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David A. Dana, *Northwestern University School of Law*

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Valuing Foreign Lives and Settlements

David A. Dana

Abstract

Cost-benefit analysis in the United States for policy and legal purposes traditionally has been highly parochial, excluding not just losses or gains in welfare to non-U.S. residents from a given policy but also excluding any losses or gains in welfare U.S. residents would experience as a result of impacts to foreigners and foreign settlements. In the climate change context, this approach has meant that cost-benefit analyses for the costs of unmitigated climate change to the United States value at zero the losses that U.S. residents will bear as a result of the direct, adverse impacts of climate change to foreign lives and settlements. This article argues that there are sound theoretical reasons to include such welfare losses in a cost-benefit analysis, and that doing so requires going beyond revealed preference data to consider stated preference surveys. The article presents the findings of internet-based surveys that strongly suggest that the implicit assumption of the current approach to cost-benefit analysis in the United States—that U.S. residents value foreign lives and settlements that may be destroyed by climate change at zero—is untenable.

KEYWORDS: climate change, benefit-cost analysis

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I. Introduction

How much unmitigated climate change would cost the United States *in the future* is an important question for those interested in the debate over how much the United States should invest *now* in efforts to mitigate or prevent such climate change. A cost-benefit analysis (CBA) for any climate change policy or regulation, in effect, compares the costs to the United States of taking mitigation and prevention measures with the costs to the United States of not taking those measures. Thus, any CBA for climate change that is or will be used for political, legal, or regulatory purposes will be determined in significant part by the methodology used for estimating the costs to residents of the United States of unmitigated climate change.

The current approaches to assessing the costs to U.S. residents of unmitigated climate change in the future exclude any values for Americans' loss of welfare due to the loss of foreign lives or settlements that might be damaged or destroyed as a result of climate change.¹ Current CBAs for the costs to Americans of climate change do include dollar sums to reflect estimates of what U.S. residents would pay to prevent the loss of U.S. lives and the loss of U.S. "settlements"² that might result from future climate change, such as deaths of U.S. residents from heat waves and losses of coastal towns and places of natural beauty within the United States from rising sea levels. Although a recent proposed joint federal EPA/DOT rulemaking broke from long-established practice in considering the global benefits of carbon reduction in addition to its domestic benefits,³ the

¹ More generally, CBA for regulatory policymaking purposes in the United States simply does not address extraterritorial economic or physical impacts, and hence, not surprisingly, does not consider U.S. residents' welfare losses due to those extraterritorial impacts. A Carter-era Executive Order seemed to imply that CBAs consider extraterritorial effects, *see* Exec. Order No. 12,114, 3 C.F.R. 356 (Jan. 4, 1979), but that Order has been substantially ignored, and extraterritoriality has not been a concern of subsequent executive orders regarding CBAs. Douglas A. Kysar & Ya-Wei Li, *Regulating from Nowhere, Domestic Environmental Law and the Nation-State Subject* (Cornell Law School Legal Studies Research Paper Series, 2008), available at ssrn.com/abstract=995301 (noting "tepid enforcement" of Executive Order 12114). Moreover, OMB Circular A-4 (Sept. 17, 2003), p. 15, which implements Executive Order 12,866, specifically directs each agency to "focus on benefits and costs that accrue to citizens of the United States."

² I use the term settlements to refer to human-made sites such as cities and towns and historic sites and places of distinctive natural beauty or note (which usually are also the product in part of the surrounding human culture). "Settlements" is a standard term of art in the CBA literature.

³ The agencies acknowledged that they were required by law to estimate domestic benefits of carbon reduction, but not global benefits. *See* Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 74 *Federal Register* 49454, 49612 (Sept. 28, 2009). Whether and to what extent the agencies actually do have the discretion to rely upon a global estimate in addition to a domestic estimate is a question that may well not be resolved until the EPA/DOT rulemaking is finalized, and the federal

agencies' methodology for calculating domestic benefits did not include any benefits to Americans from the saving of foreign lives and settlements from the adverse impacts of climate change. What agency estimates to date have not at all reflected, even nominally, is the welfare Americans would lose, and would be willing to pay money not to lose, when foreigners die due to climate-related disease and great coastal cities and sites and other foreign lands are submerged due to climate-related flooding or other adverse effects from climate change.

This article explores the case for including in domestic CBAs these now-ignored losses of foreign lives and settlements as part of estimates of costs to the United States from unmitigated climate change in the future.⁴ The basic rationale for using CBAs at all—a preference-aggregation, social-utilitarian rationale—argues in favor of including the welfare loss U.S. residents would bear as a result of the loss of foreign lives and settlements. Moreover, there is good reason to believe that observable market data do not and cannot capture the dimensions of this welfare loss, and that survey or other stated preference methods of assessing U.S. residents' willingness to pay to prevent such loss are therefore needed.

The question of what is and is not included in CBAs for climate change for the United States is important because CBAs frame and drive policy debates in the United States to a very substantial degree, and what the United States does or does not do regarding climate change almost certainly will have a large impact on the willingness of other countries to take measures to help prevent or mitigate climate change. Moreover, the inclusion of a valuation for foreign lives and settlements in CBAs for climate change almost certainly would encourage the inclusion of a valuation for foreign lives and settlements by U.S. policymakers in CBAs used to inform non-climate-change policies and by policymakers in countries other than the United States. Thus, while this article focuses on the United States and climate change, it has implications beyond the United States and outside the (admittedly broad) context of climate change.

A key problem in including foreign lives and settlements in CBAs is how to reliably measure the willingness to pay to preserve foreign lives and settlements. In the view of some economists, "talk is cheap," and hence surveys or other means of recording stated preferences are unrevealing as to people's real

courts decide upon its legality. As the agencies conceded, the relevant statutory provisions are at a minimum "ambiguous" as to the scope of agency discretion to consider global costs and benefits in addition to domestic ones. *Id.* at 49612.

⁴ The topic of indirect costs to Americans as a result of the direct effects of climate change abroad has received virtually no attention by legal academics. The one notable exception is Jody Freeman and Andrew Guzman, *Climate Change and U.S. Interests*, 109 COLUMBIA LAW REVIEW 1531 (2009), but their essay does not address costs to Americans resulting from the loss of foreign lives and settlements in and of themselves or Americans' willingness to pay to prevent such losses. Rather, it addresses possible costs to Americans such as greater political instability abroad as a result of climate change and hence greater flows of impoverished migrants into the United States.

preferences, that is, preferences they would really act upon. Such surveys, however, could provide useful information regarding U.S. residents' relative valuation of U.S. lives and settlements on the one hand and foreign lives and settlements on the other. But there have been no published reports of efforts to measure U.S. residents' relative willingness to pay to save U.S. and foreign lives and settlements from the adverse physical effects of climate change. Indeed, there appear to be no published studies attempting to capture U.S. residents' stated willingness to pay to save foreign lives and settlements relative to U.S. lives and settlements in any context.

This article discusses surveys I conducted that are a first step toward filling the empirical void in the literature. The survey results reported in this article suggest that U.S. residents equally value U.S. and foreign lives and settlements. Such results do not necessarily *prove* that U.S. residents would individually be willing to pay the same amounts to prevent the loss of foreign lives and settlements as they would to prevent the loss of U.S. lives and settlements. But such results do make the implicit assumption of CBAs as they are currently undertaken—that U.S. residents do not *at all* value foreign lives and settlements—very hard to maintain.

