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Assessing Moral Claims in International Climate Change Negotiations

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Abstract

The paper explains the importance of narrowing the gap between developed and developing countries' perceptions of justice in the climate change context and analyzes the two main ethical claims raised by the developing countries, exposing their major weaknesses and strengths. It then offers the adoption of harmonized carbon taxes and the rejection of Kyoto's cap-and-trade mitigation scheme, as a way to avoid inevitably unresolved ethical issues.

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I. Introduction

The first commitment period of the Kyoto Protocol expires at the end of 2012, and all international efforts taken so far to agree on a new international framework have failed.[1] At the heart of the deadlock lies the conflict between developed and developing countries,[2] with the United States and the large developing countries being the key (non)players.[3] The conflict surrounds the just allocation of costs.[4] Developing countries want the developed countries to bear most, if not all, of the costs of greenhouse gas (GHG) mitigation and to help them finance adaptation to the inevitable climate change that is already taking place and that will get much worse even under optimistic predictions.[5]

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1. *See, e.g.*, ANDREW DESSLER & EDWARD A. PARSON, THE SCIENCE AND POLITICS OF GLOBAL CLIMATE CHANGE: A GUIDE TO THE DEBATE xv (2d ed. 2010) ("While the Kyoto Protocol represents a modest first step toward a concrete response to climate change, there has been essentially no progress in negotiating the larger, longer-term changes that will be required to slow, stop, or reverse any human-induced climate changes that are occurring.").

2. *See, e.g.*, *id.* at 188 ("[N]egotiations of mutual mitigation effort must also address the conflict between industrialized and developing countries at the heart of the current deadlock."); GRACIELA CHICHILNISKY & KRISTEN A. SHEERAN, SAVING KYOTO 124 (2009) ("[T]he conflict between the rich and the poor nations is the cause of Kyoto's uncertain future.").

3. *See* NICHOLAS STERN, A BLUEPRINT FOR A SAFER PLANET 13 (2009) [hereinafter STERN, BLUEPRINT] (noting that the world's six highest emitters are China, the United States, Indonesia, Brazil, Russia, and India, accounting together for the majority of global greenhouse gas (GHG) emissions); ERIC A. POSNER & DAVID WEISBACH, CLIMATE CHANGE JUSTICE 30 (2010) ("Without deep cuts by these countries *from current levels*, it is impossible to achieve reasonable stabilization goals.") (emphasis in original). With the exception of Russia, none of these countries has agreed to commit itself to limitations on GHG emissions under the Kyoto Protocol—and even Russia ratified the Kyoto Protocol only because its assigned target was to hold emissions to their 1990 level, which meant it was provided with excessive emission permits it could sell to the other countries, as Russia's emissions were significantly below 1990 level at the time it joined the treaty. *See also* DESSLER & PARSON, *supra* note 1, at 25 ("Russia, for example, met the target because of the collapse of the Soviet economy after 1990.").

4. *See* RICHARD B. STEWART & JONATHAN B. WIENER, RECONSTRUCTING CLIMATE POLICY: BEYOND KYOTO 1 (2003) (discussing developing countries' opposition to emissions limitations and their assertion that wealthy countries "have emitted much greater amounts of greenhouse gases in the course of industrialization and . . . currently maintain far more greenhouse gas-intensive lifestyles"); *Global Warming*, N.Y. TIMES (Jan. 13, 2011), http://topics.nytimes.com/top/news/science/topics/globalwarming/index.html ("At the heart of the international debate is a momentous tussle between rich and poor countries over who steps up first and who pays most for changed energy menus.").

5. *See* STEWART & WIENER, *supra* note 4, at 42 (observing that the majority of developing countries have "strong equity arguments" against voluntarily submitting to growth restrictive emissions obligations).

Considerations of justice are always important in negotiations. According to Albin's seminal study, negotiators "use principles of justice and fairness as instruments to reach agreements and to regulate their interaction, in light of opposing claims and interests."[6] Relying on these principles "promotes consensus and successful outcomes."[7] Moreover, negotiators believe that agreements that are achieved on the basis of justice and fairness principles are more likely to be broadly supported and enforced.[8] Disagreements over issues of justice "all too often undermine the capacity of negotiation to produce acceptable and durable solutions to disputes."[9]

In the context of climate change, accounting for justice is especially crucial, as evidenced by the numerous international meetings that failed to make any progress on the way to a global mitigation scheme.[10] It is not enough for a climate change treaty to make each and every developing country better off under an objective cost-benefit analysis for developing countries to agree to accept it.[11] The treaty has to be perceived as fair.[12]

The classic example of such a possibility is known as the "Ultimatum Game."[13] Two players who do not know each other have to decide how to divide a sum of money between them.[14] The first player proposes how to divide the sum,[15] and the second player can either accept or reject the

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6. *See* CECILIA ALBIN, JUSTICE AND FAIRNESS IN INTERNATIONAL NEGOTIATION 219 (2001) (conducting case studies of the negotiations to combat acid rain, to manage international trade, to lay the foundations for a durable Israeli-Palestinian peace in the Oslo Accords and after, and to extend the Nuclear Non-Proliferation Treaty).

7. *Id.*

8. *See id.* at 218 (discussing the motivations that drive negotiating parties to act reasonably).

9. *Id.* at 1; *see also* LAWRENCE SUSSKIND, ENVIRONMENTAL DIPLOMACY 18–21 (1994) (making a similar argument in the context of the North–South divide on who should pay for climate change mitigation); CHAIM GANS, FROM RICHARD WAGNER TO THE RIGHT OF RETURN: PHILOSOPHICAL ANALYSIS OF ISRAELI PUBLIC AFFAIRS (forthcoming) (relying on Rawls's theory of justice in claiming that arguments that are perceived to be just and fair may influence the regimes of the negotiating countries in ways that facilitate agreement that would not have been reached on the basis of pure self-serving arguments).

10. *See* ALBIN, *supra* note 6, at 54–99 (providing examples of international meetings regarding the battle against acid rain that have failed to make progress in terms of global mitigation).

11. *See id.* at 98 (specifying "the financial cost of implementation and its perceived fairness" as among the factors influencing "whether countries choose to adhere to an environmental agreement").

12. *Id.*

13. *See* KEN BINMORE, PLAYING FOR REAL 545 (2007) (describing in detail the Ultimatum Game as an exception to traditional game theory).

14. *See id.* at 502–03 (explaining the rules of the Ultimatum Game).

15. *Id.*

proposal.[16] If the second player rejects it, neither player receives anything.[17] If the second player accepts, the money is split according to the proposal.[18] The game is played only once so reciprocation is not an issue.[19] Offers of less than thirty percent of the sum "are refused more than half the time, even though the responder then gets nothing at all."[20] In games played in poor countries, offers were rejected even when "the dollar payoffs [were] a substantial fraction of the subjects' annual income."[21] The prominent explanation for such a result is that people are willing to incur significant costs to punish people who they think treated them unfairly.[22]

One might question whether experiments with individuals indicate anything about government behavior in similar situations.[23] The truth is that we do not know, because we cannot run such experiments with real governments, but these experiments form our best prediction tool.[24]

Being aware of the importance of justice (equity) considerations, principles of justice and fairness were explicitly stated in the United Nations Framework Convention on Climate Change of 1992 (UNFCCC).[25] It is the foundational legal document of global climate change negotiations, and 195 parties have already signed and ratified it, including the United States.[26] The convention's first principle states that "[t]he Parties should

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16. *Id.*

17. *Id.*

18. *Id.*

19. *See id.* at 546 (explaining that the motivating forces in "a repeated game can be totally different from those of the one-shot game").

20. *Id.* at 545.

21. *Id.*

22. *See id.* at 546 ("In the Ultimatum Game, we have to learn the difficult lesson that there is no point in shooting yourself in the foot because you are angry at receiving an unfair offer from someone you are never going to meet again.").

23. *See* SCOTT BARRETT, ENVIRONMENT AND STATECRAFT 60 (2003) (assessing the results of game-theory experimentation as compared to state behavior in "games of transnational externalities").

24. *Id.; see also* Duncan Snidal, *The Game Theory of International Politics*, 38 WORLD POLITICS 25, 25 (1985) ("The application of game theory to international politics is hardly new, but there has been a recent increase in the popularity of the approach."); Ethan Kapstein, *Fairness Considerations in World Politics: Lessons from International Trade Negotiations*, 123 POLITICAL SCIENCE QUARTERLY 229, 234 (2008) (discussing the Ultimatum Game in the context of international relations theory and finding that "the adoption of fairness considerations may be crucial to the achievement of cooperative outcomes in many settings, and that such outcomes can be achieved even in the absence of iterated negotiations").

25. *See* United Nations Framework Convention on Climate Change, art. 3, *adopted* May 9, 1992, *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf [hereinafter UNFCCC] (listing the basic principles underlying the provisions of the Convention).

26. *See* Status of Ratification of the Convention, *United Nations Framework Convention on Climate Change*,

protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their *common but differentiated responsibilities and respective capabilities*."[27]

Unfortunately, developed and developing countries disagree on the principle's interpretation, leading to the current deadlock.[28] Delaying global action is not in the interest of either party.[29] Developing countries will be the first to suffer from climate change,[30] but developed countries will start incurring huge costs due to climate change merely a decade or so later.[31] In addition, according to climate scientists, the main problem is that there are "critical thresholds or tipping points in the climate system."[32] When the system reaches a tipping point, such as the "collapse of the polar ice sheets or a change in ocean circulation,"[33] catastrophes will be unavoidable.[34] At a certain unknown GHG concentration, our ability to stop the transformation of Earth into the equivalent of Venus[35] will depend on risky geo-engineering (e.g., injecting reflective aerosols or sulfur into the

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http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php (last visited Sept. 6, 2011) (providing detailed information on the current signatories to the UNFCCC) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

27. UNFCCC, *supra* note 25, art. 3.1 (emphasis added). For a full discussion of the UNFCCC's equity principles, see *infra* Part I.

28. *See* Lavanya Rajamani, *The Principle of Common but Differentiated Responsibility and the Balance of Commitments under the Climate Regime*, 9 REV. EUR. COM. INT'L ENVT'L L. 120, 124 (2000) ("Most industrial countries opposed the inclusion of Article 3 in the [UNFCCC] as it could potentially introduce a note of uncertainty into the context of the [UNFCCC] obligations.").

29. *See* STERN, BLUEPRINT, *supra* note 3, at 14 ("Delay now and haste later not only build up damage but also risk expensive mistakes in investment decisions. The greater the coordinated involvement of all emitters, the more successful, cheaper and equitable are the actions and outcomes.").

30. *See* POSNER & WEISBACH, *supra* note 3, at 21–22 ("[T]he regions of the world where the effects of emissions will be the worst also happen to be poor . . . . In addition, poor countries tend to be more dependent on agriculture . . . . Finally, poor countries cannot adapt as easily as rich countries, simply because of lack of resources.").

