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## UvA Dissertation

*Faculty of Humanities*

The present thesis is based on research carried out by Marc Davidson at the University of Amsterdam. Marc currently works as a senior consultant at CE Delft, Solutions for environment, economy and technology, and teaches bioethics at the University of Amsterdam.

Intergenerational justice requires that climate risks to future generations be handled with the same reasonable care deemed acceptable by society in the case of risks to contemporaries. Such general standards of conduct are laid down in tort law, for example. Consequently, the validity of arguments for or against more stringent climate policy can be judged by comparison to the general standards of conduct applying in the case of risk to contemporaries. That this consistency test is able to disqualify certain arguments in the climate debate is illustrated by a further investigation of the debate on the social discount rate, used in cost-benefit analysis of climate policy.



Arguing about climate change

Marc D. Davidson

## Arguing about climate change

*Judging the handling  
of climate risk to future generations  
by comparison to the general  
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of risk to contemporaries*

MARC D. DAVIDSON



# **Arguing about climate change**

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# **Arguing about climate change**

**Judging the handling of climate risk to future generations  
by comparison to the general standards of conduct  
in the case of risk to contemporaries**

ACADEMISCH PROEFSCHRIFT

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# Contents

General introduction	1
Chapter 1: An inconvenient truth	3
Chapter 2: Climate damage as wrongful harm to future generations	19
Chapter 3: Regulation of climate change and the reasonable man standard	47
Chapter 4: A social discount rate for climate damage to future generations based on regulatory law	65
Chapter 5: How reasonable man discounts climate damage	85
Chapter 6: Parallels in reactionary argumentation in the US congressional debates on the abolition of slavery and the Kyoto Protocol	109
Summary	129
Nederlandse samenvatting	133
Acknowledgements	137
Curriculum vitae	139





# General introduction

In the introduction to *Arguing About Slavery*, William Lee Miller describes the resistance to the abolition of slavery in the Southern United States in the mid-nineteenth century:<sup>1</sup>

“Slavery was integral to the life and culture, as John C. Calhoun kept saying, of an entire region, of eleven states (in 1835) of the Union – of almost half of the nation. When a “pecuniary interest” has that magnitude, it is a formidable opponent indeed. Rationalizations are supplied, positions are softened, conflicts are avoided, compromises are sought, careers are protected, life goes on. Don’t try to change what can’t be changed. Adapt to it.”

“Suppose today some dominant industry, built into the lives and fortunes of a great many people – to a degree of the whole nation – were found to be morally repugnant; what difficulties there would then be in extracting it from the nation’s life!”

In fact, we do have such a dominant industry today. The large-scale burning of fossil fuels, an energy source applied to *replace* human labour, is closely interwoven with almost every facet of modern production and consumption. Increasingly, the burning of fossil fuels is considered morally repugnant because we are passing on its costs – climate-change induced damage to health and property – to future generations. And as Miller anticipates, this industry is rationalised in public and political debate as slavery was one-and-a-half centuries ago.

Today, of course, the former rationalisation of slavery is easily exposed, while we must wait for a future time frame from which to effectively judge today's public discourse on global warming. “Errors that slumber peacefully through one age, may be instantly detected in the next, because they are looked at from other points of observation,” as the antebellum orator Tarbox noted in 1843. Still, I believe the validity of a wide range of arguments for or against climate policy can already be judged today.

The main objective of this thesis is not to champion why we should or should not care about future generations, though I will indeed discuss this topic. Although the moral worth of slaves was publicly questioned at the time of the abolition debates, the analogous question of why we should care

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<sup>1</sup> Miller, W.L.: 1996, *Arguing About Slavery, The Great Battle in the United States Congress*, Alfred A. Knopf, New York, p. 11.

about future generations is virtually lacking in the present climate debate. Although highly debated among moral philosophers, our duties to posterity remain more or less uncontested in both public and political debate. The main target of this thesis is therefore the kind of rhetorical rationalisation of the status quo which gives the impression that we do care about future generations but nevertheless justifies business-as-usual. The objectives are the following:

- to argue that *in theory* the validity of arguments for or against climate policy depends upon their consistency with the general standards of conduct deemed acceptable for handling risks to others, as laid down in tort law, for example;
- to show by means of examples that *in practice* this consistency test is able to disqualify a variety of oft-used arguments in the climate debate.

### *Outline*

In chapter 1, I first sketch the circumstances that go to explain why the status quo – the continued burning of fossil fuels – is rationalised the way that it is. Apart from this chapter, the rest of this thesis is composed of articles that have already been published or submitted for publication in scientific journals. In chapter 2, I argue that in spite of theoretical problems governments are justified in addressing climate damage as *wrongful* harms to future generations, i.e. as violations of their rights to bodily integrity and personal property. In chapter 3, I argue that although it is more straightforward to handle the risk of climate change through regulation, the argumentation behind such regulation ought to be consistent with the reasonable man standard from tort law. In chapters 4 and 5, I apply the idea of handling risk to future generations according to the reasonable man standard to one topic in particular: the social discount rate, which is commonly used in cost-benefit analysis of climate policy. Chapter 4 is theoretical in nature, while chapter 5 adds concrete numbers. In chapter 6, I explore similarities between the rationalisation of slavery in the abolition debates and the rationalisation of ongoing emissions of greenhouse gases in the US congressional debates on the Kyoto Protocol.

# Chapter 1: An inconvenient truth

## 1. Introduction

In 2006 the documentary film *An Inconvenient Truth* was released, based on a keynote presentation given around the world by former United States Vice President and later Nobel Peace Prize Laureate Al Gore. In this presentation Al Gore discussed the science and politics of climate change and the necessity of taking action. According to Gore “There are good people who are in politics ... who hold this at arm’s length. Because if they acknowledge it and recognize it, then the moral imperative to make big changes is inescapable.” Particularly through the success of the film, including an Academy Award for best documentary feature, *An Inconvenient Truth* has become a well-known and widely used phrase. I take this phrase as a starting point to explain the setting of the present thesis, the widespread rationalisation of the ongoing burning of fossil fuels. What is the *truth* about climate change (section 1), why is it *inconvenient* (section 2), what is being done about climate change (section 3), and why do politicians hold the truth *at arm’s length* so easily (section 4)?

## 2. The ‘truth’

Two reports have recently been published summarising the state of the art with respect to the science of climate change: the Stern Review on the Economics of Climate Change, commissioned by the UK Government (Stern, 2006), and the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2007a, 2007b). Since I have no intention of adding new insights to these authoritative documents with respect to the science of climate change, I take the liberty of borrowing extensively from the Stern Review’s first chapter *The science of climate change*, updated here and there on the basis of the IPCC report.

Human activities are changing the composition of the atmosphere and its properties. Since pre-industrial times (around 1750), carbon dioxide concentrations have increased by just over one-third from about 280 parts per million (ppm) to 379 ppm in 2005, predominantly as a result of burning fossil fuels, deforestation and other changes in land use. This has been accompanied by rising concentrations of other greenhouse gases, particularly methane and nitrous oxide. Current levels of greenhouse gases are higher now than at any time in at least the past 650,000 years (Siegenthaler et al., 2005).

There is compelling evidence that the rising levels of greenhouse gases will have a warming effect on the Earth's climate by increasing the amount of infrared radiation (heat energy) trapped by the atmosphere: "the greenhouse effect". Current understanding of the greenhouse effect has its roots in the simple calculations laid out in the nineteenth century by such scientists as Fourier, Tyndall and Arrhenius. Fourier (1827) realised that the atmosphere was more permeable to incoming solar radiation than to outgoing infrared radiation and therefore trapped heat. Thirty-five years later, Tyndall (1863) identified the types of molecules (known as greenhouse gases), chiefly carbon dioxide and water vapour, which create the heat-trapping effect. Arrhenius (1896) took this one step further, by showing that doubling the concentration of carbon dioxide in the atmosphere would lead to significant changes in surface temperatures.

As anticipated by scientists, global mean surface temperatures have risen over the past century. Since around 1900, the Earth has warmed by 0.7°C. Over the past 30 years, global temperatures have risen rapidly and continuously at a rate of around 0.2°C per decade, bringing the global mean temperature to what is probably at or near the warmest level attained in the current interglacial period, which began around 12,000 years ago (Hansen et al., 2006). All of the ten warmest years on record have occurred since 1990. The IPCC concluded in 2001 in its Third Assessment Report that there is new and stronger evidence that most of the warming observed over at least the past 50 years is attributable to human activities (IPCC, 2001a). This key conclusion has been supported in the Joint Statement of Science Academies in 2005 and a report from the US Climate Change Science Programme (2006). In its most recent report (2007a), the IPCC has strengthened its previous claims: "The understanding of anthropogenic warming and cooling influences on climate has improved since the Third Assessment Report (TAR), leading to *very high confidence* [meaning at least a 9 out of 10 chance of being correct] that the globally averaged net effect of human activities since 1750 has been one of warming".

Most climate models show that a doubling of pre-industrial levels of greenhouse gases will commit the Earth to a rise in global mean temperatures: "It is *likely* to be in the range 2 to 4.5°C with a best estimate of about 3°C, and is *very unlikely* to be less than 1.5°C. Values substantially higher than 4.5°C cannot be excluded, but agreement of models with observations is not as good for those values." (IPCC, 2007a). This level of greenhouse gases will probably be reached between 2030 and 2060. A warming of 5°C on a global scale would be far beyond the experience of human civilisation and comparable to the difference in temperature between the last ice age and the present day.

Certain impacts of climate change itself may further amplify warming by triggering the release of additional greenhouse gases, creating a real risk of even greater temperature changes:

- Higher temperatures cause plants and soils to soak up less carbon from the atmosphere and cause permafrost to thaw, potentially releasing large quantities of methane.
- Analysis of warming events in the distant past indicates that such feedbacks could amplify warming by an additional 1 to 2°C by the end of the century (Friedlingstein et al., 2006).

Warming is very likely to intensify the water cycle, reinforcing existing patterns of water scarcity and abundance and increasing the risk of droughts and floods. At high latitudes rainfall is likely to increase, while regions with Mediterranean-like climates in both hemispheres will experience significant reductions in rainfall. Preliminary estimates suggest that by the end of this century the fraction of land area in extreme drought at any one time will increase from 1% to 30%. In other regions, warmer air and warmer oceans are likely to drive more intense storms, particularly hurricanes and typhoons. As the world warms, the risk of abrupt and large-scale changes in the climate system will rise:

- Changes in the distribution of heat around the world are likely to disrupt ocean and atmospheric circulations, leading to large and possibly abrupt shifts in regional weather patterns.
- If the Greenland or West Antarctic Ice Sheets began to melt irreversibly, the rate of sea level rise could more than double, committing the world to an eventual sea level rise of 5 to 12 m over several centuries.

The report *Climate Change 2001: Impacts, Adaptation and Vulnerability*, by IPCC Working Group II (IPCC, 2001b), assesses the sensitivity, adaptive capacity and vulnerability of natural and human systems to climate change and the potential consequences of that change. Among the findings to emerge are that “natural systems are vulnerable to climate change, and some will be irreversibly damaged” and that “many human systems are sensitive to climate change and some are vulnerable”. Potentially serious impacts of climate change include sea level rise; changes in agriculture, forests and fisheries; changes in the energy, water, construction, transport and tourism sectors; increased risk of disaster, viz. changes in the frequency and severity of storms, floods, droughts, hurricanes and precipitation levels; declines in biodiversity; increased human morbidity and premature mortality; and human migration (see also IPCC, 2007b).

### **3. The ‘inconvenience’**

Why are the growing indications that human activities are changing the climate *inconvenient*? There are two reasons. First, the risk of climate change may be substantial, so too the costs of reducing that risk, for there is no cheap ‘technological fix’ available. The use of fossil fuels is closely

intertwined with our modern lifestyles. We use fossil fuels for heating our homes, for transportation, for lighting, for the production of consumer goods, et cetera. We could make our appliances more energy-efficient or use alternative energy sources, but there are price tags on all these options. Environmental pressure groups may tell us that a less consumerist life is a 'better' and 'wealthier' one, but it can hardly be denied that in the short term reducing the risk of climate change will be at the expense of long-cherished lifestyles. Since any serious climate policy will mean growing scarcity in the public availability of fossil fuels, it will effectively lead to a rise in the price of energy. We only have to look at the oil crises of the 1980s and the international efforts, including wars, to secure low energy prices to understand that a rise in these prices will not be warmly welcomed. In the 2001 IPCC assessment, the cost of stabilising the atmospheric concentration of CO<sub>2</sub> at 450, 550 and 650 ppm is estimated to lie in the range 2.5–18 trillion USD, 1–8 trillion USD and roughly 0.5–2 trillion USD, respectively, (Azar and Schneider, 2002 on the basis of section 8.4.3. of Working Group III of the IPCC, 2001c). Top-down models typically suggest that the cost of a 50% reduction of global CO<sub>2</sub> emissions from baseline by 2050 would cost some 1–4% of global GDP, and a 75–90% reduction by 2100 would cost some 3–6% (Grubb et al., 1993; IPCC, 2001c). Although many studies show that these costs are perfectly bearable (Schelling, 1997; Lomborg, 2001, p. 323; Azar and Schneider, 2002), they cannot be glossed over.

Second, the truth about climate change is not inconvenient in the same sense as the knowledge that smoking causes cancer. Although knowing the truth about smoking is annoying, one would rather hear it than not. After all, overseeing one's life, it pays to quit smoking. With climate change this is not the case, though. What makes climate change a truly inconvenient truth is that it challenges us *morally*, like the knowledge about the conditions under which factory-farmed animals are held. If we did not know the truth about factory farming, we would lead happier lives (in the hedonistic sense at least). The same is true of climate change, for we hardly gain personally by reducing the risk of it occurring. On the one hand, the lifetime of carbon dioxide in the atmosphere is between about 5 and 200 years (IPCC, 2001a).<sup>1</sup> Recent work suggests much longer effective lifetimes in the case of large emissions of carbon dioxide (see e.g. Archer, 2005; Caldeira and Wickett, 2005). On the other hand, there is a time lag between the emission of greenhouse gases and rising temperatures, because of the thermal inertia of the oceans, which need time to warm (or cool) in response to the forcing. This response time depends upon the rate at which the ocean circulation transmits changes in surface temperature into the deep ocean. Hansen (2005)

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<sup>1</sup> In fact, no single lifetime can be defined for CO<sub>2</sub> because of the different rates of uptake by different removal processes rate of removal of CO<sub>2</sub> equivalent from the atmosphere. See e.g. Maier-Reimer and Hasselmann, 1987.

estimates the climate response time at about 50-100 years (see also Wigley, 2005; Meehl et al., 2005). In other words, if we experience climate change today, it will not be due to our present emissions, but to the actions of our ancestors. Whether we decide today to emit more or less greenhouse gases will hardly result in a climatic change noticed by ourselves during our own lifetime, but by people who are as yet unborn. Even if we were to notice benefits of climate policy in our own lifetime, these benefits will be small compared to the required costs. So the inconvenient truth is that we are causally responsible for substantial risk of climate change being experienced by future generations, that we will incur substantial costs to reduce that risk, but that we ourselves will scarcely benefit.

#### **4. ‘Holding the truth at arm’s length’**

As Al Gore observes, the truth about climate change is not only inconvenient; politicians also ‘hold it at arm’s length’, generally backed up by the electorate. What practical action has thus far been taken to curb emissions of greenhouse gases? There are three major ‘achievements’: the establishment of the Intergovernmental Panel on Climate Change, the UN Framework Convention on Climate Change, and the Kyoto Protocol, each of which I shall now briefly discuss.

Recognizing the problem of potential global climate change, in 1988 the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC).<sup>2</sup> The role of the IPCC is to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation. The IPCC does not carry out research, nor does it monitor climate-related data or other relevant parameters. It bases its assessment mainly on peer-reviewed and published scientific/technical literature. One of the main activities of the IPCC is to provide, at regular intervals, an assessment of the status of the knowledge on climate change. The First IPCC Assessment Report was completed in 1990 (IPCC, 1990).

The 1990 IPCC report played an important role in establishing the Intergovernmental Negotiating Committee for a UN Framework Convention on Climate Change by the UN General Assembly. The UN Framework Convention on Climate Change (UNFCCC) was adopted in 1992 and entered into force in 1994. The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge

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<sup>2</sup> Source: <http://www.ipcc.ch/about/about.htm>

posed by climate change.<sup>3</sup> It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases. The Convention, which came into force on 21 March 1994, enjoys near universal membership, having been ratified by 189 countries. Under the Convention, governments:

- gather and share information on greenhouse gas emissions, national policies and best practices;
- launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries;
- cooperate in preparing for adaptation to the impacts of climate change.

According to article 2

“The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”

According to article 3, principle 1:

“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 respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.”

In 1997, the general agenda of the UNFCCC was translated into binding targets for the industrialised world for the coming years. In Kyoto, a protocol was formulated which asks the industrialised countries (Annex 1 Parties) to reduce their greenhouse gas emissions by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012. Developing countries, such as China and India, have no binding targets under the Kyoto Protocol. The Protocol entered into force and became legally binding on February 16<sup>th</sup>, 2005, following ratification by Russia at the end of 2004. Right from the start, however, the US Senate rejected the Kyoto Protocol, unanimously adopting the so-called Byrd-Hagel resolution in 1997 (CR, S5622), a

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<sup>3</sup> Source: [http://unfccc.int/essential\\_background/convention/items/2627.php](http://unfccc.int/essential_background/convention/items/2627.php)



position embraced by the White House in 2001 (Bush, 2001). Since then, the United States has not proposed an alternative international framework for the Kyoto Protocol.

Although the Kyoto Protocol sets binding targets, there are so-called flexible mechanisms, which weaken its force:

- Under *joint implementation*, an Annex I Party may implement a project that reduces emissions (e.g. an energy efficiency scheme) or increases removals by sinks (e.g. a reforestation project) in the territory of another Annex I Party, and count the resulting *emission reduction units* (ERUs) against its own target. However, countries like Russia and Ukraine have low emissions today compared with 1990 because of their economic collapse after the demise of the Soviet Union. Since they have agreed to stabilise at 1990 levels, which they are unlikely to reach by 2010, they can easily sell off these emissions – referred to as ‘hot air’ – which they would not emit until 2010. Thus, if an Annex 1 country buys emission reduction units from Russia, it reduces its need for domestic reduction efforts, although no real emission reduction is achieved.
- Under the *clean development mechanism* (CDM), Annex I Parties may implement projects in non-Annex I Parties, such as India, that reduce emissions and use the resulting *certified emission reductions* (CERs) to help meet their own targets. The CDM also aims to help non-Annex I Parties achieve sustainable development and contribute to the ultimate objective of the Convention. However, since the non-Annex I parties do not have binding targets, it is difficult to establish whether emission reductions are real (additional) or would also have been achieved without CDM. In the latter case, Annex I parties reduce their need for domestic reduction efforts, although no real emission cuts are achieved. The Marrakech Accords, agreed at the seventh Conference of Parties to the UNFCCC, defines additionality thus: “A CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity”. In practice, however, the additionality is difficult to determine.

In 2004, the greenhouse gas emissions of the EU-15 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom), were 0.9% below 1990 levels (EEA, 2006). This means that the EU-15 is little more than one-tenth of the way towards its 8% reduction target under the Kyoto Protocol. Greenhouse gas emissions in the EU-15 have risen since 1999 and emission levels in 2004 were the highest since 1996.

To summarise the world’s efforts to curtail global greenhouse gas emissions: the US, responsible for one-quarter of global energy-related

carbon dioxide emissions, is taking no nationwide action to reduce greenhouse gas emissions, neither has it proposed alternatives for the Kyoto Protocol. China is at present the world's second largest emitter of greenhouse gases after the US, but is expected to become the world's top emitter by 2030 (IEA, 2006). Other growing developing countries, such as India and Brazil, are also fast becoming large emitters. China and these other growing developing countries as yet have no binding targets. So far, the European Union has only kept its emissions stable. Although the IPCC concluded in 2001 that "there is new and stronger evidence that most of the warming observed over at least the past 50 years is attributable to human activities", global concentrations of greenhouse gases have thus far provided no similar empirical evidence that the rising trend in those concentrations has in any way been intentionally curtailed by deliberate human action. Neither can the impacts of present climate policy on the global economy be discerned *ex post*, i.e. empirically. Therefore, scientific knowledge about the negative impacts of climate policy on the economy as yet stands in no proportion to our knowledge about the negative impacts of climate change.

## 5. Why is so little being done?

If many politicians and policy makers claim that climate change is not only the most serious environmental problem currently facing the world, but also one of the most important international problems per se (Gardiner, 2004, p. 555), then why are words not followed by action? In section 2, I offered two-thirds of the explanation. Tackling the problem of climate change is highly costly and we, the present generations, will ourselves hardly benefit. The last part of the explanation has a socio-psychological basis.

By definition, we cannot have any direct contact with future generations, the main beneficiaries of climate policy. There are no future generations to voice their interests today, although various philosophers and psychologists emphasise the importance of personal contact in people's perceptions of responsibility. In the work of the French philosopher Emmanuel Levinas, especially, personal contact with the other – eye to eye – plays an important role (see e.g. Levinas, 1961). According to Levinas, by our nature we try to make the world around us part of ourselves, 'consuming' and enjoying it. We can also fit other people into this agreeable worldview, as long as we are not in direct contact with them. In direct personal contact, however, in the face of the other we finally experience a real other person: something that does not allow itself to be appropriated or consumed, something that does not allow itself to be made into a mere pleasing experience. We are unprepared for the uniqueness of the other, and thus the other interrupts our egoism, penetrates our self-satisfied world and makes us feel vulnerable. Because this direct contact provides an *opportunity*

to respond, moreover, it also generally forces us to do so. We assume responsibility, and feel it. In short, we cannot ignore the moral pressure ensuing from the presence of the other.

That the 'face' of the other can exert a moral appeal on us is of course well known to any organisation seeking social commitment. Development organisations like Foster Parent Plan (Plan International) know as no other the importance of giving development aid a face. Binding donors to specific children enhances their commitment. Similar considerations apply to the importance of images of victims and interviews in disaster relief campaigns on national television. The same holds, too, for environmental organisations like the World Wide Fund for Nature, with its campaigns showing animals looking straight at the viewer. Through the eyes of the seal, it is not WWF that is appealing to us but the seal itself. Emotions aligned to ideas of fairness, solidarity and empathy are thus activated by the opportunity to put oneself in the position of the other, by identifying with them. The importance of a face is evident. Future generations and their situation, however, by definition we can never see. We cannot establish contact with them, either personally or through third parties.<sup>4</sup> We cannot have a conversation with them and we cannot read their feelings from their

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<sup>4</sup> According to Passmore (1974: 88-89), there would exist a "chain of love and concern running throughout the remote future": because we love our children, we care about their children, who will also be loved by our children, and so forth. However, as de-Shalit (1995: 32-33) for example argues, it does not logically follow that we love those who are loved by the ones we love ourselves. And as far as we do, this love may diminish quickly the more remote and thus unknown our descendants are. People are not very attached psychologically to their great-great-great grandchildren (Barry, 1977: 279; Goodin, 1986: 171). We know, for example, that every inhabitant of this world is connected through ties of friendship, although we do not know the precise chain of friends. This does not mean we feel a bond of friendship with all world inhabitants.

In economics, some attempts have been made to *measure* empathy for future generations or *intergenerational altruism*, for example by determining option and bequest values in people's preference functions (see e.g. Krutilla, 1967; Greenley et al., 1981; Popp, 2001). Option value is defined as the willingness to pay for the opportunity to choose from among competing alternative uses of a natural environment in the future. Bequest value is defined as the willingness to pay for the satisfaction derived from endowing future generations with a natural environment (Greenley et al., 1981). Such research shows that people do to some extent care for the remote future. Furthermore, intergenerational transfers account for a significant part of aggregate saving, although there is much debate about the motives behind such transfers and to which extent such transfers are intended (see e.g. Kotlikoff, 1988; Fan, 2001).

The point, however, is not that present generations do not have any empathy towards future generations at all. The main point is that it is doubtful whether this empathy is strong enough to carry the demands of justice. There is a big difference between people's willingness to pay a limited amount so that their direct offspring can marvel at beautiful lakes, and the willingness to accept the fundamental changes in consumption patterns which may be required to protect the environment for unknown people living centuries from now.

face, making authors like Heilbroner (1974), Hardin (1977) and Care (1982) pessimistic about our capacity to be stirred by the interests of future generations.<sup>5</sup>

To make matters worse, some authors believe that even direct contact with vulnerable groups will be insufficient motive for those with established interests to change their ways, if those in the weaker position are unable to exert any ‘nuisance power’. Although moral considerations, with no further prudential reasons, may motivate some individuals, De Swaan (1988) believes they have rarely moved an entire society to structural change. Centuries ago, the establishment introduced public health care because diseases could no longer be confined to the living areas of the poor. Slavery was abolished in the United States under pressure of those who had little interest in slavery: the Northern States and the slaves themselves. And in modern times the willingness of the Western world to care about people in developing countries or about animals is very much dependent on the capacity of the latter to ‘annoy’. People in developing countries still have some nuisance power: they can bother the West by immigration and by causing geo-political instability. Animals can bother us by imposing the health risks accompanying modern food production. Future generations, on the other hand, have no ‘nuisance power’ whatsoever. In short, if societies choose to take the interests of future generations seriously, this would not merely mean a new step in the ever-expanding moral circle, but an unprecedented one.

On the other hand, in spite of the pessimism sketched earlier, it should also be observed that ‘the night is still young’. From a historical point of view it is hardly remarkable if the present generations are *as yet* by and large indifferent to future generations. In ancient Greek society male citizens did not yet consider foreigners, slaves or women as moral equals, i.e. entities whose interests should be given (equal) consideration in the organisation of society. Nevertheless, after centuries of emancipation processes and moral ‘progress’ slavery was abolished and in most countries equal treatment of men and women became guaranteed by law. That the ‘widening circles of identification’ (De Swaan, 1995) have not yet extended to future generations is hardly surprising, considering that it is only relatively recently that present generations are becoming aware of the negative impacts of their activities on future generations. It should be noted, though, that in the case of future generations it seems there is no doubt among the general public whether future generations are to be considered as moral equals. The problem, however, is that there is insufficient identification with future generations to translate the abstract idea of treating future generations as moral equals into effective policy.

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<sup>5</sup> See for a discussion of the motivational problem: Birnbacher (2006)

An interesting research topic would be how previous circles of identification have widened and how this might transfer to the climate debate. Although a thorough answer to this question falls outside the scope of this thesis, I suggest two promising directions to explore. The first is related to the debate about the primacy of technology versus social organisation. According to some authors, technological developments *initiate* the widening of moral circles. In America, one of the reasons that slavery was abolished in the northern states far earlier than in the southern states was because in the North mechanisation performed the tasks for which Southerners relied on slaves. Similar views exist on the influence of technological developments on the emancipation of women. Caring about the impacts of climate change on future generations may then only truly start once *autonomous* developments have led to a substantial decrease in the price of renewable energy. On the other hand, authors such as Feenberg (1999) argue that technology does not develop autonomously, but is to a large degree socially determined. *After* child labour was forbidden, technology developed which made child labour unnecessary. And in ancient Rome, new technology capable of replacing labour was not developed or used, as the abundance of slave labour made it unnecessary (Debeir *et al.*, 1991). The question then remains how society might establish the conditions for developing climate change mitigation technology.

A second direction to examine is the role of *fiction* in social change. According to the political philosopher Richard Rorty, expanding our moral circle is the product of “hearing sad and sentimental stories” from, or about, those people who are oppressed by our current rational discourse (Rorty, 1993). It involves ‘sentimental education’ about the effects of our exclusions. In this view, Harriet Beecher Stowe’s novel *Uncle Tom’s cabin or Life among the lowly* (1852) contributed more to the abolition of slavery than the whole gamut of philosophical treatises, by increasing sensitivity to the suffering of others (Rorty, 1989). Noticeably, *Uncle Tom’s cabin* had its immense influence despite Stowe lacking any first-hand acquaintance with slavery in the South. She *imagined* how it would be, on the basis of stories. This is important in the context of future generations, where first-hand acquaintance is by definition impossible. Therefore, fiction about the risks of global climate change (such as the 1995 movie *Waterworld* and the 2004 movie *The Day After Tomorrow*) may play an important role in making the electorate accept more vigorous climate policy. The film *An Inconvenient Truth*, although a documentary, had also much more public impact than the various IPCC reports, perhaps by its link to the personal story of former vice-president Gore.

It should be noted that, in the literature, many other features of climate change have been suggested as explanations of why so little is being done to

address it.<sup>6</sup> I do not consider these features decisive, however. The first major barrier cited is that climate change is a problem of collective action on a global scale, while the global institutions to enforce such collective action do not (yet) exist. Climate change is not a real social dilemma or prisoners' dilemma, however. A social dilemma is a situation in which if all the participants seek to secure their own preferences, a situation is achieved which is worse than if all participants had cooperated. As explained earlier in section 3, however, in the case of climate change people do not personally gain by cooperation. The beneficiaries of cooperation do not participate in the 'game'. Furthermore, the preferences of the present generations towards the wellbeing of future generations are presently too weak – by the previously discussed lack of identification, for example – to make climate change a problem of collective action: the present generations prefer the situation of non-cooperation (including the present preferences regarding future generations) to a situation of cooperation in which the wellbeing of future generations is taken seriously. This is not to say that the global nature of climate change does not further complicate the issue. My only point is that at present it is not a decisive bottle neck for the tackling of climate change. A further supporting argument is that many other international environmental issues, but which affected the present generations more directly, have been more successfully tackled. Take, for example, the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer, which effectively reduced the emissions of halogenated hydrocarbons.

A second barrier is deemed to be the inconclusive science about climatic change. Scientists disagree, express themselves with extreme caution, and once in a while reports are published trying to repudiate the whole issue of climate change. However, although the scientific uncertainty and controversy complicates political deliberation, this uncertainty once more does not on its own explain today's inaction. Policy is generally made under conditions of uncertainty and far-reaching decisions are often made on the basis of inconclusive information. We only have to look at the scientific basis for the invasion of Iraq by the United States, in which case inconclusive information from the US intelligence service, contradicting the conclusions of the chief UN weapons inspector, was deemed sufficient to go to war with Iraq. Or consider the recent lawsuits against the tobacco industry. Although the relationship between smoking and cancer is still the subject of research, US courts recently ruled that the *indications* of health risks reported in scientific journals in the 70s should already have been sufficient for the tobacco industry to change its ways (*Engle v. Reynolds Tobacco Co*, 2000). It seems reasonable to assume that an 'intergenerational court' would consider the first or second assessment report by the

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<sup>6</sup> See for an interesting article on the psychology of denial concerning climate change: Marshall, 2001.

Intergovernmental Panel on Climate Change (IPCC, 1990; 1996) as providing at least as much of an indication of risk to future generations as the 70s reports of the health risks of smoking.

## 6. Conclusion

The IPCC has a very high degree of confidence that human activities have already changed the earth's climate. The IPCC also expects these changes to have serious adverse effects on human society. Reducing the risk of climate change will require bearable but nevertheless substantial costs. Owing to the inertia of the climate system, and the thermal inertia of the oceans in particular, the beneficiaries of climate policy will not be the present generations, however, but first and foremost people as yet unborn. The high costs of serious climate policy and the absence of a moral appeal by the beneficiaries themselves largely explain why the status quo of ongoing fossil fuel use is amply rationalised in public debate.

## References

- Archer, D., 2005, "Fate of fossil fuel CO<sub>2</sub> in geologic time," *J. Geophys. Res.* 110: C09S05, doi:10.1029/2004JC002625
- Arrhenius, S., 1896, On the influence of carbonic acid in the air upon the temperature of the ground, *Philosophical Magazine* 5[41]: 239-276.
- Azar, C. and S.H. Schneider, 2002, Are the economic costs of stabilising the atmosphere prohibitive?, *Ecological Economics* 42 [1-2]: 73-80.
- Barry, B., 1977, "Justice between Generations", in *Law, Morality and Society. Essays in Honor of H. L. A. Hart*, P.M.S. Hacker and Joseph Raz (eds.), Oxford: Clarendon Press, 268-84.
- Birnbacher, D., 2006, What motivates us to care for the (distant) future? Séminaire 'Développement durable et économie de l'environnement', organisé par l'IDDRI et la chaire Développement durable de l'Ecole polytechnique Paris, 21 février 2006, <http://www.iddri.org/iddri/telecharge/mardis/birnbacher.pdf>
- Bush, G.W.: 2001, 'Letter from the President to Senators Hagel, Helms, Craig, and Roberts', March 13, 2001 (<http://www.whitehouse.gov/news/releases/2001/03/20010314.html>)
- Caldeira, K. and M.E. Wickett, 2005, "Ocean model predictions of chemistry changes from carbon dioxide emissions to the atmosphere and ocean," *Journal of Geophysical Research* 110: C09S04, doi:10.1029/2004JC002671
- Care, N.S., 1982, "Future Generations, Public Policy and the Motivation Problem", *Environmental Ethics* 4 [3]: 195-213.
- Debeir, J.-C., Deléage, J.-P. and Hémerly, D.: 1991, 'In the Servitude of Power, Energy and Civilization Through the Ages', Zed Books, London.
- De-Shalit A., 1995, Why Posterity Matters: Environmental Policies and Future Generations, Routledge.

- EEA (European Environment Agency), Greenhouse gas emission trends and projections in Europe 2006, EEA Report No 9/2006
- Engle v. RJ Reynolds Tobacco Co. (2000) *Final Judgment and Amended Omnibus Order*, No. 94-08273 (Fla. 11th Cir. Ct. Nov. 6, 2000)
- Fan, C.S., 2001, A model of intergenerational transfers, *Economic Theory* 17: 399–418.
- Feenberg, A.: 1999, *Questioning Technology*, Routledge, London.
- Fourier, J.B.J. (1824). "Mémoire Sur Les Températures Du Globe Terrestre Et Des Espaces Planétaires." *Mémoires de l'Académie Royale des Sciences* 7: 569-604.
- Friedlingstein, P., P. Cox, R. Betts et al. (2006): 'Climate-carbon cycle feedback analysis: results from the C<sup>4</sup>MIP model intercomparison', *Journal of Climate* 19[14]: 3337-3353
- Goodin, Robert E., 1986, *Protecting the Vulnerable: A Reanalysis of Our Social Responsibilities*, University of Chicago Press.
- Greenley, D.A., R.G. Walsh and R.A. Young, 1981, Option Value: Empirical Evidence From a Case Study of Recreation and Water Quality, *The Quarterly Journal of Economics* 96(4): 657-673.
- Grubb, M., Edmonds, J., ten Brink, P., Morrison, M., 1993. The cost of limiting fossil fuel CO<sub>2</sub> emissions: a survey and an analysis. *Annual Review of Energy and the Environment* 18, 397–478.
- Hansen, J., 2005, A slippery slope: How much global warming constitutes "dangerous anthropogenic interference"? An editorial essay. *Climatic Change* 68[3]: 269-279.
- Hansen, J., M. Sato, R. Ruedy, et al. (2006): 'Global temperature change', *Proceedings of the National Academy* 103[39]: 14288-14293.
- Hardin, G., *The Limits of Altruism* (London: Indiana University Press, 1977).
- Heilbroner, R.L., *An Inquiry into the Human Prospect* (New York: Norton, 1974).
- IEA, 2006, The International Energy Agency (IEA), *World Energy Outlook 2006*.
- IPCC (1990) *First Assessment Report: 1990*, Cambridge University Press, Cambridge
- IPCC (1996) *Second Assessment Report: Climate Change 1995*, Cambridge University Press, Cambridge
- IPCC, 2001a, The Intergovernmental Panel on Climate Change, *Climate Change 2001* (Cambridge: Cambridge University Press, 2001). Working Group I: The Scientific Basis, Summary for Policy Makers.
- IPCC, 2001b, The Intergovernmental Panel on Climate Change, *Climate Change 2001: Impacts, Adaptation and Vulnerability* (Cambridge: Cambridge University Press, 2001). Working Group I: The Scientific Basis, Summary for Policy Makers.
- IPCC, 2001c, The Intergovernmental Panel on Climate Change, *Climate Change 2001* (Cambridge: Cambridge University Press, 2001). Working Group III: Mitigation.
- IPCC, 2007a, The Intergovernmental Panel on Climate Change, *Climate Change 2007* (Cambridge: Cambridge University Press, 2007). The Physical Science Basis: Summary for Policymakers.
- IPCC, 2007b, The Intergovernmental Panel on Climate Change, *Climate Change 2007* (Cambridge: Cambridge University Press, 2007). Impacts, Adaptation and Vulnerability: Summary for Policymakers.