Part I of the article sets the stage by briefly summarizing the best current estimates of the effects of unmitigated climate change on different regions of the world. The key point is that, under current estimates of gradual, unmitigated climate change, the *direct* physical impacts of climate change will be less severe in the United States than in much of the rest of the world. Part I also discusses the various ways in which domestic CBAs used by American policymakers could be undertaken to reflect the impacts outside the United States. Part II develops the argument for considering the costs to U.S. residents of the loss of foreign lives and settlements and explains why revealed preferences via observable real-economy transactions cannot capture the true dimensions of those costs. Part III explores possible approaches to surveying U.S. residents regarding foreign lives and settlements. This part then discusses surveys that were designed to elicit information regarding U.S. residents' comparative valuation of the loss of lives and settlements within and outside the United States. Part V explores some implications of the survey results.

II. CBA and the Impacts of Climate Change in and Outside the United States

A. The Distribution of Direct Adverse Impacts

In the United States, acceptance of a precautionary approach to climate change is largely limited to certain academic and activist circles; a precautionary approach has generally been rejected by policymakers and, until recently, at least, politically influential economists.⁵ The assessments upon which US policymakers (and perhaps, policymakers in many other countries, either explicitly or implicitly) rely is not solely or primarily a scenario of rapid and hence broadly catastrophic climate change, but rather a blend of the catastrophic scenario and the non-catastrophic scenario, with the latter usually weighed as substantially more likely than the former. This blended approach does not ignore catastrophic possibilities but also does not “overweigh” them on the basis of an *a priori* commitment to precaution.⁶

Three factors seem to account for most of the variance in the estimated impacts (in dollar cost terms) of the costs for different nations of climate change under this dominant blended-scenarios approach. These are: (1) coastal exposure, (2) current or baseline climate, and (3) per capita wealth or GDP. Putting these factors together, relatively poor coastal or island nations with warm climates are the most vulnerable, whereas wealthy inland nations with cold climates are the least vulnerable.⁷ Applying the three factors to the United States leads one to conclude that the United States enjoys a relatively favorable position vis-à-vis the direct physical impacts of at least gradual climate change. The United States has very large coastal settlements, but it also has large inland areas with population centers and infrastructure that could be expanded if the coasts became less appealing. A large portion of the nation has a cold enough climate as a baseline that even with some warming, tropical diseases and deadly heat waves might not be a major concern. Indeed, in the now very cold parts of the country, some studies project significant benefits in agricultural productivity and outdoor leisure

⁵ Douglas A. Kysar, *It Might Have Been: Risk, Precaution and Opportunity Costs*, 22 JOURNAL OF LAND USE AND ENVIRONMENTAL LAW L. 1 (2006).

⁶ For a powerful argument that the current economics literature under-accounts for the extremity of adverse effects that might result from global warming given the wide range of outcomes that are conceivable, see Martin L. Weitzman, *The Role of Uncertainty in the Economics of Catastrophic Climate Change* (AEI-Brookings Joint Center Working Paper No. 07-11, 2007), available at <http://ssrn.com/abstract=992873>.

⁷ See Intergovernmental Panel on Climate Change [IPCC], FOURTH ASSESSMENT REPORT: CLIMATE CHANGE 2007 (London, UK: Cambridge University Press, 2007). See also Nicholas Stern, ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW (London, UK: HM Treasury, 2006).

time from climate change.⁸ Finally, as a wealthy nation, the United States can afford investments in flood prevention, public health, and transitional or relocation assistance that would mitigate the adverse impacts of climate change.

The leading quantitative assessment of comparative regional vulnerabilities using the blended approach remains the 2000 study by Nordhaus and Boyer. As Table One, adapted from Nordhaus and Boyer,⁹ shows, the adverse impacts outside the United States (measured in terms of percentage of lost U.S. GDP) are estimated to be much greater than the adverse impacts within the United States (measured in terms of lost GDP of the affected foreign nations). According to their estimates, climate change will result in a 1.88 percent decline in GDP for the world's population as a whole, but only a .45 decline in GDP for the United States. The Nordhaus and Boyer analysis, like all the climate change cost analyses to date, does not include any welfare costs U.S. residents might bear as a result of the loss of foreign lives and settlements.

Table One

| Nation/Area | Total Loss | Health Loss | Settlement Loss |
|---------------|------------|-------------|-----------------|
| United States | .45 | .02 | .10 |
| Japan | .50 | .02 | .25 |
| Europe (OECD) | 2.83 | .02 | .25 |
| Africa | 3.91 | 3.0 | .10 |

B. Domestic CBAs and Impacts Outside the United States in Domestic CBAs

If U.S. policymaking were premised solely on the global impacts of climate change, then the fact that the worst direct physical impacts of climate change are likely to occur outside the United States might not create any gap in eagerness to address climate change as between United States policymakers and those from countries with much greater vulnerability to direct physical impacts. But OMB only requires an assessment of domestic costs and benefits, and, with the exception of a single recent proposed rulemaking by the federal EPA and DOT, there has been a near exclusive focus on domestic costs and benefits. Domestic CBAs are likely to continue to attract the most attention in domestic political,

⁸ See, e.g., Olivier Deschenes and Michael Greenstone, *The Economic Impacts of Climate Change: Evidence from Agricultural Profits and Random Fluctuations in Weather* (MIT Departments of Economics Research Paper No. 04-26, 2004), available at <http://ssrn.com/abstract=564722>; William Nordhaus and Joseph Boyer, *WARMING THE WORLD* (Cambridge, MA: MIT Press, 2000); Jason Scott Johnston, *Climate Change Hysteria and the Supreme Court: The Economic Impact of Global Warming on the U.S. and the Misguided Regulation of Greenhouse Gas Emissions under the Clean Air Act* (University of Pennsylvania Institute for Law & Economics Research Paper No. 08-04, 2008), available at SSRN: <http://ssrn.com/abstract=1098476>.

⁹Nordhaus and Boyer, *supra* note 6.

legislative and regulatory discussions, especially in the context of domestic debates over how much the United States should invest relative to other nations. As Freeman and Guzman note, American international environmental policy is “typically driven by utilitarian calculations regarding the national interest,”¹⁰ which is exactly the kind of interest domestic CBAs are broadly understood to capture.

Domestic CBAs regarding climate change could continue to be undertaken without regard to the impacts on Americans’ welfare of the loss of foreign lives and settlements. Alternatively, an effort could be initiated to include those welfare losses in domestic CBAs. The decision whether to initiate such an effort is potentially a very consequential one, because the overall costs to U.S. residents of unmitigated climate change might be assessed to be significantly greater if foreign lives and settlements costs were included. The inclusion of these costs, therefore, might change the United States’ willingness to commit to strong carbon mitigation measures and binding reductions in greenhouse gas emissions as part of international accords.

The effects of the inclusion of such costs, of course, are logically a question of interest only if it is theoretically legitimate and practically possible to include such costs. It is to those questions that I now turn.

III. The Rationale for Assessing the Costs of Foreign Lives and Settlements Through Stated Preferences

A. Foreign Losses in Welfare Economics and Other Theoretical Frameworks

One of the oft-cited appeals of CBAs—and welfare economics generally—is that it purports to be value “neutral” in that it generally does not *ex ante* or *a priori* exclude items for valuation on the basis of some criteria imposed by the policymaker who would make use of the CBA. That people value fancy sneakers or gigantic cars in fact means that those things and the loss of those things count and should count in CBAs, even if, on some accounts, people should not value those things highly. What matters is that people are willing to pay for these things.