31. *Id.* at 26.

32. CHICHILNISKY & SHEERAN, *supra* note 2, at 11.

33. *Id.*

34. *See id.* ("Once we pass these thresholds, there is no turning back and the consequences could be dire.").

35. *See* JAMES HANSEN, STORMS OF MY GRANDCHILDREN 224–26 (2009) (summarizing changes in Venus's atmospheric composition over time and indicating that the "Venus Syndrome" is a major threat of rising GHG emissions). In the past, Venus was a wet planet, but then it experienced "a 'runaway' greenhouse gas effect." *Id.* at 225. Venus's atmosphere now is almost 97 percent carbon dioxide and its surface temperature is 450° Celsius (roughly 850° Fahrenheit). *Id.*

stratosphere).[36] The risk that such disastrous scenarios will take place is shared by everyone on the planet,[37] and as there is uncertainty regarding the exact GHG concentration that will start the runaway GHG effect,[38] all nations will be better off if they begin climate change mitigation as soon as possible.[39]

Moreover, reducing GHG concentrations gradually is much less costly than attempting to do so over a short period of time.[40] "[C]ost is linked to the pace of change."[41] Time enables us to phase out polluting plants instead of having to write-off relatively recent investments.[42] It also takes time for investments in climate-safe energy technologies to come to fruition.[43]

All of the above make it imperative to bridge the divide between the rich and poor countries and reach international cooperation on GHG mitigation.[44] This paper analyzes the two principal justice-based arguments raised by developing countries, exposing their major weaknesses and strengths in an effort to narrow the gap between developed and developing countries' perceptions of justice in the climate change context. Once the gap in perceptions of justice is narrowed, global abatement schemes must be found that will avoid unresolved ethical issues, thereby increasing the feasibility of their adoption by all parties. A Kyoto-style cap-and-trade scheme requires allocation of emissions rights across countries[45] and thus requires raising right at the beginning of the negotiations the highly ethically-loaded question of whether equal per-capita allocation should be

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36. *See id.* at 224–31 (discussing the nature of risky geo-engineering models in light of Venus's change in atmospheric compositions over time).

37. *See* CHICHILNISKY & SHEERAN, *supra* note 2, at 11 (explaining that reaching a tipping point in Earth's climate system "would cause abrupt and catastrophic changes that no living or economic system could quickly adapt to").

38. *See* HANSEN, *supra* note 35, at 226 (noting that the question is not whether Earth could experience a runaway greenhouse effect, but "rather, how much must carbon dioxide (or some other climate forcing) increase before a runaway effect occurs").

39. *See* CHICHILNISKY & SHEERAN, *supra* note 2, at 38 ("We should think of climate policy as an insurance policy against potentially catastrophic events.").

40. *See* NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW xvi (2007) [hereinafter STERN, ECONOMICS] ("Ultimately stabilisation—at whatever level—requires that annual emissions be brought down to more than 80% below current levels. This is a major challenge, but sustained long-term action can achieve it at costs that are low in comparison to the risks of inaction.").

41. STERN, BLUEPRINT, *supra* note 3, at 156.

42. *See id.* (concluding that interim reduction targets are necessary as "[i]t would be very costly to try to achieve most of the cuts in the last ten years of the [targeted] period").

43. *Id.*

44. *Supra* notes 28–39 and accompanying text.

45. *See* POSNER AND WEISBACH, *supra* note 3, at 119 (detailing the various possible emissions-allocation approaches to addressing global climate change).

the baseline.[46] Harmonized carbon taxes, with each country retaining its tax revenue, fare much better on that front.[47]

Part II discusses the UNFCCC's first principle.[48] In Part III, I will briefly explain why the developing countries' requests to be exempted from GHG mitigation must be rejected outright.[49] Part IV discusses distributive justice,[50] and Part V discusses corrective justice.[51] Finally, I conclude.[52]

II. United Nations Framework Convention on Climate Change (UNFCCC)

In 1992, nearly all countries of the world, including the United States, joined an international treaty—the United Nations Framework Convention on Climate Change (UNFCCC)[53]—to stabilize "greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[54]

The treaty sets no mandatory limits on GHG emissions for individual countries[55] and contains no enforcement mechanisms.[56] It merely provides the principles on which the countries agree to base their international agreement on climate change policy.[57]

The first principle reads as follows:

> The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and *in accordance with their common but differentiated responsibilities and*

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46. *See id.* at 120 ("[T]he per capita approach remains the reigning political and ethical paradigm for the distribution of permits because it has been largely unquestioned.").

47. *See* Yoram Margalioth, *Tax Policy Analysis of Climate Change*, 64 TAX L. REV. 63, 63–87 (2010) (detailing an exposition of this argument, including application to negative emissions (e.g., reforestation)).

48. *Infra* Part II.

49. *Infra* Part III.

50. *Infra* Part IV.

51. *Infra* Part V.

52. *Infra* Part VI.

53. *See* Status of Ratification of the Convention, *supra* note 26.

54. UNFCCC, *supra* note 25, art. 2.

55. *See generally id.*

56. *Id.*

57. *See id.*, art. 3 (providing principles by which the Parties should be guided in carrying out the provisions of the Convention). The treaty provides for updates (called "protocols") that would set mandatory emission limits. *Id.*, art. 17. The Kyoto Protocol, to which the United States is not a Party and which does not impose any limitations on developing countries, came into force in 2005 and will expire at the end of 2012. *See generally* Kyoto Protocol, *United Nations Framework Convention on Climate Change*, http://unfccc.int/kyoto_protocol/items/2830.php (last visited Sept. 9, 2011) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

> *respective capabilities*. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.[58]

The term "respective capabilities" means that rich countries should bear most of the cost of mitigation and are expected to provide developing countries with financial help to adapt to the climate change.[59] This is a distributive justice claim.[60]

The term "differentiated responsibilities" is understood by developing countries to mean that developed countries bear greater responsibility due to their greater contribution to global environmental degradation.[61] The literature generally refers to this claim as based on corrective justice principles.[62]

Developing countries interpreted the UNFCCC as allowing their exemption from GHG mitigation based on the "differentiated responsibilities" justification—namely, the corrective justice claim[63]—and as entitling them to financial help on the basis of the "respective capabilities" justification.[64] This interpretation of the UNFCCC as linking between mitigation commitments and historical emissions can find support in the differences between the commitments required of developed

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58. UNFCCC, *supra* note 25, art. 3 (emphasis added). "The chapeau to [UNFCCC] Article 4 (commitments) also obliges parties to take into account their common but differentiated responsibilities in fulfilling the commitments under the [UNFCCC.]." Rajamani, *supra* note 28, at 121.

59. *See* UNFCCC, *supra* note 25, art. 3 ("[T]he developed country Parties should take the lead in combatting climate change and the adverse effects thereof.").

60. *Id.*

61. *See* Rajamani, *supra* note 28, at 121 ("The principle of common but differentiated responsibility . . . builds on the acknowledgement by industrial countries that they bear the primary responsibility for creating climate change by taking into account the historical (rather than future) contributions of States to climate change in determining their responsibility under the regime."); STERN, ECONOMICS, *supra* note 40, at 42 ("The argument [that rich countries should transfer money to poor countries to help them finance adaptation] is strongly reinforced by the historical responsibility of rich countries for the bulk of accumulated stock of GHGs.").

62. *See, e.g.*, Eric A. Posner & Cass R. Sunstein, *Climate Change Justice*, 96 GEO. L.J. 1565, 1565–1612 (2008) (analyzing the argument made by developing countries that the United States owes remedial action or material compensation due to its past emissions as a corrective justice claim).

63. *See id.* at 1592 ("In the context of climate change, the corrective justice argument is that the United States wrongfully harmed the rest of the world—especially low-lying states and others that are most vulnerable to global warming—by emitting greenhouse gases in vast quantities.").

64. *See* Rajamani, *supra* note 28, at 130 (providing that cooperation requires wealthier countries to assist "countries particularly vulnerable to climate change to meet the costs of adaptation, financing and promoting technology transfer").

countries and those required of economies in transition, such as Eastern European countries.[65] Economies in transition had past emissions at a scale similar to that of developed countries, but were far poorer than developed countries.[66] Namely, their respective capabilities were similar to those of developing countries.[67]

Under the UNFCCC, "economies in transition, like industrial countries, are expected to stabilize their GHG emissions."[68] However, "unlike industrial countries they assume no financial obligations towards developing countries and can benefit from technological transfers."[69]

"Since countries with economies in transition have not been spared mitigation commitments, it can be inferred then that mitigation commitments under the UNFCCC are directly linked to historical responsibility."[70]

The United States, although party to the UNFCCC, opposes the above interpretation of the notion of *differentiated responsibilities*.[71] When the Kyoto Protocol was negotiated, the U.S. Senate passed a resolution (known as the Byrd–Hagel resolution)[72] that rejected any commitment to limit U.S. GHG emissions "unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period."[73] The Senate expressed its concern that "developing countries would have an unfair economic advantage if they did not face the same restrictions as the U.S." and that "there would be an export of U.S. jobs and industry to developing nations."[74] The United States eventually signed the Kyoto Protocol but never ratified it.[75] Two months after taking office in 2001, the Bush administration announced it would not ratify the Kyoto

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65. *See id.*, at 126 ("Since countries with economies in transition have not been spared mitigation commitments, it can be inferred then that mitigation commitments under the [UNFCCC] are directly linked to historical responsibility.").

66. *See id.* (citing "economic constraints" and high past-emissions rates as characteristic of economies in transition).

67. *See id.* (listing the similarities shared by developing and transition economies).

68. *Id.*

69. *Id.*

70. *Id.*

71. *See infra* notes 73–74 and accompanying text (providing an example of why the United States opposes the aforementioned interpretation of differentiated responsibilities).

72. S. Res. 98, 105th Cong. (1997).

73. *Id.*

74. Rajamani, *supra* note 28, at 128.

75. *See* Status of Ratification of the Kyoto Protocol, *United Nations Framework Convention on Climate Change*, http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php (last visited Sept. 19, 2011) (providing information on current signatories to the Protocol) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

Protocol because there was too much scientific uncertainty about climate change[76] and because ratifying it would harm the U.S. economy as no limits were imposed on developing countries' emissions.[77]

The U.S. position has not changed in all the international climate change negotiations that took place since then.[78] It is possible, however, that the justification for the United States' requirement that developing countries would limit their emissions has evolved over the years.[79] The United States' fear of economic competition may have even strengthened, as China, India, and a few other developing countries have become leading players in the global economy.[80] But it is now also much better understood that without universal coverage, a global mitigation scheme would be prohibitively costly, if not completely futile,[81] due to the inability to take advantage of the least costly abatement opportunities, as well as leakage and supply side effects, discussed in Part III below.[82]

III. Universal Coverage is Necessary

This paper discusses moral (equity) claims. There is no reason to think that such claims cannot be settled without maintaining the efficiency of

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76. *See* NAOMI ORESKES & ERIK CONWAY, MERCHANTS OF DOUBT: HOW A HANDFUL OF SCIENTISTS OBSCURED THE TRUTH ON ISSUES FROM TOBACCO SMOKE TO GLOBAL WARMING 169–215 (2010) (offering a historian's account of the misuse of science for political and commercial ends and arguing that climate skepticism is being used strategically by the fossil fuel industry and politicians influenced by that industry).