- Kotlikoff, L., 1988: Intergenerational transfers and saving. *Journal of Economic Perspectives* 2: 41–58.
- Krutilla, J.V., 1967. Conservation Reconsidered, *American Economic Review* 27: 777–86.
- Levinas, Emmanuel, 1961, Totalité et Infini. Essai sur l'extériorité, La Haye, Nijhoff.
- Lomborg, Bjorn. 2001. Global Warming. In *The Sceptical Environmentalist*, by Bjorn Lomborg, pp. 258–324. Cambridge: Cambridge University Press.
- Maier-Reimer, E. and K. Hasselmann, 1987, Transport and storage of CO<sub>2</sub> in the ocean - an inorganic ocean-circulation carbon cycle model. *Climate Dynamics* 2[2]: 63-90.
- Marshall, G., 2001, “The Psychology of Denial: our failure to act against climate change”, *The Ecologist*, 22 September 2001. Available at: <http://www.ecoglobe.ch/motivation/e/clim2922.htm>
- Meehl, G.A. et al., 2005, “How Much More Global Warming and Sea Level Rise?,” *Science* 307 (5716): 1769-1772.
- Meinshausen, M. (2006): 'What does a 2°C target mean for greenhouse gas concentrations? A brief analysis based on multi-gas emission pathways and several climate sensitivity uncertainty estimates', *Avoiding dangerous climate change*, in H.J. Schellnhuber et al. (eds.), Cambridge: Cambridge University Press, pp.265 – 280.
- Passmore, J., 1974, *Man's responsibility for nature*, London: Duckworth.
- Popp, David. 2001. “Altruism and the Demand for Environmental Quality.” *Land Economics* 77 (Aug.): 339–49.
- Rorty, R.: 1993, ‘Human Rights, Rationality, and Sentimentality’, *The Yale Review* 81 (4), 1-20.
- Rorty, R.: 1989, *Contingency, Irony, and Solidarity*, Cambridge: Cambridge University Press.
- Schelling, Thomas. 1997. The Cost of Combating Global Warming: Facing the Tradeoffs. *Foreign Affairs* 76[6]:8–14.
- Siegenthaler U, Stocker TF, Monnin E, et al. (2005) Stable carbon cycle-climate relationship during the late Pleistocene, *Science* 310[5752]: 1313 – 1317.
- Stern, N., 2006. *The Stern Review: The Economics of Climate Change*. Cambridge University Press, Cambridge.
- Swaan, A. de, *In care of the state. Health care, education and welfare in Europe and the USA in the modern era* (Cambridge: Polity press, 1988).
- Swaan, A. de, 1995, 'Widening circles of identification: Emotional concerns in sociogenetic perspective', *Theory, Culture and Society* 12[2]: 25-39.
- Tyndall, J.: 1863, ‘On Radiation Through the Earth’s Atmosphere’, *Phil. Mag.* 4[25], 200–207.
- US Climate Change Programme (2006): 'Temperature trends in the lower atmosphere: steps for understanding and reconciling differences', available from <http://www.climatechange.gov/Library/sap/sap1-1/finalreport>
- Wigley, T.M.L. (2005): 'The climate change commitment', *Science* 307[5716]: 1766-1769.



# Chapter 2: Climate damage as wrongful harm to future generations

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## 1. Introduction

The main aim of this thesis is to argue that in judging the validity of arguments for or against climate policy we have to test these arguments against the general standards of conduct deemed acceptable for handling risks to others, as laid down in tort law, for example. Basically, this requirement of consistency in argumentation follows from the formal requirement of justice. Although justice is difficult to define, the formal requirement of justice that equal cases be treated equally and different cases differently is an important starting point for any policy on justice. Amongst other things, this requirement means that every person should receive the same treatment under the law and the same treatment from the authorities. To treat people differently, one must have relevant moral grounds (see e.g. Rawls, 1972; Shrader-Frechette and Persson, 2001). In other words: if *trans-generational* air pollution due to the emission of greenhouse gases violates the rights of future generations just as *trans-national* air pollution violates the rights of contemporaries living across the border, then the climate risks ought to be handled consistent with the general standards of conduct deemed acceptable for handling trans-national air pollution.

Although we have as yet no well-defined legal duties towards future generations, there are ample signs that the international community does in fact consider climate policy a matter of intergenerational justice (see e.g. UNCHE, 1972; WCED, 1987; UNFCCC, 1992; UNCED, 1992; UNESCO, 1997; UK Government, 1999). The Parties to the United Nations Framework Convention on Climate Change (1992), for example, have stated that they are “determined to protect the climate system for present and future generations”. In 1997, the general conference of UNESCO adopted the ‘Declaration on the Responsibilities of the Present Generations Towards Future Generations’, of which Article 1 states that “The present generations have the responsibility of ensuring that the needs and interests of present and future generations are fully safeguarded.” Article 5.2 states that “The present generations should ensure that future generations are not exposed to pollution which may endanger their health or their existence itself”. In other words, the present commitment to intergenerational justice already *de facto* requires governments to handle climate risks experienced by future generations consistent with the general standards of conduct deemed acceptable for handling risks to other contemporaries.

From a theoretical point of view, however, to view climate damage to the health and property experienced by future generations as a violation of rights, i.e. as a wrongful harm, is by no means self-evident. First, it is not self-evident to view harm to future property a wrong. If we would not leave behind our own present property there would hardly be any future property and we seem entitled to do with present property whatever we like. Second, the idea that we can harm future generations is complicated by the fact that any climate policy will not only affect the future climate, but also who will live in the future, giving rise to the notorious so-called non-identity problem (Parfit, 1976, 1981, 1984). The purpose of the present chapter is therefore to examine these issues further. Are governments in fact justified in addressing climate risks by appealing to the rights of future generations to bodily integrity and personal property?

## **2. Present harm to future property**

Before discussing Parfit's non-identity problem let us first ignore it and investigate whether it makes sense to speak of damage to future generations' property as a wrongful harm or violation of rights. Since moral philosophers and environmentalists have generally had health risks in mind when speaking of harm to future generations, risks to future property have thus far received little attention (see for a few authors mentioning property rights of future generations: Bromley, 1991; Farber and Hemmersbaugh 1993; Narveson cited in Wolf, 1999; Shue, 1999). However, if future generations manage to adapt optimally to climate change, such change might even lead to no more than material losses.

Some argue that since we are entitled to our own property and all future property depends on (originates from) present property, damage to future property cannot be considered a wrongful harm. People would thus be under no moral obligation to be careful with their possessions before they bequeath them to their offspring, as Farber and Hemmersbaugh (1993) have argued:

“If your great-grand parents squandered the family fortune, you may feel that they acted reprehensibly, but you would have difficulty charging them with violating a personal obligation toward you or with violating a "right" that you possessed.”

If emitting greenhouse gases were a mere ‘squandering of the family fortune’, then climate policy would indeed be a supererogatory savings programme (Schelling, 1995) or ‘gift’ (Lind, 1999) to future generations, simply making them wealthier than they would otherwise have been. This line of reasoning is a little too straightforward, however.

First, in the case of climate change there is little chance that my individual present activities will damage the same future property as that originating from my present entitlements.<sup>1</sup> If my present activities cause a tree to fall on a house in China a hundred years from now, it is far from clear that I would be in any way entitled to make that happen. The entitlement to the future house does not originate from my present entitlements, nor did those who may presently be entitled to the particular future property – probably people in China – express their permission to me. As long as those from whose present entitlements future property originates do not grant permission for future damage to occur, then the future damage to property may still be considered a violation of rights. It should be noted, though, that a collective decision (coordination) to *relieve* the present generations of their individual duties not to pollute is conceivable. Moreover, we could assume spontaneous collusion or tacit consent.

A stronger argument, however, is given by the fact that climate change violates future generations' rights to self-ownership and the fruits of their labour. Although we put future generations on this world, we do not own them; future generations will own themselves. Consequently, we are neither entitled to harm future generations physically nor harm the fruits of their labour. *If* we were only to leave behind damaged property, future generations could build on this damaged property without us harming the fruits of their labour. We would not directly affect the results of their efforts. Then, Narveson's observation (cited in: Wolf, 1999) would make sense that:

“Obviously the property of future persons is not harmed by anything we can do now, for, since they do not yet exist, they own nothing, and by the time they get here, whatever it is that is currently destroyed will not be available to be owned by anyone.”

However, future climate damage does not result from latent damage inflicted on present personal property, such as overdue maintenance of a house, but indirectly from polluting the unowned atmosphere. The fact that climate change might damage future property is not an intrinsic quality of present property. Although present generations may have no particular duty to leave any of their possessions behind, neither are they particularly entitled to bequeath an alteration of the Earth's atmosphere. The global atmosphere is not a 'family fortune' which the present generations can legitimately squander. Polluting the global atmosphere creates the risk of damage to anything future generations will produce by their labour and own. Since future generations have no alternative but to build on what previous generations have left behind, this violates their right to self-ownership and their right to the fruits of their labour. The damage to the fruits of their

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<sup>1</sup> See for an analogous argument in relation to the non-identity problem: Carter, 2001, discussed later in this chapter.

labour is unavoidable. Therefore, damage to future property constitutes a wrongful harm.

Having raised the issue of an ‘unowned atmosphere’, it might seem an obvious line of reasoning to investigate the relation between future property and climate change along the *Lockean proviso*, according to which appropriation or use of natural resources is legitimate only if “enough and as good” is left for others (Locke, 1690, Chapter 5, section 27). However, in spite of the extensive literature on the Lockean proviso in relation to future generations (see e.g. Elliot, 1986; Bhaskar, 1995; Wolf, 1999), little has been written about its application to the extent to which we should be allowed to emit greenhouse gases or pollute the environment in other ways. In the climate debate, the Lockean proviso has generally been interpreted as requiring reduction of emissions to no-effect levels equal to the atmosphere’s capacity to absorb greenhouse gases, and subsequently distributing the available ‘emission space’ equally over all the world’s inhabitants. The first element would satisfy the condition that ‘enough and as good’ be left for members of future generations, the second that ‘enough and as good’ be left for members of the present generations (see e.g. Helm and Simonis, 2001; Singer, 2002: 14-50). The problem, however, is that a true ‘no-effect’ level is only achieved by completely abandoning the use of fossil fuels. Whatever amount of greenhouse gases the present generations emit, there will always be the risk of damage – to both health and property – being inflicted on future generations. Whether this risk is reasonable or negligent can only be determined by some form of assessment, both of the risk itself and of the cost of alleviating it. Therefore, the Lockean proviso does not help in the analysis of climate damage.

To translate the abstract intergenerational context into a more manageable situation for our moral intuitions, let us imagine two farmers, Alfred and Benjamin, living on two adjoining plots of land. Alfred has drilled a well to irrigate his own land, but as an unintentional side-effect leaks a substantial amount of water, thus irrigating Benjamin’s land as well. Since Benjamin’s land is irrigated free of charge, he receives external benefits from Alfred’s activities. Alfred is responsible for external costs as well, however, as he burns his waste close to Benjamin’s land and the prevailing wind means the smoke damages only Benjamin’s crops. Now let us assume that on balance Alfred’s activities are beneficial to Benjamin; if Benjamin had to choose, he would prefer the external benefits and costs to no externalities at all. Let us further assume that reducing the smoke would cost Alfred much less than it would benefit Benjamin. Is Alfred morally required to reduce the smoke? On the one hand, Alfred damages Benjamin’s crops, i.e. Benjamin’s property. On the other hand, Benjamin’s property results in part from Alfred’s activities. In the first place, we might consider it *reasonable* that Benjamin diverts a small part of the proceeds of his crops to compensate Alfred for reducing the smoke. However, Benjamin would be

*entitled* to require Alfred to reduce the smoke, just as Alfred would be entitled to prevent his unintentional irrigation of Benjamin's land. If Alfred were indeed capable of doing both, a bargaining process would probably start, resulting in Benjamin paying for the smoke reduction, given the fact that the negative externalities are outweighed by the positive. However, Alfred would not be *entitled* to compensation for the beneficial irrigation of Benjamin's land; Benjamin's eventual unwillingness to pay compensation for nonbargained benefits would not constitute a wrongful harm. This moral point of view that Alfred's smoke production entails a violation of Benjamin's right to his land and the fruits of his labour, while Benjamin's failure to compensate for the beneficial irrigation of Benjamin's land does not equally entail a violation of Alfred's rights, is reflected in current law. Under current law, the existence of positive externalities cannot compensate or justify the existence of negative externalities. In particular, when the creator cannot exclude the beneficiary from the external benefits, there are no legal grounds for demanding compensation for those nonbargained benefits (see e.g. Levmore, 1985; Hershovitz, 2006). Consequently, the creator of external costs and benefits cannot cancel them out one against the other either.

How does this example compare to the situation of climate change and future generations? First, the future wealth of future generations can be very well compared to the water streaming over Benjamin's land, i.e. an unintentional side-effect. Although occasionally people do deliberately invest or save resources for future generations, the overwhelming majority of future benefits arise in the form of the positive externalities of improving our own lives today. One example are the benefits of investments in public goods like infrastructure, scientific knowledge and technology, which will still be available for future generations when we are no longer around. To make this point clearer: it is hard to imagine how present society could organize itself in such a way as to *not* to leave anything behind for future generations without impoverishing our own lives as well. Second, the present emission of greenhouse gases is of course comparable to Alfred's smoke production. The main difference between the two situations, though, is that there is no possibility of a bargaining process and that future generations cannot transfer part of their wealth to the present to pay for the emission reduction. However, since the present generations cannot exclude future generations from the external benefits they are not entitled to compensation in the first place, as is acknowledged in analogous cases in current law. Therefore, there is still a moral ground for considering the property of future generations entitlements, which have to be taken into account today, and consequently for considering climate damage to future property a wrongful harm, even if this harm occurs through the infliction of damage to property originating from present property.

Although there is ground to consider climate damage to future property a wrongful harm, it is not a wrongful harm in the sense of a violation of a right to property against a baseline of the *same*, but *unharmful* property. After all, it is generally impossible to prevent damage to future property without changing future entitlements as well. Such a baseline could not be fixed, but would depend upon our present acts. Here, the baseline is defined at a more abstract level than as a particular distribution of property, but as unharmful fruits of one's labour. So harm to future property is wrongful against a baseline of *other*, but *unharmful* property the future person would otherwise have owned. Future generations are not entitled to any particular legacy or distribution of property, but are entitled to an unrestricted/unhindered/risk-free use of the possessions they will happen to own or produce. Future generations are not entitled to any amount of, say, television sets, but if they happen to own one they are entitled that it is not struck by a thunderbolt discharged by us, even if they would not have had the television without us. After all, future generations have no choice but to accept our legacy and to lead their lives on that basis. Since the risk of harm can never be entirely prevented, the baseline is set where future generations do not run 'unreasonable risk', where unreasonable risk is defined in the legal sense as the risk of harm to future property which exceeds the cost of precautions (see next chapter).<sup>2</sup> Please note that there is no hypothetical choice forced upon future generations between high material wealth, but high climate risk, and an impoverished life without climate risk. Various economists have argued that the costs of substantially reducing the risk of climate change hardly hinder economic growth (see e.g. Azar and Schneider, 2002; Stern, 2006). In other words, the material wealth, which future generations are expected to enjoy, does not depend upon our present emission of greenhouse gases.

### 3. The 'non-identity' problem

In *Utilitarianism and New Generations* (1967) Jan Narveson defended utilitarianism against the objection that if it were correct then we must be obliged to produce as many children as possible, so long as their happiness exceeds their misery. According to Narveson "all obligations and indeed all moral reasons for doing anything must be grounded upon the existence of persons who would benefit or be injured by the effects of our actions" (p. 68). By 'existence' Narveson did not mean *present* existence. If our present

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<sup>2</sup> Some authors have defined baselines in terms of minimum welfare or environmental quality levels. Lukas Meyer, for example, defines the baseline as a 'decency threshold' below which we feel no human person, whoever she might be, should ever sink (Meyer, 2004). A typical baseline according to the objective of *sustainability* is that future generations have at least the same options as we do have now.



actions were to benefit or injure people existing in the future, then we would have obligations to them as well (Narveson, 1973). It would not make sense, however, to say that *possible* future people are harmed by not being created or, conversely, benefited by being created. Therefore we would be under no obligation to create future people.

Although Narveson's 'person-affecting' view on morality is intuitively appealing, it may also lead to counter-intuitive results, as Parfit argued in *On Doing the Best for Our Children* (1976, p. 100-101; see also 1973). Parfit asks us to consider the case of

“a woman who intends to become pregnant as soon as possible. She learns that she has an illness which would give to any child she conceives now a certain handicap. If she waits for two months, the illness would have passed, and she would then conceive a normal child.”

Many people share the intuition that the woman is morally obliged to wait for two months and conceive a normal child, i.e. many people would *blame* the woman if she does not wait. A person-affecting view on morality does not seem to support this intuition, however. The child with a certain handicap, which would develop if the woman does not wait, seems not injured: he or she would not have existed if the woman had waited for two months and Parfit assumes the handicap is not so severe that the child will prefer not to have existed. Neither is the possible normal child injured, for this child does not and will not exist if the woman decides not to wait and becomes pregnant as soon as possible. Therefore, the woman seems to injure no other people.

Parfit's second example elucidates the problem in the case of long-term policy, such as climate policy (1976: 101-102):

“Suppose we have a choice between two social policies. These will alter the standard of living – or, more broadly, the quality of life. The effects of one policy would, in the short term, be slightly better, but, in the long term, be much worse. Since there clearly could be such a difference between two policies, we need not specify details. It is enough to assume that, on the “Short Term Policy,” the quality of life would be slightly higher for (say) the next three generations, but be lower for the fourth generation, and be *much* lower for several later generations.”

Here, too, Parfit adopts the same analysis. Since any attempt to change the future would influence the circumstances under which people are procreated, i.e. by whom and when children are conceived, a different policy would lead within a few generations to a planet inhabited by different people (individuals) from those who would have emerged under a different policy. As Parfit asks us to imagine: “How many of us could truly claim, “Even if railways had never been invented, *I* would still have been born?”” (1981:

115). Therefore, no particular future persons could benefit or be injured by the effects of our actions and consequently we would not be able to violate future generations' rights to bodily integrity and personal property by inducing climate change. Parfit coined this apparent unbridgeable gap between intuition and moral theory the *non-identity problem* (1976, 1981, 1984; see also e.g. Schwartz, 1978, 1979; Kavka, 1978; 1982; Adams, 1979).<sup>3</sup>

#### 4. A reflective disequilibrium

In spite of Parfit's analysis, the vast majority of moral philosophers have held to the intuitions that the woman in our example has a moral obligation to wait two months and conceive a normal child, and that we are under a moral obligation to opt for the long-term policy. Therefore, there has been an ongoing quest for solutions to Parfit's non-identity problem that can save and underpin the notion of duties towards future generations, in order to re-establish coherence between intuitions and theory. Over the last decades, various authors have claimed solutions, none of which have been entirely satisfactory, however. Generally, these authors have offered examples of cases involving only contemporary people, in which cases we have neither theoretical nor intuitive problems to see that wrongful harms are committed. It has then been argued that these cases are morally comparable to Parfit's cases involving future people. It can be shown, however, that all such examples involving contemporaries do differ from Parfit's cases in a relevant way.

In this section, I discuss a number of these attempts, which may serve to illustrate the debate, although it is unfeasible here to discuss or even cite the immense literature on this subject.<sup>4</sup> In the following section, I focus on one recent attempt following a rather different line of argumentation. Since this chapter is concerned specifically with the rights of and harms to future generations, I do not discuss the equally immense literature that attempts to resolve the non-identity problem along other lines, such as (non-person-affecting) utilitarianism. It should be noted, though, that an appeal to such utilitarianism raises new and equally difficult problems in the context

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<sup>3</sup> Please note that principally there are *two* non-identity problems. First, the problem whether one can logically compare a state of existence to a state of non-existence. Second, the problem whether someone can be harmed if one's life is worth living *on balance*. In this chapter the non-identity problem denotes this second problem. The first problem particularly plays in so-called pure wrongful-life cases, in which the assumed harm consist of creating someone whose life is considered *not* worth living on balance (see e.g. Feinberg, 1986; Den Hartogh, 2007).

<sup>4</sup> See for a specific solution proposed in the context of climate change: Page, 1999; Meyer, 2004.

of future generations, such as the ‘repugnant conclusion’ (Parfit, 1984; Ryberg and Tännsjö, 2005).

According to Baier (1981; see also Partridge, 1998; Kumar, 2003) moral principles apply to individuals by description and not denotatively:<sup>5</sup>

“Rights and obligations are possessed by persons not in virtue of their unique individuality but in virtue of roles they fill, roles that relate to others. For example, children, *qua* children, have obligations to and rights against parents *qua* parents. My obligations as a teacher are owed to my students, whoever they may be. ... As long as I believe that determinate actual persons will fill the role of students, will occupy a position involving a moral tie to me, my obligations are real and not lessened by my ignorance of irrelevant details concerning those role-fillers.”

In this line of reasoning, the indeterminateness of future people would have no moral significance for our dealings with them, either. However, although the ‘role-fillers’ in Baier’s examples may be indeterminate at the outset, for each possible ‘role-filler’ it holds that he or she has grounds for complaining if obligations are left unfulfilled. Whoever the student may be, he or she will have reason to complain if the teacher does not show up at classes. Whoever the student may be, he or she will be better off if there are lectures. Therefore, the indeterminateness of the role-fillers is irrelevant. The essence of Parfit’s problem, however, is that this is not true in the case of future generations, for their existence *depends* upon our acts.

A comparable but slightly different route was taken by MacLean (1983; see also Sikora, 1978), who introduced the notion of the ‘placeholder complainant’. According to MacLean, people would have reason to complain if someone’s act worsened the position they occupy, even if this means that without the act someone else would have occupied their place (p. 196):

“Imagine that Smith acts viciously to make things worse for the person who will occupy some position. Normally, if Smith succeeds, he will have harmed whoever that person turns out to be, and that person will have reason to complain. But if Smith’s act also inadvertently causes Jones to occupy that position, and Jones is still better off than he would have been otherwise, does Jones have reason to complain? Many of us have intuitions that lead us to think he does.”

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<sup>5</sup> See also the legal-philosophical discussion between Weiss and d’Amato. According to Weiss (1992), “Intergenerational planetary rights may be regarded as group rights, as distinct from individual rights, in the sense that generations hold these rights as groups in relation to other generations - past, present, and future. They exist regardless of the number and identity of individuals making up each generation.” D’Amato (1990: 193 note 11), however, rhetorically asks “whether, if every single member of group A is wiped out and replaced by someone else, we are still entitled to call it group A and claim that at least the group has been preserved.”

I do not think Jones has reason to complain if it is impossible for him to occupy his position without Smith having acted ‘viciously’. Any sensible complaint seems to imply a wish that Smith had acted differently and that the situation be altered (Feinberg, 1986: 169). If Jones wants the situation altered, he loses his job. Jones may still have this wish for altruistic reasons: another actual person exists who could have occupied Jones’ position under better conditions. Jones may feel this other person has been harmed. In the case of future generations, however, these others do not exist. Furthermore, the intuition that Jones has reason to complain may stem from the counterfactual idea that there would in fact have been an opportunity for Jones to both occupy his position and being better off.

Some authors, such as Visser ‘t Hooft (1999; see also MacLean, 1983, Partridge, 2002), have tried to substantiate our duties towards future generations with reference to historical examples:

"No doubt many Jews living as our contemporaries would not have been born as the particular individuals they are, had Hitler not appeared on the scene of history. It is easy to imagine chains of causation linking the one circumstance with the other. Does that mean that they must keep silent on the Holocaust, or even be thankful for its having caused them to be born?"

However, that many of the Jews alive today would not be here if Hitler had not appeared on the scene of history makes it in no way less appalling what Hitler did to their *ancestors* (and to those Jews killed without any descendants). There is therefore no reason at all why contemporary Jews should remain silent on the Holocaust rather than express their moral condemnation. There is nothing illogical in morally condemning an act for its consequences on particular people even though one’s own particular life depends upon that act. Therefore, the harm or benefits to existing people are sufficient to account for our moral intuitions about those past acts.

Woodward has argued that acts can wrong people even if the act results in the person becoming better off than he would otherwise be. Woodward (1986: 810-811) asks us to imagine the following situation:

“Suppose that Smith, who is black, attempts to buy a ticket on a certain airline flight and that the airline refuses to sell it to him because it discriminates racially. Shortly after, that very flight crashes, killing all aboard. There is a clear sense in which the airline’s action has the result that Smith is better off than he otherwise would be, and if selling or not selling Smith the ticket are the only relevant actions which the airline can perform, not selling leaves him better off than any other possible action the airline might have performed. Nonetheless, it seems quite natural to say that the airline’s action wrongs Smith.”

Likewise, Woodward argues, our present acts can wrong future people. In Parfit's example of a woman who intends to become pregnant as soon as possible, the future child would be harmed. However, although Woodward is correct in stating that people's rights can be violated although this makes them better off, Woodward's example misses the point. In theory, the airline could have respected Smith's right to buy a ticket, even though Smith would be killed in the plane crash. The racial discrimination is independent from the future consequences. In the case of future generations, however, if we act differently, then different future people will exist. The 'harm' of a disability, for example, is intrinsically connected to the 'benefit' of existence. It seems consequently impossible to respect the rights of the future people. It is difficult to see how a right that cannot, logically, be respected can be violated (see also Sanchez, 2006).

Shiffrin (1999; see also Hanser, 1990) has tried to solve the non-identity problem by taking a 'non-comparative' view on harm, i.e. the view that some states of a person are harmful states as such and causing a person to be in such a state amounts to (wrongfully) harming that person. A person with a disability, for example, would be wrongfully harmed by being brought into the world disabled, even if there would be no possibility for that person to exist without the disability. Shiffrin needs this 'non-comparative' view on harm to argue that the 'benefit of existence' cannot compensate the harm by a disability, for example.<sup>6</sup> Feinberg (1986: 169) has argued that viewing such a disability a wrongful harm would be like "holding a rescuer liable for injuries he caused an endangered person that were necessary to his saving that person's life." Shiffrin, however, considers the endangered person harmed nonetheless. This harm is only justified because it was necessary to avert a greater harm. According to Shiffrin, such a greater harm is not at stake when bringing people into this world. Shiffrin (1999) compares Parfit's cases to examples in which as she calls it 'pure benefits' are bestowed on others without their consent at the cost of a lesser harm (p. 127):

"it seems wrong to break an unconscious patient's arm even if necessary to endow her with valuable, physical benefits, such as supernormal memory, a useful store of encyclopedic knowledge, twenty IQ points worth of extra intellectual ability, or the ability to consume immoderate amounts of alcohol or fat without side effects."

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<sup>6</sup> According to Hanser, the fact that the benefit of existence outweighs the harm suffered is irrelevant since the benefit is purely accidental. We can have no foreknowledge of who will live in the future in particular, so the benefit of a particular person that he will live instead of someone else is purely accidental. Therefore, according to Hanser, it cannot compensate the harm in a morally relevant way.

According to Shiffrin, ‘pure benefits’, i.e. benefits that are just goods and which are not also removals of or preventions from harm, cannot compensate harms without consent.<sup>7</sup> Only the prevention of greater harms can justify the infliction of a lesser harm, such as in the case of a rescuer causing some injuries to an endangered person. The reason, according to Shiffrin, is that the infliction of harm without consent violates the autonomy and right to self-determination of these persons (“a cleavage between a person’s life and her will”, p. 130). Since Shiffrin begins from the assumption that being created is such a ‘pure benefit’, she also assumes that these benefits cannot compensate the harms future people suffer in Parfit’s cases, for example. The ‘non-comparative’ view on harm is problematic, however. First, in Shiffrin’s examples of the endangered person or the unconscious patient it is rather unproblematic to view breaking an arm as a harm, since these people could also have existed *without* their arm broken (although they would have missed later ‘benefits’). Someone’s arm is broken, whose arm was unbroken beforehand. In the case of future generations, however, these people cannot exist without the ‘harmed condition’. Therefore, it is difficult to view such ‘harm’ as a wrong. Second, without the comparison to another state to judge whether a ‘harmed condition’ constitutes a wrong, any ‘harmed condition’ becomes a wrong. Then no life is justified, since all life includes some harm. In fact, Shiffrin draws this strong conclusion by stating that “because procreation involves a non-consensual imposition of significant burdens, it is morally problematic” (p. 139).<sup>8</sup> However, it seems counterintuitive to say that a couple commits a wrongful harm by bringing into this world a child with a slight hearing impairment if that is the only child they can ever have. Clearly, to break an unconscious patient’s arm is committing a harm in comparison to not braking the patient’s arm. However, it is not clear that bringing into this world a child with a slight hearing impairment is committing a harm in comparison to not bringing the child into this world.

## 5. Individual responsibility

Allan Carter (2001, 2002) has suggested that, in the case of long-term policy, discerning individual responsibilities within collective action offers a solution to Parfit’s non-identity problem. While it may be true that present collective action changes the identity of all future people whose lives the action sought to affect, this would not be the case for individual action. As Carter argues, if I perform an act that worsens future living conditions, that

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<sup>7</sup> See also Weinberg (2007), who states “Existence, which is unnecessary, value neutral, and something all future people will have, does not outweigh anything.”

<sup>8</sup> See for this view explicitly defended: Benatar (1997).

act may result in a number of future people coming into existence with identities different from what would otherwise have been the case. In the case of an individual act, however, the chance is very small – even when considering the distant future – that precisely these people with a different identity will experience the change in living conditions. Most probably, someone will be harmed who will live irrespective of my act. This particular person will have reason to complain, since he or she is harmed by my present act and would also have existed if I had acted differently. It should be noted that Partridge (2002) disagrees with the idea that most future identities will be left unchanged by my present acts. According to Partridge, future identities are so contingent that even the slightest present change is sufficient to completely reshuffle the future. But let us continue for a moment on the road followed by Carter and investigate his solution by means of the following example.

Imagine once more our two farmers, Alfred and Benjamin, this time both polluting each other’s land and deciding whether or not to continue doing so. Now assume that each farmer’s decision whether or not to pollute determines only the identity of his own future child, but not the identity of his neighbour’s future child. On the other hand, each farmer’s decision whether or not to pollute determines only the conditions under which his neighbour’s future child will live, but not those of his own future child. The following possibilities are therefore available. If Alfred and Benjamin both continue to pollute, their respective future children Andrew and Benny will both develop asthma as a result of their neighbours’ pollution. If Alfred and Benjamin both stop their polluting activities, their respective future children will be the non-asthmatic Andrea and Bernadette. If only Alfred stops polluting, but Benjamin continues, Andrea and Benny will be born, with Andrea developing asthma. If on the other hand Alfred continues to pollute, but Benjamin stops, Andrew and Bernadette will be born, with Bernadette now developing asthma. The four possibilities are shown in the diagram.

		Benjamin	
		Pollute	Not pollute
Alfred	Pollute	Asthmatic Andrew / Asthmatic Benny	Non-asthmatic Andrew / Asthmatic Bernadette
	Not pollute	Asthmatic Andrea / Non-asthmatic Benny	Non-asthmatic Andrea / Non-asthmatic Bernadette

As can be seen from this situation, which has the characteristics of a prisoners’ dilemma, each farmer has an individual moral duty to stop polluting. For example, if Alfred stops polluting, Benjamin’s child (Benny or Bernadette) will be better off irrespective of Benjamin’s choice whether or not to pollute. After all, Alfred’s decision as to whether or not to pollute does not determine the identity of Benjamin’s child. However, the farmers have no *collective* duty to stop polluting. On the contrary, they might have a

reason to decide collectively to pollute. Imagine, for example, both farmers promising each other to continue polluting. If they do, what reason can Andrew and Benny have to complain for their asthma? The farmers can argue that it is due solely to their collective decision that Andrew and Benny exist, since their uncoordinated actions would have led to the existence of different children (Andrea and Bernadette) instead. Therefore, a collective decision (coordination) might *relieve* both farmers of their individual duties not to pollute. I therefore disagree with Carter, who believes each of us can avoid harming future people by “collectively adopting, and then individually acting in accord with, long-range welfare policies which conserve resources, curb pollution and limit population growth.” (Carter, 2001: 445). After all, in the very act of collective deliberation causing damage and causing identities to change become coupled. The idea of society coming together to relieve one another of the duty not to pollute may be far-fetched. The point, however, is that no collective deliberation can be required on the basis of duties towards future people.

A further oddity is that neither of the children have reason to act collectively, in the form of a collective complaint. Certainly, the children can complain individually against each of the individual farmers that they should not have polluted, whether this was decided individually or collectively. However, these complaints can only be made *in mutual competition*. If, with the aid of a time machine, the wish of one child could be effectuated, then the other child would cease to exist. Therefore, if the children were to collectively deliberate, they would probably agree to file neither individual complaints nor a collective complaint. If in the case of climate change future people can only complain individually, in mutual competition, and only a few complaints out of the many billions could in principle be recognized, then this is truly only a marginal solution to the non-identity problem.

In section 2, I offered an analogous argument with respect to the harming of future property: in the case of climate change there is little chance that my individual present activities will damage the same future property as that originating from my present entitlements. However, this argument (partly) works in the case of future property but not in the case of Parfit’s problem. The reason is that principally future generations can complain collectively about our present acts affecting future property, while they cannot in the case of identity-changing acts. The claim of one future person with regards to his property is not necessarily bad for someone else, while it is in the case of identity changing acts.