The neutrality principle that broadly animates the entire practice of conducting CBAs means that that willingness to pay to save foreign lives or settlements should be reflected in CBAs. One possible objection to the inclusion of U.S. residents’ preferences for the saving of foreign lives and settlements, however, is that such preferences are “altruistic,” rather than selfish or self-

¹⁰ See *supra* note 4, at 1538.

regarding. But the willingness on the part of U.S. residents to pay to save Venice, Italy, from sinking may not properly be understood as “altruistic” even if they have no intention of travelling there any time soon, since they may simply want the option for future travel or the pleasure of knowing that Venice as a place of beauty exists.

Moreover, the principal critiques of the inclusion of altruistic preferences in CBAs pertain to non-paternalistic altruistic preferences¹¹ and to the possibility that the inclusion of altruistic preferences will lead to a double-counting of the welfare gains or losses of the objects of the altruism.¹² U.S. residents’ preferences for saving foreign lives and settlements from heat waves and floods due to climate change—to the extent such preferences are indeed altruistic—very likely could be understood as reflecting a kind of paternalism. The inclusion of such preferences in a domestic CBA for the United States would not result in any double-counting, inasmuch as foreigners’ valuations of their own lives and settlements would not otherwise be counted in such a CBA.

Another set of objections to considering U.S. residents’ willingness to pay to save foreign lives grows out philosophical and ethical commitments to human equality and against differential valuation of human life based on nationality, race or ethnicity. Almost all the non-welfare-economics approaches to climate change—including corrective justice, Rawlsian/social contractarian, and fundamental human capabilities approaches¹³—build on a strong commitment to

¹¹ See K.E. McConnell, *Does Altruism Undermine Existence Value?* 32 JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT 22, 32 (1997) (“The purely paternalistic case occurs when the altruist values the quantity of services from the resource received by the beneficiaries. The analysis of paternalistic altruism is like an externality. One person’s service flow enters another’s utility function. . . . The altruist is better off even if the beneficiary consumes resources’ services but suffers a loss in real income or a reduction in utility. It is much like literal paternalism, for example, when parents insist that their children eat their carrots.”). See also Kevin L. Brady, *The Value of Human Life: A Case for Altruism*, 48 NATURAL RESOURCES JOURNAL 541 (2008) (summarizing the relevant economics literature). The surveys reported on below do not attempt to categorize and sort the motivations of the survey respondents, but such categorization and sorting could be undertaken in future studies by asking questions directly about motivation or by offering different scenarios that might yield different responses depending on motivation.

¹² See Richard O. Zerbe, *The Legal Foundation of Cost-Benefit Analysis*, 2 CHARLESTON LAW REVIEW 93, 115; Peter-Olov Johansson, *Altruism in Cost-Benefit Analysis*, 2 ENVIRONMENTAL AND RESOURCE ECONOMICS 605, 605-613.

¹³ Postulating that each nation has a duty not to “disproportionately” use up the world’s natural resources—and here disproportionate is understood as disproportionate to population—the corrective justice approach holds that Americans have a duty to take strong measures against climate change because Americans have “used up” a disproportionate share of the atmosphere or (to say the same thing otherwise) have disproportionately created or contributed to the current stock of greenhouse gases warming the planet. See, e.g., Peter Singer, *ONE WORLD: THE ETHICS OF GLOBALIZATION* 44-45 (New Haven, CT: Yale University Press, 2002). For thoughtful

human equality. From the vantage of that commitment, it would be troubling if domestic CBAs were to reflect that U.S. residents are willing to pay much less to save foreign lives than domestic ones or are willing to pay much more to save white European lives than black African lives. Indeed, it is fair to say that even in the welfare economics tradition, consideration of racially motivated preferences is deeply problematic.¹⁴

Although the survey results reported below suggest that U.S. residents have a slightly higher valuation for U.S. lives and perhaps also European lives as compared to other lives, the overall message of the surveys is that U.S. residents place substantial value on all foreign lives. Even if future surveys were to demonstrate that U.S. residents do value foreign lives substantially less than U.S.

assessments of this argument, see Matthew D. Adler, Commentary, *Corrective Justice and Liability for Global Warming*, 155 *University of Pennsylvania Law Review* 1859 (2007); J. Timmons Roberts & Bradley C. Parks, A CLIMATE OF INJUSTICE: GLOBAL INEQUALITY, NORTH-SOUTH POLITICS, AND CLIMATE POLICY 1-2 (Cambridge, MA: MIT Press, 2007); Eric A. Posner & Cass R. Sunstein, *Climate Change Justice*, 96 *Georgetown Law Journal* 1565 (2008). The social contract theory for global justice in climate change and other matters builds on a modified Rawlsian veil of ignorance, wherein each nation or each nation's population is imagined behind a veil of ignorance in which no one nation knows how wealthy or poor or how vulnerable or not vulnerable to climate change or other problems it or any other nation will be beyond the veil. The presumption is that, just as individuals within a single polity behind a veil will opt for a social order beyond the veil that guarantees basic rights and an entitlement to certain important goods in life, each nation behind the veil will opt for an international order beyond the veil that guarantees to each nation a comparable entitlement to important goods for its population. And presumably protection from terrible heat waves and flooding from climate change is one of those important goods. See Charles R. Beitz, *POLITICAL THEORY AND INTERNATIONAL RELATIONS*, 151 (Princeton, NJ: Princeton University Press, 1979) (arguing that national boundaries lack "fundamental moral significance" and that principles of justice "therefore apply globally"); Thomas W. Pogge, *REALIZING RAWLS* 247 (Ithaca, NY: Cornell University Press, 1989) (arguing that nationality is "just one further deep contingency . . . like genetic endowment, race, gender, and social class...that are present from birth" and that therefore "[w]ithin Rawls' conception there is no reason to treat this case differently from the other."). Finally, the human rights theory—a theory that also shares much with religiously inspired theories of social justice—builds on a fundamental commitment to human dignity, to all human beings' dignity, to human capacities, and thus calls for actions necessary to ensure that all populations have the resources needed to engage in human flourishing. As Martha Nussbaum writes, arguing in this tradition (but drawing more heavily on formal philosophy than many human rights advocates), some general principles can be defended as crucial to "the promotion of human capabilities," among which is that "it seems unconscionable that a world based on the ideas of mutual respect and human dignity should not commit itself to very significant redistribution." See Martha Nussbaum, *FRONTIERS OF JUSTICE: DISABILITY, NATIONALITY, SPECIES MEMBERSHIP* 311, 317 (Cambridge, MA: Harvard University Press, 2006). And protection from heat waves and floods and other ravages from climate change are part of what is needed for human flourishing.

¹⁴ Compare Cass R. Sunstein, *LAWS OF FEAR: BEYOND THE PRECAUTIONARY PRINCIPLE* 163-64 (Cambridge, UK: Cambridge University Press, 2005) (discussing the IPCC's struggle and the general problem of comparing the value of lives in rich and poor countries).

lives and non-Caucasian foreign lives substantially less than Caucasian ones, it is not clear that the current approach to domestic CBAs is ethically less problematic than one that seeks to capture U.S. residents' true valuations. After all, the current approach to domestic CBAs proceeds on the implicit assumption that only U.S. lives have value to U.S. residents and that foreign lives have zero value.