77. *See* Rajamani, *supra* note 28, at 127 (stating the position of the United States to be "that it would take 'meaningful participation from key developing countries' for the U.S. to ratify the Protocol").

78. *See, e.g.*, Anup Shah, *Reactions to Climate Change Negotiations and Action*, GLOBALISSUES.ORG, http://www.globalissues.org/article/179/reactions-to-climate-change-negotiations-and-action (last visited Sept. 29, 2011) (providing background on U.S. participation, actions, and reactions regarding climate change negotiations) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

79. *See id.* (describing how developing countries joined climate change negotiations in the early 1990s not expecting to face the same emission restrictions as wealthier countries).

80. *See id.* (noting that President Bush found the Kyoto protocol unfair because it did not include emission targets for China or India.

81. *See* HENRY D. JACOBY ET AL., SHARING THE BURDEN OF GHG REDUCTIONS (The Harvard Project on International Climate Agreements, Discussion Paper 2008–09), http://belfercenter.ksg.harvard.edu/files/JacobyWeb2.pdf (presenting comparative cost data of various reduction policy proposals); *see also* STEWART & WIENER, *supra* note 4, at 37 (arguing that without the participation of the United States, China, and other significant developing countries such as India, Brazil and Indonesia, "the efforts of the Kyoto Protocol participants will be swamped by the unchecked emissions increases of nonparticipants").

82. *See infra* Part III (discussing the importance of universal coverage).

climate change mitigation.[83] In fact, an efficient system would create a larger surplus that could then be divided equitably, making everyone better off.[84] Efficiency requires universal coverage for the following reasons.

Climate change is the outcome of a well-defined efficiency problem known as a negative externality.[85] This refers to instances where an individual or a firm undertakes an action that imposes a cost on other individuals or firms without compensating them for it.[86] The absence of compensation is the result of transaction costs that preclude negotiation of mutually beneficial deals between the affected parties.[87] In the case of GHG emissions, these costs are borne by the entire global population.[88] As a result, there is over-burning of fossil fuels and deforestation.[89]

The solution to the efficiency problem is obvious. Individuals and firms need to be forced to internalize the cost, that is, face a private cost that is equal to the social cost.[90] The social cost is the true cost of their actions; therefore, for them to act efficiently, this is the cost they should front.[91] The most straightforward way of achieving this outcome is to impose a tax on GHG emissions (known as Pigouvian tax, or carbon tax in this context) equal to the marginal social cost.[92] This will correct the externality.[93] Firms will abate up to the point where the marginal social cost

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83. *See infra* Part VI (providing evidence that moral (equity) claims can be settled while maintaining the efficiency of climate change mitigation).

84. *See id.* (detailing that the fact that the surplus was generated through cooperation on climate change mitigation does not mean that it should be distributed according to vulnerability to climate change or mitigation costs).

85. *See, e.g.*, Hans-Werner Sinn, *Public Policies Against Global Warming: A Supply Side Approach*, 15 INT'L TAX & PUB. FIN. 360, 360–62 (2008) (describing global warming as the greatest externality ever).

86. *See* Wilfred Beckerman, *Global Warming and International Action: An Economic Perspective*, *in* THE INTERNATIONAL POLITICS OF THE ENVIRONMENT 253 (Andrew Hurrell & Benedict Kingsbury eds., 1992) (explaining the concept of an externality and how it applies with regards to global warming).

87. *See id.* (emphasizing that negative externalities could be corrected if deals between affected parties were negotiated).

88. *See, e.g.*, JEFFREY D. SACHS, COMMON WEALTH: ECONOMICS FOR A CROWDED PLANET 87–93 (2008) (showing the effects of the impact that GHG has made on the climate).

89. *See id.* at 84–85 (explaining how GHG is a result of an over-burning of fossil fuels and deforestation).

90. *See* HANSEN, *supra* note 35, at 208 ("The solution necessarily will increase the price of fossil fuel energy.").

91. *See id.* ("Fossil fuels are cheapest because we do not take into account their true cost to society. Effects of air and water pollution on human health care are borne by the public.").

92. *See id.* ("In the end, energy efficiency and carbon-free energy can surely be made less expensive than fossil fuels, if fossil fuels' cost to society is included.").

93. *See id*. (showing that if the cost to society is included through a tax or some other cost, the externality will be corrected).

of GHG emissions is equal to the marginal cost of abatement.[94] Setting a price on GHG emissions is necessary in order to transmit their social costs to the day-by-day decisions of all firms and individuals, thereby bringing their activity to an efficient level.[95]

Another mechanism, or policy tool, to solve the externality problem is a cap-and-trade system.[96] Under cap-and-trade, the absorptive capacity of earth's atmosphere with respect to GHGs is calculated and is allocated to countries in the form of emission rights (permits).[97] The governments allocate (ideally, through sale) the permits to the resident firms that are required to use permits equivalent to their emissions.[98] The permits are tradable.[99] Firms that need to increase their emission permits can buy permits from firms that are willing to sell them.[100] In effect, the buyer is paying a charge for polluting, while the seller is being rewarded for having reduced emissions.[101] Thus, in theory, those who can reduce emissions most cheaply will do so, achieving the pollution reduction at the lowest cost to society, as in the case of a carbon tax.[102]

It is important to emphasize that for efficiency to hold, namely, to deliver reduction of GHG emissions at the least cost to society, a common price signal is required all over the world.[103] For example, if the marginal cost of reduction is lower in country A than in country B, then abatement costs could be reduced by doing a little more reduction in country A and a little less in country B.[104] Relatively low investments in scrubbers, for

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94. *Id.*

95. *See id.* (explaining that the current price of fossil fuels is too low and does not reflect the cost entailed by climate change and that "[e]nergy efficiency and carbon-free energy can surely be made less expensive than fossil fuels, if fossil fuels' cost to society is included").

96. *See id.* at 212–14 (presenting the cap-and-trade system as a policy tool to rectify the externality problem).

97. *See id.* (defining and explaining the cap-and-trade system).

98. *See id.* at 208 ("A nominal cap is defined by selling a limited number of certificates that allow a business or speculator to buy the fuel.").

99. *See id.* at 212–14 ("There will be markets for these certificates on Wall Street and such places. And markets for derivatives.").

100. *See id.* (explaining how there will be a market on which to trade the permits and that anyone who needs them will be able to procure them).

101. *See id.* (explaining that the cap-and-trade system is really a tax: those who do pollute have to pay it and those that do not pollute are rewarded in that they do not have to pay the tax and actually get paid by others eager to pay the tax).

102. *See generally* Mustafa H. Babiker, *Climate Change Policy, Market Structure, and Carbon Leakage*, 65 J. INT'L ECON. 421 (2005) (discussing the international effects of carbon leakage and emissions reduction strategies).

103. *See id.* at 443 ("These results demonstrate that implementing a policy of limiting carbon emissions that fails to include many regions of the world may, by ignoring the role of the global trading system, fail to achieve its stated ends.").

104. *See generally id.* (evaluating emissions reduction strategies and effects).

example, can significantly reduce emissions in developing countries,[105] whereas in developed countries, such relatively inexpensive abatement options have already been exhausted.[106] This efficient result will take place if *all* countries impose carbon tax at the same rate or if all countries participate in a global cap-and-trade system.

Moreover, under partial participation, industries migrate from covered to uncovered parts of the world (known as the "leakage" problem),[107] and reduction in the demand for fossil fuels in the covered countries, due to restrictions on greenhouse gas (GHG) emissions, lowers their price in the uncovered countries (known as the "supply-side effect").[108] This will increase fossil fuel consumption in uncovered countries, undermining climate change policy goals, as GHGs uniformly mix in the upper atmosphere, making damages independent of the location of emission sources.[109]

IV. Respective Capabilities (Distributive Justice)

Many argue that wealthy countries are morally required to shoulder the bulk of the global mitigation and adaptation costs because they can more easily afford to do so.[110] This is an ability-to-pay argument.[111] Henry Shue, a distributive justice and climate change scholar, presents it in the following especially compelling way: "Even in an emergency one pawns the jewelry before selling the blankets . . . . Whatever justice may positively require, it does not permit that poor nations be told to sell their blankets [compromise their development strategies] in order that the rich nations

105. *See generally id.*

106. *See generally id.*

107. *See, e.g.*, *id.* at 441 (2005) (arguing that the Kyoto Protocol resulted in an increase in global carbon emissions).

108. *See* Sinn, *supra* note 85, at 362–63 (explaining how the demand reduction for fossil fuels lowers their price and, thus, increases their consumption).

109. *See* JOSEPH E. ALDY & ROBERT N. STAVINS, INTRODUCTION AND OVERVIEW, *in* POST-KYOTO INTERNATIONAL CLIMATE POLICY 1–25 (Aldy & Stavins eds., 2009) ("Because GHG's mix uniformly in the upper atmosphere, damages are completely independent of the location of emissions sources.").

110. *See* Michael Grubb, *Seeking Fair Weather: Ethics and the International Debate on Climate Change*, 71 INTERNATIONAL AFFAIRS 463, 478 (1995) (asserting that it should be the first and overriding priority of developed countries to aid in the economic and social development of developing countries).

111. *See* Posner & Sunstein, *supra* note 62, at 1583–84 (discussing distributive justice and how it calls for the wealthy countries to prevent catastrophe simply because they are wealthy).

keep their jewelry [continue their unsustainable lifestyles]."[112] Another way to illustrate the argument is by assuming, for example, "that we could avoid the possibility of catastrophic climate change and guarantee a decent quality of life for everyone, all at the cost of slowing down our rate of accumulation of purely *luxury* goods by two years."[113]

These examples may be exaggerated, as the cost of climate change mitigation, if incurred by rich countries alone, would require them to make a greater sacrifice than the equivalent of a rich individual not buying luxury goods for two years, unless "luxury" is broadly defined.[114] Accepting the claims of developing countries in the climate change context would require developed countries to transfer hundreds of billions of dollars, and possibly much more, to developing countries.[115] Rich countries have looming budget deficits and their own poor, hence, paying such amounts would not be a trivial sacrifice for them.[116] But it is nevertheless true that it would be a much smaller sacrifice than that made by poor countries.