## **6. Present rights of future people**

Although I have only discussed a small number of attempts to defend the idea of present duties towards future people against Parfit’s analysis, I do not



believe the present literature offers a satisfactory solution. In this section I propose a different line of thinking, although I do not claim this view is immune for criticism. I believe, however, it corresponds best with our intuitions in which cases we fail to fulfil our duties towards future people and in which cases we do not.

All ‘solutions’ proposed to the non-identity problem discussed in the previous two sections take a future perspective to judge whether rights are violated, i.e. ask the question what future people would prefer retrospectively at the moment of harm to have happened in the past. Since it is impossible for future people to lead the same life without the harm, they seem to have no reason to complain. However, I believe it more fruitful to ask what a representative or proxy would prefer for the future person from the present perspective, i.e. the moment of the harmful act. To show this, we first have to be more precise when a certain act violates rights and what it means to violate a right.

To have a (negative) right is to have a right that someone else refrains from certain harmful acts. Connected to this right is the duty not to violate the right. If one violates a right one simultaneously fails to fulfil a duty; there cannot be a time lag between these moments. Nor can there be a time lag between the moment one performs an act leading to (future) harm and the moment one fails to fulfil a duty. That also happens simultaneously. Therefore, it has to be concluded that a right can only be violated at the moment of the act itself and cannot be violated in the future. Of course, at the moment of the act there is still uncertainty about the consequences. This fact is irrelevant, however, as clarified by Feinberg’s following example (1990: 20; see also 1986: 150), comparable to the example by Woodward cited earlier:

“A businessman in Sydney takes a taxicab to the airport with the intention of boarding a plane to Perth. On the way to the airport the reckless driving of the taxi driver causes a collision with a truck. The businessman, severely injured, is rushed in an ambulance to a hospital, and thus misses his plane. The plane, however, develops engine trouble and crashes shortly after takeoff, killing all the passengers. The taxi passenger, therefore, despite his injuries, is better off on balance as a consequence of the cab driver's negligence than he would be otherwise ...”

Still, as Feinberg agrees, we wish to maintain our intuition that the taxi driver has committed a *wrongful harm* to the businessman, i.e. violated the businessman’s rights. Therefore, Feinberg formulates the following principle: “*A* harms *B* only if his wrongful act leaves *B* worse off than he would be otherwise *in the normal course of events insofar as they were reasonably foreseeable in the circumstances.*” (1986: 153). In other words, the taxi driver violated the businessman’s rights because at the moment of the taxi driver’s reckless driving the businessman’s interest was a save taxi

trip on the basis of the *reasonably foreseeable normal course of events*. On the basis of the information available to the businessman, the businessman would not have permitted the reckless driving. This example strengthens the idea that whatever happens in the future, present rights are violated at the moment of the act itself.

What does the idea that present acts can only violate present rights mean for Feinberg's example of the *wicked misanthrope* (1986: 154; see also Parfit, 1984: 356-7)?

“A wicked misanthrope desires to blow up a schoolhouse in order to kill or mutilate the pupils. He conceals a bomb in a closet in the kindergarten room and sets a timing device to go off in six years. It goes off on schedule, killing or mutilating dozens of five-year-old children. It was the evil action of the wicked criminal six years earlier, *before they were even conceived*, that harmed them. It set in train a causal sequence that led directly to the harm.”

It means that if we accept that the misanthrope fails to fulfil his duties toward the future pupils, it must be at the moment he conceals his bomb. Therefore, the rights the misanthrope's act violates must also be the *present* rights of the future people. Of course, the violation of these rights is *contingent*. First, the misanthrope may dismantle his bomb at a later moment, but still before it may harm future pupils. The fact that the misanthrope may dismantle his bomb does not alter the rights violation. If he does dismantle his bomb, he just undoes or compensates his earlier act. If I steal your wallet, but replace it before you notice, my initial act still violated your rights. Second, there may be no future pupils in the kindergarten once the bomb goes off. This does not diminish, however, the misanthrope's duty not to perform his risky act. After six years we may observe and conclude that no pupils were present and consequently no rights were violated. However, as far as it is reasonable foreseeable that pupils will be around, it makes sense to take their rights into consideration. Whether one fails or not in fulfilling one's duty does not depend upon the consequences in hindsight, but on the reasonable foreseeable consequences.

Some moral philosophers have argued that present generations cannot violate future generations' rights, for the simple reason that future generations do not yet exist. De George (1979), for example, follows this Epicurean line of thought (see also Macklin, 1981; Steiner, 1994; Beckerman and Pasek, 2002):

“Future generations by definition do not now exist. They cannot now, therefore, be the present bearer or subject of anything, including rights. Hence they cannot be said to have rights in the same sense that presently existing entities can be said to have them. This follows from the briefest analysis of the present tense form of the verb ‘to have’.”

However, I do not see a problem in the acknowledgement of contingent present rights of future people. If we were to live in a deterministic world in which it was possible to predict with certainty that someone would exist in the future, then this certainty would be sufficient to grant this person present rights. Since we do not live in a deterministic world, we cannot be certain about the existence of future people. However, this uncertainty does not diminish the possibility to take the rights of future people into consideration as far as their existence is *reasonably foreseeable*. To have present rights future generations do not have to be present themselves. A proxy may be present in their place.

As Feinberg has argued, there are various legal examples of pre-conception harm, such as malpractice by pharmaceutical manufacturers. Of course, in the case of long-term risks, such as climate change, victims have little opportunity for claiming and enforcing rights themselves, for in all probability the perpetrators will already be dead by the time the damage has occurred. However, while this impossibility may be relevant in spurring present generations to action from a psychological perspective (see the previous chapter), I do not believe it is of *moral* relevance. Moral rights are called for by the principles of an enlightened conscience, not by merit of their (legal) enforceability (Feinberg, 1974).

What does the fact that present acts necessarily violate present rights mean for the non-identity problem? If we take the present perspective instead of the future perspective, the identity ceases to matter. Before turning to the troubling case of future people, let us first look at the uncomplicated situation in which a present adult is exposed to a risk materialising ten years later, for example by exposure to radioactive radiation. Clearly, the initial act does not alter the numerical identity of the person exposed to the risk. The exposure to radiation may, however, alter the course of life of the person exposed and thus his narrative identity. Therefore, if we take the future perspective, there may still be a non-identity problem. After all, the person who had been exposed to radiation ten years earlier may not wish to change the course of history (if it were physically possible) and to undo the initial act if this were to alter his narrative identity. However, if someone has no such wish, we cannot say his rights are violated from that momentary (future) perspective. From the present perspective, however, rights are in fact violated nonetheless. Although someone may not wish that history is changed from the point of view of hindsight, it is perfectly thinkable that someone does not wish his future to be endangered from the present perspective. No one prefers to be exposed to a risk such as radiation. So once someone's narrative identity is still open or unfixed, he may wish a certain harmful act not to be performed, while from a future perspective he may not wish the same.

Let us now take a bit more complicated example of a woman who is pregnant for five weeks and is considering taking a party drug. She is both aware of her pregnancy and aware that taking the drug imposes a risk on her foetus of developing into, say, an asthmatic adult. Since the woman is making her decision *after* the foetus has been conceived this is generally not the kind of situation which is thought to involve the non-identity problem. The numerical identity of the child is already fixed. Therefore, there should be no problem in reaching the conclusion that the mother wrongfully harms her child by taking the party drug. However, while the *numerical* identity of the child is fixed, his *narrative* identity is not. The child's narrative identity is changed by the decision of the mother. Once more, we cannot conclude that the rights of the future adult are violated, because he may not wish history to be changed from his future perspective. The rights of the foetus are violated, however. Of course, the foetus is unable to claim any rights. A representative or proxy may voice or defend the rights, however. The representative would certainly object against the mother taking the party drug, since this would harm the foetus' future. Therefore, taking the drug violates the foetus' rights not to run the risk of future harm to his health. These rights or interests are of a special sort, however, since they depend upon the certainty of the foetus becoming a conscious adult. If they would not depend upon this certainty, we would have to consider each abortion a violation of the foetus' rights. So *if* it is reasonably foreseeable that the foetus will develop into an adult, *then* the foetus has a right not to be harmed, as argued by Feinberg (1980: 180):

“I believe ... that unborn children are among the sorts of beings of whom possession of rights can meaningfully be predicated, even though they are (temporarily) incapable of having interests, because their future interests can be protected now, and it does make sense to protect a potential interest even before it has grown into actuality. The interest principle, however, makes perplexing, at best, talk of a noncontingent fetal right to be born; for fetuses, lacking actual wants and beliefs, have no actual interest in being born, and it is difficult to think of any other reason for ascribing in any rights to them other than on the assumption that they will in fact be born.”

So if we ‘harm’ a foetus, but not in such a way that he will lead a miserable life not worth living, we will have committed a wrongful harm to someone who will not for a single moment in his life prefer the initial act to be undone. As a foetus, he is incapable of having interests, and as an adult he is too late, since by then he will be unwilling to jump to another ‘narrative life track’. Only a representative may voice this preference at the moment of the act itself on the basis of the rights of the foetus not to be harmed.

However, if we are willing to attach a right to a foetus not to be harmed, although his future or life narrative is still open and unknown except that he will exist as an adult, why then would it be problematic to cross the

border of conception where even the numerical identity is still open? Why then wouldn't we be willing to attach a present right to 'the future child' of the mother in Parfit's example not to be harmed by a certain choice or act? If making an actual healthy foetus disabled constitutes a violation of the foetus' right, then also taking a decision which leads to the conception of a disabled child instead of the conception of a healthy child constitutes a violation of the rights of the 'child to be' if those were the two foreseeable options. If we know that a child will exist we can say it has rights before it's conception. If a third party may protect the interests of a foetus on behalf of the conscious person it once will become against the mother's act even if her act changes the child's narrative, why then wouldn't that third party may protect the interests of a *potential* person on behalf of the *actual* person it once will become?

Now it may be opposed that attaching present rights to future people would lead to right violations in counterintuitive situations. For example, that deciding to have no children would violate the rights of the possible future children. However, as Feinberg argues in the case of 'foetal rights', such rights are based upon the assumption that they will in fact be born. Likewise, in the case of future people, there are only rights on the basis of the assumption that they (reasonably foreseeable) will be conceived. If no child will exist, no rights are violated. The opposite may be claimed as well, that any conception violates the rights of the resulting person because of the 'harms' which are intrinsically connected to any life (Shiffrin, 1999). I do not believe, however, that such counterintuitive conclusions have to be drawn. The question we must ask ourselves is whether our present decisions create a *reasonably foreseeable* risk that future people (whatever their narrative or numerical identity) will be in a harmed condition (disabled for example) in comparison to the situation that we act differently. Leading in this case is the question what act would constitute a wrongful harm to a foetus. Making him disabled would, withholding a (genetic) treatment which would improve his looks or intelligence would not. If children have no right to the best possibilities once conceived, then 'children to be' have no such rights either. Children have a right that their bodily integrity is not violated. They do not have a right to, say, plastic surgery or the most expensive schools. Likewise, a 'child to be' has a right that if the choice is between a disabled future or a healthy future that the latter is chosen, but has no general right to a wealthier life above a less wealthy life. A more difficult question is whether withholding treatment to a foetus with a treatable disorder constitutes a wrongful harm. Because of the absolute dependency of the foetus on the parents, I believe there is no basic asymmetry between inflicting harm to a healthy foetus and preventing harm to an 'endangered' foetus.

I believe this idea of present rights of future people *whoever they will become* corresponds best with our intuitions in which cases we fail to

fulfil our duties and in which cases we do not. However, as I stated at the start of this section, the idea of present rights of future people *whoever they will become* is not entirely without its problems either. Perhaps, our moral intuitions are stretched too much if the case at hand is not a ‘same numbers problem’, such as in the case of the woman becoming pregnant of a handicapped or healthy child, or a long-term policy change which does not alter the number of future people.

## 7. A ‘precautionary’ approach

As stated before, I do not believe the present literature offers a satisfactory solution to Parfit’s non-identity problem. In the previous section, I have sketched a different line of thinking which might underpin our present duties towards future people. However, even if no solution to Parfit’s problem is presently available, I believe that the non-identity problem *as yet* ought not to determine how *governments* should handle climate change. I believe the present ‘reflective disequilibrium’ justifies a ‘precautionary’ approach, in which climate damage is treated *as if* it were a wrongful harm to future generations until such time as coherence between theory and intuition is regained.

First, it is a politically relevant fact that Parfit’s non-identity problem conflicts with the widely shared layman’s opinion that we do have moral duties towards future generations. Despite its electoral relevance, this fact in itself provides insufficient *moral* grounds for governments to give consideration to such duties towards future generations, as there may be good reason to deem the prevailing view (morally) *wrong*. More important from a government’s point of view, however, is that, a few exceptions aside (see e.g. Schwartz, 1978, 1979), the same moral philosophical community that queries the analytical soundness of moral duties towards future generations also holds on to its intuition that we *do* have such duties. Parfit, for example, expected that a solution would be found in the future, a solution implying an adaptation of moral theory and not a rejection of moral intuitions. He hoped that future research would offer a ‘principle X’, which would solve the non-identity paradox (1981: 172):

“My desired new principle, which will solve all problems, seems to some people a mirage – not something which might be discovered. While such pessimism may turn out to be correct, it cannot yet be justified. These are early days. Judged by the number of people who have made the subject part of their life’s work, rather than by the length of time since it began, non-religious moral philosophy is a very young subject. We should not be surprised that much of it is still puzzling.”

Although Parfit was unable to find ‘principle X’, he remarked: “On my view, the Non-identity Problem never affects what we ought or ought not to do” (1986b: 855). The vast majority of the moral philosophical community has shared Parfit’s response to the problem (see e.g. Govier, 1979; Smolkin, 1994, 1999). As a result, there has been an ongoing quest for moral theories that might support the intuitions that the woman has a moral obligation to wait for two months and conceive a normal child, and that we are under a moral obligation to opt for the long-term policy, in order to re-establish coherence between intuitions and theory. If this is the common intuition of moral philosophers, then societies and governments have good reason to handle climate damage as a wrongful harm to future generations, until such time as moral philosophers achieve consensus on disregarding such duties. In other words, the controversy among moral philosophers calls for a ‘precautionary’ approach.

The second argument for a presumption, or ‘in dubio pro futura’ approach, is that the issue at hand is not about a proposal for new moral principles or regulations to be applied society-wide, but about the *exclusion* of a particular group from the application of established principles and regulations. The question is whether governments are justified *not* to apply established legal rules governing the handling of risk and damage to the case of climate damage experienced by future generations. Of course, such a precautionary approach is not without its costs. Handling the risk of climate change with the same ‘reasonable care’ as positive law requires in the case of risk to our contemporaries will have an impact on present consumption and production patterns. However, the standard of reasonable care required in the case of risk to other contemporaries already includes a reasonable weighing of costs and benefits. Refraining from present consumption to a degree that prevents possibly greater harm to future generations seems a reasonable price to pay.

## 8. Transcendental needs

Parfit termed the non-identity problem a *problem* because of the apparently unbridgeable gap between intuition and moral theory. As explained in section 4, moral philosophers have generally held to their moral intuitions and consequently sought adaptation of moral theory. In his book *Genethics* (1992), however, David Heyd pursues the opposite route, preferring further investigation of our intuitions. According to Heyd, choices that affect *potential* beings should be judged by conventional moral principles only to the extent that such ‘genesis choices’ affect actual beings as well; but inasmuch as they have no such effect on actual beings, “they should be recognized as lying beyond the grip of moral judgment” (p. 194). Heyd

argues, however, that several general empirical facts of biology, psychology and ecology can *explain* our intuitions in such cases as presented by Parfit.

Few people would be able, for example, to project themselves into the mind of a woman who could not wait for two months until her illness had passed, but knowingly chooses to conceive a handicapped child. For most people, after all, the decision to have children is a selfish choice arising from a variety of motives, such as security for old age, status, power, psychological stimulation, expression of primary group ties (love), companionship, self-realization, the preservation of lineage, the continuation, multiplication or expansion of the self, or even simple fun (Heyd, 1992: 199). These reasons are not 'good' or 'bad' in a moral sense; they are simply 'normal' in an empirical sense. Therefore, most of us would be abhorred if someone were to strongly deviate from this 'normal' view on life. However, just as we would be abhorred were we to know of someone deliberately having his own healthy leg amputated, but would have no reason for a *moral* complaint, we can be abhorred by knowing of someone deliberately choosing to conceive of a handicapped child. According to Heyd, then, we can 'save' our cherished intuitions by realizing that the handicapped child will not itself be worse off, but its parents.

In the case of long-term policy affecting the distant future, too, we have reason to be abhorred by the prospect of declining conditions under which future generations will live. As many development psychologists argue, most people need to perceive their lives as being 'meaningful', taken to signify adding to or being connected to something of value that is greater than themselves (Maslow, 1968; Frankl, 1972; Yalom, 1980; Baumeister, 1991). As Heyd observes, people "write books, engage in long-term political activities, work for the preservation of nature, build mausoleums, and in general fill their lives with creative activity that is not only life-serving but also life-justifying" (p. 211). So if the value we attach to our own lives depends upon the value we can attach to larger frameworks (the scientific enterprise, our genetic lineage), we also have reason to be concerned about the future of these self-transcending activities even after our own deaths. The prospect of the future collapse of civilization – even if we were not around to experience it ourselves – would diminish our ability to attach value to our present activities (see also Partridge, 1980). As a matter of fact, Parfit took a similar view as a last refuge for explaining the repugnance of the prospect of the Earth being inhabited by hundreds of billions of people living at subsistence level, for which "the only good things would be muzak and potatoes" (1986a: 160, 163):

"When we are most concerned about overpopulation, our concern is only partly about the value that each life will have for the person whose life it is. We are also concerned about the disappearance from the world of the kinds of experience and activity which do most to make life worth living."



Subsequently, it may be queried *why* we would be concerned about the continued existence of activities after our own death. Related to a person-affecting view on morality is a person-affecting view on value: all value in the world is a value to *someone*. This value can be either a value to future people or a value to us. However, if we were to be concerned about the future because of its value to future generations, we once more encounter Parfit's non-identity problem. If the future is valuable to *us*, on the other hand, we may query why we should be concerned about it after our death, when we are no longer around. The clue, according to Heyd, lies in the idea of a wider conception of identity. "Begetting children is a sort of self-expansion, an attempt to extend one's existence, a guarantee for a kind of continuity of the self beyond its individual-biological bounds" (1992: 213). And of course writing books and the like serves a similar purpose. So the larger framework can be of value to us, because we remain part of it. Please note that in this case, self-transcendence should not be interpreted as deriving meaning from something larger than oneself, something which has value independent from oneself. Instead, self-transcendence is to be interpreted as transcending a narrow interpretation of the self, i.e. as something which completely ends with one's death (Heyd, 1992: 219-220):

"Self-transcendence implies that what happens to our descendants, projects, political aspirations, and social ideals affects *us*, even after our individual extinction, albeit in a roundabout manner. This is rather like the way in which ignoring their testaments is a violation of *people's* rights and interests. In both cases there is no need to assume a mysterious form of personal existence after death. If human interests extend beyond the biological life of their subject, then in the same way as people can be "affected" after their death, so can they be affected during their life by future prospects."

If the 'solution' to the non-identity problem indeed lies in rethinking our intuitions, how then should governments respond? If there is a general need for self-transcendence, people are certainly expressing it indirectly. It seems that in modern political discourse there is little room for such terms as self-transcendence, meaning in life or long-term ideals regarding the good worth pursuing. Where human interaction is concerned, a language of justice, rights and autonomy predominates, even in spheres where such language is less appropriate. Exemplary is the Brundtland definition of sustainable development as "a development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). In this definition, future generations could have just as well been a newly discovered tribe in a different part of the globe – people with whom we have no special ties, but whose interests and autonomy nevertheless deserve our due consideration (see also O'Neill, 1993). Perhaps the reluctance to employ in political discourse such terms as self-

transcendence, meaning in life and long-term ideals stems from the modern, anti-perfectionist ideal of state neutrality when it comes to conceptions of the good. Alternatively, the dominant language of justice and autonomy may stem from the modern fascination with the self (Taylor, 1989; Baumeister, 1991). Finally, Nazism and communism may have made us rather ill-disposed towards ideals about future society or utopias.

Please note that the claim is not that the need for self-transcendence is strongly present in each individual, and therefore sufficiently strong to support a drastic climate policy. In fact, society's need for self-transcendence may be quite weak. However, the point is that there is no indication that the willingness to take intergenerational justice seriously is any stronger as explained in section 4 of the previous chapter. So even if society's need for self-transcendence were weak, this fact on its own would not prove that this weak need cannot (partly) explain the present concern for intergenerational justice. My statement is only that *as far as* people are concerned about the future, this concern can be (partly) explained by a need for self-transcendence.

Whatever the origin of this indirect expression of society's need for self-transcendence, I do not believe it would make sense if governments were to wait for a paradigmatic turn in the way people perceive and express their relation to future generations and meanwhile were to ignore stated preferences regarding intergenerational justice. Taking such preferences seriously would be justified because a climate policy based on a respect for future generations' rights to bodily integrity and personal property would, I believe, be largely congruent with a policy directly grafted onto transcendental considerations or long-term ideals. It is understandable that in a pluriform society in which conceptions of futures worth aiming for differ, people can agree *at least* to take reasonable care in preventing foreseeable future damage or harm due to our present acts. Agreement on this point is more likely than agreement about present investments in technological, scientific or cultural progress, for example. Future generations' rights might thus serve to define a lower limit or minimal 'self-restriction' to our present acts, given the unlikelihood of consensus about the future to be pursued.

Now it may be argued that if I want to live on through my children and further offspring, as argued by Heyd, that I just want them to be well. I would not be interested whether that fits within (legal) standards of reasonable care. Furthermore, it may be argued that although I may be interested in my children, this interest diminishes the further along the chain of generations. However, when organizing society, the first question is not how we wish to deal with our own offspring, but how we ought to deal with someone else's offspring. Even if I am not concerned about my own future that does not mean that someone else may put my future at risk. The fact that I discount my future does not give someone else the right to discount my future. Therefore, standards of reasonable care may still govern our dealings

with the far future, even if our concern about the future is grafted onto transcendental considerations and our concern diminishes the farther we look into the future.

Once more, this approach is not without its costs. In this case, the costs are a loss of transparency if the government uses two different languages for the purposes of internal justification and external communication. Liberals might be reluctant to pay the price of such a ‘manipulative’ use of language. However, given the urgency of a political response to climate change, such a loss of transparency seems a bearable cost compared to the costs of inaction.

## **9. Conclusion**

I started this chapter by observing that governments do in fact view the mitigation of climate effects experienced by future generations a matter of intergenerational justice. Therefore, consistency of governmental policy already requires climate risks to be handled consistent with the general standards of conduct deemed acceptable for handling risks to other contemporaries. Nevertheless, I investigated in this chapter whether governments are justified to handle climate damage as a wrongful harm to future generations. I have argued that although future generations’ entitlements to property originate in our present entitlements, the principle of self-ownership do require us to take ‘reasonable care’ of the products of future labour. I have also argued, however, that the present literature does not offer a solid solution to Parfit’s non-identity problem that can underpin any notion of rights of future generations. I offered a new approach which might offer a solution. However, even if no solution to Parfit’s problem is accepted as entirely satisfactory, I believe the present reflective disequilibrium justifies a ‘precautionary approach’ until a satisfactory coherence is regained between intuitions and theory. Second, I have argued that moral intuitions regarding future generations can partly be explained through an appeal to the human need for self-transcendence. On its own, this solution does not underpin any rights of future generations. However, given the dominance of anti-perfectionist language in modern political discourse, there is reason to assume that society translates its existing concern for self-transcendence and meaning in life into terms of duties to and rights of future generations. In such a political discourse, rights offer once more a guide for political action. Therefore, I conclude that governments are justified to address climate risks by appealing to the rights of future generations to bodily integrity and personal property.

## References

- Adams, R.M. 1979. 'Existence, Self-Interest and the Problem of Evil'. *Noûs* **13**: 53-65.
- Azar, C. and S.H. Schneider. 2002. 'Are the economic costs of stabilising the atmosphere prohibitive?' *Ecological Economics* **42**(1-2): 73-80.
- Baier, A.C. 1981. 'The Rights of Past and Future Persons', in E. Partridge (ed.), *Responsibilities To Future Generations* (New York: Prometheus Books), pp.171-183.
- Baumeister, R.F. 1991. *Meanings of Life*. New York: The Guilford Press.
- Beckerman, W. and J. Pasek. 2002. *Justice, Posterity, and the Environment*. Oxford: Oxford University Press.
- Beekman, V., 2004. 'Sustainable Development and Future Generations'. *Journal of Agricultural and Environmental Ethics* **17**(1): 3-22.
- Benatar, D., 1997. 'Why it is better never to come into existence'. *American Philosophical Quarterly* **34**(3): 345-355.
- Bhaskar, V. 1995. 'Distributive Justice and the Control of Global Warming', in V. Bhaskar and A. Glyn (eds.), *The North, The South and the Environment: Ecological Constraints and the Global Economy* (London: Earthscan/United Nations University Press), pp.102-117.
- Bromley, D.W. 1991. *Environment and Economy: Property Rights and Public Policy*. Oxford UK: Basil Blackwell.
- Carter, A. 2001. 'Can We Harm Future People?'. *Environmental Values* **10**(4): 429-454.
- Carter, A. 2002. 'On harming others'. *Environmental Values* **11**(1): 87-96.
- D'Amato, A. 1990. 'Do We Owe a Duty to Future Generations to Preserve the Global Environment?' *American Journal of International Law* **84**(1):190-198.
- De George, R. 1979. 'The environment, rights and future generations', in K. Goodpaster and K. Sayre (eds.), *Ethics and problems of the 21st century* (Notre Dame, Ind.: University of Notre Dame Press), pp. 93-105.
- Elliot, R. 1986. 'Future Generations, Locke's Proviso and Libertarian Justice'. *Journal of Applied Philosophy* **3**(2): 217-227.
- Farber, D.A. and P.A. Hemmersbaugh. 1993. 'The Shadow of the Future: Discount Rates, Later Generations, and the Environment'. *Vanderbilt Law Review* **49**(2): 267-304.
- Feinberg, J. 1974. 'The Rights of Animals and Future Generations', in W. Blackstone (ed.), *Philosophy and Environmental Crisis*, Athens, Georgia: University of Georgia Press.
- Feinberg, J. 1986. 'Wrongful Life and the Counterfactual Element in Harming'. *Philosophy and Social Policy* **4**(1): 145-178.
- Feinberg, J., 1990. *The Moral Limits of the Criminal Law: Volume 4: Harmless Wrongdoing*. Oxford: Oxford University Press.
- Frankl, V.E. 1972. *Der Wille zum Sinn*. Bern: Hans Huber.
- Govier, T. 1979. 'What Should We Do About Future People?'. *American Philosophical Quarterly* **16**(2): 105-113.
- Hanser, M. 1990. 'Harming Future People'. *Philosophy and Public Affairs* **19**(1): 47-70.
- Hartogh, G.A. den. 2007. 'Not to be born were best', unpublished paper, University of Amsterdam.

- Hershovitz, S. 2006. 'Two Models of Tort (and Takings)'. *Virginia Law Review* **92**(6): 1147-1188.
- Heyd, D. 1992. *Genethics: Moral Issues in the Creation of People*. Berkeley: University of California Press.
- Helm, C. and U.E. Simonis. 2001. 'Distributive Justice in International Environmental Policy: Axiomatic Foundation and Exemplary Formulation'. *Environmental Values* **10**(1): 5-18.
- Kavka, G. 1978. 'The futurity problem', in R. Sikora and B. Barry (eds.), *Obligations to Future Generations* (Philadelphia: Temple University Press), pp.180-204.
- Kavka, G. 1982. 'The paradox of future individuals'. *Philosophy and Public Affairs* **11**(2): 93-112.
- Kumar, R. 2003. 'Who Can Be Wronged?'. *Philosophy & Public Affairs* **31**(2): 99-118.
- Levmore, S. 1985. 'Explaining Restitution'. *Virginia Law Review* **71**(1): 65-124.
- Lind, R.C. 1999. 'Analysis for Intergenerational Decisionmaking', in P.R. Portney and J.C. Weyant (eds.), *Discounting and intergenerational equity* (Washington, D.C.: Resources for the Future), pp.173-180.
- Locke, J. 1690. *Two Treatises of Government*, ed. by P. Laslett, New York: Cambridge University Press, 1960.
- Macklin, R. 1981. 'Can future generations correctly be said to have rights?', in E. Partridge (ed.), *Responsibilities to Future Generations* (New York: Prometheus Books), pp.151-155.
- MacLean, D. 1983. 'A Moral Requirement for Energy Policies', in D. MacLean and P.G. Brown (eds.), *Energy and the Future* (New Jersey: Rowman and Littlefield), pp.180-197.
- Maslow, A.H. 1968. *Toward a psychology of being*. New York: Van Nostrand.
- Meyer, L.H. 2004. 'Compensating Wrongless Historical Emissions of Greenhouse Gases'. *Ethical Perspectives* **11**(1): 20-35.
- Narveson, J. 1967. 'Utilitarianism and new generations'. *Mind* **76**(301): 62-72.
- Narveson, J. 1973. 'Moral problems of population'. *The Monist* **57**(1): 62-86.
- Nozick, R. 1974. *Anarchy, State, and Utopia*. New York: Basic Books.
- O'Neill, J. 1993. *Ecology, policy and politics*. London: Routledge.
- Page, E. 1999. 'Intergenerational Justice and Climate Change'. *Political Studies* **47**(1): 53-66.
- Parfit, D. 1973. 'Rights, Interests and Possible People; Address to the London Medical Group'. Shortened version reprinted in: S. Gorovitz et al. (eds.), 1976, *Moral Problems in Medicine*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Parfit, D. 1976. 'On doing the best for our children', in M. D. Bayles (ed.), *Ethics and Population* (Cambridge: Schenkman), pp.100-115.
- Parfit, D. 1981. 'Future Generations: Further Problems'. *Philosophy & Public Affairs* **11**(2): 113-172.
- Parfit, D. 1983. 'Energy Policy and the Further Future: The Social Discount Rate', in D. MacLean and P.G. Brown (eds.), *Energy and the Future* (New Jersey: Rowman and Littlefield), pp.31-37.
- Parfit, D. 1984. *Reasons and Persons*. Oxford: Clarendon Press.
- Parfit, D. 1986a. 'Overpopulation and the Quality of Life', in P. Singer (ed.), *Applied Ethics* (New York: Oxford University Press), pp.145-64.

- Parfit, D., 1986b. 'Comments'. *Ethics* **96**(4): 832-872.
- Partridge, E. 1980. 'Observations: Why care about the future?' *Alternative Futures* **3**(4): 77-91.
- Partridge, E. 1998. 'Should we seek a better future?'. *Ethics and the Environment* **3**(1): 81-95.
- Partridge, E. 1990. 'On the Rights of Future Generations', in: D. Scherer (ed.), *Upstream/Downstream: Issues in Environmental Ethics* (Philadelphia, Pennsylvania: Temple University Press), pp.40-46.
- Partridge, E. 2002. 'The Future - For Better or Worse'. *Environmental Values* **11**(2): 75-85.
- Rawls, J.: 1972, *A Theory of Justice*, Oxford University Press, Oxford.
- Ryberg J. and T. Tännsjö (eds.). 2005. *The Repugnant Conclusion: Essays on Population Ethics*. Dordrecht: Kluwer Academic Publishers.
- Sanchez, J. 2006. 'Wronged Possibilities: The Non-Identity Problem and Harms to Future Persons'. At: <http://www.juliansanchez.com/essays/wrongposs.php>
- Schelling, T.C. 1995. 'Intergenerational Discounting'. *Energy Policy* **23**(4/5): 395-401.
- Schwartz, T. 1978. 'Obligations to Posterity', in R.I. Sikora and B. Barry (eds.), *Obligations to Future Generations* (Philadelphia: Temple University Press), pp.3-13.
- Schwartz, T. 1979. 'Welfare Judgments and Future Generations'. *Theory and Decision* **11**(2): 181-194.
- Shiffrin, S.V. 1999. 'Wrongful life, Procreative Responsibility, and the Significance of Harm'. *Legal Theory* **5**(2): 117-148.
- Shrader-Frechette, K.S. and Persson, L.: 2001, *Ethical Problems in Radiation Protection*, Stockholm, Sweden: The Swedish Radiation Protection Authority. SSI-Report 2001:11.
- Shue, H. 1999. 'Bequeathing Hazards: Security Rights and Property Rights of Future Humans', in M.H.I. Dore and T.D. Mount (eds.), *Global Environmental Economics: Equity and the Limits to Markets* (Malden, Mass.: Blackwell Publishers), pp.38-53.
- Sikora, R.I. 1978. 'Is it Wrong to Prevent the Existence of Future generations?', in R.I. Sikora and B. Barry (eds.), *Obligations to Future Generations* (Philadelphia: Temple University Press), pp.112-166.
- Singer, P. 2002. *One World; The Ethics of Globalization*. New Haven and London: Yale University Press.
- Smolkin, D. 1994. 'The Non-Identity Problem and the Appeal to Future People's Rights'. *Southern Journal of Philosophy* **32**(3): 315-329.
- Smolkin, D. 1999. 'Toward A Rights-Based Solution to the Non-Identity Problem'. *Journal of Social Philosophy* **30**(1): 194-208.
- Steiner, H. 1994. *An Essay on Rights*. Oxford: Blackwell.
- Stern, N. 2006. *The Stern Review: The Economics of Climate Change*. Cambridge University Press, Cambridge.
- Visser 't Hooft, H.Ph. 1999. *Justice to Future Generations and the Environment*. Dordrecht: Kluwer Academic Publishers.
- WCED. 1987. *Our Common Future*. Oxford: Oxford University Press.
- Weiss, E.B. 1992. 'Intergenerational equity: a legal framework for global environmental change', in *Environmental change and international law: New*

*challenges and dimensions, Edited by Edith Brown Weiss. Tokyo: United Nations University Press.*

- Weinberg, R. 2007. 'Identifying and Dissolving the Non-Identity Problem'. *Philosophical Studies* (online: DOI: 10.1007/s11098-007-9168-y).
- Wolf, C. 1999. 'Property Rights, Human Needs, and Environmental Protection: A Response to Brock'. *Ethics and the Environment* **4**(1): 107-113.
- Woodward, J. 1986. 'The Non-Identity Problem'. *Ethics* **96**(4): 804-831.
- Yalom, I.D. 1980. *Existential psychotherapy*. New York: Basic Books.