B. Objections Based on the Likely Magnitude of the Willingness to Pay to Save Foreign Lives and Settlements

One conceivable reason for excluding foreign lives and settlements could be that such items are likely of so minor value to U.S. residents that it would simply not be worth the bother to include them in any overall cost estimate. After all, estimations of willingness to pay themselves are not costless, in terms of the direct costs of estimations. Moreover, there are costs of introducing a new source of error into CBAs to the extent that estimations might prove difficult to reliably undertake. Eric Posner and Cass Sunstein have suggested that foreign lives and settlements should not be included in CBAs for climate change (or generally) for these reasons.¹⁵

However, even if it is true that U.S. residents value the loss of the average foreign life or the average historic foreign settlement at a fraction of the value of a U.S. life or U.S. historic settlement, the *net* valuation of foreign lives and settlements at risk from climate change may be very large and it is this figure that matters. In that regard, a key point (once again) is that the direct adverse effects of climate change would be much greater outside the United States than within. One estimate of U.S. taxpayers' valuation of foreign lives as indicated by foreign aid expenditures is that U.S. taxpayers value foreign lives as on average worth one-eighth of U.S. lives.¹⁶ It is beyond dispute that more than eight foreign lives would be lost for every U.S. life as a result of unmitigated climate change. If so, even if a foreign life is worth only one-eighth as much as a U.S. life, the net loss to U.S. residents from the loss of all foreign lives would have a value greater than the loss of all U.S. lives from unmitigated climate change.¹⁷

¹⁵ See Eric A. Posner, *Agencies Should Ignore Distant- Future Generations*, 74 UNIVERSITY OF CHICAGO. LAW REVIEW 139; Eric A. Posner and Cass Sunstein, *Dollars and Death*, 72 UNIVERSITY OF CHICAGO. LAW REVIEW 537, 579-581.

¹⁶ See Wojciech Kopczuk et al, *the Limitations of Decentralized World Redistribution: An Optimal Taxation Approach*, 49 EUROPEAN ECONOMIC. REVIEW 1051, 1054.

¹⁷ To the extent government aid is a meaningful representation of popular preferences or valuations regarding foreign lives, however, it may be that certain military expenditures should be included in the aid figures and not simply development or humanitarian assistance (which was the basis of the Koczuk model and extrapolation). For example, the United States has spent billions on peacekeeping in Kosovo, presumably in large part because of United States' concern about ethnic cleansing and killing in Kosovo that could occur in the absence of peacekeeping. See Steve

Moreover, it may well be that U.S. residents value foreign lives and settlements at a bigger fraction than any estimate derived from foreign aid payments would suggest. Foreign aid may not be a very good indication of what individual U.S. residents would be willing to pay to save foreign lives and settlements from climate change since, as Jason Johnston has argued, government expenditures do not necessarily mimic or perhaps come close to resembling the aggregation of individual preferences within the electorate.¹⁸ But there are other sources of “revealed preference” evidence of U.S. residents’ valuation of foreign lives and settlements, which, by extrapolation, do indeed suggest that U.S. residents would be willing to pay some amount of money to save foreign lives and settlements from loss due to climate change in the future. For example, U.S. residents spend millions each year on foreign travel, including travel to places that are at substantial risk from climate change, such as European cities like Venice and tropical destinations like the Caribbean islands.¹⁹ Large expenditures on travel do not directly translate into proof that U.S. residents place a large value on foreign places or that they would be willing to pay to preserve such places from climate change, but these expenditures are hard to square with the view that U.S. residents would be willing to pay nothing or negligible amounts to preserve foreign lives and places.

Even more powerful evidence of U.S. residents’ willingness to pay is how much U.S. residents individually or through corporations and foundations give to charities serving foreign populations and to foreign family and friends in the form of individual remittances. According to one estimate, U.S. residents’ private

Bowman, CRS ISSUE BRIEF FOR CONGRESS: KOSOVO AND MACEDONIA: U.S. AND ALLIED MILITARY OPERATIONS (Jul. 8, 2003), *available at* www.au.af.mil/au/awc/awgate/csr/ib10027.pdf (estimating that Congress had already appropriated \$8.83 billion for Kosovo operations); Center for Strategic and Budgetary Assessments, AFTER THE WAR: KOSOVO PEACEKEEPING COSTS (Jun. 7, 1999), *available at* <http://www.csbaonline.org/4Publications/PubLibrary/U.19990607> (estimating U.S. peacekeeping costs in Kosovo to be \$2-3.5 billion per year).

¹⁸ See Jason Scott Johnston, *Desperately Seeking Numbers: Global Warming, Species Loss, and the Use and Abuse of Quantification in Climate Change Policy Analysis*, 155 *University of Pennsylvania Law Review* 1901, 1908.

¹⁹ See, e.g., *Final US Citizen Air Traffic To Overseas Regions, Canada & Mexico 2006*, 2006 *Profile of Resident Travelers Visiting Overseas Destinations* (2006), and *U.S. Resident Travel Abroad Historical Visitation Estimates for U.S. Outbound 1996-2006 (One or More Nights)* (2006), all *available at* <http://tinet.ita.doc.gov/research>. In the surveys discussed below, respondents who travelled abroad had larger mean contributions to save both U.S. and foreign lives and settlements than people who did not travel abroad, but did not have notably different ratios of mean contribution for U.S. lives and settlements in relation to mean contribution for foreign lives and settlements. The overall pool of respondents, however, contained fewer than 5 percent who reported frequent travel abroad, and thus it is difficult to draw any conclusions as to whether travelling abroad generally translates into greater relative valuation of and foreign lives and settlements.

charitable giving abroad plus remittances to foreigners, with respect to developing countries, totaled \$71.2 billion in 2004 and \$95.2 billion in 2005. Aggregate giving abroad including everything—private charitable giving and remittances, plus U.S. development assistance—exceeded 0.68 percent of GDP in 2004 and 0.98 percent of Gross National Income in 2005.²⁰ A large portion of this giving goes to countries at high risk from climate change, in particular Latin American and Middle Eastern countries and India and the Philippines. This giving, moreover, has included substantial amounts to victims of arguably climate-change-related hurricanes, such as the tsunamis that have ravaged Southeast Asia.²¹

There are good reasons to believe, moreover, that current patterns of giving for foreign causes and to foreigners understate U.S. residents' valuation of the foreign lives and settlements that are at risk of loss from unmitigated climate change in the future. For one thing, foreign lives and settlements that U.S. residents may value very highly—lives and settlements in the European Union countries and Japan—have not been threatened with the kind of powerful adverse effects that climate change could impose upon them in the future and that could overwhelm even the considerable adaptive capacity of those wealthy countries. Thus, U.S. residents, individually and collectively, have not had an opportunity to show how much they value those settlements and lives and how much they would spend to help save the settlements or lives from severe effects from climate change in the future. If Europe were about to lose major coastal cities, U.S. residents might experience that as an important possible loss and be willing to pay to prevent that; the United States, after all, entered two world wars substantially in response to crises in Europe and largely financed a massive postwar reconstruction via the Marshall Plan. Indeed, given cultural and historic ties to the United States, U.S. residents might pay a great deal to prevent losses just in the British Isles and Ireland.

Another important reason U.S. residents may not now give more to save foreign lives and settlements, particularly in poor regions such as sub-Saharan Africa, is that such giving is chilled by a kind of prisoner's dilemma dynamic. In a justly famous article, Sen argued that individuals faced with the decision to contribute to a collective good such as reductions in pollution from recycling face a classic prisoner's dilemma choice.²² If they knew that others would recycle all

²⁰ See Hudson Institute, *THE INDEX OF GLOBAL PHILANTHROPY 2007* 14, 16 (2007); Hudson Institute, *THE INDEX OF GLOBAL PHILANTHROPY 2006* 13-15 (2006), both available at www.hudson.org.