The argument, however, is inaccurate when examined from a welfarist perspective, which is the relevant theory in the case of an ability-to-pay argument. When measuring the ability-to-pay of individuals for distributive justice purposes, we usually rely on income or wealth because innate earning abilities are assumed to be private information, unobservable by the government.[117] When measuring income or wealth of countries, we usually rely on Gross Domestic Product (GDP) or GDP per capita.[118]

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112. Grubb, *supra* note 110, at 478 (quoting Henry Shue, *The Unavoidability of Justice*, *in* THE INTERNATIONAL POLITICS OF THE ENVIRONMENT 397 (Andrew Hurrell & Benedict Kingsbury eds., 1992)).

113. Stephen M. Gardiner, *Ethics and Climate Change: An Introduction*, 1 WILEY INTERDISCIPLINARY REVIEWS: CLIMATE CHANGE 54, 55 (2010) [hereinafter Gardiner, *Ethics, An Introduction*].

114. *See id.* ("This might satisfy the 'care for little gains' condition even if the cost of those luxury goods in dollar terms were very large.").

115. *See* Posner & Sunstein, *supra* note 62, at 1608 ("The key point is that such an approach would represent a significant transfer of resources from the United States to other nations—indeed, the transfer would be worth hundreds of billions of dollars and perhaps more."); *see also* BERT METZ, CONTROLLING CLIMATE CHANGE 343 (2010) (discussing the investment in developing countries by the United States and how much more these developing countries will need).

116. *See id.* ("[T]here is no sign that the United States wants to give hundreds of billions of dollars to China or India. Indeed, any proposal that it should do so, in [any context], would be unpopular to say the least; domestic political constraints would probably doom any such proposal.").

117. *See* James Mirrlees, *An Exploration in the Theory of Optimum Income Taxation*, 38 REV. ECON. STUD. 175, 175 (1971) (presenting optimal design of the tax and transfer system).

118. *See generally* SACHS, *supra* note 88 (using GDP per capita throughout the book to compare the wealth of nations).

According to public finance literature, differential commodity taxation should not be used in the presence of an optimal income tax.[119] A similar argument was made against the use of legal rules for redistribution purposes, namely, that legal rules, like commodity taxation, should not be equity-informed and should only be used to correct market failures, such as externalities (in analogy to Pigouvian taxation), serving an efficiency cause.[120] The idea is that relying on anything other than income is redundant because it does not provide the government with any additional information regarding the individual's innate ability, while creating additional, unnecessary distortions.[121]

There are qualifications to this argument. In case there is something that is observable by the government and is correlated with individual's innate abilities, not through income, it could be used for redistribution purposes.[122] For example, if consumption patterns differed across households with different innate earning abilities, controlling for other differences (notably, differences in income), differential commodity taxation could enhance welfare.[123] In such a case, households with the same level of income but different innate earning abilities would have different consumption patterns.[124] The consumption pattern, observed by the government, would provide the government with information regarding innate abilities and could therefore be relied on for redistribution purposes.[125]

Applying this analysis to countries, it is difficult to see what relevant information about a country's ability-to-pay could be learned from its GHG mitigation or adaptation costs. Surely, these costs, like any other costs,

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119. *See* A.B. Atkinson & Joseph Stiglitz, *The Design of Tax Structure: Direct Versus Indirect Taxation*, 6 J. PUB. ECON. 55, 74 (1976) ("If a general income tax function may be chosen by the government, we have shown that, where the utility function is separable between labor and all commodities, no indirect taxes need be employed."). "In this case, the use of consumption of particular commodities as a screening device offers no benefit." *Id.*

120. *See* Louis Kaplow & Steven Shavell, *Why the Legal System is Less Efficient than the Income Tax in Redistributing Income*, 23 J. LEGAL STUD. 667, 677 (1994) ("Redistribution is accomplished more efficiently through the income tax system than through the use of legal rules, even when redistributive taxes distort behavior.").

121. *See* Mirrlees, *supra* note 117, at 175 ("One might obtain information about a man's income-earning potential from his apparent I.Q., the number of his degrees, his address, age or colour: but the natural, and one would suppose the most reliable, indicator of his income-earning potential is his income.").

122. *See id.* at 207 (discussing that there are other factors than income that the government could consider when levying taxes).

123. *See* Atkinson & Stiglitz, *supra* note 119, at 57 ("In a world where income and wages are unobservable, but purchases of certain luxuries are observable, the latter may provide the best screening device.")

124. *Id.*

125. *Id.*

reduce the country's wealth. But the effect of these costs on the country's ability-to-pay operates through its wealth.

Climate change is only one of many factors that affect a nation's wealth.[126] Some poor countries that will incur significant adaptation costs will nevertheless be wealthier than other poor countries with lower climate change-related costs.[127] The latter should be helped first.

Redistribution from rich to poor should be based on the relative overall well-being of the poor and not on one specific factor.[128] Rich countries will suffer less than poor countries from climate change, in the short term, because they have more resources to adapt to the change (e.g., building walls), are less dependent on agriculture, and generally tend to be located in cooler and higher areas.[129] But all countries, rich and poor, vary greatly in the extent to which they are expected to be affected by climate change, with some countries even benefiting from it in the short term.[130]

The important point, which is possibly unintuitive as it is absent from the climate change literature, is that even if there was a perfect correlation between mitigation and adaptation costs and countries' poverty (as measured, for example, according to GDP per capita), consideration of distributive justice could not be used to justify basing transfers to developing countries on such costs. These costs do not add any information about the ability-to-pay of these countries that was not already captured in their wealth.

The above analysis does not mean that redistribution from rich to poor countries is not justified. Quite the opposite. National boundaries are irrelevant under welfarism, which requires the application of distributive justice to the entire world.[131] But in terms of providing moral justification, climate change is irrelevant.[132]

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126. *See* SACHS, *supra* note 88, at 230–31 (describing that an escape from extreme poverty requires investment in things other than climate change).

127. *See* Posner & Sunstein, *supra* note 62, at 1582 (noting "that some nations would benefit far more than others from world-wide reductions").

128. *See* POSNER & WEISBACH, *supra* note 3, at 74 ("The rich indeed have an obligation to help the poor, but they should fulfill this obligation in the best possible way . . . . It is conceivable that climate change policies will turn out to be the best way to help poor people.").

129. *See id.* at 21–22 (describing why poor nations are likely to suffer the most from climate change).

130. *See* Posner & Sunstein, *supra* note 62, at 1608 (showing how some countries, such as Russia due to the increase in temperature and subsequent increase in agricultural productivity, are benefitted by the climate change).

131. *See* LOUIS KAPLOW, THE THEORY OF TAXATION AND PUBLIC ECONOMICS 379 (2008) (explaining that national boundaries have practical and political significance but no clear ethical relevance); *see also* PETER SINGER, ONE WORLD: THE ETHICS OF GLOBALIZATION 154–60 (2004) (advocating the development of the ethical foundations of the coming era of a single world community); CHARLES BEITZ, POLITICAL THEORY AND

In reality we see that very little global redistribution takes place.[133] This may be the result of policies based on non-welfarist ethics, such as statism,[134] or could be explained within the welfarist framework by an assumption that national policymakers assign lower weight to the welfare of foreigners compared to that of their residents or citizens.[135]

Redistribution is clearly required, not only under cosmopolitanism and welfarism, but even under statism, when it is based on humanitarian duties, such as starvation or severe malnutrition from flooding or drought.[136] Climate change could have such effects, and rich countries should certainly help poor countries finance the huge costs of adaptation, as preventive action is more cost effective than emergency action, and poor countries lack the necessary resources.[137] But the reason for redistribution would then be poverty, not its causes.

This does not mean that developed countries should only transfer cash to alleviated their poverty and refrain from helping them through climate

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INTERNATIONAL RELATIONS 181–82 (1979) (showing that cosmopolitanism also supports global distributive justice by promoting principles of international distributive justice that establish a fair division of natural resources, income, and wealth among persons living in different countries); THOMAS POGGE, WORLD POVERTY AND HUMAN RIGHTS 122–23 (2008) (arguing that the global rich have violated a negative duty which is the duty not to contribute to the imposition of a global institutional order that foreseeably and avoidably renders the basic socioeconomic rights of other human beings unfulfilled).

132. *See* KAPLOW, *supra* note 131, at 347 ("Considered first is the doctrine referred to as welfarism, under which social welfare is taken to depend on individuals' levels of well-being and nothing else.").

133. *See generally* SACHS, *supra* note 88 (showing as evidence the relatively low percentage of foreign aid in developed countries' budgets).

134. *See* JOHN RAWLS, THE LAW OF PEOPLES 116 (1999) (rejecting the idea of an indefinite international redistribution duty and the global application of his difference principle, mainly due to the current lack of a world government and a global legal system); *see also* Thomas Nagel, *The Problem of Global Justice*, 33 PHIL. & PUB. AFF. 113, 125–26 (2005) (drawing a distinction between humanitarian duties, which we owe to fellow human beings threatened with starvation or severe malnutrition, and obligations of justice, which are limited to the nation-state).

135. *See* KAPLOW, *supra* note 131, at 379–82 (suggesting that consideration of incentives may also limit the extent of global redistribution because differences in well-being across nations partially reflect differences in prior investments, such as in education, and it would be optimal to protect winners' claims to some degree).

136. *See id.* at 354–56 (describing the moral intuitions that contribute to a requirement of redistribution based on humanitarian duties).

137. *See* Posner & Sunstein, *supra* note 62, at 1583 (using an example of an impending asteriod to show the importance of preparation now: "[b]ut many scientists believe that the best approach, considering relevant costs and benefits, is to start immediately to build technology that will divert the asteroid"). The poorest countries will be hit earliest and hardest by climate change, and they are particularly short of the resources requires to manage a changing climate.

change policies, such as limiting global GHG emissions and financing adaptation in developing countries.[138] The explanation is as follows.

An unconditioned cash transfer is generally better than a transfer of a benefit in-kind or a cash transfer that is conditioned on the recipient's actions (a targeted transfer) because the former allows the recipient to spend the money on whatever maximizes its utility.[139] A transfer in-kind may be justified in certain circumstances, such as in the case the benefit entails positive externalities, costs the provider less than what it is worth to the recipient, serves to overcome asymmetric information, or is a welfare ordeal.

Redistribution from rich to poor countries through climate change policies is a form of a transfer in-kind or a targeted cash transfer. It may be justified on the basis of most, if not all, of the reasons mentioned above.