# Chapter 3: Regulation of climate change and the reasonable man standard

## 1. Introduction

Climate change due to the emission of greenhouse gases involves substantial risk of damage to human health and property (IPCC, 2007a, 2007b). Because of the inertia of the climatic system, however, most of the impacts of our present acts will not be clearly felt for another 50 years or more, when the planet is occupied by future rather than present generations (Hansen, 2005; Wigley, 2005; Meehl et al., 2005).<sup>1</sup> At various summits and in many national policy reports the international community has therefore stated that it considers climate policy a matter of intergenerational justice (see e.g. UNCHE, 1972; WCED, 1987; UNFCCC, 1992; UNCED, 1992; UNESCO, 1997; UK Government, 1999). The Parties to the United Nations Framework Convention on Climate Change (1992), for example, have stated that they are “determined to protect the climate system for present and future generations”. In 1997, the general conference of UNESCO adopted the ‘Declaration on the Responsibilities of the Present Generations Towards Future Generations’, of which Article 5.2 states that “The present generations should ensure that future generations are not exposed to pollution which may endanger their health or their existence itself”. What exactly would intergenerational justice with respect to the handling of climate risk entail, however? Justice is difficult to define, but the formal requirement of justice that equal cases be treated equally and different cases differently is an important starting point for any policy on justice. Amongst other things, this requirement means that every person should receive the same treatment under the law and the same treatment from the authorities. To treat people differently, one must have relevant moral grounds (see e.g. Rawls, 1972; Shrader-Frechette and Persson, 2001). Therefore, the question is from what part of the legal system of regulations governing the conduct of the people of a community, society or nation, relevant rules can be obtained for the handling of climate risk.

Since the emission of greenhouse gases involves risk of harm to others’ health and property, and this harm is not an intentional wrong-doing (*dolus*), but an unintentional side-effect of our acts (*culpa*), there are two

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<sup>1</sup> Throughout this chapter, the term ‘future generations’ refers to all those who will exist in the future, but are not yet conceived and born. Thus, the first members of future generations will be born in nine months’ time, while in a hundred years’ time almost everyone will belong to future generations from today’s perspective.

obvious ways to handle the risk of climate change: regulation, which requires a potential injurer to take measures to prevent the harm from occurring, and tort law, which seeks to deter the harm by making a potential injurer liable for the costs of the harm should it occur. So far, the focus has been on regulation as a means to reduce the impacts of climate change. In 1997, in Kyoto, a protocol was formulated which asks the industrialised countries to reduce their greenhouse gas emissions by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012. The Kyoto Protocol entered into force and became legally binding on February 16<sup>th</sup>, 2005. Governments are presently translating this target into regulation, such as the introduction of systems of tradable emission rights (see e.g. European Commission, 2003), emission charges and other policy instruments. There are, however, also some preliminary attempts at climate change litigation (see e.g. Gupta, 2007).

The main purpose of this chapter is not to champion either regulation or tort law as a means of handling climate change, although I shall indeed argue that regulation is a more straightforward instrument. The main purpose is to argue that the argumentation behind such regulation ought to be consistent with the *reasonable man* standard from tort law. Although regulation and tort law may differ methodologically, the formal requirement of justice assumes that types of reasoning that are considered unreasonable under negligence tort law must be unreasonable as well when regulating the emission of greenhouse gases.

Since I believe the general working of regulation needs little further explanation, I shall first describe tort law and the reasonable man standard (section 1). Next, I shall argue why the application of actual tort lawsuits are problematic in the case of climate change (section 2) and why regulation is better equipped to handle the risk of climate change (section 3). Finally, I shall argue that although actual liability suits are problematic in the case of climate change, the argumentation on which regulation is based should be consistent with the reasonable man standard from tort law (section 4).

## **2. Negligence tort law and reasonable man**

A tort is a legal wrong. Tort law is a branch of the civil law; the other main branches are contract and property law. Generally, two aims are distinguished in tort law: to provide relief for damages incurred (corrective justice) and to deter others from committing the same harms. It should be noted, though, that different theories of torts exist, claiming either corrective justice to be the primary aim of tort law (see e.g. Coleman, 1992; Weinrib, 1995; Ripstein, 1998) or deterrence instead (see e.g. Sheinman, 2003). According to the economic approach to tort law the primary aim is *efficient* deterrence, i.e. minimizing the sum of the costs of accidents and the costs of

avoiding them (see e.g. Coase, 1960; Calabresi, 1961, 1970; Posner, 1972, 1973). It is difficult, however, to label one of the aims of tort law as primary, since tort law effectively *results* in both deterrence and compensation. Since the primary aim of this chapter is to investigate the relevance of tort law for judging the argumentation behind the regulation of greenhouse gas emissions, I focus on deterrence and disregard the issue of compensation. The central conclusion of this chapter will not depend, however, on which of the aims of tort law is to be considered primary.

Of particular interest is the *reasonable man* standard from *negligence* tort law. In our society, everyone has a legal duty not to cause injury to others, whether with or without intent. Negligence is a kind of conduct that falls below the standards of behaviour established by law for the protection of others against unreasonable risk of harm. Other branches of tort law include intentional torts (e.g. intentionally hitting a person) and strict liability torts (e.g. liability for making and selling defective products). A person has acted negligently if he or she has departed from the conduct expected of a reasonably prudent person acting under similar circumstances. As Lord Atkin argued in *Donoghue v. Stevenson* ([1932] All ER Rep 1; [1932] AC 562; House of Lords):

“The rule that you are to love your neighbour becomes in law, you must not injure your neighbour; and the lawyer's question, Who is my neighbour? receives a restricted reply. You must take reasonable care to avoid acts or omissions which you can reasonably foresee would be likely to injure your neighbour. Who, then, in law is my neighbour? The answer seems to be - persons who are so closely and directly affected by my act that I ought reasonably to have them in contemplation as being so affected when I am directing my mind to the acts or omissions which are called in question.”<sup>2</sup>

To establish negligence, a plaintiff must prove that the defendant had a duty to the plaintiff, that the defendant breached that duty by failing to conform to the required standard of conduct, that the defendant's negligent conduct was the cause of the harm to the plaintiff, and that the plaintiff was, in fact, harmed or damaged.

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<sup>2</sup> It is important to note that Lord Atkin does not hold a restricted opinion about who is to be considered a neighbour, as he further explains: “So A. L. Smith L.J.: “The decision of *Heaven v. Pender* (11 Q. B. D. 503, 509.) was founded upon the principle, that a duty to take due care did arise when the person or property of one was in such proximity to the person or property of another that, if due care was not taken, damage might be done by the one to the other.” I think that this sufficiently states the truth if proximity be not confined to mere physical proximity, but be used, as I think it was intended, to extend to such close and direct relations that the act complained of directly affects a person whom the person alleged to be bound to take care would know would be directly affected by his careless act.”

Sometimes the distinction between negligence and recklessness is made, depending, respectively, on whether the defendant acted unknowingly with respect to the risk or with foresight (see e.g. Feinberg, 1975: 71). When acting recklessly, a person consciously or knowingly disregards a substantial and unjustifiable risk. When acting negligently, a person exposes others to substantial and unjustifiable risk unknowingly, although he could and should have been aware of the risk.

Negligence tort law recognises the fact that risk of harm to others can never be avoided entirely. Such an absolute demand would either be physically impossible to fulfil or would bankrupt society, and some risk, however small, will usually remain. Therefore, common law requires us to take the care that a *reasonable man* would exercise under the circumstances. According to the Second Restatement of Torts (§ 291) of U.S. common law, for example (see also the First and draft Third Restatement of Torts of U.S. common law (Wright, 2002)):

“Where an act is one which a reasonable man would recognize as involving risk of harm to another, the risk is unreasonable and the act is negligent if the risk is of such magnitude as to outweigh what the law regards as the utility of the act or of the particular manner in which it is done.”

The reasonable man or reasonable person standard is a legal fiction: a person appropriately informed, capable, aware of the law, and fair-minded. The reasonable man is allowed to exercise self-interest and is not required to give his money to the poor. He exercises due care, however, to ensure that his acts do not injure others. He may weigh up the risk itself and the cost of alleviating it. In some instances legal formulations require a quantitative cost-benefit analysis. According to a famous ruling by judge Learned Hand in the *Carroll Towing* case (Hand, 1947; see also Posner, 1972, 2002; Landes and Posner, 1987), the defendant is found negligent if the cost of precautions is less than the damage multiplied by its probability:<sup>3</sup>

“[T]he owner's duty, as in other similar situations, to provide against resulting injuries is a function of three variables: (1) The probability that she will break away; (2) the gravity of the resulting injury, if she does; (3)

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<sup>3</sup> Positive law sometimes even requires consumption losses to the risk bearer to be afforded a higher weight than consumption losses to the risk creator. In the United Kingdom the Law Lords were asked in 1949 to give a definitive ruling on the meaning of ‘reasonably practicable’. Lord Justice Asquith (1949) ruled that “‘Reasonably practicable’ is a narrower term than ‘physically possible’ and seems to me to imply that a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that if it be shown that there is a *gross disproportion* between them - the risk being insignificant in relation to the sacrifice - the defendants discharged the onus on them.” (emphasis added).

the burden of adequate precautions. Possibly it serves to bring this notion into relief to state it in algebraic terms: if the probability be called P; the injury, L; and the burden, B; liability depends upon whether B is less than L multiplied by P: i.e., whether B less than PL.”

It should be noted that the hand interpretation of reasonableness is not undisputed (see e.g. Gilles, 2001; Wright, 2002; Zipursky, 2007). Some have remarked that in most cases there is more to the determination of negligence or reasonableness than the weighing of benefits and risk of harm, or that not all the relevant factors can be put in a single (economic) metric. However, since there is nothing more involved in the issue of discounting than the weighing of costs and benefits, we do not have to be concerned with this criticism here. A second criticism is that the Hand formula would not be stringent enough. Wright (1995, 2002) offers an example of possible criticism: “It is not properly respectful of the equal dignity and autonomy of others, and hence not just, for you to impose substantial unaccepted risks of injury or loss upon them merely for your own personal benefit, even if your gain will exceed their loss.” This might explain why English law sometimes attaches a higher weight to the injury. When in the United Kingdom the Law Lords were asked in 1949 to give a definitive ruling on the meaning of ‘reasonably practicable’, Lord Justice Asquith (1949) ruled that

“‘Reasonably practicable’ is a narrower term than ‘physically possible’ and seems to me to imply that a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that if it be shown that there is a *gross disproportion* between them - the risk being insignificant in relation to the sacrifice - the defendants discharged the onus on them.” (emphasis added).

Generally, however, judges undertake their task in a broad, impressionistic manner (Ogus, 1997).

People do not only have a legal duty to exercise the care of a reasonable man when their acts involve the risk of harm to fellow-countrymen; international treaties also oblige us to take reasonable care when our acts involve the risk of harm to people living abroad, as in the case of transboundary air pollution (see in the context of climate change e.g. Tol and Verheyen, 2004). A landmark case in this context is the decision by the Trail Smelter Arbitral Tribunal (1941) between the United States and Canada concerning American farmers who had suffered damage from sulphur dioxide emissions by a Canadian smelter of zinc and lead ores located in Trail, British Columbia. The arbitral Tribunal declared that "no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is

established by clear and convincing evidence". Furthermore, the arbitral Tribunal agreed with a decision by the Federal Court of Switzerland between the Swiss cantons of Solothurn and Aargau (see Schindler, 1921, p. 174) that "no more precautions may be demanded ... near the boundaries of two cantons than are required ... in the interior of a canton." In other words, the precautions taken by a state in such a context should be no more and no less than those it would take to protect its own citizens. This responsibility for transboundary pollution has found its way into many contemporary treaties, primarily from its inclusion in the influential Principle 21 of the 1972 UN Conference on the Human Environment (Stockholm Convention), which declares that "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction." This principle was reaffirmed at the UN Conference on the Environment and Development (UNCED) convened in Rio de Janeiro in 1992.

### **3. Tort-based climate change litigation**

Is tort-based climate change litigation feasible in principle? There are various questions that need to be answered (see e.g. Peñalver, 1998; Culley, 2002; Hodas, 2002; Kerr, 2002; Davidson, 2003; Grossman, 2003; Spier, 2006; Posner, 2007). As stated earlier, to establish negligence a plaintiff must prove that the defendant had a duty to the plaintiff, that the defendant breached that duty by failing to conform to the required standard of conduct, that the defendant's negligent conduct was the cause of the harm to the plaintiff, and that the plaintiff was in fact harmed or damaged. I focus here on the following issues, although these certainly do not exhaust the entire palette of legal issues: 1. Causation: did the defendant's acts or omissions cause the damage? 2. Does the defendant have a duty of care to the plaintiff? 3. Do future generations or their representatives have legal standing?

#### *1. Causation: did the defendant's acts or omissions cause the damage?*

One of the most problematic aspects of tort-based climate change litigation is the issue of causation. Generally, courts require a plaintiff to prove that the defendant's negligent conduct was the cause of the harm to the plaintiff, i.e. to prove the precise causal link between the specific harm of the plaintiff and the act or omission of the specific defendant in the sense of a *condicio sine qua non*-relationship (or *but for* causation). In the case of climate change this is highly problematic. First, even if there were absolute certainty about mankind's influence on the earth's climate, then it would still be impossible

to distinguish man-made climate change from natural variability of the climate system (the 'background level' or 'confounding factors') in specific cases. Although the frequency of cyclones in a particular area might triple, it would be impossible to prove that a particular cyclone was caused by the enhanced greenhouse effect. Second, even if the damage could be ascribed to climate change, it would be impossible to ascribe such impacts to particular present acts. Although general causation can be argued for, individual causation is problematic (Peñalver, 1998).<sup>4</sup>

What *might* be established with sufficient confidence are the probability that a present individual act contributed to man-made climate change and the probability that certain damage was due to man-made climate change. On a person-to-person basis, this will generally result in negligible risks. If I travel the world by air transport, this will create a negligible risk for a specific future individual. However, the *aggregated* risk to the whole future world community would by no means have to be negligible. This aggregated risk is precisely what economists estimate when calculating marginal damage costs of carbon dioxide emissions (see e.g. Tol, 2005). The marginal climate damage of one intercontinental holiday might for example be around 1000 Euro, an amount worth contemplating. Divided over billions of future people, the individual impact is negligible, however. Tort law is not well equipped to handle such dispersed impacts. Nevertheless, a proportional liability rule (in relation to the probability of causation) is in fact gaining ground in tort law (Green, 2004; see for analogues in English law: Howarth, 2002). In the case of *Sindell v. Abbott Laboratories* 607 P.2d 924 (1980), which involved the mass disaster of the DES drug, the court determined each manufacturer to be liable for a fraction of every victim's harm, with liability determined in proportion to the manufacturer's market share (Ben-Sharar, 2000). Such a proportional liability rule is indeed required from the point of view of optimal and efficient deterrence (Calabresi, 1970) and courts may in the future be willing to consider such a rule in the case of climate risk (Verheyen, 2005). Lipanovich (2005) believes that in this respect the tobacco tort litigation can be a model for suits against large greenhouse gas emitters, such as the auto and oil industry. Furthermore, it should be noted that since we are here concerned about the meaning of tort law for regulation

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<sup>4</sup> The difficulties in establishing causal links over a long time period are illustrated by the recent cases to win reparations for the U.S. descendants of African slaves. In one case, for example, the company Aetna has been sued for making profits from slavery by selling insurance policies to protect slaveholders from loss in the event of their slaves running away (*Deadria Farmer-Paellmann v. FleetBoston Financial Corporation et al.*, 02cv1862 (United States District Court for the Eastern District of New York, March 26, 2002)). One of the main problems, however, is that plaintiffs have to show that their particular situation is a harm caused by acts one and a half century ago and that this harm is related to particular ancestors of the plaintiffs being slaves working for the particular precursor of the defendant (see e.g. Brophy, 2004). So far, this has been unsuccessful.

by governments, we do not have to establish the precise risk created at the individual level, but at the level of nations.

## 2. *Does the defendant have a duty of care to the plaintiff?*

This question has two components. The defendant has a duty of care to the plaintiff if the damage is a wrongful harm, and if the damage was reasonably foreseeable. With respect to the first component, I refer to the previous chapter, in which I argued that governments are indeed justified in considering climate damage a wrongful harm, i.e. a violation of future generations' rights to bodily integrity and property. Moreover, as stated in the introduction of this chapter, governments have expressed their willingness to accept a duty of care to future generations, in particular in the case of climate change.

The second question is whether climate damage is reasonably foreseeable. It should be noted that the answer to this question is unrelated to the question of whether the damage is reasonably *acceptable*. The question is only whether the risk is not too far-fetched to contemplate before acting, not so remote that a reasonable man would not think it over. In section 2, I discussed the science of climate change and concluded that the emission of greenhouse gases involves substantial risk of damage to future generations' health and property. There are scientifically based harm scenarios available supporting the assumption that such a risk can pose a threat to future people (Ekeli, 2004). Since the public debate about the science of climate change has been going on for many years across the media landscape, climate damage to future generations is a *reasonably foreseeable* risk (see also Kerr, 2002: 13); it is not so remote that taking climate change into consideration is an unreasonable requirement. With respect to climate change, future generations are – in Lord Atkin's words – our neighbours. Any reasonable person driving a fossil-fuel powered car could and should foresee the risk involved of climate change, even if they are unable to assess whether their particular contribution to the risk is reasonably acceptable. This holds particularly at the level of governments.

If what is reasonably foreseeable were to imply foreseeing the precise chains of cause and effect, then this would be problematic, as argued before. However, this is not required. If I drop a brick from an open window, it is reasonably foreseeable that a passer-by might get hurt, although I do not know for certain that this will occur or know who this passer-by will be. So the requirements for reasonable foreseeability *ex ante* are less stringent than the requirements to prove a *condicio sine qua non*-relationship *ex post*. According to Ekeli (2004), it would be unreasonable to interpret the foreseeability condition in such a way that it demands absolute certainty regarding the harmful consequences of an action: "Such an interpretation is unreasonable because it will exclude the possibility that a person can be held responsible for his or her actions at all. Absolute certainty about the



consequences of an action is impossible in principle.” In this context, Ekeli cites Lackey (1986: 636-7):

“What is of moral interest in what we ordinarily call ‘the infliction of harm’ is itself nothing other than the infliction of a risk. Any infliction of harm can be decomposed into some basic action, not by itself the infliction of harm, and certain causal and perhaps conceptual consequences that constitute the harm. Since the basic action cannot suffice to produce the causal consequences, all it does is to increase the probability that the harm will ensue. ... All our moral attention must center on the basic act, evaluated in terms of the risk it generates. To take risk seriously, then, is to treat the infliction of risk as morally akin to the infliction of harm. Where there is a moral rule against inflicting harms, there is a moral rule against imposing risks, regardless of whether the risk is realized.”

In conclusion, I do not see any problem in the recognition of a duty of care to future generations with respect to climate change.

### *3. Do future generations or their representatives have legal standing?*

In contrast to regulation, tort law seeks to deter the harm by making a potential injurer liable for the costs of the harm should it occur. The fear of future liability should deter potential injurers. Therefore, tort-based actions are generally initiated *after* loss or damage has occurred and tort law does not generally require a potential injurer to take measures to prevent the harm from occurring. In other words, to have a case one has to prove *injury in fact*. Taken literally, however, this requirement makes climate change litigation virtually impossible (Rosenkranz, 1986), since the defendants will already be in their graves before harmed plaintiffs can file suits. The reason is the time lag between the emission of greenhouse gases and rising temperatures, due to the thermal inertia of the oceans. The oceans require time to warm (or cool) in response to the forcing. This response time depends on the rapidity with which the ocean circulation transmits changes in surface temperature into the deep ocean. Hansen (2005) estimates the climate response time at about 50-100 years (see also Wigley, 2005; Meehl et al., 2005). In other words, if we experience climate change today, it will not be due to our contemporaries’ emissions, but due to the acts of our ancestors. Whether we decide today to emit more or less greenhouse gases will hardly result in a climatic change noticed by ourselves during our own lifetimes, but by people who are as yet unborn. Therefore, future liability can hardly frighten and deter present potential injurers in the case of climate change.

A way out of this problem would be an injunction, such as a *Quia timet* (because he fears) injunction: a court order requiring individuals to take reasonable care when emitting greenhouse gases in view of the associated risk (Kerr, 2002; Howarth, 2002; Spier, 2006). Generally, an

injunction is an extraordinary remedy that courts utilize in special cases where preservation of the status quo or taking some specific action is required in order to prevent possible injustice; for example, to ensure to a plaintiff that the defendant will not make him- or herself judgment-proof, nor insolvent in some way. In the case of climate change, the rationale behind an injunction might precisely be the fact that the defendant makes himself judgment-proof by sheer time, i.e. by not being alive at the time of damage. There are, however, several problems with an injunction in the case of climate change. First, injunctions are generally not available unless the threatened injury to the plaintiff is *irreparable* or *irreversible*, a requirement which is much more stringent than injury that is simply *unreasonable*, according to the Learned Hand formula, for example. Although an intercontinental flight just to see the opera in Sydney might be unreasonable in view of its contribution to climate change, it is difficult to argue that the particular flight itself leads to irreparable or irreversible damage. The second question is who could demand such an injunction. Future generations are not around and contemporaries acting on behalf of future generations face the problem of legal standing or *locus standi* (Davidson, 2003; see also Hodas, 2000; Mank, 2005). Legal interest criteria of standing often demand that an individual or a group has some kind of personal stake in the controversy in question (Ekeli, 2006). In U.S. law, there is a Prohibition of Third Party Standing: a party may only assert his or her own rights and cannot raise the claims of a third party who is not before the court. However, as Davidson notes, future generations occupy a position that resembles, both legally and practically, the position of other equitably protected ‘incompetent’ classes, which cannot request attorney representation or directly express any of their own interests or preferences, such as the mentally disabled or infants. Still, however, representatives must show why they in particular should be the representatives. Third, if the injunction route is followed, the distinction between tort law and regulation fades, its main difference being that an injunction is employed at the urgings of private parties (Shavell, 1984). If the issue becomes *ex ante* norm-making instead of *ex post* norm-enforcing, however, regulatory authorities are in a much better position than courts to handle the risk of climate change, as I shall argue in the following section.

In conclusion, climate change litigation is problematic to say the least. Although a duty of care can be established, there will be few cases in which plaintiffs are able to prove that the defendant's negligent conduct was the cause of the harm to the plaintiff. Furthermore, either the defendants will already be defunct by the time the causal relationship can be established, or the difficult route of an injunction must be followed.

#### 4. Why climate change is better regulated

Some authors are optimistic that climate change litigation may indeed prove feasible. However, even if climate change litigation were to be successful in some cases, it will certainly not lead to *optimal deterrence*: making society take all measures to reduce the emission of greenhouse gases of which the costs would be less than the harm prevented. Shavell (1984) cites four considerations when choosing between liability for harm versus regulation of safety (see also Landes and Posner, 1984; Kolstad *et al.*, 1990). In the case of the emission of greenhouse gases, all these considerations point towards a preference for regulation.

##### *1. Difference in knowledge about risky activities between a regulatory authority and private parties.*

The difference in knowledge might be over the value of parties' activities, the costs of reducing risks, or the probability or magnitude of risks. If the private parties possess information about these elements that is superior to the regulatory authority's, then, other things being equal, it would be desirable for them to be the parties performing the calculations to decide how to control the risks (Shavell, 1984). In the case of climate change this knowledge is divided over both governments and private parties. Governments are clearly at an advantage with respect to knowledge about the probability or magnitude of climate risks, since even the IPCC established and paid for by governments via the United Nations Environment Programme has a hard job assessing the impacts of climate change and determining the marginal costs of greenhouse gas emissions. Such a thorough assessment of the scientific literature by private parties would be an almost impossible task. Furthermore, it is difficult for private parties to establish the emissions due to specific activities, such as individual car journeys. Therefore, it also seems unfeasible for private parties to determine the specific emissions of each act and weigh up the costs and benefits of that act. Even if private parties could obtain all the relevant information, the social costs of assessments and cost-benefit analyses at the level of individual consumption and production acts would be enormous.

With respect to knowledge about the value of parties' activities and the costs of reducing risks, however, private parties are clearly at an advantage, since the number of activities involved in greenhouse gas emissions and the variety of measures to reduce such emissions are enormous. Therefore, direct regulation such as the prescription of specific measures and techniques seems unfeasible or highly inefficient. Although knowledge is thus divided, there is a kind of regulation which could bring together both kinds of information: economic instruments, such as tradable emission rights and emission charges. In the case of emission charges or tradable emission rights, governments attach a price to emissions equal to

the estimated marginal costs of damage. These instruments leave it to private parties, however, to assess on the basis of their own information whether it is better to reduce emissions or pay the calculated price. An increase in petrol prices reflecting the marginal costs of greenhouse gas emissions would integrate cost-benefit analysis of emission reduction in every individual consumption or production decision.

*2. The possibility that private parties would not be able to pay fully for harm done.*

To the extent that this is so, potential liability would not furnish an adequate incentive to reduce risk. Specifically, such would be the case because liability exceeding a party's assets would be seen by him only as liability equal to his assets; thus the party's motive to reduce risk would be less than society's (Shavell, 1984). This argument can only be in favour of regulation, but not against it. It is less relevant in the case of climate change,

*3. The chance that private parties would not face suit for harm done.*

Shavell (1984) gives three reasons. First, the chance of dispersal of harm over many victims, making it less than worthwhile for any particular victim to initiate legal action. Second, the passage of a long period of time before harm eventuates, raising the possibility that by the time suit could be brought, the evidence necessary for a successful action would be stale or that the responsible parties would be defunct. Third, the difficulty in attributing harm to responsible parties, for example due to background risk or the contribution to the risk by different parties. Particularly in cases where many different actors contribute to a problem and cause-effect relations are based on statistical data and models, regulation seems better equipped than tort law to handle risk of harm. As explained earlier, all these reasons hold to an extreme extent in the case of climate change.

*4. Administrative costs incurred by private parties and the public in connection with use of the legal system and with regulation.*

An advantage of litigation is that under liability law administrative costs are borne only if harm occurs, while in the case of regulation there are always administrative costs. However, because of the wide dispersion of climate damage an enormous number of claims might result, with equally enormous administrative costs. In the case of asbestos litigation in the United States, for example, over 60 percent of the \$70 billion paid in settlements was spent on administrative costs, primarily attorneys' fees (Kakalik *et al.*, 1984; Elliott, 1985). In the case of regulation via taxation, the administrative costs are low, especially if an early link in the chain from energy production to consumption is chosen; in the case of schemes of tradable emission rights, the administrative costs are more substantial (enforcement, trading, control *et cetera*), but still small compared to the expected costs of litigation.

Finally, it should be mentioned that there is also a political side to the choice between regulation and litigation. The choice also depends upon citizens' attitudes towards their government and their willingness to be regulated by it. Some authors have suggested climate change litigation as an answer to government's inability (or reluctance) to formulate climate policy (see e.g. Peñalver, 1998). However, it should be noted that the United States, in particular, has been unwilling to participate in the Kyoto Protocol and also has a strong tradition of settling disputes by means of litigation. In the European Union, on the other hand, which has been one of the champions of the Kyoto Protocol, citizens are generally much less suspicious of their governments imposing regulating and taxation.

## 5. Why regulation should be consistent with tort law

So far, I have cited several reasons why regulation is more appropriate than tort law for handling the risk of climate change. Nevertheless, the *reasonable man* standard from *negligence* tort law does offer important leverage points for the discussion about climate damage regulation. First, although regulation and tort law may differ methodologically, the formal requirement of justice assumes that types of reasoning that are considered unreasonable under negligence tort law must likewise be unreasonable for regulating the emission of greenhouse gases. Standards for good governance include the principle of due care and the principle of equality ('equal cases must be treated equally and different cases with due observance of their difference').

Second, the reasons why regulation is more appropriate than tort law for handling the risk of climate change are all practical reasons rather than morally relevant reasons justifying a different level of 'due care'. In other words, the precautions required from *reasonable man* under tort law are also required under regulation. The reason is that although it is difficult or impossible for a plaintiff to establish negligence in the case of climate change, the duty of care can indeed be established: climate damage is a wrongful and reasonably foreseeable harm. This duty of care is not diminished by the fact that the risk creator cannot be held liable once he is dead, nor by the fact that the dispersion of risk over many potential victims makes it impossible to establish *but for* causation.

Apart from these two reasons why regulation should be consistent, many choices and questions are encountered in the design of climate change regulation which *can* be considered from the point of view of legal reasonable man. In other words, the requirement of consistency also has practical meaning. Here I briefly discuss three issues, the first of which will be further investigated in the following two chapters:

1. Climate policy is increasingly based upon cost-benefit analysis. One of the pivotal issues in such cost-benefit analysis is how to weigh the benefits of climate policy, i.e. the climate-change-related damage prevented decades hence, against the consumption we would forfeit today by incurring expenses on climate damage prevention. The standard approach in conventional economic analysis is to assume a *social rate of time preference*, whereby society is held to prefer present consumption over future climate damage because future generations are empathically remote from us and are moreover expected to be much wealthier. According to the reasonable man standard, however, neither geographic (empathic) distance nor differences in wealth between the risk creator and risk bearer are taken into account in setting the standard of reasonable care (Arlen, 1992; 2000).

2. In cost-benefit analysis, economists are often optimistic about the capacity of technological development and innovation to solve future environmental problems. This view results in low estimates of the future costs of damage and mitigation, obtained by extrapolating past technological developments to the future. It is then argued that scarcely any environmental policy is required to mitigate long-term risks, or that mitigation should be deferred to the future (see for an example from the climate debate: Wigley, Richels and Edmonds, 1996). However, although one could not argue for a single, objectively 'right' approach to technological progress, it is a matter of fact that in today's society there are strong *de facto* limits to the degree of anticipation of future technological or scientific developments that is considered appropriate in the case of risk to others. One could hardly imagine someone responsible for infecting another person with HIV or Creutzfeld-Jacob defending themselves by saying: "The risks were known to me, but the disease only manifests itself several decades after infection. History shows that medical science has found a cure for almost every disease in such a time span." It is unthinkable that such a defence would convince a judge, even if it were accompanied by a sound cost-benefit analysis. When creating risk to others, reasonable man would base his decisions at least on currently available technology or seriously account for the risk that the anticipated technological developments will not materialise.

3. In climate policy making, there is an imbalance between the certainty required about the impacts of climate change and the certainty required about the economic impacts of climate policy. While there is an insatiable demand for stronger evidence and indication of the risks of climate change, indications vis-à-vis the (short-term) economic costs of risk prevention are generally readily accepted. What if the economic models used by governments to predict, say, economic growth and future employment were to be scrutinised with the thoroughness with which climate models are examined by the International Panel for Climate Change and further questioned in public debate? This imbalance can also be illustrated by reference to the lawsuits in the United States against the tobacco industry.

Even today's state-of-the-art knowledge about the health risks of smoking offers no absolute proof that smoking indeed causes cancer. There are still scientists who question their colleagues' results. However, although the relationship between smoking and cancer is still the subject of research, US courts recently ruled that the *indications* of health risks reported in scientific journals in the 70s should already have been sufficient for the tobacco industry to change its ways (*Engle v. Reynolds Tobacco Co*, 2000). It seems reasonable to assume that an 'intergenerational court' would consider the first or second assessment report by the Intergovernmental Panel on Climate Change (IPCC, 1990; 1996) as providing at least as much of an indication of risk to future generations as the 70s reports of the health risks of smoking. Although I shall not investigate this issue further, it seems that reasonable man would consider climate change 'reasonably foreseeable' at an earlier point than some governments, which still today require greater proof of climate change before changing their ways.<sup>5</sup>

## 6. Conclusion

In this chapter, I have argued that the application of actual tort lawsuits is problematic in the case of climate change. Although a duty of care can be established, there will be few cases in which plaintiffs are able to prove that the defendant's negligent conduct was the cause of the harm to the plaintiff. If such a causal relationship can be established, the defendants will probably already be defunct. However, although regulation seems better equipped to handle the risk of climate change, the argumentation on which regulation is based should be consistent with the reasonable man standards from tort law. Although regulation and tort law may differ methodologically, the formal requirement of justice assumes that types of reasoning that are considered unreasonable under negligence tort law must likewise be unreasonable for regulating the emission of greenhouse gases. Therefore, the point of view of reasonable man has implications for how future benefits and present costs are weighed up in cost-benefit analysis, how expectations about technological progress are dealt with, and how scientific uncertainty and controversy are handled.

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<sup>5</sup> Interesting to note in this respect is the plea of Lord Woolf, the Lord Chief Justice of England and Wales, for an environmental court, which he believes should have "general responsibility for overseeing and enforcing the safeguards provided for the protection of the environment which is so important to us all" (Woolf, 1992, 2001).

## References

- Arlen, J.: 1992, 'Should Defendants' Wealth Matter?', *Journal of Legal Studies* 21 (2) 413-429.
- Arlen, J.: 2000, 'Tort Damages', in Bouckaert B. and De Geest, G. (eds.), *Encyclopedia of Law & Economics* 2, Edward Elgar, Cheltenham.
- Ben-Shahar, O., "Causation and Forseeability." In *Encyclopedia of Law and Economics*, edited by B. Bouckaert and G. DeGeest, vol. 2 (Civil Law and Economics): 644-68. Cheltenham, UK: Elgar Publishing, 2000.
- Brophy, A.L., 2004, "Reparations Talk: Reparations for Slavery and the Tort Law Analogy", *Boston College Third World Law Journal* 24(1): 81-138.
- Calabresi, G., 1961, "Some Thoughts on Risk Distribution and the Law of Torts", *The Yale Law Journal* 70[4]: 499-553.
- Calabresi, G., 1970, *The Costs of Accidents: A Legal and Economic Analysis*. New Haven: Yale University Press.
- Coase, R.H., 1960, "The Problem of Social Cost", *Journal of Law & Economics* 3[1]: 1-44.
- Coleman, J.L., 1992, *Risks and Wrongs*, Cambridge: Cambridge University Press
- Culley, D., 2002, Global Warming, Sea Level Rise and Tort, *Ocean and Coastal Law Journal* 8[1]: 91-125.
- Davidson, J.E., 2003, "Tomorrow's Standing Today: How the Equitable Jurisdiction Clause of Article III, Section 2 Confers Standing upon Future Generations", *Columbia Journal of Environmental Law* 28(1): 185.
- Ekeli, K.S., 2004, Environmental Risks, Uncertainty and Intergenerational Ethics, *Environmental Values* 13(4): 421-48.
- Ekeli, K.S., 2006, The principle of liberty and legal representation of posterity, *Res Publica* 12(4): 385-409.
- Elliott, E.D., 1985, Why Courts? Comment on Robinson, *Journal of Legal Studies* 14(3): 799-805.
- Engle v. RJ Reynolds Tobacco Co. (2000) *Final Judgment and Amended Omnibus Order*, No. 94-08273 (Fla. 11th Cir. Ct. Nov. 6, 2000)
- European Commission, 2003, Directive 2003/87/EC of the European Parliament and the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
- Feinberg, J., 1975. 'Sua Culpa', in J. Feinberg and H. Gross (eds.) *Responsibility*. California: Dickenson Publishing Company.
- Gilles, S.G., 2001. On Determining Negligence: Hand Formula Balancing, the Reasonable Person Standard, and the Jury. *Vanderbilt Law Review* 54 (2) : 813-860.
- Green, M.D., 2004, "The Future of Proportional Liability". Wake Forest Univ. Legal Studies Paper No. 04-14 Available at SSRN: <http://ssrn.com/abstract=610563>.
- Grossman, D.A., 2003, 'Warming Up to a Not-So-Radical Idea: Tort-Based Climate Change Litigation', *Columbia Journal of Environmental Law* 28[1]: 1-61.
- Gupta, J., 2007, "Legal Steps Outside the Climate Convention: Litigation as a Tool to Address Climate Change", *Review of European Community & International Environmental Law* 16 (1): 76-86.