²¹ According to one estimate, the total U.S. private tsunami donations exceeded \$1.8 billion. U.S. Agency for International Development, *Tsunami Reconstruction, Two Years Later* (Fact Sheet, 2006), <http://www.usaid.gov/press/factsheets/2006/fs061222.html>.

²² See Amartya Sen, *Behaviour and the Concept of Preference*, 40 *ECONOMICA* 241, 249.

their bottles so that pollution were reduced, they could have their cake and eat it too—not have the bother of recycling their bottles but see and enjoy a reduction in pollution. On the other hand, if they do not know that others will recycle and others do not in fact recycle, they could be made worse off by recycling themselves, as they would then have assumed the burden of recycling without there being any possibility for an appreciable net reduction in pollution. These individuals would be willing to enter into an agreement with others to recycle, as they would be better off if they could see pollution reduced even if they had to assume the burden of recycling. But since binding agreements are not feasible, the individuals simply may not recycle at all.

Extending the Sen recycling example to climate change, individual U.S. residents may not contribute to helping foreigners avoid or adapt to climate change or other challenges because they would like to assume that others—other individual U.S. residents, other foreigners, other kinds of entities (governments, domestic and foreign, or international organizations)—will make contributions that achieve that purpose so that they do not have to do so to save foreign lives and settlements. Conversely, individual U.S. residents may not contribute more because they may fear that others will not do likewise, so that the total funds available will be insufficient to make a difference in saving foreign lives and settlements. U.S. residents also may fear that their contributions will not be well-used by recipient organizations and hence will be ineffective. The climate change problem is so technically challenging that the mitigation efforts to which they could contribute may simply not have any real impact, or that at least may be a comprehensible fear.

Moreover, technical difficulties aside, money contributed to foreign charities for humanitarian purposes (climate-change related or not) could be misused as a result of corruption and conflict within the foreign countries, and U.S. residents may not give or support aid on that account. Broadly speaking, corruption is perceived to be a great problem in the developing countries that would be most severely impacted by unmitigated climate change, such as the countries of sub-Saharan Africa and Bangladesh. The popular press not infrequently features a report of foreign aid that has been appropriated by corrupt leaders of desperately poor countries.²³

Finally, willingness to pay regarding the value of foreign lives and settlements may not be revealed or fully revealed because Americans do not fully know what is happening outside their borders or what could happen outside their borders in the future due to unmitigated climate change. One of the fundamental

²³ See, e.g., John Stossel & Patrick McMenamin, *Will More Foreign Aid End Global Poverty?*, 20/20 (2006), available at <http://abcnews.go.com/2020.Story?id=1955664> (“So much is stolen because we rely primarily on governments to administer foreign aid, and many African governments are kleptocracies.”).

puzzles of the CBA approach to social welfare assessments is whether a loss in welfare is really a loss if people do not know about it: this is another form of the classic question if a tree falls and no one hears it, has it really made a sound? Americans—many of them anyway—do not hear about and learn about every foreign famine and heat wave and flood. If they did, they might reveal a stronger valuation of foreign lives and settlements through their actions. Americans may not be aware of—or really focused upon—the risks unmitigated climate change pose to foreign lives and settlements. Moreover, for whatever reasons, Americans may believe that the United States is already providing vulnerable developing countries far more aid than is truly the case.²⁴

Using stated preference methods such as surveys does not eliminate all of the problems that make revealed preferences—actual behavior in paying money—an imperfect means to assess the true value and hence willingness of Americans to pay to save foreign lives and settlements. But surveys can ask about particular circumstances many Americans would not hear about or that have not yet happened—such as flooding in Europe from climate change that is so severe that Europeans cannot afford to address it. The surveys also can be constructed to try to lessen distortions from free-riding and corruption/misuse of aid concerns, as discussed in Part III below.

IV. Stated Preference Surveys and the Value of Foreign Lives and Settlements

This part explores the problems of stated preference surveys as a means of assessing Americans' willingness to pay to prevent the loss of foreign lives and settlements to unmitigated climate change in the future. This part considers some general problems with stated preference approaches and also problems that are specific to the climate change context, and considers possible responses. Finally, two surveys I administered are discussed.

A. Designing and Interpreting Stated Preference Surveys

Critics of stated preference methods argue that such methods are subject to excessive manipulation on the part of the design givers, a fact that they argue proves that the survey results are not grounded in meaningful, true preferences. For example, they point out that the order of the items to be valued on a multiple-

²⁴ According to the Center on Policy Attitudes report in 2001, America “greatly” overestimated the percentage of the U.S. budget that is devoted to foreign aid Program on International Policy Attitudes., AMERICANS ON FOREIGN AID AND WORLD HUNGER: A STUDY OF U.S. PUBLIC ATTITUDES (2001), available at http://www.pipa.org/archives/us_opinion.php (finding that Americans overestimated aid by a factor of 20 or more).

item survey can substantially affect results: put a different item first and one gets different results. They also argue that survey respondents may provide very different responses based on minor changes in the factual information provided them, and that survey respondents also may intentionally inflate their responses if they guess that the surveys may be used to support policies or court judgments that big companies—not they—would have to pay.²⁵

These critics of stated preference surveys also have questioned whether surveys capture willingness to pay at all, rather than certain feelings or sensitivities to social norms.²⁶ In particular, they argue that results just show that respondents get a sense of “warm glow” or moral comfort in saying they would be willing to pay to prevent some harm even though they really would not be willing to pay the amount they report—or perhaps anything. They also argue that respondents offer their responses to impress the surveyors as to their generosity and conformity with social ideals, even though, again, they would not be willing to pay what they say they would be willing to pay. According to these critics, the results of these surveys therefore inflate the real willingness to pay of surveyed individuals.²⁷

The manipulation and overstatement or inflation problems, to the extent they generally do obtain, can be mitigated by reframing stated preference methods

²⁵ See James J. Murphy et al., *A Meta-Analysis of Hypothetical Bias in Stated Preference Valuation*, 30 ENVIRONMENTAL AND RESOURCE ECONOMICS 313; Sameer H. Doshi, *Making the Sale on Contingent Valuation*, 21 ENVIRONMENTAL LAW JOURNAL 295, 302-303; Frank B. Cross, *Natural Resource Damage Valuation*, 42 VANDERBILT LAW REVIEW. 269, 316.

²⁶ See Peter A. Diamond and Jerry A. Hausman, *Contingent Valuation: Is Some Number Better Than No Number?*, 8 JOURNAL OF ECONOMIC PERSPECTIVES 45, 52-53.

