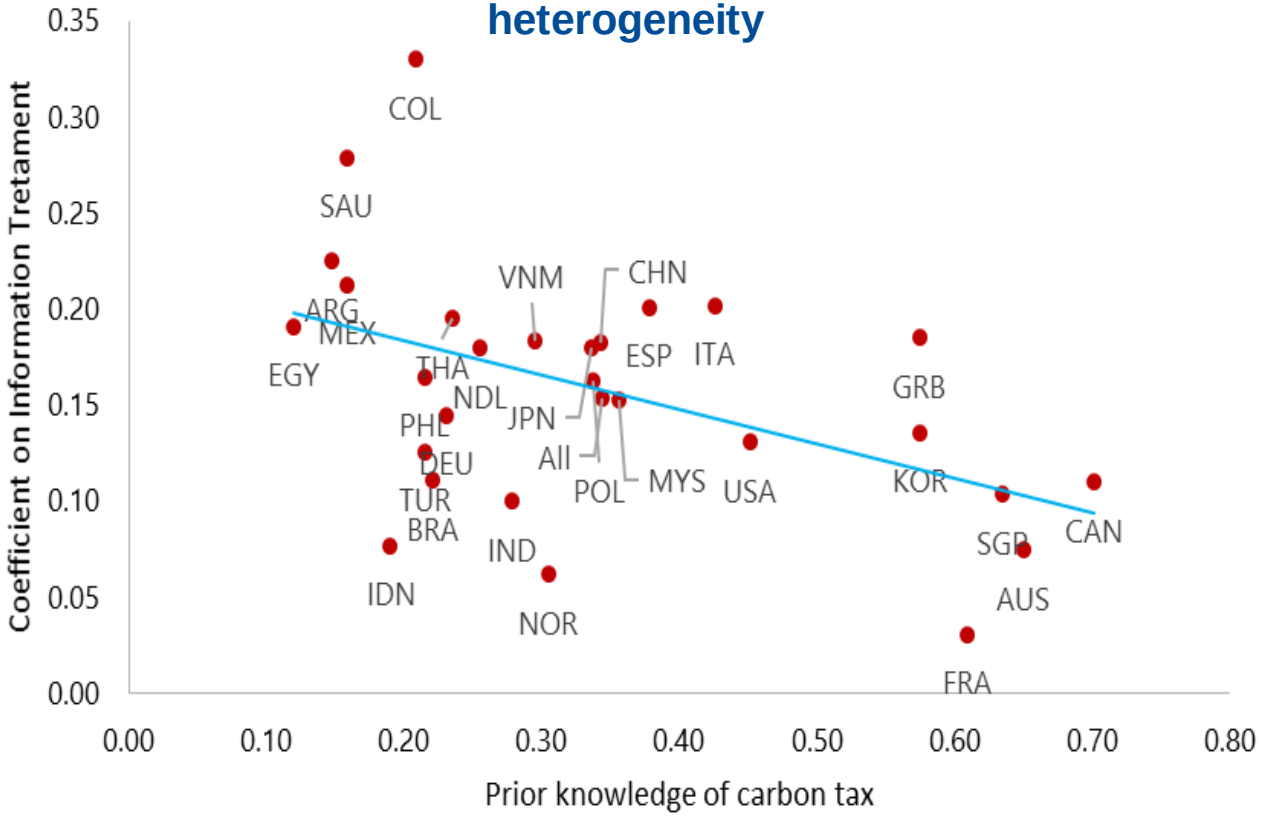
Group differences in how carbon pricing revenues should be used.

- **High-income**, **older**, and **educated** prefer earmarking revenues to clean technologies and renewables
- Belief that **government should play a role in regulating the economy** associated with using revenues to support low-income households

Note: Coefficients and 95% confidence intervals for linear probability models that include country fixed effects. Only three most popular choices are displayed for responses to the question to the questions *"A carbon pricing policy that charges companies for their emissions would also raise the amount of money the government is able to collect and spend. Which, if any, of the following would increase your support for the policy? Please select up to three"*.

Higher impact of information treatment in countries with lower pre-existing knowledge of carbon tax

Carbon pricing efficacy treatment and country-level heterogeneity



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Note: The figure shows a country level plot of respondents' prior knowledge of carbon pricing (x-axis) and the size of the treatment effect from a regression analysis which includes information provision about how effective carbon pricing policies are in reducing greenhouse gas emissions.

International burden sharing: who should pay?

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(share of responses)

High — Low

	Asia Pacific	Australia	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	Korea	Thailand	Vietnam	Americas	Argentina	Brazil	Canada	Colombia	Mexico	USA	Middle East	Egypt	Saudi Arabia	Europe	France	Germany	Italy	Netherlands	Norway	Poland	Spain	Turkey	UK
Only rich countries		16	21	28	16	19	25	22	14	16	23	23		24	23	16	21	23	14		28	28		27	13	14	13	19	21	24	27	14
All countries		69	68	59	73	48	66	69	73	74	61	70		57	65	65	68	71	63		51	51		58	69	73	70	57	56	64	55	70
Don't know		15	12	12	11	33	8	8	13	10	16	7		20	12	19	10	6	23		22	22		15	18	13	18	24	24	12	18	16
Current emissions		51	40	50	47	35	50	48	50	47	47	52		41	43	50	48	54	44		37	36		49	48	49	53	45	55	48	41	51
Past emissions		28	44	35	35	26	38	41	32	38	35	37		33	41	27	37	38	26		35	37		35	20	31	16	18	16	33	37	26
Don't know		22	16	15	18	38	12	11	18	15	18	10		26	16	23	16	8	30		28	26		16	32	19	31	36	29	19	22	23

Note: This figure shows the share of responses (in percentage points) to the questions: "*Should countries be paying to reduce carbon emissions based on their current or accumulated historic levels of emissions?*" and "*Which countries do you think should be paying to reduce carbon emissions?*".