- Hansen, J., 2005, A slippery slope: How much global warming constitutes "dangerous anthropogenic interference"? An editorial essay. *Climatic Change* 68[3]: 269-279.
- Hodas, D.R., 2000, Standing and Climate Change: Can Anyone Complain about the Weather?, Joint issue *Journal of Land Use* 15[3] and *Transnational Law and Policy* 9[supplement]: 451-486.
- Howarth, D., 2002, Muddying the Waters: Tort Law and the Environment from an English Perspective, *Washburn Law Journal* 41[3]: 469-513.
- IPCC (1990) *First Assessment Report: 1990*, Cambridge University Press, Cambridge
- IPCC (1996) *Second Assessment Report: Climate Change 1995*, Cambridge University Press, Cambridge
- IPCC, 2007a, The Intergovernmental Panel on Climate Change, *Climate Change 2007* (Cambridge: Cambridge University Press, 2007). The Physical Science Basis: Summary for Policymakers.
- IPCC, 2007b, The Intergovernmental Panel on Climate Change, *Climate Change 2007* (Cambridge: Cambridge University Press, 2007). Impacts, Adaptation and Vulnerability: Summary for Policymakers.
- Kakalik, J.S. et al., 1984, *Variation in Asbestos Litigation Compensation and Expenses*, Rand Corporation, Santa Monica.
- Kerr, M., 2002, Tort Based Climate Change Litigation in Australia, *Discussion Paper Prepared for the Climate Change Litigation Forum London, March 2002*. Available at: [http://www.acfonline.org.au/uploads/res\\_climate\\_change\\_litigation.pdf](http://www.acfonline.org.au/uploads/res_climate_change_litigation.pdf).
- Kolstad, C.D., T.S. Ulen and G.V. Johnson, 1990, Ex Post Liability for Harm vs. Ex Ante Safety Regulation: Substitutes or Complements?, *The American Economic Review* 80(4): 888-901.
- Lackey, D.P., 1986, "Taking risk seriously", *Journal of Philosophy* 83(11): 633-640.
- Landes, W. and R. Posner, 1984, "Tort law as a regulatory regime for catastrophic personal injuries", *Journal of Legal Studies* 13[3]: 417-434.
- Lipianovich, A., 2005. 'Smoke before Oil: Modelling a Suit Against the Auto and Oil Industry on the Tobacco Tort Litigation is Feasible', *Golden Gate University Law Review* 35(3): 429-489.
- Mank, B.C., 2005. "Standing and Global Warming: Is Injury to All Injury to None?," *Environmental Law* 35(1): 1- 84.
- Meehl, G.A. et al., 2005, "How Much More Global Warming and Sea Level Rise?," *Science* 307 (5716): 1769-1772.
- Peñalver, Eduardo M., 1998, 'Acts of God or Toxic Torts? Applying Tort Principles to the Problem of Climate Change', *Natural Resources Journal* 38[4], 563-602.
- Posner, R.A., 1972, "A Theory of Negligence." *The Journal of Legal Studies* 1[1]: 29-96.
- Posner, R.A., 1973, *Economic Analysis of Law*, Boston, Little Brown, 1<sup>st</sup> edition)
- Posner, R.A., 2002. *Economic Analysis of Law* (6<sup>th</sup> edition). Aspen Law & Business, New York.
- Posner, E.A., 2007. "Climate Change and International Human Rights Litigation: A Critical Appraisal", U of Chicago Law & Economics, Olin Working Paper No. 329 Available at SSRN: <http://ssrn.com/abstract=959748>

- Ripstein, A., 1998, *Equality, Responsibility, and the Law*, Cambridge: Cambridge University Press.
- Rosenkranz, E.J., 1986, A Ghost of Christmas Yet to Come: Standing to Sue for Future Generations, (Georgetown University Law Center) *Journal of Law & Technology* 1: 67.
- Shavell, S., 1984, "Liability for Harm versus Regulation of Safety", *Journal of Legal Studies* 13[2]: 357-374.
- Sheinman, H., 2003, Tort law and corrective justice, *Law and Philosophy* 22[1]: 21-73
- Spier, J., 2006, "Legal aspects of global climate change and sustainable development", InDret 2/2006 (346), Barcelona. Available at [http://www.indret.com/pdf/346\\_en.pdf](http://www.indret.com/pdf/346_en.pdf).
- Tol R.S.J. and R. Verheyen, 2004, State responsibility and compensation for climate change damages; a legal and economic assessment, *Energy Policy* 32(9): 1109-1130.
- Tol, R.S.J., 2005, "The marginal damage costs of carbon dioxide emissions: an assessment of the uncertainties", *Energy Policy* 33(16): 2064–2074.
- Verheyen, R., 2005. "Climate Change Damage and International Law: Prevention Duties and State Responsibility", *Developments in International Law*, Vol. 54, Martinus Nijhoff Publishers.
- Weinrib, E.J., 1995, *The Idea of Private Law*, Cambridge, MA: Harvard University Press.
- Wigley, T.M.L. (2005): 'The climate change commitment', *Science* 307[5716]: 1766-1769.
- Wigley, T.M.L., Richels, R and Edmonds, J.A. (1996) 'Economic and environmental choices in the stabilization of atmospheric CO<sub>2</sub> concentrations', *Nature* 379(6562): 240-243.
- Woolf, Lord HK (1992) 'Are the judiciary environmentally myopic?', *Journal of Environmental Law*, vol 4 (1), pp1-14
- Woolf, Lord HK (2001) 'Environmental risk: the responsibilities of the law and science', *Environmental Law and Management*, vol 13 (3), pp131
- Wright, R.W., 1995. The Standards of Care in Negligence Law. In: D.G. Owen (editor), *Philosophical Foundations of Tort Law*, Clarendon Press, Oxford, pp. 249-275.
- Wright, R.W., 2002. Negligence in the Courts: Introduction and Commentary. *Chicago-Kent Law Review* 77 (2): 425-487.
- Zipursky, B.C., 2007. Sleight of Hand. *William & Mary Law Review* 48 (5): 1999-2041.

# Chapter 4: A social discount rate for climate damage to future generations based on regulatory law

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## Abstract

This chapter examines the implications for the social discount rate for damage due to climate change if risk to future generations is handled in accordance with the laws regulating our handling of risk to contemporaries. The conclusions are the following. Under current law, neither geographic distance nor differences in wealth between risk creator and risk bearer play any part in establishing a standard of 'reasonable care'. The concept of intergenerational justice requires these same principles to be applied in the intergenerational context too, implying a zero consumption rate of interest for climate damage. Assuming that the extent to which mitigation is at the expense of alternative investments is equal to society's marginal propensity to save, the social discount rate becomes society's marginal propensity to save times the long-term market rate of return on private investment, implying a social discount rate of around one per cent or a fraction of one per cent. This formula is exact under the assumption of average saving behaviour and by attributing consumption losses due to investment in damage prevention before damage occurs to the risk creator and after damage occurs to the risk bearer.

## 1. Introduction

In articulating policies to address climate change, governments are turning increasingly to cost-benefit analysis. One of the pivotal issues in such analysis is how to translate the benefits of climate policy, i.e. the climate-change-related damage prevented decades hence, into present-day monetary terms by means of a suitable *social discount rate*. Despite decades of debate, however, economists still disagree widely about the discount rate to be used for this purpose (see e.g. Lind, 1982; Arrow *et al.*, 1996; Portney and Weyant, 1999). This controversy is one of the key reasons why recommendations on climate policy range from business-as-usual to radical changes to present production and consumption patterns (Arrow *et al.*, 1996; Azar, 1998). Obviously, part of the controversy results from the issue being so morally charged. The generations creating the costs of climate change will most likely not overlap the generations bearing them. There now exists a vast literature in which economists and moral philosophers advocate a wide

range of social discount rates based on various theories of justice and rationality, such as utilitarianism, egalitarianism or libertarianism. When contemplating how to handle climate costs to future generations, however, we can build on existing national and international laws prescribing how risks to our contemporaries are to be handled. As we shall see below, these laws establish certain boundaries for any debate about the social discount rate to be adopted for the costs of climate change to future generations. Nevertheless, the possible relevance of current law for the discounting debate has been all but neglected to date (one exception being a short conference contribution by Shrader-Frechette, 1998).

The purpose of the present chapter is to examine the implications of current law for the social discount rate for consumption losses to future generations due to climate change. The term ‘consumption losses’ should be interpreted here in a broad sense, from reduced market purchases of goods and services like food and shelter to the fear of dying in a flood disaster. The term ‘future generations’ refers to all those not yet born. Thus, the first members of future generations will be born tomorrow, while in a hundred years’ time almost everyone will belong to future generations from today’s perspective. Due to the inertia of the climate system, any consideration of consumption losses due to climate change boils down to an evaluation of consumption losses to future generations.

This paper is structured as follows. In section 2, I first explain the ‘standard’ theory of discounting and argue that the consumption rate of interest for climate damage may differ from the consumption rate of interest for changes in one’s own future consumption. In section 3, I point out that in the case of risk to our contemporaries, national and international law require us to give equal weight to consumption losses to the risk bearer due to damage and to consumption losses to the risk creator due to risk prevention. In section 4, I argue that intergenerational justice requires a zero consumption rate of interest for climate damage and, in section 5, that such an interest rate does not conflict with the principle of consumer sovereignty. After having clarified the resulting social discount rate with an example in section 6, in section 7, finally, I draw some conclusions.

## **2. Economics of discounting**

### **2.1. ‘Standard’ theory**

Discounting is a means of comparing costs and benefits that occur at different points in time. There are two basic reasons for discounting future costs and benefits. First, individual consumers prefer consumption today to consumption tomorrow, i.e. there is a positive consumption rate of interest. Second, capital investments enhance future production and consumption, i.e. there is a positive social return on investment.

Economists generally cite two motives for employing a positive consumption rate of interest (CRI). First, people expect to be wealthier in the future and that an extra dollar will therefore then matter less: rather an extra dollar today as a poor medical student than an extra dollar in twenty years' time as a well-paid surgeon. Second, people may simply prefer the present to the future, whether through 'weakness of will' (*akrasia*), erroneous overestimation of benefits accruing earlier (*myopia*) or the uncertainty that one will still be alive in the future. Economists generally call this a 'pure' rate of time preference, or the utility discount rate. The CRI can thus be expressed as a sum of two terms (Ramsey, 1928; Koopmans, 1960; Arrow and Kurz, 1970):

$$(1) \quad \text{CRI} = \rho + \mu g$$

where  $\rho$  is the pure rate of time preference,  $\mu$  the absolute value of the elasticity of marginal utility (a measure of the relative effect of a change in income on welfare), and  $g$  the expected growth rate of per capita consumption.

The marginal rate of return on private investment (MRRI) expresses the fact that capital is productive, i.e. that a dollar invested in productive activities rather than consumed will generate additional income and hence additional consumption in the future. There are therefore opportunity costs involved in investing money in one activity rather than another.

The interplay of the supply of savings and the demand for investment results in a market interest rate  $i$ . In a world without market failure, tax or risk one would write:

$$(2) \quad i = \text{MRRI} = \text{CRI} = \rho + \mu g$$

In this simplified world, the *social* discount rate, i.e. the rate to be used to calculate the present value of the costs and benefits of public policies, is simply the market rate of interest. When taxes introduce a hedge between the consumption rate of interest and the rate of return on private investment, determining the social discount rate is a complicated and somewhat controversial issue, first and foremost because investments will generally be partly at the expense of present consumption and partly at the expense of savings and alternative investments. The most thorough and theoretically correct approach to this problem is the shadow price of capital approach (Lind, 1982; see also Eckstein, 1958; Arrow and Kurz, 1970; Bradford, 1975). This method applies the CRI to both consumption and investment flows, after the latter have been converted to consumption equivalents using a shadow price of capital: the present value of the future stream of consumption benefits associated with one dollar of private investment discounted at the CRI (Lind, 1982: p. 39). The shadow price of capital

approach allows one to use the CRI as the discount rate without ignoring the opportunity cost of displaced investment.

In principle, the shadow price of capital approach requires detailed information about the future consumption and investment flows associated with individual investment decisions. However, the approach is very much simplified if one takes average values for the economy as a whole. If case-specific information does not provide evidence to the contrary, it is reasonable to assume that the fraction of expenditure that is at the expense of alternative investments is given by society's *marginal propensity to save* ( $\alpha$ ), which most economists estimate to be around 20% (see e.g. Lind, 1982; Cline, 1992). For generic 'optimal policy' instruments such as carbon taxes or systems of tradable emission rights, for example, this is a reasonable assumption (Cline, 1992). In the absence of contrary evidence it is, moreover, reasonable to assume that invested capital remains fully invested and that a fraction  $\alpha$  of the returns on investment is reinvested (Lind, 1982). The social discount rate (SDR) then simply becomes the weighted average of MRRI and CRI (Krutilla and Eckstein, 1958; Haveman, 1969; Sandmo and Drèze, 1971; Harberger, 1972; see also section 6):

$$(3) \quad \text{SDR} = \alpha \text{MRRI} + (1-\alpha) \text{CRI}$$

In the following sections, I focus on the value of CRI to be used in the context of climatic change mitigation. The appropriate value for MRRI is a highly controversial subject in its own right, which I shall not discuss in this chapter (see e.g. Weitzman, 1998, 2001; Howarth, 2003; Newell and Pizer, 2003; 2004). Illustrative rates in government guidelines are seven percent by the US Office on Management and Budget (OMB, 1992), two to three percent by the US Environmental Protection Agency (EPA, 2000) and a declining schedule of rates starting at three-and-a-half percent by the UK government (HM Treasury, 2003).

## 2.2. The consumption rate of interest for climate damage

In the above discussion of the social discount rate it has been assumed that people's consumption rate of interest does not depend on the nature of the change in consumption. The consumption rate of interest may be time-dependent, but at any given time it has been assumed to be the same for different goods. This assumption is not necessarily valid, however. People may well employ different consumption rates of interest depending on whose consumption is at stake and the cause of the change in consumption (see e.g. Eckstein, 1957; Marglin, 1963; Sen, 1982; Lind, 1982). To analyse the consumption rate of interest for climate damage, it is important to distinguish three situations in particular: 1. action today that changes one's own future consumption; 2. action today that changes someone else's future

consumption, either by causing damage or by preventing damage one would otherwise cause; 3. action today that changes someone else's future consumption without causing or preventing damage. At this point in my argument I claim neither that people do in fact employ different consumption rates of interest for these different situations, nor indeed that they should. The only claim is that they potentially *can*. For example, people may either be indifferent to future generations and apply an infinite consumption rate of interest for changes in their consumption, or see reason to apply a zero consumption rate of interest. Even if it could be argued that to hold such different consumption rates of interest would be inefficient, immoral or irrational, it would not be *impossible*.

There are two reasons why I do not exclude the possibility of three different consumption rates of interest. First, people generally have both personal interests and moral convictions, leading them to value changes in consumption differently depending on who they accrue to and what causes them. Most people, while preferring to win the lottery themselves rather than see a stranger do so, are prevented by a sense of duty from deriving equal enjoyment from the same amount of money acquired in a perfect crime. Furthermore, people may distinguish between negative and positive duties (see e.g. Feinberg, 1973). Negative duties are duties not to interfere with others, for example the duty not to harm others in health and property. Positive duties, on the other hand, oblige one to take action to help others, often through the mediation of the government. Examples here might include the positive duty to help others to obtain housing, work, health care, a pension or unemployment benefits. Generally speaking, people attach greater weight to the negative duty not to harm others than to the positive duty to help them (Pogge, 2002). Only a hypothetical 'pure utilitarian' would be immune to such differences and show the same preference towards every change in consumption, whether it be his or her own or someone else's. Once again I emphasise that at this point in my argument I wish to claim about people's moral views neither what they generally are nor what they should be, only that there is sufficient reason to analytically distinguish the three situations I have cited.

The second reason for distinguishing three different consumption rates of interest is that when considering measures to mitigate climate change, the change in consumption due to mitigated climate change does not accrue to the same person, but generally to people living in the (distant) future. After all, because of the inertia of the climate system the most adverse effects of climate change will probably not be felt in the coming decades but after half a century, say, by people who by and large are as yet unborn (Fankhauser and Tol, 1996; Mendelsohn and Neumann, 1999). Furthermore, the aim of mitigating climate change is to prevent dangerous *anthropogenic* interference with the climate system (UNFCCC, 1992), i.e. the adverse effects do not occur independently of our actions. Climate

change is in fact a risk we impose on others, which means mitigation is more closely allied to negative than to positive duties. Consequently, the consumption rate of interest employed for climate damage may differ from that for the general benefits to future generations arising from investments in, say, knowledge or transport infrastructure.

For all these reasons, people may employ a specific pure rate of time preference for climate damage ( $\rho_{cd}$ ) and a specific factor to account for eventual differences in per capita consumption between present and future generations ( $v_{cd}$ ), which may differ from the absolute value of the elasticity of marginal utility ( $\mu$ ). For the specific case of climate damage I therefore propose formula:

$$(4) \quad CRI_{cd} = \rho_{cd} + v_{cd} g$$

Formula (3) for approximating the social discount rate thus becomes:

$$(5) \quad SDR_{cd} = \alpha MRRI + (1-\alpha) CRI_{cd} = \alpha MRRI + (1-\alpha) (\rho_{cd} + v_{cd} g)$$

Now it may be objected from the start that applying different social discount rates to different changes in consumption would be *inefficient*, i.e. not lead to optimal economic growth or maximisation of total social utility (see e.g. Nordhaus, 1994, p. 132; 1997). First, however, it should be noted that in formula (5) only  $v_{cd} \neq \mu$  may be at the expense of efficiency if future generations indeed enjoy a higher per capita consumption. MRRI and  $\alpha$  do not depend on the kind of change in consumption and to use a  $\rho_{cd}$  that differs from the pure rate of time preference for changes in one's own consumption only affects the inter-temporal distribution of utility. There may or may not be good *moral* reasons for holding a specific  $\rho_{cd}$ , but it is not *inefficient*. Second, it should be noted that although  $v_{cd} \neq \mu$  may be at the expense of efficiency with respect to *utility* maximisation, it is not at the expense of efficiency with respect to *wealth* maximisation. As I shall argue in the following sections, there is good reason to accept such inefficiency with respect to utility maximisation in the context of climate change mitigation.

### 3. Legal regulation of risk to contemporaries

In the following sections I focus on the value of  $CRI_{cd}$ , i.e. on the question of how to deal with temporal distance and differences in wealth between present and future generations. To answer this question, it is important to appreciate from the start that there are a multitude of legal regimes, private and public, laying down standards of behaviour for dealing with risks imposed on *contemporaries*. I should emphasise that I claim neither that these legal regimes are 'just' in a moral sense, nor that all societies adhere to



the same legal systems. Laws may differ from country to country and from era to era. As I shall argue in the following section, however, the legal regimes guiding permitted behaviour among contemporaries, as they happen to exist in a particular country at a particular time, do matter for the consumption rate of interest for climate damage.

First, it should be noted that time discounting is in fact considered appropriate in tort law when assigning monetary damage awards in the case of latent harm or future losses of welfare due to an accident in the present (see e.g. Revesz, 1999). For example, people may be exposed to carcinogens and face the risk of disease twenty years later, or may have become disabled in a traffic accident and lose future wages. However, this practice of discounting is irrelevant for the discussion of  $CRI_{cd}$ . In the case of future harm to contemporaries, compensation is paid to the victim him/herself in the present, i.e. before the future costs occur. Since the victim is free to choose whether he/she diverts the damage award to present consumption or invest it to compensate for the future damage, current law allows future damages to be fully discounted at the marginal rate of return on private investment. In the case of climate damage, however, future generations can neither receive present damage awards, nor decide themselves how to divert such awards. As a result, the social discount rate for climate damage should not only reflect  $MRR$ , but also  $CRI_{cd}$  as argued in section 2. I therefore turn to the question of how current law deals directly with *spatial*, rather than temporal, distance and with differences in wealth between risk creators and bearers.

Legislation seldom requires us to avert all risk of damage to other parties. Such an absolute demand would either be physically impossible to fulfil or would bankrupt society, and some risk, however small, will usually remain. Consequently, legislation generally requires people to take ‘reasonable care’ or ‘due care’ or keep risk to others as low as ‘reasonably achievable’ or ‘practical’. Application of such standards inevitably involves some form of assessment, both of the risk itself and of the cost of alleviating it. In some instances legal formulations require a quantitative cost-benefit analysis. According to a famous ruling by judge Learned Hand (Hand, 1947), the defendant is found negligent if the cost of precautions is less than the damage multiplied by its probability.<sup>1</sup> Generally, however, judges undertake their task in a broad, impressionistic manner (Ogus, 1997).

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<sup>1</sup> Positive law sometimes even requires consumption losses to the risk bearer to be afforded a higher weight than consumption losses to the risk creator. In the United Kingdom the Law Lords were asked in 1949 to give a definitive ruling on the meaning of ‘reasonably practicable’. Lord Justice Asquith (1949) ruled that “‘Reasonably practicable’ is a narrower term than ‘physically possible’ and seems to me to imply that a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that if it be shown that there is a *gross disproportion*

Although a quantitative cost-benefit analysis seldom underlies interpretation of ‘reasonable care’, there are two conclusions to be drawn from present legislation that are important for the discounting debate. First, under current law geographic distance between the risk creator and risk bearer is not taken into account in setting the standard of reasonable care. Lack of interest in what happens farther away, or ‘short-sightedness’, does not qualify as an extenuating circumstance. Second, under current law differences in wealth between risk creator and risk bearer are not taken into account in setting the standard of reasonable care either (Arlen, 1992; 2000). No legal interpretation of ‘reasonable care’ is conceivable in which the risk creator explicitly characterises consumption losses by the risk bearer as less important on the argument that the risk bearer is wealthier than the risk creator. According to current law, the owner of a chemical plant, say, must spend the same funds on preventing damage to surrounding residences irrespective of the wealth of their owners.

It may be argued that differences in wealth are irrelevant because ‘reasonable care’ is simply an efficient rule with which to balance the marginal costs of risk mitigation and damage compensation. This is not the case, however. Under current law, differences in wealth are not only irrelevant for setting the standard of reasonable care in the case of strict liability, but also in the case of negligence liability. Strict liability is the responsibility to pay compensatory damages according to the amount of actual harm suffered by the plaintiff even if there is no (proof of) negligence, whereas negligence liability is the responsibility for compensatory damages only if there is indeed such (proof of) negligence. Particularly in the case of negligence liability it has been argued that making the standard of ‘reasonable care’ dependent on differences in wealth between defendant and victim would improve total social utility, following Marshall (1890), who noted that "a pound's worth of satisfaction to an ordinary poor man is a much greater thing than a pound's worth of satisfaction to an ordinary rich man" (see e.g. Abraham and Jeffries, 1989; Arlen, 1992; Miceli and Segerson, 1995; Arlen, 2000). However, legal-scientific debate about such adaptations has so far been without consequence for the standard of ‘reasonable care’ in current law (Arlen, 1992).

The laws according to which damage to others is not to be deemed less important when assessing ‘reasonable care’ hold not only within national borders but also when dealing with transboundary risks. International law forbids the owner of a chemical plant to offer less risk protection to people simply because they are living across the border. Neither does international law allow developing countries to discount damage to citizens in developed countries due to transboundary air pollution

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between them - the risk being insignificant in relation to the sacrifice - the defendants discharged the onus on them.” (emphasis added).

in cost-benefit analyses of preventive measures on the basis of differences in per-capita income between the countries. A landmark case in this context is the decision by the Trail Smelter Arbitral Tribunal (1941) between the United States and Canada concerning American farmers who had suffered damage from sulphur dioxide emissions by a Canadian smelter of zinc and lead ores located in Trail, British Columbia. The arbitral Tribunal declared that "no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence". Furthermore, the arbitral Tribunal agreed with a decision by the Federal Court of Switzerland between the Swiss cantons of Solothurn and Aargau (see Schindler, 1921, p. 174) that "no more precautions may be demanded ... near the boundaries of two cantons than are required ... in the interior of a canton." In other words, the precautions taken by a state in such a context should be no more and no less than those it would take to protect its own citizens. This responsibility for transboundary pollution has found its way into many contemporary treaties, primarily from its inclusion in the influential Principle 21 of the 1972 UN Conference on the Human Environment (Stockholm Convention), which declares that "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction." This principle was reaffirmed at the UN Conference on the Environment and Development (UNCED) convened in Rio de Janeiro in 1992.

In conclusion, when determining reasonable care in the case of risk to other *contemporaries*, national and international law require us to give equal weight to consumption losses to the risk bearer due to damage and to consumption losses to the risk creator due to risk prevention. These laws apply in equal measure to all the planet's present inhabitants, with neither spatial distance nor greater wealth of the risk bearer being acceptable grounds for discounting.

#### **4. Intergenerational justice**

In the previous section I observed that most societies adhere to legal systems according to which risk mitigation by risk creators does not depend on the wealth or location of those bearing the risk. In this section I argue that consistency from the angle of intergenerational justice would require consistency between the consumption rate of interest for climate damage and

existing legal systems guiding permitted behaviour among contemporaries. This would imply  $CRI_{cd} = 0$ .

Justice is difficult to define, but the formal requirement of justice, that equal cases be treated equally and different cases differently, is an important starting point for any policy on justice. Amongst other things, the requirement means that everyone should receive the same treatment under the law and the same treatment from the authorities. To treat people differently one must have *relevant moral grounds* (see e.g. Rawls, 1972; Shrader-Frechette and Persson, 2001).

In moral philosophy, the question of whether future generations have any moral standing and deserve to be treated as moral equals is a controversial one. Some moral philosophers have argued, for example, that there is no meaningful sense in which present generations can be held to harm future generations (see e.g. Parfit, 1984) or that people cannot have rights if they cannot claim them (see e.g. De George, 1979). I wish neither to defend such positions nor refute them. However, I do claim that if the concept of intergenerational justice is to have any meaningful content and practical value, then it should comprise the notion that norms, which today hold in equal measure for all contemporaries *and* which can be meaningfully applied in the intergenerational context, should hold for future generations as well. The norm according to which risk mitigation by risk creators should not depend on the wealth or location of risk bearers is one such norm, for which there are no relevant moral grounds for not applying it to future generations except by denying future generations moral equality. This implies  $\rho_{cd} = 0$ ,  $v_{cd} = 0$ , and consequently  $CRI_{cd} = 0$ .

It is important to note that intergenerational justice does not imply a zero consumption rate of interest for *every* change in the consumption of future generations. As argued in section 2.2, the consumption rate of interest may differ for changes in the consumption of future generations that are unrelated to damage prevention, such as those due to investments in education and long-term infrastructure. There is therefore no reason to fear “a situation where one was always ready to starve oneself in the present so long as there was any annual benefit however small to be derived from adding to the community's stock of capital” (Dobb 1960, p. 19; see also Koopmans, 1960; Olsen and Bailey, 1981; Pearce and Turner, 1990; Pearce *et al.*, 2003).

It might be argued that a relevant moral ground for treating future generations differently is that we are already amply compensating them by the material and other benefits we bequeath them. However, the lion's share of these benefits is in the form of positive externalities: new technologies and useful artefacts created to improve our own lives, for example, but still available to future generations when we are no longer around. Under current law, the existence of positive externalities cannot compensate or justify the existence of negative externalities. In particular, when the creator cannot

exclude the beneficiary from the external benefits, there are no legal grounds for demanding compensation for those benefits. Consequently, the creator of external costs and benefits cannot cancel one against the other, either. There seems to be no justification for adopting a different approach in the intergenerational context.

It might also be argued that a relevant moral ground for treating future generations differently is the absence of an intergenerational income tax system (see e.g. Tullock, 1964; Baumol, 1968; Nordhaus, 1994, p. 123; 1997). In the intra-generational context it has been argued (by Kaplow and Shavell, 1994, for example) that the legal system should not aim for utility maximisation, as the income tax system is a more efficient means of achieving distributional goals. One might then easily jump to the conclusion that the current legal system does not take differences in wealth into account in setting the standard of 'reasonable care' because there is an income tax system. However, there is no indication that societies would have taken differences in wealth into account in present regulatory law if there had been no income tax system. International law regulating transboundary risks provides clear evidence of the opposite in fact, as no account is taken of transboundary differences in wealth despite the absence of an international income tax system.

Since I take intergenerational justice to imply treating future generations consistent with the institutionalised norms guiding permitted behaviour among contemporaries, I disagree with the various proposals for a  $CRI_{cd}$  based upon ideal theories of justice and rationality (see for the latter e.g. Lagerspetz, 1999). Utilitarians, for example, advocate maximisation of utility (happiness or well-being) over time and therefore recommend  $\rho_{cd} = 0$ ,  $v_{cd} = \mu$ , and subsequently  $CRI_{cd} = \mu g$  (see e.g. Cline, 1992; Rabl, 1996).<sup>2</sup> In *A Theory of Justice* (1972) the political philosopher Rawls rejected utilitarianism and argued for a society in which the position of those who are least well-off is optimised (according to the 'maximin criterion' or 'difference principle'). Although Rawls himself saw reasons not to apply the difference principle in the intergenerational context, other authors did, arriving at a high or even infinite value of  $v_{cd}$  and therefore  $CRI_{cd}$  (see e.g. Solow, 1974; d'Arge *et al.*, 1982). If future generations are wealthier, *any* expenditure on mitigation will worsen the position of the least well-off

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<sup>2</sup> It should be noted that current law is incompatible not only with this 'growth discounting', but also with 'equity weighting', the intragenerational counterpart of growth discounting (see e.g. Fankhauser *et al.*, 1997). If a higher per capita income of future generations is a motive for discounting future costs to them in cost-benefit analysis, then the lower per capita income of the inhabitants of developing countries is then a motive for assigning costs to them greater weight. As I have argued, however, legal regulation provides no grounds for applying growth discounting to damage to future generations. Likewise, legal regulation provides no grounds for applying equity weighting to harm suffered by the populations of developing countries.

generation, the present. According to the libertarian Nozick (1974, p. ix), “Individuals have rights, and there are things no person or group may do to them (without violating their rights).” Nozick therefore argues that no risk may ever be imposed on others without their express consent. With reference to such absolute rights as the right to be left unharmed in health or property, authors such as Sen (1982) and Spash (1993, 1994) have questioned the whole notion of discounting.

The problem, however, is that such views build on *ideal* moral theories rather than on the actual moral choices that societies have already made and institutionalised in law, as well as in other ways, and that stipulate how contemporaries should treat one another. It is difficult to see how governments could endorse moral choices with respect to the treatment of future generations that conflict with the moral choices already endorsed by the same governments with respect to behaviour among contemporaries. For example, if all the institutionalised moral choices guiding society were based on utilitarian principles, governments could not found intergenerational justice on Rawls’ principles. The very concept of justice requires governments to treat equal cases equally, which means that *if* a government decides to embrace intergenerational justice, it cannot just start from scratch and deem the social discount rate for climate damage an experimental playground for new moral views.

Once more, I emphasise that I claim neither that the moral choices guiding permitted behaviour among contemporaries are ‘just’ in a moral sense, nor that all societies have made the same moral choices. Intergenerational justice requires a government merely to treat future generations according to the moral choices currently prevailing for its contemporary citizens. As laws may differ from country to country and from era to era, one consequence is that intergenerational justice may, in principle, do so as well. This does not undermine practical and successful implementation of intergenerational justice, however. For example, climate policy is shaped partly in international climate negotiations, with negotiators hailing from countries with different institutionalised moral codes. From their respective negotiating positions, however, negotiators only have to treat future generations as moral equals with respect to the moral rules institutionalised within their own countries. In this way future generations are treated as moral equals even though the outcome of the negotiations may be founded on other principles. Furthermore, the fact that institutionalised moral rules change with time does not complicate the process of shaping intergenerational justice. The emancipation of women was not complicated by the fact that at the time of the emancipation debate the institutionalised moral rules applying to the male section of the population were not yet fixed (as indeed they never will be).

## 5. Is a zero $CRI_{cd}$ contrary to people's preferences?

In the previous section I argued that consistency from the angle of intergenerational justice would require consistency between the consumption rate of interest for climate damage and existing legal systems prescribing permitted behaviour among contemporaries, implying  $CRI_{cd} = 0$ . The question now is whether such a  $CRI_{cd}$  would conflict with people's preferences.

According to the principle of consumer sovereignty, individuals are the best judges of their own welfare and social policy should be based upon individuals' own preferences. The social discount rate should therefore reflect people's actual consumption rate of interest (see e.g. Bauer, 1957; Eckstein, 1957; Marglin, 1963; and more recently Olson and Baily, 1981). In this chapter I do not challenge the principle of consumer sovereignty. However, I do disagree with the assumption commonly made, by many authors, with reference to the principle of consumer sovereignty, *viz.* that people's consumption rate of interest for climate damage ( $CRI_{cd}$ ) is revealed through market behaviour (see e.g. Nordhaus, 1994 and Pearce *et al.*, 2003). If there were only one consumption rate of interest, i.e. if the consumption rate of interest were the same for changes in one's own future consumption and for changes in the consumption of future generations due to climate change, then  $CRI_{cd}$  would be close to the market interest rate  $i$ , as can be seen from formula (2). As I have argued, however, people may employ different consumption rates of interest for these two kinds of changes in future consumption. As there are no separate capital markets on which these different 'time preferences' can be expressed, there is consequently no way that market behaviour can be used to distinguish citizens' preferences regarding handling of damage to future generations from preferences regarding their own future consumption.

Others have argued that there is no reason to presume any difference between the consumption rate of interest for changes in one's own future consumption and for changes in the consumption of future generations due to climate change, by making a comparison with *intra*-generational or *spatial* discounting (see e.g. Schelling, 1995, 1999; Pearce *et al.*, 2003). They have argued that comparison of the limited expenditures by developed countries on foreign aid with expenditures to improve domestic living conditions would clearly show that there is no basic difference between the consumption rate of interest for one's own future consumption and that for the consumption of someone else separated from us in time or space. Pearce *et al.*, for example, argue that

“the ethical principle that ‘all men and women are equal’ is not one that is practised anywhere in the world. If everyone was equal in an economic sense, for example, expenditure by rich countries on saving lives in poor countries would be higher than expenditure on saving the rich countries’

‘own’ lives. The extra (marginal) cost of life-saving in poor countries is very much lower than the extra cost of saving lives in rich countries. Yet the opposite is true ...”

However, as I have argued in section 2.2, one should distinguish (revealed) preferences regarding negative duties from (revealed) preferences regarding positive duties. While the willingness to help others, correlated with acknowledgement of positive duties, clearly diminishes the remoter people are from us, the willingness not to harm others, correlated with acknowledgement of negative duties, does not necessarily diminish the remoter people are from us (Kamm, 1999). In fact, as I have argued in section 3, the duty to mitigate risk imposed on others is acknowledged in equal measure for the entire global population through commitments that have been institutionalised in national and international law. Since there is no direct correlation between the willingness to pay for aid and the willingness to pay to prevent harm, expenditure on development aid does not tell us much about people’s preferences concerning the prevention of damage to future generations for which we are responsible, i.e.  $CRI_{cd}$ .