A. Mitigation, Adaptation, and Redistribution

When a country limits its GHG emissions, it incurs mitigation cost, but the resulting benefits are distributed globally, as the atmosphere is a global public good.[140] For efficiency reasons, explained in Part II above, mitigation should be performed on a global basis, so that the marginal cost of GHG emissions would be the same all over the world.[141]

This could be achieved in more than one way, but for presentation purposes I will assume it is achieved through a carbon tax. The tax rate would be set to equal the marginal harm from climate change.[142] This tax rate would not necessarily be the optimal rate from the perspective of each particular country for many reasons, including the following: the impact of climate change is expected to differ across countries,[143] and countries differ

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138. *See id.* at 1591 ("We cannot exclude the possibility that desirable redistribution is more likely to occur through climate change policy than otherwise, or to be accomplished more effectively through climate policy than through direct foreign aid.").

139. *See id.* at 1584–85 ("Other things being equal, the more sensible kind of redistribution would be a cash transfer, so that poor nations can use the money as they see fit.").

140. *See id.* at 1610 ("Similarly, one might think that all states should receive the same net benefit from greenhouse gas abatement.").

141. *See supra* Part III (explaining why, for efficiency reasons, mitigation should be performed on a global basis).

142. *See* Sinn, *supra* note 85, at 383 ("The theoretically correct value of the unit tax that would internalize the marginal externalities from global warming would have to be equal to the present value of the flow of damages it causes.").

143. *See* Posner & Sunstein, *supra* note 62, at 1587 (discussing and giving examples of the fact that not all countries will be hurt by the climate change and some countries will even be positively affected). The climate change effects are expected to be harsher, in the near to medium time range, on developing countries, which means that based on this factor by itself, the optimal global tax rate would be higher (lower) than optimal for the developed

in their opportunity costs,[144] in their GHG mitigation costs,[145] in their GHG intensity,[146] and in the extent to which they shift mitigation costs to residents of other countries, for example, through increased prices of their exported goods.[147]

It is therefore quite complicated to determine to what extent a global mitigation scheme makes a specific country better or worse off. Law professors Posner and Sunstein assume that the United States would be a net loser under a global mitigation scheme.[148] I do not find this assumption to be plausible. Without U.S. participation, China and other developing countries are unlikely to participate in a global GHG emissions mitigation scheme.[149] The choice faced by the United States is therefore between (a) continued global emissions more or less at the business-as-usual (BAU) rates, if no global agreement is reached or (b) a universal agreement that would be set at the optimal global tax rate.[150] It seems clear that the United States would be better off under the latter option for the following two reasons: First, because the terrible consequences suffered by hundreds of millions of people in other parts of the world are likely to have indirect effects on the United States, due to globalization and security issues.[151]

(developing) countries as a group. But this depends on how we account for time. If we take a longer time perspective, the developed countries will incur much higher costs.

144. *See* Gardiner, *Ethics, An Introduction*, *supra* note 113, at 60–61 (factoring in opportunity cost to the discussion and explaining that developing countries have greater opportunity costs and, thus, other more important things to spend money on instead of GHG mitigation).

145. *See* Posner & Sunstein, *supra* note 62, at 1611 (using the Kyoto Protocol, where the United States would have paid eighty percent of the total, as an example to demonstrate that the United States would pay substantially more in mitigation than other countries).

146. *See* ALDY & STAVINS, *supra* note 109, at 19–20 ("Developing countries have a key role to play in efforts to address climate change—both because they could be strongly affected by future damages and because they account for an increasing share of global emissions."). Developed countries emit fewer GHG per unit of GDP, that is, use more fossil fuel energy to produce GDP. *Id.* This makes it relatively more difficult for developing countries to meet the global standard. *Id.*

147. ORG. FOR ECONOMIC COOPERATION AND DEV., THE ECONOMICS OF CLIMATE CHANGE MITIGATION: POLICIES AND OPTIONS FOR GLOBAL ACTION BEYOND 2012 88–89 (2009).

148. *See* Posner & Sunstein, *supra* note 62, at 1567–69 (explaining that a global mitigation scheme would not be optimal for the United States and that they would probably be disadvantaged by it).

149. *See id.* at 1607–08 (discussing China and their reluctance to take blame for the climate change situation due to their incredibly low per capita GHG emission).

150. *See id.* at 1574–75 (laying out and explaining the most credible options for retribution that the United States, as well as other countries, have).

151. *See id.* at 1567–71 (expounding upon the choices that the United States has and concluding that a global mitigation scheme, though not extremely beneficial for the United States, is probably the most viable option).

Second, an increase in temperature above moderate levels, which is the likely outcome of a failure to reach international cooperation, will result in grave consequences to the developed countries, including the United States.[152] Their losses, measured in monetary terms, will be much greater than those of the developing countries.[153]

It is possible to make a global mitigation scheme distributionally-neutral through transfer payments.[154] As the aggregate benefits exceed the aggregate costs, it would also assure that no country would be a net-loser.[155] By definition, such transfer payments do not redistribute wealth from rich to poor countries.[156] Developing countries that receive such payments, receive them as compensation for their participation in the effort of creating a global public good.[157]

In contrast, transfers from developed to developing countries to finance adaptation can only be motivated by distributive justice. Adaptation does not require global cooperation. It is not subject to free riding. Contrary to mitigation—an activity that confers benefits on the entire globe—adaptation has no external effects. When a country takes adaptation measures it has no effect on other countries. It is a policy that benefits its own residents alone. Therefore, when developed countries pay for adaptation that takes place in developing countries, they do so only for distributive justice purposes. Outside the theory of welfare-economics this transfer may be justified on the basis of needs, according to a general standard to which people or nations are entitled, or simply as an act of generosity.

Developing countries prefer to see it differently.[158] They would like to view the commitment of developed countries towards them to be based on a

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152. *See* METZ, *supra* note 115, at 12–20 (detailing the impact of future climate change on developed countries). In addition, there are critical thresholds, or tipping points, in the climate system. When the system reaches a tipping point, catastrophes on a global scale will be unavoidable. *Id.*

153. *See id.* at 78–79 (explaining that even though rich countries, such as the United States, can take measures to protect people, these measures will be extremely costly and, thus, in monetary terms, they will have greater losses than developing countries).

154. *See* Posner & Sunstein, *supra* note 62, at 1610 ("If . . . some states receive a large benefit (because they benefit more from a given level of abatement or can reduce their greenhouse gases to an agreed-upon level at low cost) and other[s] . . . very little, the first group of states should make a side payment to the second group.").

155. *See id.*

156. *See id.*

157. *See id.* at 1608–09 ("One answer is that the gift would represent a side-payment, designed to ensure that developing nations—above all China—participate in the deal.").

158. *See id.*at 1591–1602 (discussing the doctrine of corrective justice and the notion that developing countries particularly blame developed countries for the current climate change problem).

stronger notion of entitlement—compensatory justice.[159] According to this notion, developed countries are required to indemnify costs that they unduly inflicted upon the developing countries and may even be legally responsible under tort law, in general, and the doctrine known as corrective justice, in particular.[160]

V. Differentiated Responsibilities (Corrective Justice)

A. Possible Justifications for Using a Fairness Principle

Standard welfare-economics analysis rejects any principle whose application depends on the use of information other than information about well-being.[161] Social policies, notably, legal rules, should be selected entirely with respect to their effects on the well-being of individuals.[162] Accordingly, notions of fairness, which are reasons that are not reducible to concerns about individuals' well-being, should receive no independent weight in policy analysis.[163]

In light of the above, tort law should be designed and used only according to its influence on individuals' well-being.[164] Relying on notions such as corrective justice is either redundant when the result is the same as under distributive justice or harmful when the outcomes differ.[165] Corrective justice requires the reversal of wrongful changes to an initial

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159. *Id.*

160. *Id.*

161. *See, e.g.*, AMARTYA SEN, DEVELOPMENT AS FREEDOM 60–62 (1999) (discussing the idea of *well-being* as one of the merits within the context of the utilitarian approach to freedom and the foundation of justice). Non-standard welfare-economics analysis embraced a broader perspective on the objectives of policy, such as capabilities and freedom. *Cf.* Louis Kaplow & Steven Shavell, *Any Non-Welfarist Method of Policy Assessment Violates the Pareto Principle*, 109 J. POLITICAL ECON. 281, 282 (2001) (suggesting the growing tension between the concern for an individual's well-being and factors outside of their well-being affecting social welfare).

162. *See* LOUIS KAPLOW & STEVEN SHAVELL, FAIRNESS VERSUS WELFARE 16 (2002) ("The hallmark of welfare economics is that policies are assessed exclusively in terms of their effects on the well-being of individuals. Accordingly, whatever is relevant to individuals' well-being is relevant under welfare economics. . . .").

163. *See id.* at 56 (discussing the effects of the Pareto Principle on determining policy choices based on the assumption that it is not beneficial to make everyone worse off).

164. *See id*. at 86 (stating that "the effects of tort law are relevant to the extent that they influence individuals' well-being").

165. *See generally* Ernest J. Weinrib, *Corrective Justice in a Nutshell*, 52 TORONTO L.J. 349 (2002) [hereinafter Weinrib, *Corrective Justice*] (discussing the interplay between corrective justice and distributive justice).

distribution of resources.[166] If, on the one hand, some initial distribution of resources is just, then corrective justice seemingly does no more than require that we return individuals to the position to which they are entitled, merely as a matter of distributive justice.[167] If, on the other hand, an initial distribution of resources is unjust, then corrective justice seemingly requires that we sustain or enforce an unjust distribution.[168]

So what could justify the use of a corrective justice notion under a welfare-economics analysis? Practical constraints. Welfare-economics analysis is based on the assumption that legal rules (e.g., tort law) maximize efficiency.[169] For example, in the context of tort law, legal rules are designed to assure optimal deterrence.[170] The reason legal rules can generally ignore redistribution is the existence of a tax-and-transfer system that operates simultaneously and redistributes resources to maximize society's welfare function.[171] When applying this analysis to the global context we should acknowledge that the tax-and-transfer system has no presence. Developing countries therefore look for additional arguments and try to apply to additional institutions (e.g., courts) in an effort to increase the transfers to them from the developed countries.

Another reason for the use by developing countries of a corrective justice argument is its intuitive appeal to our moral instincts.

B. Is the Intuition Justified?

According to Ernest J. Weinrib, one of the leading scholars on corrective justice, the situation of GHG emissions does not fit a corrective justice claim.[172] For corrective justice purposes we have to establish

166. *See id.* at 350 (explaining that for a remedy to conform to corrective justice, it must be aimed at both parties, in a manner in which the court takes away the wrongful gain of one party and makes good the other party's loss).

167. *See id.* at 351–52 (discussing the different functions and effects of corrective justice versus distributive justice).

168. *See id.* at 352 ("The consequence of this contrast between corrective and distributive justice is that no distributive consideration can serve as a justification for holding one person liable to another.").

169. *See* KAPLOW & SHAVELL, *supra* note 162, at 5 ("[L]egal rules are assessed by reference to wealth maximization or efficiency . . . .").