²⁷ There are other criticisms as well, including the criticism that responses are insensitive to the scope of the loss to be avoided (that is, how many of an item or entity will be saved), which is also inconsistent with revealed preference, market behavior, in which willingness to pay generally corresponds to the scope or magnitude of the good or goods at issue. Whether the scope of loss or quantity objection is well-grounded depends in part on one’s interpretation of the body of CVM studies as a whole. But even if surveys do not reflect well per-unit, scope-sensitive valuations of a particular good or goods, they may capture valuation of the general category of the good—how much people value polar bears generally, as opposed to how much they value 100 as opposed to 1000 bears. This is a plausible interpretation because published surveys have not generally given respondents enough information to assess the significance of 100 versus 1000 bears, and generally have not focused respondents on the issue by asking them to provide a valuation for 100 and 1000 bears. Instead most surveys are between-subject surveys where respondents are asked to assess the value of only one loss of a particular, stated scope or quantity. Extrapolating this point to the context of surveying about the value of foreign lives and settlements, one might reasonably argue that such studies may not capture per-unit valuation of foreign lives and settlements as much as they may capture valuation of foreign lives and settlements generally or valuation of particular categories of foreign lives and settlements (e.g., European or Latin American lives and settlements).

as an inquiry not into *absolute* willingness to pay but rather *comparative* willingness to pay.²⁸ It may be that stated preference surveys overstate the willingness to pay to save *both* the endangered polar bear population and the endangered salmon population, and it may well be that the particular wording of the salmon and bear surveys, even if the wording seems unimportant, may either increase or decrease the reported willingness to pay. But if we want to know something that may be important to know—how much greater or lesser is the willingness to pay to save the bears as compared to the willingness to pay to save the salmon—we can compare the relative magnitudes of the two willingnesses to pay. As long as the inflation or overstatement dynamic is the same in the bear as in the salmon context, that dynamic becomes irrelevant once we focus on the comparison of the two willingnesses to pay. And as long as the wording and tenor and kind of factual information provided in the salmon and bear surveys or the salmon or bear portions of a single survey are identical (or as close as possible), any effects of that wording should not affect the ratio between the two willingnesses to pay.²⁹

The nature and temporal frame of climate change also presents difficult questions of survey design, regardless of whether the surveys measure absolute or relative willingness to pay. Climate change is an overarching phenomenon that will happen over a long time period, and people have difficulty reliably projecting into the distant future.³⁰ Moreover, climate change is a massive and difficult-to-

²⁸ We can obtain comparative data in stated preference studies in a number of ways. Within a single group of subjects, subjects can be asked to rank or allocate a budget with respect to various goods or to choose between two possible donations or contributions involving different goods, in which case they presumably will choose which they think is more valuable. In between-subject studies, the subjects in different groups can be given different goods to value. The former kind of survey may capture better the respondents' conscious attitudes—the attitudes they believe they have—regarding the comparative value of the items that can be saved. The latter kind of survey, by contrast, may better capture both conscious and unconscious attitudes that affect valuation. This article discusses only between-group surveys regarding the comparative valuation of American and foreign lives and settlements: future work could and should explore whether surveys where a single group comparatively values foreign lives and settlements yields different results from between-subjects surveys.

²⁹ There are in fact differences in stated preference valuations for different species. For example, one study indicates that the Northern Spotted Owl is valued roughly nine times as much as Atlantic Salmon. See John B. Loomis & Douglas S. White, *Economic Benefits of Rare and Endangered Species: Summary and Meta-Analysis*, 18 *ECOLOGICAL ECONOMICS* 197, 199 (1996). For a recent review of the studies, see Wayne Hsiung & Cass R. Sunstein, *Allocating Responsibility for the Failure of Global Warming Policies*, 155 *UNIVERSITY OF PENNSYLVANIA LAW REVIEW* 1693, 724 (2007).

³⁰ See Jeffrey J. Rachlinski, *The Psychology of Global Climate Change*, 2000 *University of Illinois Law Review*. 299, 305-306; David A. Dana, *A Behavioral Economic Defense of the Precautionary Principle*, 97 *NORTHWESTERN UNIVERSITY LAW REVIEW* 1315, 1322.

grasp phenomenon that even experts have difficulty describing in terms that are accessible to the lay population. And most ordinary people cannot readily imagine how any contribution they could make could affect in any meaningful way “climate change” writ large. For these reasons, it is not reasonable to assume that people can provide any intelligible answer to the broad question of how much would they pay to stop the effects of climate change, whether within a particular country such as the United States or outside.³¹ Indeed, one might expect a high percentage of respondents would say they are unable to or unwilling to respond.

The principal means of tackling this challenge is to structure the surveys around physical impacts that are or would be associated with climate change but that are also within or close enough to the respondents’ experience that they can readily imagine and comprehend them. Thus, in the surveys discussed below, respondents are asked about adverse happenings now, not at an undefined future date, and in a particular region of the world, rather than throughout the planet. And the happenings, such as flooding or deaths from heat waves, are ones that can be readily imagined by respondents because, as we all know, even now there are major floods and deadly heat waves, at least in some parts of the world.

The level of specificity of climate change surveys is another challenging question. In order to determine how much Americans value the settlements of Italy, we could estimate and then add up the costs Americans will bear from adverse effects in any given region or part or city of that country. That approach, however, would require an enormous number of surveys. One could instead ask about a single identified and well-known city in the nation at issue—Venice in the case of Italy, for example—but then it would not be clear whether the answers reflected attitudes toward losses in just Venice or more broadly Italy or even more broadly Europe.

One approach would be to ask about an unspecified city or area in the nation or region at issue while giving enough facts that the respondent can imagine the general nature or character of the city or region at issue. This approach may be grounded and specific enough to allow respondents to answer meaningfully while remaining general enough to capture attitudes about regions or nations rather than attitudes about just one place. The surveys described below adopt this intermediate approach but ideally we would combine various approaches and compare results. More generally worded surveys combined with highly place-specific ones would provide a fuller account of stated preferences. That kind of project, however, requires that the principal object of this article first be achieved—that the costs Americans bear as a result of the loss of foreign lives and settlements be accepted as a category of costs that require real consideration and hence study.

³¹ See Richard Posner, *CATASTROPHE* (New York, NY: Oxford University Press, 2004), 119-122.

Finally, any climate-change-related survey needs to try to address two principal reasons revealed preferences may be less than fully instructive—deflated or depressed giving or support for public expenditure due to free-riding, and foreign corruption concerns. If Americans are concerned about the free-riding of other wealthy nations, or more generally about free riding by other potential givers, whether American or foreign, that concern can be allayed by specifying that there has already been substantial giving by others. If Americans are tempted to free ride on giving by others, telling them that others have given substantially but cannot or will not give any more may also be helpful. With regard to the foreign corruption concern, surveys can include wording to provide respondents some assurance that contributions would be well spent for their stated purposes. In the surveys discussed below, respondents are told that the charity at issue already has raised much of the needed money (which addresses the free-riding concern somewhat) and that the charity is highly reputable (which addresses the corruption concern, at least to an extent).

B. The Flood and Heat Wave Surveys

I administered two kinds of surveys to respondents who are part of an Internet-based subject pool organized by researchers at Syracuse University. The survey pool, which did not include a significant number of full-time students, was recruited over the Internet using small monthly rewards as an inducement for participation in surveys. The most notable feature of the demographics of the respondent groups is a very high percentage of non-Hispanic Caucasians. Out of the 406 respondents who completed one of the variants of what I call the “heat wave survey” and the 274 respondents who completed one of the variants of what I call the “flood survey,” almost 90 percent self-identified as Caucasian.³² The surveys also asked for information regarding age and household income. The modal response for age was between 30 and 40, and the modal income response was between \$25,000 and \$50,000.