Since people’s  $CRI_{cd}$  is revealed neither by market behaviour nor by development aid budgets, governments find themselves obliged to make an explicit political choice with respect to  $CRI_{cd}$ , based on the preferences expressed by their citizens in democratic debate and through the democratic process. In many countries the majority of citizens have expressed their concern for the well-being of future generations via democratic debate. Likewise, most elected politicians have expressed such concerns en route to their election. Consequently, politicians did not come without a mandate when they signed up to the Rio Declaration on Environment and Development in 1992, and in particular Principle 3: “The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.” In particular, the Parties to the United Nations Framework Convention on Climate Change (1992) have stated to be “determined to protect the climate system for present and future generations”. In 1997, the general conference of UNESCO adopted the ‘Declaration on the Responsibilities of the Present Generations Towards Future Generations’, of which Article 5.2 states that “The present generations should ensure that future generations are not exposed to pollution which may endanger their health or their existence itself”. Governments have indeed expressed this commitment to intergenerational justice at several key summits (see e.g. UNCHE, 1972; WCED, 1987; UNCED, 1992) and in national policy reports. Since there is no reason to assume that by expressing this commitment governments acted against the electoral will, there is no reason to assume that applying a  $CRI_{cd}$  equal to zero would be contrary to people’s preferences and thus in conflict with the principle of consumer sovereignty.



## 6. The social discount rate for climate damage

In the previous sections I have argued for  $CRI_{cd}$  equal to zero. With formula (5) the social discount rate for climate damage then becomes:

$$(6) \quad SDR_{cd} = \alpha MRRI$$

Let me clarify this formula with an example and a comparison to the shadow price of capital approach. Suppose that the marginal rate of return on private investment is 5%, that invested capital remains fully invested and that, of the returns on investment, a fraction is reinvested equal to society's marginal propensity to save (20%). Suppose, further, that one is considering an investment of \$ 100 to prevent \$ 300 of damage occurring 100 years from now. Such an investment would result in an infinite flow of alternative investment losses and therefore consumption losses covering not only the period between year 0 and 100 in which damage occurs, but also later years (Table 1).

Table 1 Consumption and alternative investment losses due to a \$ 100.00 investment to prevent damage in a hundred years.

	Investment in damage prevention	Alternative investment losses	Consumption losses (cumulative)	Prevented damage
Year 0	\$ 100.00	\$ - 20.00	\$ - 80.00	
Year 1		\$ - 20.20	\$ - 80.80	
Year 2		\$ - 20.40	\$ - 81.61	
Year 3		\$ - 20.61	\$ - 82.42	
...		...	...	
Year 100		\$ - 54.10	\$ - 216.38	\$ - 300.00
...		...	...	

The shadow price of capital is obtained by summing the consumption losses due to investment in damage prevention discounted at the consumption rate of interest. The consumption rate of interest for consumption losses between year 0 and 100 due to investment in damage prevention is equal to  $CRI_{cd}$ : although the risk creator is not allowed to calculate to his own advantage by discounting damage to the risk bearer, neither is he obliged to put himself at a disadvantage by discounting consumption losses between year 0 and 100 due to investment in damage prevention. Therefore, these consumption losses are summed at a zero consumption rate of interest, resulting in a total of \$ - 216.38. *After* year 100, however, it is the risk bearer himself who will face any further consumption losses due to investment in damage prevention.

Since the risk bearer can interchange consumption and investment, he will be indifferent to \$ 54.10 of alternative investment losses in year 100 versus \$ 54.10 of consumption losses in year 100. The \$ 54.10 of alternative investment losses in year 100 is therefore counted as \$ 54.10 of consumption losses in year 100. This gives the same result as applying a consumption rate of interest for consumption losses due to investment in damage prevention after year 100 equal to the marginal rate of return on investment. As a result, the shadow price of investing \$ 100 to prevent damage occurring 100 years from now is \$ 270.48 (\$ 216.38 plus \$ 54.10). Since this is less than the \$ 300 prevented damage, reasonable care would require such an investment in mitigation. This is exactly the same conclusion that is obtained if the damage occurring 100 years from now is discounted at a social discount rate of  $\alpha$  times MRRI (1%) and compared with present investment costs. The present value of the damage is then \$ 110.91, which is more than \$ 100.00 of investment. The present value of \$ 270.48 in year 100 discounted at 1% is exactly \$ 100.00. In other words, formula (6) is exact under the assumption of average saving behaviour and by attributing consumption losses due to investment in damage prevention after damage occurs to the risk bearer.

## 7. Conclusion

In this chapter I have argued that under current law neither geographic distance nor differences in wealth between risk creator and risk bearer play any part in establishing a standard of 'reasonable care'. The concept of intergenerational justice requires these same principles to be applied in the intergenerational context too, implying a zero consumption rate of interest for climate damage. Furthermore, it has been argued that such a consumption rate of interest does not conflict with the principle of consumer sovereignty. Assuming that the extent to which mitigation is at the expense of alternative investments is equal to society's marginal propensity to save, the social discount rate becomes society's marginal propensity to save times the long-term market rate of return on private investment. Although this chapter does not enter into the debate on long-term interest rates, it is anticipated that the social discount rate will then be around one per cent or a fraction of one per cent. One possible consequence for policy-makers is that the 'right' carbon tax may well exceed 100 Euro per tonne of carbon, compared with the figure of around 10 Euro per tonne currently being discussed on the basis of a social discount rate of 6% (see e.g. Eyre *et al.*, 1999; Nordhaus and Boyer, 2000).

## References

- Abraham, K.S. and Jeffries, J.C. Jr.: 1989, 'Punitive Damages and the Rule of Law: The Role of Defendant's Wealth', *J. Legal Stud.* 18 (2), 415-425.
- Arlen, J.: 1992, 'Should Defendants' Wealth Matter?', *J. Legal Stud.* 21 (2) 413-429.
- Arlen, J.: 2000, 'Tort Damages', in Bouckaert B. and De Geest, G. (eds.), *Encyclopedia of Law & Economics 2*, Edward Elgar, Cheltenham.
- Arrow, K.J. and Kurz, M.: 1970, *Public Investment, the Rate of Return, and Optimal Fiscal Policy*, Johns Hopkins University Press, Baltimore, MD, U.S.A.
- Arrow, K.J., Cline, W.R., Mäler, K.G., Squitieri, R. and Stiglitz, J.E.: 1996, 'Intertemporal Equity Discounting, and Economic Efficiency', in: Bruce, J. P., Lee, H. and Haites, E. F., (eds.), *Climate Change 1995 - Economic and Social Dimensions of Climate Change*, Cambridge University Press, Cambridge, pp. 125-144.
- Asquith, Lord Justice: 1949, 'Edwards v. National Coal Board', *All England Law Reports* 1, 747.
- Azar, C.: 1998, 'Are Optimal CO<sub>2</sub> Emissions Really Optimal?', *Environ. Resour. Econ.* 11 (3-4), 301-315.
- Baumol, W.J.: 1952, *Welfare Economics and the Theory of the State*, Harvard University Press, Cambridge, MA.
- Bauer, P.T.: 1957, *Economic Analysis and Policy in Underdeveloped Countries*, Duke University Press, Durham, NC.
- Bradford, D.F.: 1975, 'Constraints on Government Investment Opportunities and the Choice of Discount Rate', *American Economic Review* 65 (5), 887-899.
- Cline, W.R.: 1992, *The Economics of Global Warming*, Institute for International Economics, Washington, DC.
- D'Arge, R.C., Schulze, W.D. and Brookshire, D.S.: 1982, 'Carbon Dioxide and Intergenerational Choice', *American Economic Review* 72 (2), 251-256.
- De George, R.T.: 1979, 'The Environment, Rights and Future Generations', in Goodpaster, K.E. and Sayre, K.M. (eds.), *Ethics and Problems of the 21st Century*, University of Notre Dame Press, Notre Dame, pp. 93-105.
- Dobb, M.: 1960, *An Essay on Economic Growth and Planning*, Routledge & Kegan Paul, London, p. 19.
- Eckstein, O.: 1957, 'Investment Criteria for Economic Development and the Theory of Intertemporal Welfare Economics', *Quarterly Journal of Economics* 71 (1), 56-85.
- Eckstein, O.: 1958, *Water Resource Development: The Economics of Project Evaluation*, Harvard University Press, Cambridge, MA.
- Eyre, N., Downing, T., Hoekstra, R. and Rennings, K.: 1999, *Externalities of Energy, Volume 8: Global Warming Damages*, Office for Official Publications of the European Commission, Luxembourg.
- EPA (United States Environmental Protection Agency): 2000, *Guidelines for Preparing Economic Analysis*, Washington D.C.
- Fankhauser, S. and Tol, R.S.J.: 1996, Climate Change Costs – recent advancements in the economic assessment, *Energy Policy* 24 (7), 665-673.
- Fankhauser, S., Tol, R.S.J. and Pearce, D.W.: 1997, 'The Aggregation of Climate Change Damages: A Welfare Theoretic Approach', *Environ. Resour. Econ.* 10 (3), 249-266.
- Feinberg, J.: 1973, *Social Philosophy*, Englewood Cliffs, NJ.

- Hand, Judge L.: 1947, *United States v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947).
- Harberger, A.C.: 1972, *Project Evaluation: collected papers*, The University of Chicago Press, Chicago.
- Haveman, R.H.: 1969, 'The Opportunity Cost of Displaced Private Spending and the Social Discount Rate', *Water Resources Research* 5 (5), 947-957.
- HM Treasury: 2003, *The Green Book; Appraisal and Evaluation in Central Government*, HM Treasury, London.
- Howarth, R.B.: 2003, 'Discounting and Uncertainty in Climate Change Policy Analysis', *Land Economics* 79 (3), 369-381.
- Kamm, F.M.: 2000, 'Does Distance Matter Morally to the Duty to Rescue?', *Law and Philosophy* 19 (6), 655-681.
- Kaplow, L. and Shavell, S.: 1994, 'Why the Legal System is Less Efficient than the Income Tax in Redistributing Income', *J. Legal Stud.* 23 (2), 667-681.
- Koopmans, T.C.: 1960, 'Stationary Ordinal Utility and Impatience', *Econometrica* 28 (2), 287-309.
- Krutilla, J.V. and Eckstein, O.: 1958, *Multiple Purpose River Development*, Johns Hopkins University Press, Baltimore, MD, U.S.A.
- Lagerspetz, E.: 1999, 'Rationality and Politics in Long-Term Decisions', *Biodiversity and Conservation* 8 (1), 149-164.
- Lind, R.C.: 1982, 'A Primer on the Major Issues Relating to the Discount Rate for Evaluating National Energy Options', in Lind, R.C. et al. (eds.), *Discounting for Time and Risk in Energy Policy*, Resources for the Future, Washington, D.C.
- Marglin, S.A.: 1963, 'The Social Rate of Discount and the Optimal Rate of Investment', *Quarterly Journal of Economics* 77 (1), 95-111.
- Marshall, A.: 1890, *Principles of Economics*, Macmillan and Co., Ltd., London.
- Mendelsohn, R. and Neumann, J. (ed.): 1999, *The Impacts of Climate Change on the US Economy*, Cambridge University Press, Cambridge.
- Miceli, T.J. and Segerson, K.: 1995, 'Defining Efficient Care: The Role of Income Distribution', *Journal of Legal Studies* 24 (1), 189-208.
- Newell, R.G. and Pizer, W.A.: 2003, 'Discounting the Distant Future: How Much Do Uncertain Rates Increase Valuations?', *Journal of Environmental Economics and Management* 46 (1), 52-71.
- Newell, R.G. and Pizer, W.A.: 2004, 'Uncertain Discount Rates in Climate Policy', *Energy Policy* 32 (4), 519-529.
- Nordhaus, W.D.: 1994, *Managing the Global Commons*, MIT Press, Cambridge, MA.
- Nordhaus, W.D.: 1997, 'Discounting in Economics and Climate Change; An Editorial Comment', *Clim. Change* 37 (2), 315-328.
- Nordhaus, W.D. and Boyer, J.: 2000, *Warming the World: Economic Models of Global Warming*, MIT Press, Cambridge, MA.
- Nozick, R.: 1974, *Anarchy, State, and Utopia*, Basic Books, New York.
- Ogus, A.I.: 1997, 'Risk Management and 'Rational' Social Regulation', in Baldwin, R. (ed.), *Law and Uncertainty: Risks and Legal Processes*, Kluwer Law International, The Hague, pp. 139-153.
- Olsen, M. and Bailey, M.: 1981, 'Positive Time Preference', *Journal of Political Economy* 89 (1), 1-25.

- OMB (Office on Management and Budget): 1992, *Circular A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, <http://www.whitehouse.gov/omb/circulars/a094/a094.html>
- Parfit, D.: 1984, *Reasons and Persons*, Oxford University Press, Oxford.
- Pearce, D. and Turner, R.K.: 1990, *Economics of Natural Resources and the Environment*, Harvester Wheatsheaf, Hemel Hempstead.
- Pearce, D., Groom, B., Hepburn, C. and Koundouri, P., 2003, 'Valuing the Future: Recent Advances in Social Discounting', *World Economics* 4 (2), 121-141.
- Pogge, T.: 2002, *World Poverty and Human Rights*, Polity Press, Cambridge.
- Portney, P.R. and Weyant, J.P. (eds.): 1999, *Discounting and Intergenerational Equity*, Johns Hopkins University Press, Baltimore.
- Rabl, A.: 1996, 'Discounting of Long Term Costs: What Would Future Generations Prefer Us to Do?' *Ecological Economics* 17 (3), 137-145.
- Ramsey, F.P.: 1928, 'A Mathematical Theory of Saving', *Economic Journal* 38 (152), 543-59.
- Rawls, J.: 1972, *A Theory of Justice*, Oxford University Press, Oxford.
- Revesz, R.L.: 1999, 'Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives', *Columbia Law Review* 99 (4), 941-1018.
- Sandmo, A. and Dreze, J.H.: 1971, 'Discount Rates for Public Investments in Closed and Open Economies', *Economica* 38 (152), 395-412.
- Schelling, T.C.: 1995, 'Intergenerational Discounting', *Energy Policy* 23 (4/5), 395-401.
- Schelling, T.C.: 1999, 'Intergenerational Discounting', in: Portney P.R. and Weyant J.C. (eds.), *Discounting and intergenerational equity* (pp. 99-101), Resources for the Future Washington, D.C.
- Schindler, D.: 1921, 'The Administration of Justice in the Swiss Federal Court in Intercantonal Disputes', *American Journal of International Law* 15 (2), 149-188.
- Sen, A.K.: 1982, 'Approaches to the Choice of Discount Rates for Social Benefit-Cost Analysis', in Lind, R.C. et al. (eds.), *Discounting for Time and Risk in Energy Policy*, Resources for the Future, Baltimore, MD: Johns Hopkins University Press, pp. 325-353.
- Shrader-Frechette, K.S.: 1998, 'Risk, Ethics, and Discounting Future Generations', in Mosleh A. and Bari, R.A. (eds.), *Probabilistic Safety Assessment and Management, Proceedings of the 4th International Conference on Probabilistic Safety Assessment and Management (PSAM 4)*, Springer-Verlag, London, 2553-2358 (vol. 4).
- Shrader-Frechette, K.S. and Persson, L.: 2001, *Ethical Problems in Radiation Protection*, Stockholm, Sweden: The Swedish Radiation Protection Authority. SSI-Report 2001:11.
- Solow, R.M.: 1974, 'Intergenerational Equity and Exhaustible Resources', *Review of Economic Studies* 41 (Symposium on the Economics of Exhaustible Resources), 29-45.
- Spash, C. L.: 1993, 'Economics, Ethics, and Long-Term Environmental Damages', *Environmental Ethics* 15 (2), 117-132.
- Spash, C.L.: 1994, 'Double CO<sub>2</sub> and Beyond: Benefits, Costs and Compensation', *Ecological Economics* 10 (1), 27-36.
- Trail Smelter Arbitral Tribunal: 1941, 'Decision', *The American Journal of International Law* 35 (4), 684-736.

- Tullock, G.: 1964, 'The social rate of discount and the optimal rate of investment: Comment', *Quarterly Journal of Economics* 78 (2), 331-336.
- UNCHE: 1972, *Stockholm Declaration of the United Nations Conference on the Human Environment*, June 16, 1972, U.N. Doc.A/Conf.48/14/Rev.1.
- UNCED: 1992, *Rio Declaration on Environment and Development and Agenda 21*. The United Nations Conference on Environment and Development. Rio de Janeiro.
- WCED (World Commission on Environment and Development): 1987, *Our Common Future: The Brundtland Report*, Oxford University Press, New York.
- Weitzman, M.L.: 1998, 'Why the Far Distant Future Should be Discounted at its Lowest Possible Rate', *Journal of Environmental Economics and Management* 36 (3), 201-208.
- Weitzman, M.L.: 2001, 'Gamma Discounting', *The American Economic Review* 91 (1), 260-271.

# Chapter 5: How reasonable man discounts climate damage

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## Abstract

The social rate of time preference to be used in cost-benefit analysis of climate policy differs from the social rate of time preference to be used for policy issues which do not involve the prevention of risk of harm to future generations. The reason is that people weigh changes in other people's consumption differently, depending on whether or not a violation of rights is at stake. These different preferences are reflected in the standard of the 'reasonable man' from common law. There is no reason why these different preferences should not hold equally in the intergenerational context. If applied to the issue of climate policy, the reasonable man standard implies a zero social rate of time preference. The social discount rate for climate damage is about half a percent, the product of a twenty percent savings rate and a two to three percent risk-free rate of return on alternative investments.

## 1. Introduction

The *Stern Review on the Economics of Climate Change* (Stern, 2006) has refuelled the already hot debate on the social rate of time preference to be used in cost-benefit analysis of climate policy. The social rate of time preference determines how to weigh the benefits of climate policy, i.e. the climate-change-related damage prevented decades hence, against the consumption we would presently lose by incurring expenses on climate damage prevention. In his Review, Stern describes the common point of departure of standard welfare economics:

“The ethical framework of standard welfare economics looks first only at the consequences of actions (an approach often described as ‘consequentialism’) and then assesses consequences in terms of impacts on ‘utility’ (an approach often described as ‘welfarism’ ...). This standard welfare-economic approach has no room, for example, for ethical dimensions concerning the processes by which outcomes are reached. Some different notions of ethics, including those based on concepts of rights, justice and freedoms, do consider process.”

With respect to the social rate of time preference, welfarism implies the point of view that there is but one social rate of time preference, to be applied consistently across all policy issues. This rate may be time-

dependent (Thaler 1981; Frederick, Loewenstein, and O'Donoghue 2002), but at any given moment it is assumed to be the same for different changes in welfare. Welfarism assumes that it makes no difference whether or not the future change in welfare results from any violation of rights. Although Stern's particular quantitative choice of the social rate of time preference has been amply criticised (Beckerman and Hepburn 2007; Dasgupta 2007; Nordhaus 2006; Weitzman 2007), the underlying framework of welfarism still remains virtually uncontested (see also Dasgupta 2007 and for a notable exception Sen 1982).

However, while the welfarism perspective may be justified for certain policy issues, in the case of climate change this is not the case. Society does not perceive climate policy as a mere redistribution of our income to future generations (Schelling 1995) or as a gift to them (Lind 1999), but as a matter of justice – and when justice is at stake, welfarism contradicts people's everyday behaviour and preferences. In the real world people are not indifferent to the 'ethical dimensions concerning the processes by which outcomes are reached'. If economics ought to be based on the principle that preferences count (Pearce et al. 2003) and that societies should not be ruled by 'elites and philosopher-kings' (Beckerman and Hepburn, 2007), then economists should not ignore these preferences.

The purpose of this chapter is therefore first to show that people do indeed weigh changes in other people's consumption differently, depending on whether or not a violation of rights is at stake. In fact, these different preferences are already reflected in the standard of the 'reasonable man' from common law. In section 3, I argue that there is no reason why these different preferences should not hold equally in the intergenerational context. In section 4, I show how 'reasonable man' would discount climate damage. In section 5, I show that by assuming different social rates of time preference for different policy issues, the so-called opposition between the prescriptionist and descriptionist view can be resolved. In section 6, I discuss the extent to which expenditure on climate risk mitigation displaces alternative investment and, in section 7, how to estimate the rate of return that might be achieved on such alternative investment. In section 8, finally, I discuss the results. This chapter extends the work in the previous chapter (Davidson, 2006), first by offering new argumentation for the application of the reasonable man standard and second by offering a quantitative analysis in addition to the qualitative analysis in the previous chapter.

## **2. Spatial discounting and reasonable man**

Not without reason, the social rate of time preference is called a *preference*. It expresses society's preference as to how to weigh changes in present consumption against changes in future consumption. Since it is a preference,



it may depend on the issue at hand. As there is no fundamental difference between temporal discounting and *spatial* discounting, I first show that societies do indeed hold different preferences with regard to changes in welfare affecting contemporaries rather than future generations.

According to the standard welfare economic point of view, people have two basic reasons for discounting future changes in consumption relative to present changes (Ramsey 1928). First, people simply care less about remote events. Second, the wealthier one is, the less changes in consumption matter. In the world around us such discounting can indeed be observed in spatial terms, too. Thus, people generally attach less value to changes in other people's utility compared with their own, with that value declining ever further the more (empathically) remote those others are. We spend most on our own well-being, less on the well-being of our fellow countrymen via social security payments, and far less on the well-being of people abroad via development aid. If we are willing to spend money on the well-being of others, we are certainly less inclined to improve the well-being of the well-to-do than that of the poor.

However, this picture of reality only holds as long as there are no rights at stake. In practice, the cited behaviour is constrained by one's respect for other people's rights to bodily integrity and personal property. Although I may prefer winning the lottery rather than you, this does not imply a preference for stealing your property if you happen to win. Likewise, the fact that I care less about your gains from my activities than my gains does not imply indifference on my part if my activities happen to harm your property or health. Although I have no duty to benefit you, I have a duty not to harm you. Giving someone a hundred dollars and inflicting a hundred dollars of harm are not the same thing, simply with an opposite sign. From the perspective of welfarism they are, however.

It is not merely the case that people reveal a preference for rights to be respected and a willingness to respect the rights of others; these preferences have also been formalized in law. In our society, everyone has a legal duty not to cause injury to others, whether negligently or with intent. Risk of harm to others can never be avoided entirely, however. Therefore, common law requires us to take the care that a *reasonable man* would exercise under the circumstances. According to the Second Restatement of Torts (§ 291) of U.S. common law, for example:

“Where an act is one which a reasonable man would recognize as involving risk of harm to another, the risk is unreasonable and the act is negligent if the risk is of such magnitude as to outweigh what the law regards as the utility of the act or of the particular manner in which it is done.”

People do not only have a legal duty to exercise the care of a reasonable man when their acts involve the risk of harm to fellow-countrymen; international treaties also oblige us to take reasonable care when our acts involve the risk

of harm to people living abroad, as in the case of transboundary air pollution (see e.g. UNCHE 1972; UNCED 1992).

Since the standard of reasonable man is highly relevant for the issue of intergenerational justice, I discuss this standard in more detail. Please note that I have no intention to advocate a particularly male view on the subject, but wish to stay close to common legal parlance. The most common interpretation of reasonableness was introduced by Judge Learned Hand in the famous *Carroll Towing* case (Hand 1947; see also Posner 1978, 2002; Landes and Posner 1987):

“[T]he owner's duty, as in other similar situations, to provide against resulting injuries is a function of three variables: (1) The probability that she will break away; (2) the gravity of the resulting injury, if she does; (3) the burden of adequate precautions. Possibly it serves to bring this notion into relief to state it in algebraic terms: if the probability be called P; the injury, L; and the burden, B; liability depends upon whether B is less than L multiplied by P: i.e., whether B less than PL.”

In other words, an act is considered reasonable if the resulting benefits outweigh the risk of harm to another person, a view which is reflected for example in the First, Second and draft Third Restatement of Torts of U.S. common law (Wright 2002). If damage is to occur, the reasonable man is entitled to demonstrate to the victim that the benefits outweigh the damage. It should be noted that the standard of reasonable care does not necessarily require compensation for damage. In the case of negligence liability, one is only responsible for compensatory damages if one has failed to take reasonable care.

The Hand interpretation of reasonableness is not undisputed, though (Wright 2002; Gilles 2001; Zipursky 2007). Some have remarked that there is generally more to the determination of negligence or reasonableness than the weighing of benefits and risk of harm, or that not all the relevant factors can be encompassed by a single (economic) metric. However, since discounting involves no more than the weighing of costs and benefits, this criticism need not concern us here. A second criticism is that the Hand formula is not stringent enough. Wright (1995, 2002) offers an example of a possible criticism: “It is not properly respectful of the equal dignity and autonomy of others, and hence not just, for you to impose substantial unaccepted risks of injury or loss upon them merely for your own personal benefit, even if your gain will exceed their loss.” This might explain why English law sometimes attaches greater weight to the injury. When in the United Kingdom the Law Lords were asked in 1949 to give a definitive ruling on the meaning of ‘reasonably practicable’, Lord Justice Asquith (1949) ruled that

“‘Reasonably practicable’ is a narrower term than ‘physically possible’ and seems to me to imply that a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that if it be shown that there is a *gross disproportion* between them - the risk being insignificant in relation to the sacrifice - the defendants discharged the onus on them.” (emphasis added).

Since the Hand formula offers the most common interpretation of the reasonable man standard and this standard, as I shall argue, would already qualify most argumentation in the present discounting debate as *negligent*, I shall interpret the reasonable man standard as requiring an act to result in benefits outweighing the risk of harm to another person. It should be borne in mind, though, that more stringent interpretations are conceivable.

There are two features of the reasonable man standard that are of particular importance for the discounting issue. Although the standard of ‘reasonable care’ is open to interpretation, no legal interpretation is conceivable in which the risk creator explicitly characterises losses by the risk bearer as less important on the grounds that the risk bearer is wealthier than the risk creator, or (empathically) remote (Arlen 1992, 2000). Although Marshall (1890) noted that "a pound's worth of satisfaction to an ordinary poor man is a much greater thing than a pound's worth of satisfaction to an ordinary rich man", no judge or court would see this as a justification for the less wealthy to harm the better off. If the Mexican government, for example, were to perform a cost-benefit analysis of a power plant to be built near the border with the United States, it would not be permitted to discount any dollar of harm experienced by U.S. citizens, for example due to sulphur deposits, to account for the fact that U.S. citizens are on average five times wealthier than Mexican citizens or to account for the fact that the emotional ties between fellow Mexicans are generally stronger than those between Mexicans and U.S. citizens. Even if governments occasionally follow these lines of reasoning *off the record*, it is inconceivable that such reasoning would be written down and justified in public policy reports. Furthermore, such conduct would violate international law.

In conclusion, while people generally attach less weight to changes in consumption if these changes are experienced by people who are wealthier or (empathically) remote, reasonable man applies a zero *consumption rate of interest* if he recognizes that his acts involve risk of harm to others. This is not just one theoretical moral position among many, but a social preference revealed through the establishment of law and accepted standards of conduct. It is therefore to be concluded that societies do indeed hold different preferences as to how to weigh changes in other people’s welfare, depending on whether or not rights are at stake.

### 3. Intergenerational justice

If the prevailing social preference as to how to value changes in other people's welfare depends on whether or not rights are at stake, why should this then differ if these others are not contemporaries, but future generations? What could justify governments handling trans-national air pollution according to different moral rules than trans-generational air pollution (see also Parfit, 1983)? Certainly, we have as yet no well-defined legal duties towards future generations. Some might even question whether our present acts really involve any risk of harm to them (see for a discussion: Davidson, 2008). Yet, it is a political reality that most governments have already recognized that our present acts involve the risk of harm to future generations, for example through climatic change (UNFCCC 1992). Moreover, most governments have expressed their commitment to intergenerational justice (UNFCCC 1992; UNESCO 1997; UNEP 1997; UK Government 1999). Although intergenerational justice is difficult to define, the formal requirement of justice, that equal cases be treated equally and different cases differently, is an important starting point for any policy on justice. Amongst other things, this requirement means that every person should receive the same treatment under the law and the same treatment from the authorities. To treat people differently, one must have relevant moral grounds (Rawls 1972; Shrader-Frechette and Persson 2001). Therefore, a relevant question for any government taking its commitments to intergenerational justice seriously is how to handle the risk of damage future generations experience due to our present acts through the eyes of the 'reasonable man' from common law.<sup>1</sup>

It may be argued that the reasonable man standard involves assessments of damages that differ in their context from the problem of climate change, in which the core issue is the potential for intergenerational damages experienced by persons largely as yet unborn. The point, however, is that the differences in context are *morally irrelevant*. In former times, the law was not applied equally to foreigners, coloured people and women. For sure, at the time the context in which the law was applied also varied: application to coloured people, for example, took place in a different context from its 'normal' application, i.e. to white people. However, since the differences between white and coloured people were morally irrelevant, the formal requirement of justice required the law to be applicable to coloured as well as white people. There was no discussion possible about other moral views on how to treat coloured people except by simply extending law to encompass coloured people as well. Therefore, the application of the

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<sup>1</sup> Please note that this interpretation of intergenerational justice is explicitly linked to actual law in contrast to various interpretations of intergenerational justice based upon principles of distributional fairness (see e.g. Howarth 1997).

reasonable man standard in the intergenerational context is not just one moral point of view among many. *Even* if one were to disagree with the reasonable man standard from common law, intergenerational justice cannot mean anything but the application of present law to future generations, until such time as the reasonable man standard itself, as applied to contemporaries, is changed.<sup>2</sup>

To my knowledge, there is no government or government statement which has expressed the point of view that future generations differ from present generations in any morally relevant respect that might justify different treatment, i.e. that norms regarding the handling of risk to others should not apply equally to future generations. On the contrary, in public debates and policy reports a willingness is generally expressed to treat future generations in accordance with justice. If economics are to be based on the principle that preferences count and that societies should not be ruled by ‘elites and philosopher-kings’, then it is highly relevant that most people *do* consider physical injury or personal loss experienced by future generations due to man-made climate change to be wrongful harms, for which the present generations are morally accountable.

Finally, it may be argued that society’s support for intergenerational justice is only a weak ‘stated preference’ that will not be confirmed as a ‘revealed preference’ once governments actually implement climate policy on the basis of the reasonable man standard. This conclusion is premature, however. Economists generally downplay citizens’ support of intergenerational justice on the basis of a comparison with Western budgets for development aid, which are only a tiny fraction of the budgets spent locally on health care, education, unemployment benefits, et cetera, even though an Euro spent in a developing country will most likely be better ‘value for money’ (Pearce et al. 2003). As argued earlier, though, people’s willingness to improve the general well-being of others has little to do with their willingness to respect the right of others to be left unharmed. While our willingness to help others clearly diminishes the more remote those others are, this is not necessarily the case when it comes to our willingness not to harm others. This distinction between helping and not harming is reflected in common law: although the reasonable man has a duty not to cause injury to others, he may exercise self-interest and is not required to donate his money to the poor, for example. Therefore, expenditure on development aid does not tell us much about people’s preferences concerning the prevention of damage to future generations for which we are responsible. So all we know about the willingness of the citizenry to prevent harm to future generations is what they express directly, through the political process, and this does in fact

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<sup>2</sup> On the basis of an utilitarian, consequentialistic moral view Parfit (1983), for example, argues that discounting is morally allowed to account for the fact that future generations may be wealthier. However, the point is that as long as this moral view is not reflected in common law it cannot be a basis for intergenerational justice.

indicate such a willingness. To confront society with an ‘optimal’ climate policy in which economists already anticipate society’s presumed unwillingness to protect future generations against harm is to put the cart before the horse.

#### **4. How reasonable man discounts climate damage**

What might the reasonable man standard imply in the case of climate damage, where the initial act and the damage are separated by many decades? The answer to this question is complicated by the fact that expenditure on climate change mitigation is not only at the expense of present consumption, but at the expense of alternative investments as well, reducing the opportunities for increased future consumption. Owing to reinvestment, expenditure on climate risk mitigation may in fact be at the expense of a consumption stream extending infinitely into the future. How then to compare postulated climate damage with this infinite consumption stream that would be lost if expenses are incurred to prevent climate damage? Here, too, reasonable man should be able to justify his acts to the victim, although this will generally be in thought only, for in all probability our reasonable man is already deceased by the time the damage has occurred. The latter fact is morally irrelevant, however. What benefits of his actions could justify the ensuing damage? First, he could point to the consumption that had resulted from not refraining from the act he performed or not reducing its risk. This consumption includes not only the consumption at the time of the act, but also that occurring between then and the moment of damage, ensuing from alternative investment of the money that would otherwise have been spent on risk prevention. Second, he could point to the investments made from the moment of his act up to the moment of damage. That investment sum would be available to the victim and could be diverted to consumption as well. If the sum of these two benefits – the consumption *before* the moment of damage and the investment still available *at* the moment of damage – outweighs the damage, reasonable man would not have been negligent. The benefits of his acts would then outweigh the costs and he would have taken reasonable care.

By adding the investment sum available to the victim to the consumption before the moment of damage, we can neglect the consumption stream extending beyond the moment of damage. It is up to the victim how to divert the investment sum. If one prefers, however, one can also ignore the investment sum, and instead add the consumption stream extending beyond the moment of damage discounted against the consumption rate of interest for changes in one’s *own* consumption, since this stream is viewed from the point of view of the victim. Under the assumption that the interest rate for changes in one’s own consumption is closely related to the (risk-

free) rate of return on investment, this will give the same result as adding the investment sum available at the moment of damage.

Table 1 clarifies this approach by means of a numerical example. In this example, I take an advance on two assumptions which I shall substantiate in later sections. First, I assume a marginal propensity to save of 20% (section 6); second I assume a two and a half percent (risk-free) rate of return on investment (section 7). That means that money saved by *not* investing in damage prevention is consumed for 80% and alternatively invested for 20%. Furthermore, I assume that invested capital remains fully invested and that the same 20% of the returns on investment is reinvested. Imagine then sixty-one dollars are spent today to prevent one hundred dollars of climate harm in a hundred years' time. Would this expenditure still be *reasonable*? If sixty-one dollars are spent today on climate risk mitigation, we may expect – under the given assumptions – the loss of eighty dollars of consumption between today and the moment of harm, and the loss of twenty dollars of alternative investments at the moment of harm. This amount exactly balances the hundred dollars of climate damage. Therefore, the conclusion is that reasonable man would prevent a hundred dollars of climate damage in a hundred years time if it costs less than sixty-one dollars today.

Table 1 Consumption and alternative investment losses due to a \$ 60.73 investment to prevent damage in a hundred years' time.