170. *See id.* at 98 (discussing rules in tort law, whether just or unjust, that result in greater deterrence of wrongful acts).

171. *See id.* at 460 (stating that distributive concerns are addressed effectively through the income tax and transfer system).

172. Discussion with Ernest J. Weinrib, Faculty of Law, University of Toronto (May 12, 2011).

ownership rights and fault,[173] and we need to match specific victims and injurers.[174] Ownership rights and fault are two substantive requirements, analyzed below,[175] whereas the matching is merely a technical requirement.[176] Nevertheless, the matching requirement is the one that exposes the inappropriateness of the use of corrective justice in the climate change context.[177]

Corrective justice is an idea that liability rectifies the injustice inflicted by one person on another.[178] This rectification operates correlatively on both parties.[179] The central feature of a system of liability is that any liability of a particular defendant is simultaneously a liability to a particular plaintiff.[180] In holding the defendant liable to the plaintiff, the court is making not two separate judgments (one that awards something to the plaintiff and the other that coincidentally takes the same from the defendant), but a single judgment that embraces both parties in their interrelationship.[181] Each party's position is intelligible only in the light of the position of the other.[182] The defendant cannot be thought of as liable without reference to a plaintiff in whose favor such liability runs.[183] Similarly, the plaintiff's entitlement exists only in and through the defendant's correlative obligation.[184]

It is difficult to imagine how countries could be matched in this way. A high GHG-emitting country inflicts harm on the entire global population, including its own residents. All countries are victimized to some extent by

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173. *See* ERNEST J. WEINRIB, THE IDEA OF PRIVATE LAW 175 (1995) [hereinafter WEINRIB, PRIVATE LAW] (discussing the idea of corrective justice as a regime of rights and the idea of ownership as leading to a strict liability standard).

174. *See id.* at 71 (discussing the inherent link between a victim's loss and the injurer's gain).

175. *See id.* at 175–76 (discussing the strict liability claims from a property perspective).

176. *See id.* at 71 (describing Aristotle's mathematical interpretation of the forms of justice).

177. *See id.* at 72 ("No single mathematical operation combines proportionate and quantitative equality[.]").

178. *See* Weinrib, *Corrective Justice*, *supra* note 165 ("[C]orrective justice has a rectifactory function. By correcting the injustice that the defendant has inflicted on the plaintiff, corrective justice asserts a connection between the remedy and the wrong.").

179. *Id.*

180. *Id.*

181. *Id.*

182. *Id.*

183. *Id.*

184. *See* WEINRIB, PRIVATE LAW, *supra* note 173 at 114–22; *see also* Weinrib, *Corrective Justice*, *supra* note 165, at 349.

the emissions of other countries. Clearly, corrective justice was designed to handle completely different types of situations.[185]

C. Applying Tort Law More Generally

Even if corrective justice does not fit the climate change case, tort law analysis could still be helpful in clarifying and assessing the strength of moral claims that could be raised by developing countries against developed ones.

In the context of climate change, tort law arguments require that nations which contributed to the buildup of GHG in the atmosphere, more than other nations, compensate those other nations for the cost they inflicted upon them.[186]

I argue that to make the case that emissions were excessive we have to adopt some benchmark, such as emissions per-capita. Otherwise it is impossible to define in what sense nations contributed more or less to the buildup of GHG in the atmosphere. This would be true even if we do not assign fault. We all emit GHGs, even simply by breathing; hence we all contribute to whatever harm takes place.[187] In order for an individual to be responsible (though not necessarily liable) to another for the harm caused by her emissions, we need to define by what measure her emissions were greater than his. And because the claims are brought by countries against other countries, we need to find a way to compare the aggregate emissions of their residents.

Simple per-capita measurement, however, cannot be considered fair.[188] There are differences between countries in the amount of GHGs their residents would need to emit to maintain an equal standard of living.[189] Thus, for example, merely accounting for heating homes in cold countries and cooling them in very warm countries would require quite significant

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185. *See* WEINRIB, PRIVATE LAW, *supra* note 173 at 73 ("In corrective justice the unity of the plaintiff-defendant relationship lies in the very correlativity of doing and suffering harm.").

186. *See* Stephen Gardiner, *Ethics and Global Climate Change*, 114 ETHICS 555, 580 (2004) [hereinafter Gardiner, *Global Climate Change*] (reasoning that developed countries have overused the earth's capacity to absorb emissions, such that "justice seems to require that the developed countries compensate the less developed for this overuse").

187. *See* Posner & Sunstein, *supra* note 62, at 1591–1601 (providing examples of what actions lead to greenhouse gas emissions).

188. *See* Gardiner, *Global Climate Change*, *supra* note 186, at 584 (arguing that a major concern with the per capita proposal is that it "does not take into account the fact that emissions may play very different roles in people's lives"). "In particular, some emissions are used to produce luxury items, whereas others are necessary for most people's survival." *Id.*

189. *Id.*

fairness-based adjustments to the per-capita measurement.[190] This, unless we assume that residence is a matter of choice and individuals should be held responsible for the larger amounts of GHGs they emitted due to their choice of residence. I believe that for most people residence is not a matter of choice. Hence, adjusting the per-capita emission measure is required, but would be highly controversial and difficult to agree on.

Calculating the adjusted emissions per-capita measurement described above in a way that is relevant to a tort claim would be especially difficult because such claims are backward-looking.[191] We need to find the relevant information for past years. Fairness would require that GHG emissions be defined to include any activity that increases the GHG concentration in the atmosphere, as this is what creates the harm.[192] It should therefore include land use changes, such as deforestation, as they too have very significant effects on GHG concentration.[193] Because what matters is the effect of human behavior on GHG concentration in the atmosphere, there should be no difference between cutting down trees and driving a car.[194] Both increase GHG concentration.[195] Weisbach, who looked for such data, was only able to find data on emissions from land use change between 1950 and 2000.[196] If we want to raise tort claims based on emissions that took place prior to 1950, we need to take into consideration our inability to measure the relative per-capita emissions of quite a few countries.[197]

There will probably be a need to check the average global per-capita emissions year by year and measure the deviation of each nation from the average. For each country, this deviation would then be multiplied by its number of residents during that year to calculate the aggregate amount of GHG emissions it emitted above or below the benchmark. Each country would then be required to pay (in case it emitted above the average) or be

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190. *Id.*

191. *See* Gardiner, *Global Climate Change*, *supra* note 186, at 579 (arguing that the first issue in the context of responsibility for climate change to be considered is "backward-looking considerations").

192. *See* Posner & Sunstein, *supra* note 62, at 1591–1601 (providing examples of what actions lead to greenhouse gas emissions).

193. *See* David Weisbach, *Negligence, Strict Liability, and Responsibility for Climate Change* 6 (The Harvard Project on International Climate Agreements Discussion Paper 10-39, 2010) (discussing land use changes).

194. *See id.* at 7 ("Any good measure of responsibility should consider all sources of climate change, to the extent possible.").

195. *Id.*

196. *See generally* WORLD RESOURCES INSTITUTE, CAIT: GREENHOUSE GAS SOURCES & METHODS (2010), http://cait.wri.org/downloads/cait_ghgs.pdf (displaying the Climate Analysis Indicator Tool (CAIT)) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

197. *See* Weisbach, *supra* note 193, at 8 (discussing why data from years prior to 1950 is sparse and inadequate).

entitled to receive a payment from the others (in case it emitted below the average). This is a retroactive equal distribution allocation mechanism which may be thought is what tort law is supposed to achieve, namely, rectify the transactional imbalance.

Next we need to assess the harm. This is very complicated for at least two reasons. First, we need to be able to put a dollar value on the cost that each country will incur due to climate change which is the outcome of the above average emissions of that country in the relevant years. Second, the activity that generated the GHG emissions benefited not only those who engaged in it, but also others.[198] The United States, for example, contributed more than its share in terms of population to the increase in GHG concentration,[199] but some of the emissions were generated by activity that had positive spillover effects on other countries,[200] including countries with low per-capita emissions. It seems that fairness would require offsetting the harm caused by the GHG emissions with the benefit derived via spillovers from the activity that generated the emissions.[201] I am not sure that such a calculation is possible, and even if it were, it would probably be very difficult to reach an international agreement on how it should be made.

Developing countries could argue that it is clear that the positive spillovers were insignificant, pointing to the differences in GDP per capita.[202] The weakness of such an argument is that there could be many other explanations as to why certain countries are rich while other are poor. The earlier and greater use of fossil energy is only one of them and may not even be that prominent.[203]

It might be possible to calculate the harm if we interpret the tort claim a bit differently. We could argue that the atmosphere's capacity to absorb GHG without adverse effects is limited and that this is a common resource. Developed countries took more than their fair share of this resource and by doing so denied developing countries their fair share and should therefore compensate them. Such a claim would require calculation of what is left of

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198. *See* POSNER & WEISBACH, *supra* note 3, at 106 ("Many of these benefits are positive externalities").

199. *See* Posner & Sunstein, *supra* note 62, *at* 1604 (listing the United States as the world's seventh highest per capita emitter of GHGs in 2004).

200. *See id.* at 1594 ("[I]f past generations of Americans have imposed costs on the rest of the world, they have also conferred substantial benefits.").

201. *See id.* at 1594 ("As long as the costs are being toted up, the benefits should be as well, and used to offset the requirements of corrective justice.").

202. *See, e.g., id.* at 1606 ("China might well urge that its low per capita emissions rate . . . should be taken into account in deciding on appropriate policy.").

203. *See, e.g.*, Stephen L. Parente & Edward C. Prescott, *Monopoly Rights: A Barrier to Riches*, 89 AMERICAN ECON. REV. 1216, 1216 (1999) (explaining that the reason many poor countries do not use better technologies to improve their wealth is due to protected monopoly rights).

the absorptive capacity of the atmosphere and a comparison of it to how much was used by past emitters.[204] These data are available.[205] The difficulty with this approach is conceptual. It requires answering the very difficult question of how to allocate emission rights across countries. This question is beyond the scope of this paper. I will merely note that there seems to be no clear normative theory to guide us on it. The equal per-capita basis allocation, which is highly popular with scholars and the developing world,[206] cannot be defended on normative grounds.

D. Can a Tort Claim be Directed at a Collective?

An often-repeated fairness-based objection to the use of tort claims in the climate change context is that it is unfair to aggregate every individual's emissions in each country.[207] The tort claim is directed at the country and thereby to all individuals who currently reside in it, but those individuals may differ sharply in their GHG emissions. Some individuals may have consumed only relatively little electricity and did not own a vehicle, while others emitted a lot.