In a more racially/ethnically diverse group, particularly if some of the minorities were foreign born, we perhaps might expect higher valuations of foreign lives and settlements or of at least some kinds of foreign lives and settlements. For example, we might expect that a respondent group with a substantial percentage of Asian Americans might place a relatively high value on saving Asian settlements. The role of race and ethnicity is an interesting question

³²According to a recent U.S. census estimate, 65 percent of U.S. households self-identify as Caucasian. See <http://quickfacts.census.gov/qfd/0000.html>. Complete copies of all the survey variants are available from the author, who can be reached at d-dana@law.northwestern.edu.

but one that the demographic characteristics of the respondents did not allow me to consider.³³

In the heat wave survey, the subjects received one of five variants of the survey.³⁴ Each variant was the same except as to where the heat wave in question was expected to occur. There was a variant for an unidentified city in the United States, an unidentified city in Southeast Asia, an unidentified city in Africa, an unidentified city in Latin America, and an unidentified city in Europe. One of the goals of the survey was to try to isolate valuations of foreign lives as opposed to settlements, and to that end, each heat wave survey variant addressed only loss of life and did not imply that there would be a loss of historical or other structures. For example, the text of the Southeast Asia variant read as follows:

There is a City in Southeast Asia that is facing severe heat waves this summer. Several thousands of the residents of the City are at risk of death from the severe heat. The City lacks the resources to re-locate its threatened population to air-conditioned structures or to cooler areas outside the City. A highly reputable charity is raising money for the emergency re-location of the City residents who are most at risk of death from the severe heat. The charity has already collected much of the needed money but requires some additional contributions to finance the emergency effort. Unless the charity can provide the needed financing for the emergency effort, it is highly likely that several thousands of the City residents will die from heatstroke. How much money would you be willing to contribute to the charity to help finance the emergency re-location?

In the flood survey, respondents received one of four variants of the survey.³⁵ The variants differed only in the location of the city facing flooding, with one variant addressing an unidentified city in the United States, an unidentified city in North Africa, an unidentified city in Asia, and an unidentified

³³ The racial gaps in attitudes about public funding in the wake of hurricane Katrina suggest that the race and ethnicity of survey participants could well significantly affect willingness to pay to prevent or rectify climate-change-related natural disasters. See Michael Dawson et al., 2005 RACIAL ATTITUDES AND THE KATRINA DISASTER STUDY 2 (2006), available at www.news.uchicago.edu/releases/06/images/katrina_report.doc (finding that 79 percent of black respondents agreed that the “Federal Government should spend whatever’s necessary to rebuild and restore people to their homes in Katrina’s aftermath” but only 33 percent of white respondents agreed with that proposition).

³⁴ The number of respondents who completed each variant was: United States, 85, Europe, 79, Africa, 81, Latin America, 80, Asia, 76.

³⁵ The number of respondents who completed each variant was: United States, 66, Europe, 72, Asia, 68, Africa, 73.

city in Europe. Respondents were told the city at issue had historic significance and to underscore that point were also told that the city attracted at least 250,000 American visitors as tourists each year (which is a number of tourists that certain cities in each of these regions do attract annually). The goal of the survey was to isolate valuation of foreign settlements as opposed to foreign lives, and hence each variant of the survey provided that the structures of the city would be destroyed from flooding but the population could be re-located. For example, the text of the North Africa variant read as follows:

There is a City in North Africa that was established hundreds of years ago and is known for its historic areas. Approximately 250,000 Americans visit the City each year. The City is being threatened by a flood that can only be prevented if new levees are constructed immediately. The population of the City could be safely re-located if there is a flood, but the flood would destroy the physical structures in the City. A highly reputable charity is collecting the money to finance the construction of the levees needed to prevent the flooding. The charity has already collected much of the needed money but requires some additional contributions to have enough to finance the construction. Unless the charity can provide the needed financing, it is highly likely that the levees will not be constructed in time and that the City will be flooded. How much money would you be willing to contribute to the charity to help fund the construction of the levees?

Rather than asking respondents for a specific dollar figure, respondents were asked to pick one of several levels or brackets, ranging from “Less than \$1” to “More than \$5,000.” The second, third, and fourth brackets were \$1 to \$10, \$10.01 to \$50, and \$50.01 to \$100, respectively. The bracket approach was designed to capture the general intensity of respondents’ enthusiasm for giving. In coding and comparing the results among respondent groups to generate means and test for statistically significant differences, the brackets were converted into a 1 to 7 scale, with “Less than \$1” equaling a 1 and “More than \$5,000” equaling a 7.³⁶ Respondents were also asked for income and other personal information, including how much they travel outside the United States.

The results do provide some modest support for the view that Americans value American lives and settlements more than foreign ones. As Figures 1 and 2 show, the mean contribution was highest for the American city on both the heat

³⁶ Only a handful of responses fell within the 5, 6, or 7 categories (there were none in the 7 category), and these few responses did not measurably affect results for means: that is, the results of no statistical significance and of statistical significance reported below still hold when the few responses above 4 are simply excluded.

wave and flood surveys. As Figure 3 shows, a lower percentage of respondents selected the lowest level of contribution (less than \$1) with respect to an American city than with respect to a city anywhere else on the heat wave survey. As Figures 4 and 5 show, on the flooding survey, a lower percentage of respondents selected the lowest level of contribution (less than \$1) for an American city than for a city in Africa or Asia.