	Investment in damage prevention	Alternative investment losses	Consumption losses (cumulative)	Prevented damage
Year 0	\$ - 60.73	\$ - 12.15	\$ - 48.58	
Year 1		\$ - 12.21	\$ - 48.83	
Year 2		\$ - 12.27	\$ - 49.07	
Year 3		\$ - 12.33	\$ - 49.32	
...		...	...	
Year 100		\$ - 20.00	\$ - 80.00	\$ 100.00

Basically, this calculation follows the shadow price of capital approach, in which future consumption flows are discounted against the consumption rate of interest (Eckstein 1958; Arrow and Kurz 1970; Bradford 1975; Lind 1982). The main difference with the common application, is a zero consumption rate of interest to consumption losses due to climate change and consumption (losses) due to alternative investments before the moment of damage.

Instead of using this shadow price of capital approach, one can also directly compare the climate damage against the present investment by means of the social discount rate instead of the consumption rate of interest. The social discount rate can be approximated by the weighted average of the

marginal rate of return on investment and the consumption rate of interest, where the weight factors are given by the marginal propensities to save and consume, respectively (Krutilla and Eckstein 1958; Haveman 1969; Sandmo and Dreze 1971; Harberger 1972). In the numerical example, where the marginal rate of return on investment is 2.5% and the marginal propensity to save is 20%, the social discount rate becomes 0.5%. And indeed, if a hundred dollars of climate damage in a hundred years time is discounted against a social discount rate of 0.5%, the same sixty-one dollars results as in the example.

In this numerical example, the climate damage is taken to occur at a single moment in time. Of course, in reality climate change is not such a 'one-off event'. However, the fact that climate damage extends over many decades or centuries does not alter the approach. Any stream of consumption losses due to climate change damage can be discounted by means of the social discount rate against present expenditure on damage prevention.

## 5. Two opposing views

Because of the assumption of a single social rate of time preference whatever the processes by which outcomes are reached, there has been an apparently unbridgeable gap between two opposing positions in the discount debate. Arrow et al. (1996) have labelled these positions the 'prescriptionist view', such as Stern's view according to which there is moral reason to 'treat the welfare of future generations on a par with our own' (Stern 2006) and the 'descriptionist view' according to which the social rate of time preference should reflect observed savings behaviour (see e.g. Weitzman 2007). The gap results, however, from the all-or-nothing moral choice welfarism commands: either *impersonal* welfarism, as advocated by Stern, or an 'agent-relative ethics' (Beckerman and Hepburn 2007; Arrow 1995, 1999), according to which we are justified to care less about the emphatically remote. The moral point of view of impersonal welfarism, as expressed in classical utilitarianism, has been criticized by moral philosophers as being too demanding and alienating from our personal projects and commitments (Smart and Williams 1973). Certainly, such a self-sacrificing and self-denying attitude is rarely found in this world and thus hardly corresponds to public preferences. An agent-relative welfarism conflicts just as much with moral theory and public preferences, however, for it neglects rights. The gap can be bridged, though, if welfarism is abandoned and it is acknowledged that the social rate of time preference may depend on whether or not rights are at stake.<sup>3</sup> When rights are *not* at stake, as in the case of present

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<sup>3</sup> Not accidentally Weitzman (1998) made his observation that "to think about the distant future in terms of standard discounting is to have an uneasy intuitive feeling that something is wrong, somewhere" in the context of "global climate change, radioactive



investments in transport or communications technology, there is no decisive moral reason to apply a lower social rate of time preference than observed in savings behaviour. When rights are at stake, though, there is good reason to apply a zero social rate of time preference. The latter rate does not conflict with observed savings behaviour, however, since savings behaviour has nothing to do with preferences regarding how people wish to deal with harm to future generations. Savings behaviour simply expresses how people weigh present and future changes in their *own* consumption. Preferences regarding intergenerational justice are expressed through the political process. The application of a zero social rate of time preference for future harm does not therefore imply that the present generations should save more for the future, since this rate does not relate to general investments. There is no general duty to make future generations wealthier.

Some argue, however, that the social rate of time preference is simply irrelevant, since future changes in consumption should always be discounted against the marginal rate of return on investment. After all, it is argued, if the future is discounted at a rate *lower* than the marginal rate of return on investment, then alternative investments are available which offer future generations a higher rate of return than the investment in climate change mitigation (Nordhaus 1997, 2006; Birdsall and Steer 1993). From the reasonable man perspective this approach will not do, though, for something is promised that cannot reasonably be delivered. On the one hand, we know that such a full, continuous (re)investment process is not an actual alternative. In practice, only a small fraction of society's expenditures on climate policy is at the expense of alternative investments, with the lion's share at the expense of present consumption (for quantitative estimates, see the next section). On the other hand, even if society were to immediately establish a dedicated investment fund from which to compensate future climate victims, it is highly doubtful whether such a fund would survive until the moment of climate damage (Lind 1995; Arrow et al. 1996; Cline 1999). Since, as Cline states (1999: 134), history gives us reasonable "fear that in the interim some populist administration will loot the fund", the idea that the present generations could *potentially* compensate future generations becomes unrealistic and baseless. If at some time in the future, therefore, we are called on to justify our present acts, we simply know we will be unable to demonstrate the benefits resulting from those acts that are supposed to

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waste disposal, loss of biodiversity, thinning of stratospheric ozone, groundwater pollution, [and] minerals depletion". These are precisely the kind of issues where people have an intuitive feeling that our present acts involve the risk of harm to future generations. In such cases, people also have an intuitive feeling we are not treating these risks with the same reasonable care we expect in the case of risk to our contemporary fellowmen. If, on the other hand, the examples involved future benefits resulting from increased present investments in communication or transport technologies, few people would share the same 'uneasy intuitive feeling' about discounting.

outweigh the future damage. Consequently, the Kaldor-Hicks compensation test will not be passed. Since the choice between two options – damage mitigation or not – should not depend on a third option that is in practice unavailable (Hammit and Harvey 2000), it is unreasonable to assume such a scenario in determining the reasonableness of our present acts. In other words, reasonable man does not compare future climate damage with an unrealistic, wishful-thinking scenario, but with a reasonable estimate of what will actually happen to consumption and investment as a result of his present acts.

## **6. Consumption and investment shares**

How to make a reasonable estimate of the fractions of expenditure on climate risk mitigation that are at the expense of consumption and alternative investment? Of course, these fractions depend on the kind of government action involved (Lind 1990). As a point of departure, however, I shall assume the government taking action to urge society to reduce greenhouse gas emissions, rather than the government itself making investments. One could think of direct regulation, such as the prescription of specific technologies, or generic policy instruments, such as introduction of a regulatory carbon tax or a system of tradable carbon rights. Even given this demarcation, there has been much debate about the displacement of consumption and investment. Some have argued that environmental regulation might not displace any private investment at all, for example Kolb and Scheraga (1990, see also Lind 1990):

“In competitive markets, the costs of environmental controls can be fully passed through to consumers in the long run, just as are other capital and operating costs. Product prices would increase by an amount reflecting the marginal rate of return on investment, the expected lifetime of the pollution controls, and any operating costs. The capital that was initially displaced would be returned to the economy as the firm recovers its costs over time. Further, it is reasonable to assume that consumers’ savings rates out of disposable income would not be affected by the regulation (i.e., they are fixed). Thus, the increased amount paid for products due to the imposition of environmental controls would come from reductions in other consumption, not from reductions in savings.”

This last assumption is unlikely, however, given the empirical fact of society's non-zero marginal propensity to save. In other words, if people have less disposable income, they reduce not only their consumption, but also their savings. Empirical estimates of the marginal propensity to save are a difficult matter, however, and a wide range of results is available (Souleles 1999, 2002; Dynan, Skinner, and Zeldes 2004). Furthermore, empirical data

on the marginal propensity to save out of disposable income is strongly influenced by fluctuations in the real value of assets. In the United States, for example, since the 90s the marginal propensity to save out of disposable income has been much lower than the overall savings rate (U.S. Census Bureau 2006), because the large increase in the real value of assets reduced the necessity to save (Hall and Mishkin 1982; Dynan and Maki 2001). If the increase in savings due to rising values of equities and real estate is included, the marginal propensity to save is much higher. Therefore, in cost-benefit analysis it is ‘common procedure’ (Pearce and Ulph 1999) to use the ratio of gross national investment to Gross National Product as an estimate of the share of expenditure on environmental investments from displaced alternative investment. It should be noted, however, that although a *marginal* propensity to save and invest is required, the most reliable data available concern the *average* ratio of gross national investment to Gross National Product. Cline, for example, uses this approach (1992: 237):

“If a carbon tax is used to discourage emissions, for example, the tax revenue comes out of the general economy. Similarly, if a quota limit is set on emissions, and less efficient means of production must be substituted for fossil fuels, the resulting reduction in production comes from the economy at large. In either case, the sourcing of the resource cost of the policy will reflect the general shares of consumption and investment in the economy. As a result, some 80 percent of the resources withdrawn for the greenhouse action is likely to come from consumption and only some 20 percent from investment. ... This is a reasonable global average. For the United States, the historical investment rate is closer to 15 percent to 17 percent of GDP.”

For the United Kingdom, Pearce and Ulph (1999) find a value of 0.17, which is the same as Moore et al. (2004) found for the United States. Finally, in his widely cited standard work on discounting (1982: 85), Lind gave a value of 0.2, although in 1990 (page S-16) he assumed a value of 0.1. The latter value relates more, however, to the marginal propensity of consumers to save out of disposable income only.

It should be noted that higher income groups generally save more than lower income groups (Dynan, Skinner, and Zeldes 2004) and that nations with a higher per capita GDP generally have a higher savings rate than low-income countries (Weil 2005: 70, based on Heston, Summers and Atten 2002). However, historical data gives no reason to assume that the savings rate likewise increases in step with growing per capita GDP (U.S. Census Bureau 2006: 875; Heston, Summers and Atten 2002). Given that the savings rate does not generally deviate far from 0.2, I shall assume that if case-specific information provides no evidence to the contrary, it is reasonable to assume that twenty percent of expenditure on climate mitigation is at the expense of alternative investments. Historical data provides no grounds for assuming this value will change substantially in the

(distant) future. Moreover, it is assumed that although the costs of climate policy may be substantial, the economic impacts will still be sufficiently small not to alter the savings rate. In the most recent IPCC report (2007), for example, the reduction of average annual GDP growth rates in 2030 is estimated at less than 0.12% to achieve stabilisation of concentrations at 445-535 ppm CO<sub>2</sub>-eq. (see also Azar and Schneider 2002).

Finally, in the absence of evidence to the contrary, it is reasonable to assume that invested capital remains fully invested and that the same fraction of 0.2 of the returns on investment is reinvested (Lind 1982; Mendelsohn 1981).

## 7. The rate of return on investment

How to estimate the rate of return on investment that will be achieved by refraining from climate mitigation? In this section, I shall first describe the approach in which the *expected* rate of return on private investment is used. Subsequently, I shall argue that both economic reasoning and legal practice provide grounds for using the *risk-free* rate of return instead. Please note that when I speak of *the* rate of return on private investment, this is short-hand for the marginal pre-tax net real rate of return on private investment:

- *marginal*, since it is the marginal investment that will be displaced if regular private investment is crowded out by investments to reduce climate risk. Most authors believe that the schedule for the marginal efficiency of capital slopes downward, and that therefore the marginal rate of return on investment will be less than the average rate of return (Lind 1982: 78-79; Cline 1992: 261-2; Arrow et al. 1996: 133 and 142 note 17; Poterba 1998: 14-15). See for doubts about the relevance of the difference between average and marginal rates of return: Stockfish 1982: 263;
- *pre-tax*, since the government's share of the return via corporate and private-income taxes goes into individual consumption as well taking the form of publicly provided goods and services (Lind 1982: 30);
- *net*, since part of the gross returns on investment is required to replace depreciated assets and therefore does not add to consumption;
- *real*, since the nominal return includes the impact of inflation, while the real rate measures the opportunity cost of foregoing consumption.

Some economists concern themselves with the rate of return that is *expected* on the basis of the empirical evidence of past rates of return, for which there are three basic sources (Nordhaus 1994: 125-129). In the first approach, used by Nordhaus in his DICE model, the rate of return is derived from economic

models using aggregate data on inputs of labour and capital, and estimates of the pure rate of time preference and the elasticity of the marginal utility of income. Nordhaus thus arrives at an average real return on assets of 6.3 percent during the period 1960-89.

In the second approach one looks at the rates of return in capital markets for financial instruments such as equities. These returns are highly volatile, since they include expectations of future performance. The real, post-corporate tax, pre-income tax annual returns of the Standard and Poor's index of the 500 largest companies (S&P 500) yield a geometric mean of 7% over the period 1926-2004 (Ibbotson Associates 1999; Standard and Poor 2005). Under the assumption of 35% corporate income taxes, the pre-corporate-tax return to large capitalization stocks would be around 11%.

In the third approach one looks at the actual 'accounting' returns to investments such as corporate capital. According to Poterba (1998), in the US the average pre-tax return on capital in the non-financial corporate sector averaged 8.5 percent over the period 1959-1996 (5.1% after corporate taxes). Elmendorf and Mankiw (1998: 21) estimate the net marginal pre-tax return on aggregate capital at 6 percent between 1960 and 1994 in the United States. In part, this lower estimate of the marginal product of capital reflects the fact that the return on capital in the non-corporate sector (e.g. housing) may be lower than in the corporate sector. Another influential source is the US Office on Management and Budget (1996):

“The discount rate specified in [OMB Circular A-94] is intended to be an approximation of the opportunity cost of capital, which is the before-tax rate of return to incremental private investment. The Circular A-94 rate, which was revised in 1992 based on an extensive review and public comment, reflects the rates of return on low yielding forms of capital, such as housing, as well as the higher rates of returns yielded by corporate capital. This average rate currently is estimated to be 7 percent in real terms (i.e., after adjusting for inflation).”

And: “In a recent analysis, OMB found that the average rate of return to capital remains near the 7 percent rate estimated in 1992” (OMB 2003).

Given the various kinds of empirical evidence of past rates of return, and the assumption that investments due to 'optimal' climate policy instruments will crowd out both low and high yielding forms of capital investments, OMB's current estimate of seven percent seems a reasonable estimate of the marginal pre-tax net real rate of return on private investment in the past as well as in the future.

At the same time, however, “past performance is no guarantee of future results”, as investment funds always warn us. Likewise, the *actual* future return on investment achieved by refraining from climate mitigation may differ substantially from the *expected* figure of seven percent. Therefore, both economic theory and legal practice give governments reason

to estimate the return on investment achieved by refraining from climate mitigation not on the basis of the expected rate of return on average investment, but rather on the basis of the much lower *risk-free* rate of return, such as that on U.S. Treasury securities. Treasury securities are considered practically risk-free, as the government is able to create money to fulfil its debt obligations under virtually any scenario (Ibbotson Associates 1999).

The economic reasoning runs as follows (see e.g. Arrow and Lind 1970; Lind 1982; Lanzillotti and Esquibel 1990; Fisher and Romain, 1990: 146; Arrow 1995; Arrow et al. 1996; Knoll 1996: 314; Howarth 2003; Spackman 2004). Given the uncertainty surrounding predictions of climatic change, returns on investments in climate risk mitigation are probably even more uncertain than returns on conventional investments. However, to avoid comparing apples and oranges, i.e. costs and benefits with different risk characteristics, *and* to keep the analysis as transparent as possible, the approach commonly adopted in cost-benefit analysis is first to convert uncertain costs and benefits into certainty equivalents, *before* discounting the latter at a risk-free rate (Lind 1982; Arrow et al. 1996; Bazelon and Smetters 2001). The certainty equivalent is the guaranteed return that would make an individual indifferent between it and the uncertain outcome. For risk-averse individuals, the certainty equivalent would be lower than the expected value, because risk intrinsically has a negative value. The difference between the expected value of net benefits subject to risk and the certainty equivalent is called the risk premium (OMB 1996).

So the question of interest is what investment in climate risk mitigation ‘reasonable man’ should make to prevent a certainty equivalent of climate damage. This being our question, we are also looking for the certainty equivalent of the return on investment achieved by refraining from climate risk mitigation. This certainty equivalent is the *borrowing* interest rate, which in the case of the government is the rate of return on Treasury bonds. That the borrowing interest rate is the certainty equivalent of the expected rate of return on conventional investment is readily clarified: if the relatively low borrowing interest rate were to be valued less than the relatively high expected rate of return on conventional investments, then individuals and companies would start borrowing funds to increase investments *en masse*. The present equilibrium shows, however, that at the margin investors are indifferent between the risk-free rate of return or borrowing interest rate and investments in the corporate sector (Arrow and Lind 1970: 374-375; Arrow 1995). Therefore, climate damage is to be weighed against the consumption that is lost by borrowing funds either to finance climate damage prevention or to fund the alternative investments that would be lost by investing in such prevention. Any return on conventional investments over and above the risk-free rate is compensation for bearing risk, not a benefit of refraining from climate risk mitigation (Myers et al. 1997: 9).

Legal practice supports estimating the return on investment achieved by refraining from climate mitigation on the basis of the risk-free rate of return. Although courts have used a variety of approaches in the past, there are presently sufficient precedents to defend a risk-free rate (see e.g. Podolsky 2002; Fuhrman 2003). Imagine, for example, a defendant who for several years has been in unlawful possession of an asset, through theft or non-compliance with regulations. Holding the asset for this period has given the defendant the opportunity to invest. Under current law, the defendant can successfully claim that the only returns on investment to which the plaintiff is entitled are the risk-free returns. First of all, this view is contained in the U.S. federal pre- and post-judgment interest rate (US Courts 2006):

“Interest is allowed on most judgments entered in the federal courts from the date of judgment until paid. The types of judgments generally fall under one of three statutes: 28 U.S.C. 1961, which governs civil and bankruptcy adversary judgment interest; 18 U.S.C. 3612 (f)(2), which governs criminal judgments or sentences; and 40 U.S.C. 3116, which governs deficiency judgments in condemnation proceedings. ... Under each of the above statutes the rate of interest used in calculating the amount of post judgment interest is the weekly average 1-year constant maturity (nominal) Treasury yield, as published by the Federal Reserve System.”

Second, there are various cases in which courts have estimated the economic benefit of non-compliance with regulations using the risk-free rate of return as the pre-judgment interest rate. For example, in *United States v. WCI Steel, Inc.* (1999) the court had to choose a rate of return to calculate the present economic benefits accruing to WCI Steel through non-compliance with the National Emission Standard for Hazardous Air Pollutants for Asbestos:

“The central issue is whether a rate reflecting risk should be used as to past benefits or obligations. Any return above the risk-free rate is earned not from delay but by assuming risk, and therefore is not properly considered economic benefit from non-compliance. ... In determining economic benefit, the Court therefore finds an after-tax, risk-free rate is correct.”

In a 2003 case of non-compliance with regulations, the federal district court made the following ruling in *United States v. The New Portland Meadows LLC* :

“I also assume the United States Treasury’s short-term cost of capital for the calculations because I believe it results in a more reasonable economic benefit estimate [as a result of non-compliance].”

If a defendant can successfully claim that it is only the risk-free rate that may be taken as the economic benefit of non-compliance with regulations, then it

seems obvious that in determining ‘reasonable care’ the risk-free rate should be used as well. The point, therefore, is not that the climate-risk creator cannot expect higher returns from alternative investments, but that the risk premium should not enter into determination of ‘reasonable care’. Risk-related profits should be distinguished from the economic benefits of leaving climate risk be (Podolsky 2002: 1018).

In conclusion, since we are asking what figure should be spent on preventing the certainty equivalent of future climate damage, we are also looking for the certainty equivalent of the consumption lost through investment in climate damage mitigation. To calculate the certainty equivalent of this lost consumption, we need the risk-free rate of return on investment. At the time of this writing, the weekly average 1-year constant maturity (nominal) U.S. Treasury yield is about 5%. On the basis of the yields on Treasury Inflation-Protected Securities (TIPS), the present real risk-free rate of return is estimated at just over two percent (US Federal Reserve Board 2006). Because the average of the real interest rate on long-term Treasury securities between 1870 and 2000 is about three percent, the real interest rate is generally expected to be about three percent in the long term as well (US Department of the Treasury 2005).

## 8. Discussion and conclusion

In section 4, I stated that from the reasonable man perspective the sum of the consumption *before* the moment of climate damage and the investment still available *at* the moment of damage should outweigh the projected damage. If it does not, one has been negligent or *reckless* in more precise juridical terms given the foresight of climate risk. In the previous sections, I argued that reasonable man would estimate that about twenty percent of investment in climate change mitigation is at the expense of alternative investments and that these alternative investments obtain a two to three percent risk-free rate of return. Given these values, it can be shown that a reasonable man would apply a social discount rate in cost-benefit analysis equal to the rate of return on private investment times the extent to which alternative investment is displaced by expenditure on climate risk mitigation, i.e. about half a percent.

Half a percent is a much lower value than commonly used in cost-benefit analysis and may raise resistance on purely arithmetic grounds. A social discount rate of half a percent could lead to infinite marginal damage estimates of present carbon dioxide emissions if it is assumed that global GDP grows faster than the rate at which greenhouse gases are removed from the atmosphere, *and* if it is assumed that climate damage is directly proportional to GDP (Tol 2003). Under these assumptions, the damage due to a present emission of greenhouse gases would continue to grow forever and a social discount rate would be required to arrive at finite marginal



damage estimates of present carbon dioxide emissions. This arithmetic trick does not seem inevitable, however, since there are more reasons to consider for assuming that future impacts will be both higher and lower than if they were to occur today. On the one hand, rich societies tend to have a higher willingness to pay for a clean environment and intact nature (Manne 1999; Horowitz 2002). On the other hand, rich societies are less vulnerable to climate change (Yohe and Tol 2002; Adger 2006, Smit and Wandel 2006). The share of climate-sensitive sectors such as agriculture will diminish and the vulnerability will diminish, for example through technological progress and adaptation (Yohe and Tol 2002). All these effects are uncertain. To a large extent, however, these countervailing effects are coupled (Smit and Wandel 2006). Vulnerability will decrease and adaptation increase more rapidly with economic growth. Given this coupling and the lack of quantitative information (see for an exception: Tol 2002), I do not see sufficient reason to assume that in the future climate change will have different overall impacts on consumption than the same climate change would have today. Consequently, on the basis of presently available information it does not appear to be reckless for reasonable man to take precautions as if the future were like the present, apart from climate change. In that case, the impacts of a present emission of greenhouse gases diminish in the distant future solely at the rate at which these gases are removed from the atmosphere, and there is no need for a social discount rate on purely numerical grounds to arrive at finite results.

## References

- Adger, W. N. 2006. "Vulnerability." *Global Environmental Change* 16 (3): 268-281.
- Arlen, J. 1992. "Should Defendants' Wealth Matter?" *Journal of Legal Studies* 21 (2): 413-429.
- Arlen, J. 2000. "Tort Damages." In *Encyclopedia of Law & Economics* 2, ed. B. Bouckaert and G. de Geest, 682-734. Cheltenham: Edward Elgar.
- Arrow, K. J. 1995. "Intergenerational Equity and the Rate of Discount in Long-Term Social Investment." IEA World Congress, December 1995. Available at: [www-econ.stanford.edu/faculty/workp/swp97005.pdf](http://www-econ.stanford.edu/faculty/workp/swp97005.pdf).
- Arrow, K. J. 1999. "Discounting, Morality, and Gaming." In: *Discounting and intergenerational equity*, ed. P. R. Portney and J. P. Weyant, 13-21. Baltimore: Johns Hopkins University Press.
- Arrow, K. J., and M. Kurz. 1970. "Public Investment, the Rate of Return, and Optimal Fiscal Policy." Baltimore: Johns Hopkins University Press.
- Arrow, K. J., and R. C. Lind. 1970. "Uncertainty and the evaluation of public investment decisions." *American Economic Review* 60 (3): 364-78.
- Arrow, K. J., W. R. Cline, K. G. Mäler, R. Squitieri, and J. E. Stiglitz. 1996. "Intertemporal Equity, Discounting, and Economic Efficiency." In: *Climate Change 1995 - Economic and Social Dimensions of Climate Change*, ed. J. P.

- Bruce, H. Lee and E. F. Haites, 125-144. Cambridge: Cambridge University Press.
- Asquith, Lord Justice. 1949. "Edwards v. National Coal Board." *All England Law Reports* 1: 747.
- Azar, C., and S. H. Schneider. 2002. "Are the economic costs of stabilising the atmosphere prohibitive?" *Ecological Economics* 42 (1-2): 73-80.
- Bazelon, C., and K. Smetters. 2001. "Discounting in the Long Term." *Loyola of Los Angeles Law Review* 35 (1): 277 – 291.
- Beckerman, W., and C. Hepburn. 2007. "Ethics of the discount rate in the Stern review on the economics of climate change." *World Economics* 8 (1): 187-210.
- Birdsall, N., and A. Steer. 1993. "Act Now on Global Warming - But Don't Cook the Books." *Finance and Development* 30 (1): 6-8.
- Bradford, D. F. 1975. "Constraints on Government Investment Opportunities and the Choice of Discount Rate." *American Economic Review* 65 (5): 887-899.
- Cline, W. R. 1992. "The Economics of Global Warming." Washington, DC: Institute for International Economics.
- Cline, W. R. 1999. "Discounting for the Very Long Term." In: *Discounting and intergenerational equity*, ed. P. R. Portney and J. P. Weyant, 131-140. Baltimore: Johns Hopkins University Press.
- Dasgupta, P. 2007. "Commentary: The Stern review's economics of climate." *National Institute Economic Review* 199 (1): 4-7.
- Davidson, M. D. 2006. "A social discount rate for climate damage to future generations based on regulatory law." *Climatic Change* 76 (1-2): 55-72.
- Davidson, M. D. 2008. "Wrongful harm to future generations: the case of climate change." *Environmental Values* 17(4), 2008: 471-488.
- Dynan, K. E., and D. M. Maki. 2001. "Does Stock Market Wealth Matter for Consumption?" *Finance and Economics Discussion Series 2001-23*. Board of Governors of the Federal Reserve System.
- Dynan, K. E., J. Skinner, and S. P. Zeldes. 2004. "Do the Rich Save More?" *Journal of Political Economy* 112 (2): 397-444.
- Eckstein, O. 1958. "Water Resource Development: The Economics of Project Evaluation." Cambridge, MA: Harvard University Press.
- Elmendorf, D. W., and N. G. Mankiw. 1998. "Government Debt." *NBER Working Paper No. W6470*. Cambridge, Massachusetts: National Bureau of Economic Research.
- Fisher, F. M., and R. C. Romaine. 1990. "Janis Joplin's Yearbook and the Theory of Damages." *Journal of Accounting, Auditing & Finance* 5 (1): 145-157.
- Frederick, S., G. Loewenstein, and T. O'Donoghue. 2002. "Time Discounting and Time Preference: A Critical Review." *Journal of Economic Literature* 40 (2): 351-401.
- Fuhrman, R. H. 2003. "U.S. v. The New Portland Meadows Deviates from 'BEN' Methodology." *Environmental reporter* 34 (50): 1-6.
- Gilles, S. G. 2001. "On Determining Negligence: Hand Formula Balancing, the Reasonable Person Standard, and the Jury." *Vanderbilt Law Review* 54 (2) : 813-860.
- Hall, R. E., and F. S. Mishkin. 1982. "The Sensitivity of Consumption to Transitory Income: Estimates from Panel Data on Households." *Econometrica* 50 (2): 461-482.

- Hammitt, J. K., and C. M. Harvey. 2000. "Equity, efficiency, uncertainty, and the mitigation of global climate change." *Risk Analysis* 20 (6): 851-860.
- Hand, Judge L. 1947. "United States v. Carroll Towing Co." 159 F.2d 169 (2d Cir. 1947).
- Harberger, A.C. 1972. "Project Evaluation: collected papers." Chicago: The University of Chicago Press.
- Haveman, R. H. 1969. "The Opportunity Cost of Displaced Private Spending and the Social Discount Rate." *Water Resources Research* 5 (5): 947-957.
- Heston, A., R. Summers, and B. Atten. 2002. "Penn World Table Version 6.1 (October)." Center for International Comparisons at the University of Pennsylvania.
- Horowitz, J. K. 2002. "Preferences in the future." *Environmental and Resource Economics* 21 (3): 241-258.
- Howarth, R. B. 1997. "Sustainability as Opportunity." *Land Economics* 73 (4): 569-579.
- Howarth, R. B. 2003. "Discounting and Uncertainty in Climate Change Policy Analysis." *Land Economics* 79 (3): 369-381.
- Ibbotson Associates. 1999. "Stocks, Bonds, Bills, and Inflation: 1999 Yearbook." Chicago: Ibbotson Associates.
- IPCC (The Intergovernmental Panel on Climate Change). 2007. "IPCC Fourth Assessment Report *Climate Change 2007*. Mitigation of Climate Change: Summary for Policymakers." Available at: <http://www.ipcc.ch>.
- Knoll, M. S. 1996. "A Primer on Prejudgment Interest." *Texas Law Review* 75 (2): 293-374.
- Kolb, J. A., and J. D. Scheraga. 1990. "Discounting the Benefits and Costs of Environmental Regulations." *Journal of Policy Analysis and Management* 9 (3): 381-390.
- Krutilla, J. V., and O. Eckstein. 1958. "Multiple Purpose River Development." Baltimore: Johns Hopkins University Press.
- Landes, W. M., and R. A. Posner. 1987. "The Economic Structure of Tort Law." Cambridge, MA: Harvard University Press.
- Lanzillotti, R. F., and A. K. Esquibel. 1990. "Measuring Damages in Commercial Litigation: Present Value of Lost Opportunities." *Journal of Accounting, Auditing & Finance* 5 (1): 125-142.
- Lind, R. C. 1982. "A primer on the major issues relating to the discount rate for evaluating national energy options." In: *Discounting for Time and Risk in Energy Policy*, ed. R. C. Lind, K. L. Arrow, and G. R. Corey, 21-94. Baltimore: Johns Hopkins University Press.
- Lind, R. C. 1990. "Reassessing the Government's Discount Rate Policy in Light of New Theory and Data in a World Economy with a High Degree of Capital Mobility." *Journal of Environmental Economics and Management* 18 (2): S8-S28.
- Lind, R. C. 1995. "Intergenerational equity, discounting, and the role of cost-benefit analysis in evaluating global climate policy." *Energy Policy* 23 (4-5): 379-389.
- Lind, R. C. 1999. "Analysis for Intergenerational Decisionmaking." In: *Discounting and intergenerational equity*, ed. P. R. Portney and J. P. Weyant, 173-180. Baltimore: Johns Hopkins University Press.

- Manne, A. 1999. "Equity, Efficiency, and Discounting." In: *Discounting and intergenerational equity*, ed. P. R. Portney and J. P. Weyant, 111-129. Baltimore: Johns Hopkins University Press.
- Marshall, A. 1890. "Principles of Economics." London: Macmillan and Co., Ltd.
- Mendelsohn, R. 1981. "The Choice of Discount Rate for Public Projects." *American Economic Review* 71 (1): 239-241.
- Moore, M. A., A. E. Boardman, A. R. Vining, D. L. Weimer, and D. H. Greenberg. 2004. "Just Give Me a Number! Practical Values for the Social Discount Rate." *Journal of Policy Analysis and Management* 23 (4): 789-812.
- Myers, S. C., K. T. Wise, and M. A. Maniatis. 1997. "The Ben Model and the Calculation of Economic Benefit." Cambridge: The Brattle Group, Inc.
- Nordhaus, W. D. 1994. "Managing the Global Commons." Cambridge, MA: MIT Press.
- Nordhaus, W. D. 1997. "Discounting in Economics and Climate Change." *Climatic Change* 37 (2): 315-328.
- Nordhaus, W. D. 2006. "The *Stern Review* on the Economics of Climate Change." *National Bureau of Economic Research Working Paper No. 12741*.
- OMB, US Office of Management and Budget. 1996. "Economic Analysis of Federal Regulations Under Executive Order 12866." Washington, DC: Executive Office of the President.
- OMB, US Office of Management and Budget. 2003. 'Discount rate policy' and 'Discount rates for costeffectiveness, lease-purchase and related analyses', section 8 and appendix C (revised January 2003). In: Guidelines and Discount Rates for Benefit–Cost Analysis of Federal Programs, OMB Circular no. A-94, Washington, DC.
- Parfit, D. 1983. "Energy Policy and the Further Future: The Social Discount Rate." In: *Energy and the Future*, ed. D. MacLean and P. G. Brown, 31-37. Totowa, New Jersey: Rowman and Littlefield.
- Pearce, D. W., and D. Ulph. 1999. "A Social Discount Rate for the United Kingdom." CSERGE Working Paper GEC 95-01. London: University College London and University of East Anglia, CSERGE.
- Pearce, D., B. Groom, C. Hepburn, and P. Koundouri. 2003. "Valuing the Future: Recent Advances in Social Discounting." *World Economics* 4(2): 121-141.
- Podolsky, M. J. 2002. "The Use of the Discount Rate in EPA Enforcement Actions." *Case Western Reserve Law Review* 52 (4): 1009-1032.
- Posner, R. A. 1972. "A Theory of Negligence." *The Journal of Legal Studies* 1 (1): 29-96.
- Posner, R. A. 2002. "Economic Analysis of Law" (6<sup>th</sup> edition). New York: Aspen Law & Business.
- Poterba, J. 1998. "The Rate of Return to Corporate Capital and Factor Shares: New Estimates Using Revised National Income Accounts and Capital Stock Data." *Carnegie-Rochester Conference Series on Public Policy* 48: 211-246.
- Ramsey, F. P. 1928. "A Mathematical Theory of Saving." *Economic Journal* 38 (152): 543-59.
- Rawls, J. 1972. "A Theory of Justice." Oxford: Oxford University Press.
- Sandmo, A. 1972. "Discount rates for public investment under uncertainty." *International Economic Review* 13: 287–302.
- Schelling, T. C. 1995. "Intergenerational discounting." *Energy Policy* 23 (4/5): 395-401.