I do not find this argument convincing. Under the tort claim, if successful, the state will be required to pay compensation. This will be paid from revenue raised by its tax system. It is the government's responsibility toward its residents to raise the taxes according to each individual's emissions. In the likely case that the government did not do so, it is the government's fault that it did not impose taxes on GHG emissions. The citizens can raise claims against their own government for not making people pay for the real cost of their activities, but they cannot raise any claims against other countries that request compensation based on the harm that was caused to them. As for the responsibility of people for the wrongful acts of their governments, there are scholars who argue that in a

204. *See* Wallace S. Broecker, *CO_2 Arithmetic*, 315 SCI. 1371 (2007) (calculating necessary GHG emission limits based on the concept of a "carbon pie").

205. *Id.*

206. *See* Eric Neumayer, *In Defense of Historical Accountability for Greenhouse Gas Emissions*, 33 ECOLOGICAL ECON. 185, 187 (2000) ("That emission rights should be allocated on an equal per capita basis and that historical differences in emissions should also be accounted for is . . . the shared view of almost every scholar and policy maker from the developing world.").

207. *See id.* at 188 (suggesting that one objection to accountability "holds that present generation of developed countries must not be held accountable for something that was caused not by themselves, but by individuals in the past").

democracy individuals may be held liable, unless they did whatever they could (e.g., voting and demonstrating) against it.[208]

Another related aspect has to do with time.[209] Some of the current residents were not residents of that country at the time the GHG emissions took place.[210] They may have been residents of a different country. Some people were born only later. How can these people be responsible for emissions that took place before they were born or immigrated to the country?

A possible justification is that people who immigrate to a country, or are born there, benefit from its wealth. Past GHG emissions contributed to the economic growth of the country, and they benefit from it. A state is an institution that outlives its residents. New residents, by immigration or birth, inherit both rights and responsibilities. An argument by environmental philosopher Stephen Gardiner is stated as follows: "Put most baldly, if we are not responsible for at least some of the debts incurred by our ancestors, why are we entitled to inherit all of the benefits of their activities? Hence, if we disavow their emissions, must we also relinquish the territory and infrastructure they left to us?"[211] Shue provides the example of an individual who inherited a suit from his father and it turned out that his father had not paid the tailor.[212] Shue argues that he would be bound to pay the tailor[213] and that this would be the case even if the father did not pay the tailor because he mistakenly thought the suit was gift.[214]

E. Liability (Fault)

Assuming we can solve the measurement problems, there is a need to distinguish between responsibility and liability. As will be discussed below, it is much easier to base a tort law-inspired moral claim on responsibility

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208. *See, e.g.*, MICHAEL WALZER, JUST AND UNJUST WARS 300–01 (1977) (stating that a citizen's lack of participating, in voting in particular, renders them responsible for the subsequent wrongful actions that result from their non-participation).

209. *See* Neumayer, *supra* note 206, at 188 ("A second objection holds that the present generation of developed countries must not be held accountable for something that was caused not by themselves, but by individuals in the past who are long since dead.").

210. *See* Posner & Sunstein, *supra* note 62, at 1593 ("The basic problem for corrective justice is that dead wrongdoers cannot be punished or held responsible for their behavior, or forced to compensate those they have harmed.").

211. Gardiner, *Ethics, An Introduction*, *supra* note 113, at 57.

212. Henry Shue, *Historical Responsibility* (Technical Briefing for Ad Hoc Working Group on Long-term Cooperative Action under the Convention [AWG-LCA], SBSTA, UNFCC, Bonn, 4 June 2009), *available at* http://unfccc.int/files/meetings/adhocworkinggroups/lca/application/pdf/1shuerev.pdf.

213. *Id.*

214. *Id.*

than to prove fault.[215] In tort law, we usually require fault.[216] Therefore, if we look to the law as our normative guide, we should generally raise claims only with regard to faulty behavior.

Once we require fault, there is a very strong fairness-based case to limit tort claims to emissions that took place only in recent years.[217] The reason is simple. Until relatively recently, developed countries were not (and could not be) aware of the effects of GHG emissions and so should not be held accountable for past emissions. Nor could they have known that fossil fuels would remain essential to the economy for centuries to come: their emissions only became part of a problem because economies continued to depend on fossil fuels.[218] What is the cut-off date? Before what point should emitters not be blamed for emissions? There are various possible dates. In my opinion, the earliest possible date is 1992, when nearly all countries of the world signed the UNFCCC,[219] which stated that "[t]he Parties to this Convention [are] [c]oncerned that human activities have been substantially increasing the atmospheric concentrations of greenhouse gases, that these increases enhance the natural greenhouse effect, and that this will result on average in an additional warming of the Earth's surface and atmosphere and may adversely affect natural ecosystems and humankind."[220]

F. What would be Regarded as Negligent Behavior?

Posner and Sunstein argue that on the individual level, each GHG-emitting activity cannot be regarded as negligent if the benefit the individual derived from the activity was greater than what she would have been required to pay under a carbon tax regime, had such a system been in place.[221] Assuming that a carbon tax would have added ten cents to the price of a gallon of gas,[222] Posner and Sunstein argue that "a person is negligent when she drives rather than walks if the benefit she obtains from

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215. *See infra* Part IV.G.

216. *See* Weisbach, *supra* note 193, at 28 ("Most notions of responsibility require fault. This is deeply embedded in tort law.").

217. *See id.* at 28–30 (discussing why fault-based claims are improbable in the context of greenhouse gas emissions).

218. *See* Mathias Risse, *Who Should Shoulder the Burden? Global Climate Change and Common Ownership of the Earth* (Harvard Kennedy Sch. Faculty Research, Working Paper No. RWP08-075, 2008) (mentioning the "considerable" amount of carbon dioxide that has been a result of burning fossil fuels).

219. UNFCCC, *supra* note 25, at 1.

220. *Id.*

221. Posner & Sunstein, *supra* note 62, at 1600.

222. *See* WILLIAM NORDHAUS, A QUESTION OF BALANCE 196 (2008) (relying on an estimate by Nordhaus of what would be the optimal carbon tax in 2010).

driving is less than ten cents per gallon consumed. The argument could be extended to the choice of driving rather than using convenient forms of public transportation and to other activities as well."[223]

This, however, is merely another version of the argument against aggregation which I find to be problematic. This time, the argument is also against aggregation of an individual's many separate acts. The carbon tax is a Pigouvian tax.[224] Its main purpose is not to raise revenue, but to change individuals' behavior.[225] The example gives the impression that the tax will be too small to change anyone's behavior.[226] But this would mean that either everyone in the United States is behaving efficiently, fully internalizing the costs (in terms of climate change) of their behavior, or that the tax is too low, namely, that it is not set at the optimal rate.[227] Plausibly assuming that a tax set at the optimal rate would change many individuals' behavior, this aggregate change in behavior represents the negligence, measured collectively.[228] It can then be arbitrarily attributed to the individuals who form the group.

Posner and Sunstein also argue as follows:

> If many or most people fail to pay a carbon tax or (as we argue) fail to act as if they pay it by cutting back on less important activities that produce greenhouse gases, then the contribution of Americans who do this is quite small. And if this is the case, it cannot be considered negligent for Americans to fail to reduce their greenhouse gas emitting activities. Put differently, it is not negligent to fail to contribute to a public good if not enough others are doing similarly, so that the public good would not be created even if one did contribute.[229]

I do not find this argument convincing. First, the underlying assumption that climate change is an all-or-nothing phenomenon is wrong. If "the public good was not created,"[230] namely, if dangerous climate change is taking place, any additional emission increases the harm. This is not equivalent to the case (analyzed by philosophers, as will be described below)[231] where many people kill a person together, each contributing a little to the killing, and some of them, unknowingly, do so after the person

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223. Posner & Sunstein, *supra* note 62, at 1599.
224. *See* Weisbach, *supra* note 193, at, 37 (explaining the theory behind Pigouvian tax).
225. *Id.*
226. *Id.*
227. *Id.*
228. *Id.*
229. Posner & Sunstein, *supra* note 62, at 1600 (citing Matthew D. Alder, *Corrective Justice and Liability for Global Warming*, 155 U. PA. L. REV. 1859, 1862–63 (2007)).
230. *Id.*
231. *See infra* Part IV.G–H.

is already dead.[232] The earth is not dead yet, so adding excessive emissions is morally wrong.

Even assuming that the emissions were so severe that nothing could be done to save the planet, their behavior would have been negligent according to the following classic statement by Parfit: "Even if an act harms no one, this act may be wrong because it is one of a *set* of acts that *together* harm other people."[233] In the case of a jointly harmful act, the order in which the agents contribute to that harm is irrelevant in the moral assessment of the agents' behavior.[234] The American individuals who emit beyond their baseline per-capita emissions contribute to the harm, together with all other individuals in the world who exceed their per-capita level. Each one of them is morally liable.

G. Responsibility

As argued above, the law generally requires liability, namely, fault.[235] Even when strict liability is the legal rule, often the underlying rationale is that the activity was faulty, even if, to save costs, proving this is not required.[236] Moral considerations, however, can be broader than the legal system. I do not think that developing countries should base their claims on arguments that cannot be supported by the law, but it is not my opinion that matters. What matters, as explained in the Introduction, is what developing countries think, and feel, to be a fair allocation of the cost of climate change.[237]

We discussed a notion of fairness.[238] As such, it is based on our sense of what is right and wrong. In the tort context, it invokes the intuitive principle that one should "clean up one's own mess," or the "you broke it,

232. *See generally* DEREK PARFIT, REASONS AND PERSONS 70 (1984) (philosophizing over the individualization of multi-person activities).

233. *Id.*; *see also* STEVE VANDERHEIDEN, ATMOSPHERIC JUSTICE 165 (2008) (quoting DEREK PARFIT, REASONS AND PERSONS 70 (1984)).

234. *See* VANDERHEIDEN, *supra* note 233, at 165 ("Where joint contributions to a collective harm involve thresholds, the relevant fact is not the order in which each contributed . . . but rather the fact that theirs was one of a set of acts that caused some good or bad outcome.").

235. *See supra* Part IV.E.

236. *Id.*

237. *See supra* Part I.

238. *See supra* Part IV.A.

you fix it" rationale.[239] This suggests that the developed (i.e., industrialized) countries should bear the costs imposed by their past emissions.[240]

When responsibility, not liability, is the guiding norm, the argument against the application of tort to emissions before 1992 loses much of its force.[241] It is clear that past emitters cannot be blamed, but it is not clear that they do not have a moral responsibility to correct whatever wrong they did, even if it was unintentional.