FIGURE 1: Mean Heat Wave Contributions

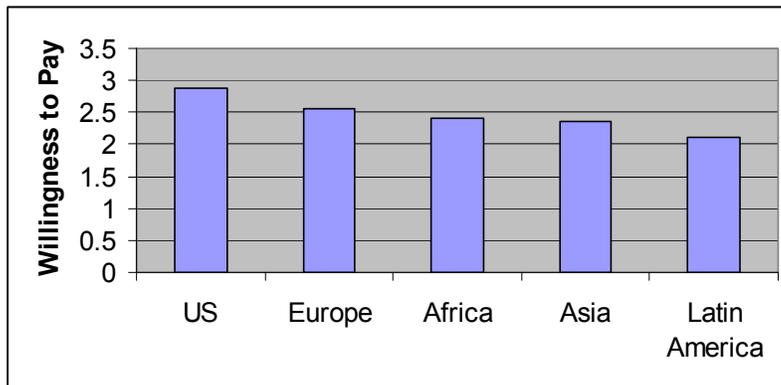


FIGURE 2: Mean Flooding Contributions

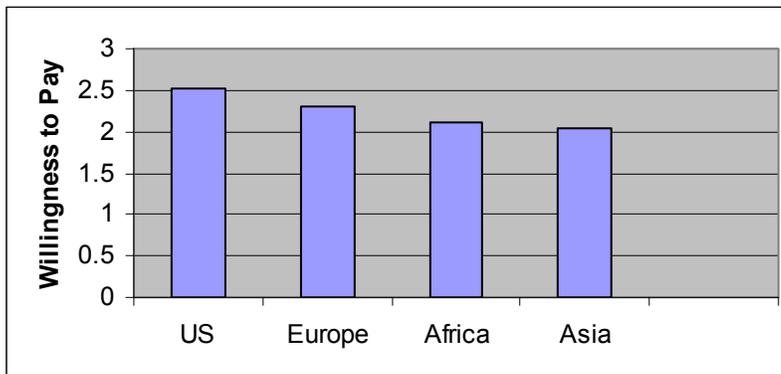


FIGURE 3: Heat Wave: Percentage Contributions < \$1

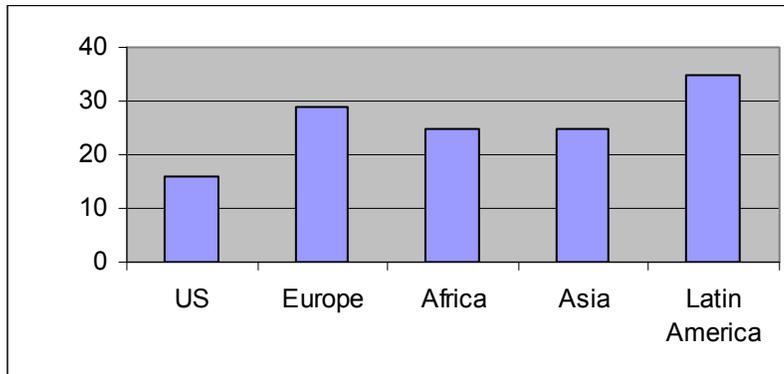
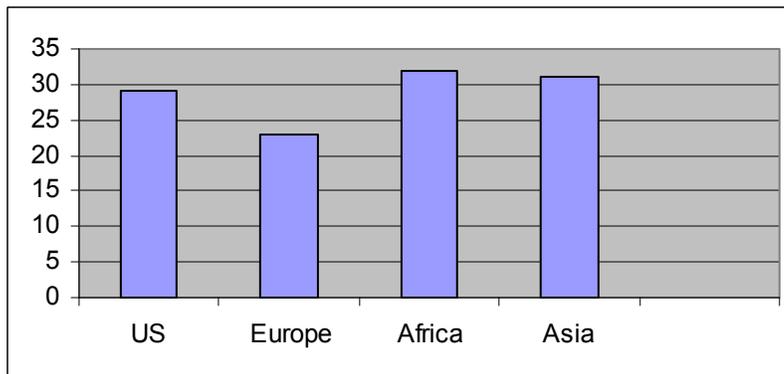


FIGURE 4: Flooding: Percentage Contributions < \$1



These results also suggest a certain favoritism toward Europe among respondents. The mean contribution for Europe on the heat wave study is greater than the mean contribution for Africa, Asia, or Latin America, and the difference between the European and Latin American means is statistically significant ($p < .01$).³⁷ The mean contribution for Europe on the flooding survey was greater than that for Africa and Asia, and in the case of both Africa and Asia, the difference was statistically significant. An even lower percentage of respondents selected the lowest contribution level on the flooding survey for the European city than for the U.S. city (or for the city in Asia or Africa), suggesting, perhaps, that when it comes to historic settlements, European ones may be more highly valued than even American ones. Overall, the results tend to support the view that assessments of Americans' willingness to pay to prevent losses from climate change should take account of Europe, even though much of Europe, as of now, is

³⁷ Throughout the paper, the standard used for statistical significance is $p < 0.01$.

too wealthy and too little threatened to plausibly make a case for needing substantial U.S. government aid or private charity.

The most striking thing about the survey results, however, is how *similar* the valuations are between American lives and settlements on the one hand and foreign lives and settlements on the other. A majority of respondents (indeed 65 percent or more) in all the variants of the heat wave surveys and the flooding surveys reported that they would be willing to contribute \$1 or more; in other words, the majority clearly did not select no or a zero contribution for American or foreign cities. Even more importantly, the differences between the mean responses for American lives and settlements and foreign lives and settlements were not large, and in most cases were not statistically significant at any conventionally employed significance threshold. On the heat wave survey, the only statistically significant differences between the U.S. mean and a foreign mean was between the mean for the United States on the one hand and that for Latin America on the other. Moreover, even that statistically significant difference seems small when viewed in absolute terms (0.77 on a range of 1 to 7).

On the flooding survey, there was no statistically significant difference between the mean for the United States and Europe. There were statistically significant differences between the United States mean and the Asia and North Africa means, but again the differences seem small when viewed in absolute terms (0.41 and 0.48 on a range of 1 through 7). Moreover, the statistically significant differences for Latin America on the heat wave survey and for Asia and Africa on the flooding survey may not indicate a lower willingness to pay for lives or settlements in these regions so much as greater concern about corruption and ineffectiveness of aid there (notwithstanding the survey language labeling the charity as “highly reputable”).

The ratio of the United States means to the foreign means gives the same overall impression. The mean contribution for a foreign country was not below “2” (that is, between 1 dollar and 10 dollars) on any variant of either study. The mean contribution for the United States approached but did not reach “3” (between 10.01 dollars and 50 dollars) for either the heat wave or flood survey. The modal response for five of the seven foreign variants was “2,” whereas the modal response for the two United States variants was “3.” One possibly crude interpretation of these results is that, at the very most, the average valuation of an American life or settlement was valued no more than 50 times that of a foreign life or settlement. A 50 to 1 American/foreign valuation ratio may not obviously smack of transnational egalitarianism, but 50 to 1 is still very significant because one could very plausibly posit that unmitigated climate change would result in more than fifty lost lives and destroyed settlements in foreign counties for each lost life and settlement within the United States.

V. Implications of Survey Results

The most immediate implication of the survey results is to suggest that more—and differently worded and administered surveys—are needed to develop our understanding of U.S. residents' stated preferences. If the initial surveys reported here had suggested something consonant with current CBA practice—that is, they had suggested a zero or near zero valuation of foreign lives and settlements—then one might plausibly argue that further studies would not be in order. But that the reported survey results suggest a valuation completely at odds with CBA practice provides a compelling reason for investing in more research to evaluate, as best as possible, how U.S. residents do value foreign lives and settlements relative to U.S. lives and settlements in the context of climate change.

If future studies have similar results to the ones reported here, then it would be appropriate to consider an upward revision in the estimate of net costs to the United States of unmitigated climate change. How much of an upward revision almost certainly would be a matter of dispute no matter how many stated preference surveys or other efforts to gather preference data are undertaken. In their 2000 estimate, Nordhaus and Boyer assign a 0.10 percent-of-GDP cost to capture the loss of value that would be attributable to loss of settlements within the U.S. If U.S. residents—as the flood survey results discussed certainly suggest may be true—would at least value the loss of *all* foreign settlements as highly as the loss of U.S. settlements from climate change, then the loss of settlement value should be at least 0.20, rather than 0.10. Within the Nordhaus and Boyer framework, that adjustment would increase the total cost assessment for the United States by 18 percent. If one assumes a direct relationship between CBA cost estimates accepted by policymakers and the magnitude of resources the United States will invest to prevent or mitigate climate change, then that one change could translate into a substantial shift in U.S. policy.

Moreover, if the U.S., Europe and other countries and regions all include in their national cost estimates their residents' willingness to pay to save foreign lives and settlements, it would result in a significantly higher global estimate for the costs of unmitigated climate change.

Nor is there any reason to confine the issue of valuation of foreign lives and settlements to the policy debate surrounding climate change. Many national policies and laws have substantial extra-territorial consequences, including the loss of foreign lives and settlements. For example, if an accepted methodology were to be developed for valuing foreign lives and settlements, it could be applied beyond climate change to such issues as the (now lawful, but controversial) exporting to foreign countries of pesticides and other chemicals that are banned within the United States.

VI. Conclusion

In the context of unmitigated climate change, the losses in welfare to U.S. residents may result more from physical impacts outside our borders than within. Yet current CBA approaches ignore that potential loss of welfare. That loss—as measured by willingness to pay to prevent the loss—cannot be readily measured by revealed preferences, and so stated preference methods, however imperfect, are important to provide a broader basis on which to approximate the magnitude of that loss. This article has reported on results of an Internet survey that suggests that U.S. residents value U.S. and foreign lives and settlements equally or close to equally. These survey results are the first of their kind to shed light on Americans' stated preferences regarding their evaluation of U.S. and foreign lives and settlements in the context of climate change, and, as such, they lay the groundwork for much-needed additional research.