As illustrated by Gardiner,

> If I accidentally break something of yours, we usually think that I have some obligation to fix it, even if I was ignorant that my behavior was dangerous, and perhaps even if I could not have known. It remains true that I broke it, and in many contexts that is sufficient. After all, if I am not to fix it, who will? Even if it is not completely fair that I bear the burden, isn't it at least less unfair than leaving you to bear it alone?[242]

This seems especially unfair in the climate change context where the countries that "broke it" are generally much wealthier than the other countries that now have to incur great costs to deal with the possible consequences of the "broken" atmosphere.[243] This last comment leads to a different type of objection to the use of tort claims, an objection that does not depend on whether liability or responsibility is the underlying norm, as will be discussed below.[244]

H. The Distributive Implications of Accepting the Corrective Justice Claim

The frequent use of the corrective justice claim in the climate change negotiations is based on a factual assumption that developed countries are responsible for a very large percentage of the historical emissions, whereas the costs likely to be imposed by those emissions are expected to be disproportionately visited on the poorer countries.[245] This is also reflected in the UNFCCC as follows: "*Noting* that the largest share of historical and

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239. *See* Gardiner, *Ethics, An Introduction*, *supra* note 113, at 56 (quoting Henry Shue, *Global Environment and International Inequality*, 75 INT. AFFAIRS 531(1999)).

240. *See* Gardiner, *Global Climate Change*, *supra* note 186, at 579 (reasoning that since developed countries have contributed largely to the stock of GHG in the atmosphere, they should bear the costs of climate change imposed by those emissions).

241. *Id.*

242. Gardiner, *Ethics, An Introduction*, *supra* note 113, at 56 (citing Henry Shue, *Global Environment and International Inequality*, 75 INT. AFFAIRS 531(1999)).

243. *Id.*

244. *See infra* Part IV.H.

245. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC), CLIMATE CHANGE 1995: ECONOMIC AND SOCIAL DIMENSIONS OF CLIMATE CHANGE 94 (1996).

current global emissions of greenhouse gases has originated in developed countries."[246]

Weisbach presents an alternative view.[247] He found that many poor countries are among the top current emitters of GHGs, especially if we take changes in land use into account, as we should.[248] Using the data he could find on emissions, including land use change and the World Bank definition of high income of more than $11,906 GDP per capita, he found that high income countries in the top 20 emitters comprise thirty-six percent of cumulative emissions.[249] Other countries make up forty-one percent of cumulative emissions, and the results hold if we look at the entire list of countries.[250]

Weisbach found that once we account for land use change, there are many developing countries on the list of top emitters, with Brazil and Venezuela among the major emitters in terms of the percentage of their contributions to the global total.[251]

It is clear that the United States and a few other developed countries are responsible for a large share of the GHG stock and are high per-capita emitters.[252] It is also clear that many poor countries that will be severely harmed by climate change are far less responsible for the existing GHG stock, both in absolute terms, and due to their much lower emissions per-capita.[253] India is a case in point.[254]

However, what has also become clear is that the conventional wisdom was based on the aggregation of many developing countries together, while ignoring emissions from land use change.[255] Weisbach highlighted the surprising fact that it was not only rich countries that contributed to the stock of GHG in the atmosphere; many poor countries have very high emissions per-capita.[256] This means that if we endorse the use of tort claims in the climate change context, and assuming that the required calculations could be made, many poor countries will be held liable/responsible.[257] Tort

246. UNFCCC, *supra* note 25, at 1.

247. *See* Weisbach, *Negligence*, supra note 193, at 32 (The Harvard Project on International Climate Agreements Discussion Paper, 2010) [hereinafter Weisbach] (arguing that many poor countries are top emitters, even on a per-capita basis).

248. *See id.* at 14–15 ("[P]oor countries have higher emissions from land use change . . . .").

249. *Id.* at 16.

250. *Id.*

251. *Id.* at 18–19.

252. *Id.* at 16.

253. Weisbach, *supra* note 193, at 16.

254. *Id.*

255. *Id.*

256. *Id.* at 17–18.

257. *Id.* at 35.

claims would therefore have unwarranted distributive implications.[258] Under a welfarist analysis, this would be a strong claim against the use of corrective justice,[259] but this is not very meaningful because, under a welfare analysis, we would not have considered corrective justice, which is a fairness-based notion, in the first place. However, the distributive effects also matter under an equality-based analysis.[260] Remembering that the principle of "common but differentiated responsibilities"[261] in the UNFCCC was followed by the words "and respective capabilities"[262] tells us that promoting corrective justice (the differentiated responsibilities) was not supposed to be in conflict with the redistributive goal ("respective capabilities").[263]

VI. Conclusion

International climate change negotiations are complex, and a lot is at stake. Ban Ki-moon, Secretary-General of the United Nations, expressed it succinctly in his 2007 speech in Bali: "Today we are at a crossroads—one path leading towards a comprehensive new climate agreement and the other towards a betrayal of our planet and our children. The choice is clear."[264]

We are still at that crossroads and the choice is still clear. But the temptation to free ride is great, as mitigation costs are high, and near universal cooperation is required.[265] There are no historical precedents for international cooperation in which so many countries cooperated over such high economic stakes.[266]

Developed countries are expected to show leadership, but the major developing countries will have to join them at the helm. As stated by climate change expert Nicholas Stern, "the future of the climate will largely

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258. *See id.* at 35 ("Notions of corrective justice typically make no exception for income levels or poverty. Tort law imposes liability on negligent injurers regardless of income: if you negligently hit me with your car, you are liable even if you are poor.").

259. *See* Posner & Sunstein, *supra* note 62, at 1610–11 (noting the welfarist analysis in connection with corrective justice).

260. *Id.*

261. UNFCCC, *supra* note 25, at 1.

262. *Id.*

263. *Id.*

264. Ban Ki-moon, United Nations Secretary General, Address at the United Nations Climate Change Conference (Dec. 12, 2007).

265. *See* METZ, *supra* note 115, at 318 (2010) (explaining the necessity of everyone participating, considering that "no economic sector covers more than 25% of the total emissions").

266. *See* Thomas C. Schelling, *What Makes Greenhouse Sense? Time to Rethink the Kyoto Protocol*, 81 FOREIGN AFFAIRS 2, 7 (2002) (mentioning the creation of the WTO, the Marshall Plan, and NATO as the only possible exceptions, but explaining that climate change is much more challenging).

be shaped by the developing countries: in population terms, it is their planet . . . . The large developing countries will be central to the design and execution of international action to protect their future . . . . [T]he numbers on population and future emissions are such that a credible response cannot come from the rich countries alone."[267]

If developing countries perceive the agreement to be unfair, this would affect not only their willingness to sign it, but also their motivation to implement and enforce it if they signed it due to political or other pressure.[268] One of the major impediments to the success of the international negotiations is the suspicion held by developing countries that climate change discussions are a "tool that the North is using to slow the economic and political rise of the South."[269] At such high levels of suspicion, engaging in an open analysis of the moral claims by developing countries is critical to creating the trust necessary to reach an agreement.

Finally, I find it important to stress that equity arguments should not be used to justify exempting any nations from taking part in the global abatement scheme. As mentioned earlier, global coverage is necessary to prevent leakage and supply side effects.[270] Without coverage on a level sufficient to prevent leakage and supply side effects, it is doubtful that significant, possibly disastrous, climate change can be prevented.[271] Equity-based arguments should only justify transfer payments. The recipients will be free to use the money as they see fit, but unlike the case under the Kyoto Protocol, they will have to limit their GHG emissions (defined to include deforestation) according to a global abatement scheme.[272]

I think that the global abatement scheme should be made explicit and binding on all countries, developing and developed alike. Setting goals and

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267. STERN, BLUEPRINT, *supra* note 3, at 13.

268. *Id.*

269. *See* Ramgopal Agarwala, *Towards a Global Compact for Managing Climate Change*, *in* POST-KYOTO INTERNATIONAL CLIMATE POLICY 75 (Aldy & Stavins eds., 2009) (referring to the need for the South to conduct its own research on climate change).

270. Babiker, *supra* note 102, at 441.

271. Sinn, *supra* note 85, at 360.

272. *See* DESSLER & PARSON, *supra* note 1, at 188–89 (making this suggestion, including the possibility that developing countries' emission limitations will become effective conditional on "measures of development progress or indicators of the severity of climate change risk"). If absolutely necessary to bridge the current divide between developed and developing countries on how to share the costs of mitigation, developing countries should be allowed to commit to emission limitations that will come into effect only a few years after the developed countries have restricted themselves. This should be done only as a last resort because it would be much better to include all countries immediately in the global mitigation scheme and pay developing countries significant side-payments either as compensation or simply as inducement. A uniform global mitigation scheme is much more efficient and the costs saved by full coverage can be used to increase overall welfare including increased side-payments to developing countries.

targets for GHG emission reduction is not enough. Governments commit, but in practice ignore the goals, either because they are overly optimistic or because there is no sanction for failing to meet them.[273] Targets are not very helpful in solving the free riding problem.

In theory, cap-and-trade and carbon tax are equally efficient, but cap-and-trade requires an initial decision regarding the allocation of emission permits to states.[274] This is a highly loaded issue, as it raises very difficult moral questions regarding people's rights in the atmosphere. It is much better to avoid those questions and negotiate the global abatement scheme immediately. A carbon tax does just that and may therefore allow more fruitful negotiations.[275]

"Developing countries are much more likely to agree to a global harmonized carbon tax, with each country retaining the tax revenue, than to any form of global cap-and-trade regime, short of one that involves an equal per capita allocation,"[276] which is unacceptable to the United States. As I have written in another article,

> The reason is simple. Under a cap-and-trade regime, when a developing country such as China or India experiences economic growth that is relatively greater than that experienced by developed countries, it emits more GHG. Under a cap-and-trade regime, it is then required to purchase permits from developed countries such as the United States. Under a harmonized carbon tax regime, it pays more carbon taxes, but the tax revenue is retained by its own treasury. This makes a huge difference and is likely to be the key to achieving global cooperation.[277]

Once distributive and corrective justice claims are openly discussed, their normative weaknesses exposed, and their strengths acknowledged, they can be put aside to allow for a forward-looking agreement to be signed. On signing the agreement, countries will use transfer payments to roughly equalize their benefits from the global mitigation scheme. Developing countries will tend to be on the receiving side, due to their comparatively high opportunity costs.[278] In addition, developing countries

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273. *See* Schelling, *supra* note 266, at 5 ("[N]either the United States nor the other major developed countries will likely accept serious sanctions for missing emissions targets.").

274. Margalioth, *supra* note 47, at 64.

275. *See id.* at 70 ("[A] harmonized carbon tax regime . . . is likely to be the key to achieving global cooperation.").

276. *Id.*

277. *Id.* at 70.

278. *See generally* Posner & Sunstein, *supra* note 62 (contrasting the roles of, and issues facing, developed and developing countries in the climate change scheme). They need

will receive transfers on distributive (not corrective) justice grounds to finance adaptation. To assure compliance with the mitigation scheme, these transfers will be paid in installments, conditional on performance.

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the money spent on GHG mitigation to fight poverty and to invest in technology, human capital, and infrastructure to improve their opportunities to experience economic growth. *Id.*