- Sen, A. K. 1982. "Approaches to the choice of discount rates for social benefit-cost analysis." In: *Discounting for Time and Risk in Energy Policy*, ed. R.C. Lind et al., 325–353. Baltimore: Johns Hopkins University Press.
- Shrader-Frechette, K. S., and L. Persson. 2001. "Ethical Problems in Radiation Protection." SSI-Report 2001:11. Stockholm: The Swedish Radiation Protection Authority.
- Smart, J. J. C., and B. Williams. 1973. "Utilitarianism: For and Against." Cambridge, MA: Cambridge University Press.
- Smit, B., and J. Wandel. 2006. "Adaptation, Adaptive Capacity and Vulnerability." *Global Environmental Change* 16 (3): 282–292.
- Souleles, N. S. 1999. "The Response of Household Consumption to Income Tax Refunds." *American Economic Review* 89(4): 947-58.
- Souleles, N. S. 2002. "Consumer Response to the Reagan Tax Cuts." *Journal of Public Economics* 85(1): 99-120.
- Spackman, M. 2004. "Time Discounting and of the Cost of Capital in Government." *Fiscal Studies* 25 (4): 467-518.
- Standard and Poor. 2005. "Standard and Poor's Global Index Review, September 2005". Available at: [www.standardandpoors.com](http://www.standardandpoors.com)
- Stern, N. 2006. "The Stern Review: The Economics of Climate Change." Cambridge: Cambridge University Press.
- Stockfish, J. A. 1982. "Measuring the social rate of return on private investment." In: *Discounting for Time and Risk in Energy Policy*, ed. R. C. Lind, K. L. Arrow and G. R. Corey, 257–71. Baltimore: Johns Hopkins University Press.
- Thaler, R. 1981. "Some empirical evidence on dynamic inconsistency." *Economics Letters* 8 (3): 201-7.
- Tol, R. S. J. 2002. "Estimates of the Damage Costs of Climate Change: Part II. Dynamic Estimates." *Environmental and Resource Economics* 21 (1): 135–160.
- Tol, R. S. J. 2003. "Is the uncertainty about climate change too large for expected cost-benefit analysis?" *Climatic Change* 56 (3): 265–289.
- UK Government. 1999. "A better quality of life - strategy for sustainable development for the United Kingdom." London: Department of the Environment, Transport and the Regions.
- UNCED. 1992. "Rio Declaration on Environment and Development and Agenda 21." The United Nations Conference on Environment and Development. Rio de Janeiro.
- UNCHE. 1972. *Stockholm Declaration of the United Nations Conference on the Human Environment*, June 16, 1972, U.N. Doc.A/Conf.48/14/Rev.1.
- UNESCO. 1997. Resolution 44 (Article 1 and 5.2.): Declaration on the Responsibilities of the Present Generations Towards Future Generations. Adopted on 12 November 1997 by the General Conference of UNESCO at its 29th session.
- UNEP, United Nations Environment Programme. 1997. Climate Change Information Kit Published in January 1997 by the United Nations Environment Programme's Information Unit for Conventions. Available at: <http://unfccc.int/cop3/foreword.htm>
- UNFCCC. 1992. United Nations Framework Convention on Climate Change. Adopted 9 May 1992 in New York, NY, USA.

- United States v. The New Portland Meadows, Inc., 2003. US District Court for the District of Oregon, No. 00-507-KI, 07/29/03.
- United States v. WCI Steel, Inc., 1999. N.D. Ohio, 72 F. Supp. 2d. 810, 831, 49 ERC 1685 (1701).
- U.S. Census Bureau. 2006. "Statistical Abstract of the United States."
- US Courts. 2006. "Post Judgment Interest Rates." Available at: <http://www.uscourts.gov/postjud/postjud.html>
- US Department of the Treasury. 2005. "The Long-Term Real Interest Rate for Social Security." March 30, 2005.
- US Federal Reserve Board. 2006. "Selected Interest Rates." Available at: <http://www.federalreserve.gov/releases/h15/current/>
- Weil, D. N. 2005. "Economic Growth." Boston: Pearson, Addison - Wesley.
- Weitzman, M. L. 1998. "Why the Far Distant Future Should Be Discounted at Its Lowest Possible Rate." *Journal of Environmental Economics and Management* 36 (3): 201-208.
- Weitzman, M. L. 2007. "The Stern Review of the Economics of Climate Change." *The Journal of Economic Literature* 45 (3): 703-724.
- Wright, R. W. 1995. "The Standards of Care in Negligence Law." In: *Philosophical Foundations of Tort Law*, ed. D. G. Owen, 249-275. Oxford: Clarendon Press.
- Wright, R. W. 2002. "Negligence in the Courts: Introduction and Commentary." *Chicago-Kent Law Review* 77 (2): 425-487.
- Yohe, G. W., and R. S. J. Tol. 2002. "Indicators for social and economic coping capacity; moving toward a working definition of adaptive capacity." *Global Environmental Change* 12 (1): 25-40.
- Zipursky, B. C. 2007. "Sleight of Hand." *William & Mary Law Review* 48 (5): 1999-2041.

# **Chapter 6:**

## **Parallels in reactionary argumentation in the US congressional debates on the abolition of slavery and the Kyoto Protocol**

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### **Abstract**

Today, the United States is as dependent on fossil fuels for its patterns of consumption and production as its South was on slavery in the mid-nineteenth century. That US congressmen tend to rationalise fossil fuel use despite climate risks to future generations just as Southern congressmen rationalised slavery despite ideals of equality is perhaps unsurprising, then. This chapter explores similarities between the rationalisation of slavery in the abolition debates and the rationalisation of ongoing emissions of greenhouse gases in the US congressional debates on the Kyoto Protocol.

### **1. Introduction**

On July 4th, 1776, the thirteen United States of America unanimously declared to “hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.” Despite these ‘self-evident truths’, slavery was upheld in many states and rationalised in congressional debates for almost another century before it was formally abolished by the US Congress in 1865 (see e.g. Jenkins, 1935; Tise, 1987; Miller, 1996). On June 12<sup>th</sup>, 1992, the United States signed the United Nations Framework Convention on Climate Change (UNFCCC), in which the Parties stated their determination “to protect the climate system for present and future generations”. Despite this commitment, the US Congress has as yet rejected any mandatory regulation of greenhouse gases, including the binding emission targets for the industrialised nations agreed to under the Kyoto Protocol (see e.g. PEW, 2004).

This chapter explores similarities between the rationalisation of slavery by congressmen from the Southern United States in the abolition debates in the mid-nineteenth century and the rationalisation of ongoing greenhouse gas emissions in the congressional debates on the Kyoto Protocol (see also Orr, 2000). In the main, I leave the quotations to speak for themselves. I do not claim that all or even a majority of US congressmen and women approve of all the arguments quoted, which – even if it were so –

would be impossible to prove.<sup>1</sup> However, anyone taking the time to read through the congressional records will see that the quotations do not give a twisted view of the general sentiments expressed in the US Congress in the case of the Kyoto debate (see also Müller, 2000) and by Southern congressmen in the case of the abolition debate. Most quotes can easily be retraced from the *Register of Debates in Congress* (RDC) the *Congressional Globe* (CG), and the *Congressional Record* (CR), all available at the Internet.

This chapter is structured as follows. In section 2 I describe the similarities between the circumstances under which the abolition debate and ‘Kyoto’ debate were and are being conducted. In section 3 I show that several types of argument against social change are found to recur in the US congressional debates on both issues. As this particular comparison runs the risk of being labelled demagogic, I shall also argue that the arguments cited from the climate debate are suspect in their own right. In section 4 some conclusions are drawn.

## **2. Similarities between slavery and the use of fossil fuels**

In this section I argue that the present climate debate shows several fundamental similarities in circumstance with the abolition debate of the mid-nineteenth century. In both debates US congressmen and Southern congressmen, respectively, represent an electorate with substantial interests in maintaining the status quo (2.1), costs are shifted to people who are not part of the electorate (2.2), and Congress rejects proposals for change (2.3).

### **2.1 Vested interests of the electorate**

Both the abolition and the climate debate revolve around ‘energy resources’ considered vital to the economy and pivotal to everyday life. In the mid-nineteenth century slave labour was the cheap and indispensable energy source underpinning the economies of the Southern United States. While the Northern States industrialized, the chief economic sectors in the South, such as cotton cultivation and production of other crops, were entirely dependent on slavery. In 1860 there were about four million slaves of African descent in a total Southern population of twelve million (U.S. Census, 1860). Not all southerners had an equal interest in the institution of slavery. Only one in every four southerners owned slaves, and non-slave owners also had to contribute to the costs of upholding the institution of slavery. Some of the free labourers were forced into lower-paid jobs than might have been

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<sup>1</sup> This chapter focuses on the congressional debates on the Kyoto Protocol. I do not deny that some individual states or businesses are taking a more pro-active position (PEW, 2004). Neither do I deny that former US president Clinton and vice-president Gore have been far ahead of congress as well.



available in the absence of slavery. Nevertheless, much of the economy was tied to this free labour source, be it directly or indirectly. The slavery-centred economic system offered white non-slave owners jobs at plantations, in the trading sector in products bought from or sold to plantations, and in support sectors such as shipbuilding, banking, and insurance. Consequently, many Southerners could not imagine their prosperous society existing without the institution of slavery, as expressed by Governor Hammond on the senate floor on March 4, 1858 (CG, p. 962):

“In all social systems there must be a class to do the mean duties, to perform the drudgery of life. That is, a class requiring but a low order of intellect and but little skill. Its requisites are vigor, docility, fidelity. Such a class you must have or you would not have that other class which leads progress, civilization, and refinement. It constitutes the very mud-sills of society and of political government; and you might as well attempt to build a house in the air, as to build either the one or the other, except on the mud-sills. Fortunately for the South, she has found a race adapted to that purpose to her hand ... We use them for the purpose and call them slaves.”

Nowadays, the use of fossil fuels, an energy source applied to *replace* human labour, is closely woven into almost every facet of modern production and consumption. The ‘oil crisis’ of the seventies and eighties clearly demonstrated this dependence on fossil fuels. With its 4.6% of global population the United States is responsible for one-quarter of global oil consumption (EIA, 2004). Reducing the risks of climate change may demand substantial reductions in combustion of fossil fuels, however, implying substantial changes in long-cherished ways of life and consumption patterns. There is no cheap ‘technological fix’, as there has been for many other environmental problems. As Senator Craig expressed this dependence on energy on the senate floor on April 20, 1998 (CR, S3245):

“So let me say to all Senators and to the American people, tonight, walk around your house. Think about the light fixture you have just turned on, the appliance you have just turned off, the telephone device you might make a call on, or the computer you will sit down to, to communicate anywhere in the world. Many of these things you have added to your home since 1990. Look at the car you drove home from work. And to the farmer who is out there on the plains and the farmlands of America this very hour, that marvelously efficient diesel tractor that is pulling the plow and the drill to plant the crop that creates the abundant harvest that feeds not just the people of America but the people of the world. All of those tools are a product of energy. In fact, Americans today are consuming more energy as the economy continues to grow, and we will need to consume more. We will need to turn on our lights and our computers. We will need our cars. In the future, they will be better and they will be cleaner, but they still must consume energy.”

Obviously, US congressmen represent a wide variety of interests. The interests of an oil company in the status quo are different from those of a software producer, and rising energy prices will hit energy-conscious consumers less hard than owners of sport utility vehicles. US congressmen may well be more susceptible to certain interests than others. While the scope and influence of these various interests may differ, though, virtually the whole electorate uses fossil fuels in one way or the other. Apart from specific groups like manufacturers of solar cells or windmills, few people have a personal interest in rising energy prices. Although economic forecasts vary widely, there are few studies predicting that climate policy will benefit employment or economic growth (see e.g. EIA, 1998; Azar and Schneider, 2002).

### *2.2 Transfer of costs to third parties*

In both the slavery and fossil fuel and climate debate, the electorate shifts costs to people that are not part of the electorate. In the case of slavery, the shifting of costs to the slaves themselves requires no further explanation. Moreover, the Southern United States shifted costs to the Northern States. Although the Northern States had already abolished slavery, the enforcement costs of upholding the institution of slavery were spread over the federation, for example by the Fugitive Slave Act of 1850 (Hummel, 1996).

In the case of fossil fuel use the issue is more complex but hardly less of a moral issue than was slavery two centuries ago. The report *Climate Change 2001: Impacts, Adaptation and Vulnerability*, by IPCC Working Group II, assesses the sensitivity, adaptive capacity and vulnerability of natural and human systems to climate change and the potential consequences of that change. Among the findings to emerge are that “natural systems are vulnerable to climate change, and some will be irreversibly damaged” and that “many human systems are sensitive to climate change and some are vulnerable”. Potentially serious impacts of climate change include sea level rise; changes in agriculture, forests and fisheries; changes in the energy, water, construction, transport and tourism sectors; increased risk of disaster: changes in the frequency and severity of storms, floods, droughts, hurricanes and precipitation levels; changes in biodiversity; increased human morbidity and premature mortality; and human migration.

What makes climate change pre-eminently a moral issue is that due to the inertia of the climatic system the bulk of impacts of climate change will clearly not be felt for another 50 years or more, when *future* generations will occupy this planet rather than present generations (Fankhauser and Tol, 1996; Mendelsohn and Neumann, 1999). In other words *those creating the risks are not the same as those bearing them*. With a few negligible exceptions, mitigation measures would therefore cost present generations more than they would benefit in the form of risk reduction. Or, in economic terms, few mitigation measures would survive an egocentric cost-benefit

analysis by the present electorate. Future generations, by definition, have no direct say in present-day decision-making; they are not part of the present electorate. It is present generations that decide whether or not to improve the living conditions of future generations by mitigating climate change.

Apart from this *intergenerational* shifting of costs, there is also *intra-generational* shifting, for each country holds that the benefits of fossil fuel use are reaped domestically, while the costs of climate change are diffused across the world. Although in principle the ‘import’ of climate costs might balance the ‘export’, in practice it does not. As mentioned, in 2001 the United States emitted about 24 percent of global energy-related carbon dioxide emissions (EIA, 2004), while its population and land surface amounted to 4.6 percent (US Census Bureau, 2004) and 6.4 percent, respectively.

### *2.3 Resistance to social change*

In the case of both slavery and fossil fuel use, there is and was widespread resistance to social change, unsurprisingly in the light of the cited vested interests at stake. It existed when slavery was abolished – in the United States sufficient to start a civil war – and it exists today with respect to cutting consumption of fossil fuels. Although the risks of climate change have been on the political agenda for decades – in 1988 then-NASA scientist James Hansen testified before Congress that global warming "is already happening now" – it took until 1992 before the global community acknowledged the problem and agreed on establishing the UNFCCC for future action. It took five more years before the general agenda of the UNFCCC was translated into binding targets for the industrialised world for the coming years. In 1997, in Kyoto, a protocol was formulated which asks the industrialised countries to reduce their greenhouse gas emissions by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012. The Kyoto Protocol entered into force and became legally binding on February 16<sup>th</sup>, 2005, following ratification by Russia at the end of 2004. Right from the start, however, the US Senate rejected the Kyoto Protocol, unanimously adopting the so-called Byrd-Hagel resolution in 1997 (CR, S5622), a position embraced by the White House in 2001 (Bush, 2001). Since then, no alternative international framework for the Kyoto Protocol has been proposed.

Since the 1997 debates on the Kyoto Protocol, there has been an increase in the number of climate change-related legislative proposals introduced in the US Congress. To date, however, not a single item of legislation has been enacted to curb greenhouse gas emissions (PEW, 2004). On February 14, 2002, US President Bush announced a new climate change strategy for the United States. However, the strategy involved a voluntary domestic "greenhouse gas intensity" target that would allow US emissions to actually increase by 12 percent by 2012, and established no mechanism for

ensuring that even that target will be met (PEW, 2004). On August 28, 2003, the US government's Environmental Protection Agency declared that carbon dioxide and other greenhouse gasses are not air pollutants under the Clean Air Act and therefore cannot be regulated under the Clean Air Act (EPA, 2003). In October 2003, the Senate voted for the first time on a measure to limit US economy-wide greenhouse gas emissions, the Climate Stewardship Act (S.139) introduced by Senators Joseph I. Lieberman and John McCain. The measure did not pass, however. Amendments to the Energy Policy Act requiring automotive fuel efficiency standards were similarly defeated by the House and Senate.

### 3. Reactionary rhetoric

In *Arguing About Slavery*, Miller (1996, p. 11) does not draw any parallels between slavery and fossil fuel use, but points in the direction of what might be found were one to do so:

“Suppose today some dominant industry, built into the lives and fortunes of a great many people – to a degree of the whole nation – were found to be morally repugnant; what difficulties there would then be in extracting it from the nation's life! ... Slavery was integral to the life and culture, as John C. Calhoun kept saying, of an entire region, of eleven states (in 1835) of the Union – of almost half of the nation. When a “pecuniary interest” has that magnitude, it is a formidable opponent indeed. Rationalizations are supplied, positions are softened, conflicts are avoided, compromises are sought, careers are protected, life goes on. Don't try to change what can't be changed. Adapt to it.”

In the previous sections, I have argued that fossil fuel use is indeed as “integral to the life and culture” of the United States today as slavery was for the Southern United States in the mid-nineteenth century. That US congressmen tend to rationalise ongoing fossil fuel use despite climate risks to future generations just as Southern congressmen rationalised slavery despite ideals of equality is perhaps not surprising, therefore.<sup>2</sup> In the

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<sup>2</sup> For other discussions of reactionary rhetoric see, for example, Albert Hirschman's *The Rhetoric of Reaction* (1991). Hirschman argues that for (at least) the past two hundred years reactionary thinkers have argued against progressive agendas and reforms through a recurrent pattern of polemical postures and manoeuvres built up around three main theses. First, the Perversity Thesis: "any purposive action to improve some feature of the political, social, or economic order only serves to exacerbate the condition one wishes to remedy." Second, the Futility Thesis: "attempts at social transformation will be unavailing, that they will simply fail to 'make a dent'." Third, the Jeopardy Thesis: "the cost of the proposed change or reform is too high, as it endangers some previous, precious accomplishment." Hirschman draws his examples from three historic epochs: the French Revolution and the rise of individual liberties, universal suffrage and the rise of

following subsections, I discuss six specific arguments cited in the US Congress against the abolition of slavery that are now being voiced against ratification of the Kyoto Protocol, elucidating briefly why they are rhetorically suspect.

### 3.1 What is deemed bad is in fact good

The most direct argument against social change is a complete reversal of claims: what the advocates of change call bad is in fact a positive good. In public discourse about the abolition of slavery it was argued that slaves would be better off and socially securer than free people in Africa or the poor in the Northern States of the US. Abolition of slavery would therefore worsen the position of slaves rather than improve it, as senator en vice-president John Caldwell Calhoun argued on the senate floor on February 6, 1837 (RDC, p. 718-9):

“the Central African race ... had never existed in so comfortable, so respectable, or so civilized a condition as that which it now enjoyed in the Southern States”. ... Slavery was not “an evil. Not at all. It was a good – a great good.”

Thomas R. Dew, professor and later president of William and Mary College, gave similar arguments in his *Review of the Debate in the Virginia Legislature of 1831 and 1832* (Simms, 1852):

““There is a time for all things,” and nothing in this world should be done before its time. An emancipation of our slaves would check at once that progress of improvement which is now so manifest among them.” (p. 443)

“A merrier being does not exist on the face of this globe, than the negro slave of the U. States.” (p. 459)

In the congressional debates about the Kyoto Protocol the claim that global warming would be harmful has similarly been completely reversed, it being held that increases in global levels of greenhouse gases and temperature would actually be *beneficial*. Senator Inhofe, chairman of the Environment and Public Works Committee, for example, took this position on the senate floor on July 28, 2003:

“Thus far, no one has seriously demonstrated any scientific proof that increased global temperatures would lead to the catastrophic predictions by alarmists. In fact, it appears just the opposite is true, that increases in global temperature have beneficial effect on how we live our lives. (CR, S10013)... What gets obscured in the global warming debate is the fact that

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democracy in the nineteenth century, and the rise of the welfare state in the twentieth century.

carbon dioxide is not a pollutant. It is necessary for life. Numerous studies have shown that global warming can actually be beneficial to mankind.” (CR, S10019) ... it would be beneficial to our environment and the economy.” (CR, S10022)

What makes these arguments suspect is that by “numerous studies” Inhofe does not refer to the assessment of peer-reviewed literature by the International Panel on Climate Change, established by the World Meteorological Organization and the United Nations Environment Programme, but to a specific review by Robinson *et al.* (1998) that was neither peer-reviewed nor published in a scientific journal. The Oregon Institute of Science and Medicine used the manuscript, made up in a nearly identical format to scientific articles published in the *Proceedings of the National Academy of Sciences*, to persuade 17,000 people with an academic degree to sign the so-called Oregon Petition opposing the Kyoto Protocol (see <http://www.oism.org/pproject/index.htm>). The Council of the National Academy of Sciences, however, issued a statement that neither the petition nor the accompanying manuscript had anything to do with them and that they disagreed with its conclusions and recommendations (NAS, 1998).

### 3.2 The benefits of the proposed policy are uncertain

A second kind of argument against social change, more subtle and heard more often than a direct reversal of claims, is the idea that we are simply too ignorant about the future benefits of change. This might seem a particularly modern argument, especially suitable for the climate debate. However, William Harper, chancellor and senator of South Carolina, argued in 1838 in his *Memoir on Slavery* that we are ignorant as to whether abolition of slavery would in fact benefit the slaves themselves:

“And I would impress most earnestly, that with our imperfect and limited faculties, and short-sighted as we are to the future, we can rarely, very rarely indeed, be justified in producing considerable present evil or suffering, in the expectation of remote future good - if indeed this can ever be justified.” (in: Simms, 1852, p. 18)

“Very different indeed is the course of [the abolitionists] whose precipitate and ignorant zeal would overturn the fundamental institutions of society, uproar its peace and endanger its security, in pursuit of a distant and shadowy good, of which they themselves have formed no definite conception - whose atrocious philosophy would sacrifice a generation - and more than one generation - for any hypothesis.” (in: Simms, 1852, p. 98)

Uncertainty about the benefits of change is a popular argument against the Kyoto Protocol as well. Many US senators have argued that there is no ‘proof’ or scientific consensus about global warming, despite growing indications that human activity is indeed largely responsible for global

climate change. While the IPCC concluded in its Second Assessment Report (1995) that “The balance of evidence suggests a discernible human influence on global climate”, many senators doubted the IPCC’s conclusions, such as senator Hagel on the house floor on October 3, 1997:

“Mr. President, the fact is this treaty is not based on sound science. The scientific community has not definitely – even close to definitely – concluded that there is global warming caused by human actions. The science is inconclusive and often contradictory.” (CR, S10309).

In its Third Assessment Report (2001) the IPCC reinforced its previous claim: “There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.” In 2001 the U.S. National Academy of Sciences confirmed the IPCC’s major conclusions, after being requested by the White House to review the findings of that body: “The changes observed over the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes is also a reflection of natural variability” (NAS, 2001). The new IPCC and NAS findings did not move the senators, however, as expressed for example by representative Rohrabacher on the house floor on June 12, 2001:

“The National Academy of Science report is filled with weasel words and caveats. That was true of many of the other scientific investigations. Almost every one of the scientific investigations, the findings about global warming were not conclusive enough to make any solid statement other than words to the effect that further research is necessary.” (CR, H3053)

As recently as July 28, 2003, Senator Inhofe, chairman of the Environment and Public Works Committee, stated on the senate floor that:

“After studying the issue over the last several years, I believe the balance of the evidence offers strong proof that natural variability, not manmade, is the overwhelming factor influencing climate, and that manmade gases are virtually irrelevant.” (CR, S10013).

How to take account of controversial information is a difficult matter, of course. To make a decision we must first weigh up the judgments of the various ‘experts’ on the basis of their credibility as well as our own attitude towards risk. If we are generally ‘rather safe than sorry’, we will attach more importance to information that is unpleasant rather than reassuring. If we are risk seeking, on the other hand, we will attach rather less weight to unpleasant information. In the context of everyday risk management, however, the demand for ‘definite conclusions’ and lack of controversy before action is taken, as required by the US Congress when it comes to cutting fossil fuel consumption, is uncommon practice and in fact

unprecedented. Policy-makers frequently take serious, far-reaching decisions on the basis of information generated by (economic) models that are far less reliable than the models used in climate science. No one seems to advocate inaction because of the uncertainties involved in these economic projections. For example, it is unlikely that any of the economic models used by the US government to predict economic growth and future employment would survive scrutiny as thorough as that to which climate models are subjected by the IPCC and all the additional questioning involved in public debate. Secondly, the bias of US Congressmen towards scientific information about climate change clearly shows up when compared to their attitude towards the perceived threat of Saddam Hussein possessing weapons of mass destruction. For example, the same senator Inhofe who insisted upon ‘sound science’, consensus among scientists and complete scientific certainty before devoting funds to climate mitigation, found sufficient justification in inconclusive information from the US intelligence service, contradicting the conclusions of the chief UN weapons inspector, to start a war on Iraq (see e.g. CNN Late Edition, August 25, 2002). In short, although there is no uniquely ‘right’ approach to risk assessment, consistency is a prime consideration in any intellectual debate.

### 3.3 Change brings economic ruin

Perhaps the most important argument against social change is that it would have devastating economic effects. Much use was made of this argument in the abolition debate, for example by James Henry Hammond, senator and later governor of South Carolina on the House floor on February 1, 1836 (RDC, p. 2456):

“There are about 2,300,000 slaves at this moment in the United States, and their annual increase is about 60,000. Sir, even the British Government did not dare to emancipate its enslaved West India subjects without some compensation. They gave them [the owners] about sixty percent of their value. It could scarcely be expected that this Government would undertake to free our slaves without paying for them. Their value, at \$400, average, (and they are now worth more than that,) would amount to upwards of nine hundred millions. The value of their annual increase, alone is twenty-four millions of dollars; so that to free them in one hundred years, without the expense of taking them from the country, would require an annual appropriation of between thirty-three and thirty-four millions of dollars. The thing is physically impossible.”

A second example can be found in Dew’s *Review of the Debate in the Virginia Legislature of 1831 and 1832* (Simms, 1852, p. 384):

“There is slave property of the value of \$100,000,000 in the State of Virginia, &c., and it matters but little how you destroy it, whether by the slow process of the cautious practitioner, or with the frightful dispatch of



the self-confident quack; when it is gone, no matter how, the deed will be done, and Virginia will be a desert.”

In the climate debate it is likewise argued that the Kyoto Protocol would be ‘devastating’ for the US economy, as illustrated by the following three quotations:

“The economic impact would be devastating for the United States. We would see the loss of millions of jobs, entire industries would flee to other countries, our people would face higher fuel costs, higher taxes, leading to lower productivity and a lower standard of living. ... And it would have a devastating impact on our national security interests. ... One of the biggest users of fossil fuels in America is what? The U.S. military.” (Senator Hagel, October 3, 1997, CR, S10309-10310).

“Every credible economic study on this treaty paints a dark picture for the American people. According to the Wharton Econometric Forecasting Associates (WEFA), the Kyoto treaty would cause energy prices to soar and the standard of living in our country to plummet. In a well-respected study, WEFA found that the Kyoto treaty would result in the elimination of over 2.4 million American jobs by the year 2010 and cost the average American family over \$2.700 a year.” (Representative Knollenberg, May 20, 1999, at the hearing “Kyoto Protocol: Is the Clinton-Gore Administration Selling Out Americans?”, subcommittee on National Economic Growth, Natural Resources, and Regulatory Affairs)

“The most widely cited and definitive study came from Wharton Econometric Forecasting Associates. According to Wharton Econometric Forecasting Associates’ economists, Kyoto would cost 2.4 million U.S. jobs and reduce GDP by 3.2 percent, or about \$300 billion annually, an amount greater than the total expenditure on primary and secondary education in America.” (CR, S10014)

“Kyoto is an economic weapon designed to undermine the global competitiveness and economic superiority of the United States” (Senator Inhofe, July 28, 2003, CR, S10021)

Although the substantial costs involved in implementing the Kyoto Protocol cannot be ignored, in the case of the climate debate there are reasons to distrust these particular economic arguments. First, it should be noted that the study *Global Warming: The High Cost of the Kyoto Protocol* by Wharton Econometric Forecasting Associates (WEFA, 1998), which has been the study most widely cited in congressional debates and considered definitive, was in fact commissioned by the American Petroleum Industry. The study ignored many of the options available under the Kyoto Protocol that would lower the costs of compliance, such as reducing emissions of non-CO<sub>2</sub> greenhouse gases, the use of ‘sinks’ and emission trading or the Clean Development Mechanism (the so-called flexible mechanisms of the

Kyoto Protocol). A review study by the Energy Information Administration, an independent statistical and analytical agency of the US Department of Energy, showed that other studies – also available to members of Congress – arrived at much lower estimates of economic impact than the WEFA study (EIA, 1998). A second reason for suspicion is the inconsistent approach to scientific information: while the darkest available picture of the economic cost of climate policy is readily taken for granted, equally dark pictures of climate change are ignored entirely.

A third point is that much of the impression made by a macro-economic study depends on how results are presented. When quoted as sum-total costs, the billions of US dollars cited in such studies create an impression that the cost of CO<sub>2</sub> reductions is so great as to threaten economic development. However, if one remembers that income is forecast to grow consistently by several percent a year, the cost of climate policy “amounts to ‘only’ a couple of years delay in achieving very impressive growth in per capita income levels” (Azar and Schneider, 2002). One and a half centuries ago, Abraham Lincoln (1860) used a story to illustrate how the pecuniary interests of the slave owners expressed in large macro-economic terms influenced their (moral) judgment (see Tise, 1987). There was, said Lincoln, an argument between two pastors. One pointed to a word in the Bible. “Do you see that word?” “Yes, of course.” Then the first pastor put a gold coin over the word. “Do you see it now?” The audience laughed. “Whether the owners of this species of property [slaves] do really see it as it is,” Lincoln went on, “it is not for me to say, but if they do, they see it as it is through 2,000,000,000 of dollars, and that is a pretty thick coating.” The audience laughed. “Certain it is,” Lincoln continued, “that they do not see it as we see it. Certain it is, that this two thousand million of dollars, invested in this species of property, all so concentrated that the mind can grasp it at once – this immense pecuniary interest, has its influence upon their minds.”

### 3.4 Solo action will be ineffective and unfair

Social change is seldom set into motion simultaneously around the world, which means different rules may hold in different regions. This provides a seemingly rewarding argument against social change: solo action would be unfair and ineffective. The abolition of slavery in the Southern States, for example, would lead to inequality and compulsion among slaveholders elsewhere, as argued by Dew (Simms, 1852, p. 382):

“Every prudent slaveholder in the slaveholding part of the State, would either migrate with his slaves to some State where his rights in slave property would be secured to him by the laws, or would surrender at once his rights in the parent stock as well as in their future increase, and seek some land where he may enjoy at least the earnings of his own industry.”

In the case of the congressional debates on the Kyoto Protocol, the US senate rejected the protocol because it would not require developing countries to reduce their emissions, too, and would thus be ineffective and unfair. The Byrd-Hagel resolution (CR, S5622), passed in the US Senate in 1997 by a 95-0 majority, states that the US “should not be a signatory to any protocol ... 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”. In March 2001, President George W. Bush confirmed his support to the Byrd-Hagel resolution in a letter to the Senate describing as “unfair” the exemption of countries like India (Bush, 2001) and calling the Kyoto Protocol ‘ineffective’. The unanimity of the US Senate is explicit enough, but several quotes may serve to exemplify the sentiments expressed. Let me first turn to the alleged ineffectiveness of the Kyoto Protocol:

“We won’t even get reduced carbon emissions. That’s because every ton of reduced emissions in the United States and other developed nations will be made up – and then some – in the developing world.” (Senator Ford, June 12, 1997, CR, S5625)

“Even from an environmental standpoint, the Kyoto Protocol is a failure. ... Even if one accepts the validity of the science on global warming, which is still uncertain and at best contradictory, this treaty would do nothing to stop any of these emissions.” (Senator Hagel, April 20, 1998, CR, S3241)

“... the global warming treaty will create more pollution, not less, because it exempts the countries that permit the dirtiest of industrialization.” (Representative Rohrabacher, July 27, 2001, CR, H4774)

Whether the Kyoto Protocol is effective depends entirely on how it is implemented, though. If it merely sets restrictions on industries competing on the international market, the protocol would indeed accomplish little, for industries could just move to developing countries. However, not all industry is exposed to international competition and, more importantly, climate policy can also be designed to address domestic consumption. There is no reason to assume that the emission reductions to be achieved in the developed world by increasing fuel prices for domestic use such as private transport would be cancelled by greater fuel use in developing nations. Neither would tighter regulations on insulation of buildings result in increased emissions by developing countries, to name just some of the possibilities.

Apart from being ‘ineffective’, the Kyoto Protocol has also been characterised as “blatantly unfair” (Senator Murkowski, April 20, 1998, CR, S3242), or in the following words:

“I have a long record of defending the American worker and American industry from unfair business and trade practices overseas – many of which

occur in these developing countries. My fear is that failing to include developing nations in this agreement will undermine America's ability to compete internationally and will only work to force American industry overseas to these developing areas." (Senator Hollings, CR, S5887, June 17, 1997)

"The treaty is also patently unfair because it exempts 77 percent of all countries from any obligations. China, India, Mexico, and Brazil, just to name a few, are completely unfettered by the Treaty – these countries already have the competitive advantages of cheap labor, lower production costs, and lower environmental, health, and safety standards. If President Clinton has his way, now these countries will be free to develop and pollute all they want, while the U.S. economy goes into a deep freeze." (Senator McIntosh, May 20, 1998)

What makes the US Senate's rejection of the Kyoto Protocol on the basis of its 'unfairness' suspect is, first, the fact that the greenhouse emissions of the average North American outstrip those of the average citizen of India, say, by a factor *twenty*. This inequality was taken into consideration under the UNFCCC, which the United States signed in 1992. In the UNFCCC it was noted "that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs..." On the basis of these considerations and others, Article 3, Principle 1 of the UNFCCC states that: "the developed country Parties should take the lead in combating climate change and the adverse effects thereof." As a direct result of this article, developing countries are not subject to binding emissions targets under the Kyoto Protocol.

Many developing countries, such as India, China and the African countries, have proposed commitments to which they could agree and which would ensure a 'level playing field' for internationally competing industries. One such proposal is to allocate (tradable) emission rights to countries on a per capita basis (see e.g. Müller (2001) and Meyer (2000) for a proposal including convergence from 'grandfathering' to per capita allocation). This would indeed level the playing field, as emitting greenhouse gases would then cost the same throughout the world. However, because of the higher per-capita emissions in the developed countries like the US, such a scheme would result in substantial financial flows from the developed to the developing world. During the Kyoto Protocol negotiations of 1997, the delegation of Brazil made an even more far-reaching proposal: to distribute the burden of emission reductions among Parties proportional to their relative share of responsibility for climate change. Such a scheme would also take historical emissions into account and would therefore result in even

fewer emission rights for developed countries than under the equal per-capita scheme.

From the debates in the US Congress, however, emerges no willingness to embrace proposals that might lead to payments being made to developing countries. That means that congress' idea of 'fairness' does not primarily relate to the idea of an economic 'level playing field', but to the idea of 'historical rights': if the global community decides on a ceiling for greenhouse gas emissions, past emissions imply acquired rights. In this view, the United States has legitimately 'settled' in a quarter of globally available – previously unoccupied – 'emission territory'. Why should Americans give way and incur costs while people in the developing countries do not?

While congress' view of international 'fairness' may or may not be sincerely felt, there are grounds for further suspicion. First, the 'unfairness' of an international agreement cannot in itself be sufficient reason for rejecting climate policy. For example, the fact that slavery is not abolished by other countries cannot serve as a reason for upholding it. Second, over the last few years the US has often acted unilaterally or used 'power play' to force other countries to accept the US position on global political issues. Examples include the war on Iraq and the International Criminal Court, where the US has forced other countries into agreements that no US citizen could ever be handed over to the court. Remarkably, the US does not use this kind of 'power play' in the climate negotiations. This passivity and inconsistency once more indicates that US Congress does not see global warming as a problem.

### 3.5 Sovereignty

In *Arguing About Slavery* (1996), Miller shows that a central issue in the US congressional debates on slavery was the legitimacy of raising the subject at all at the congress or federal level. Many congressmen considered slavery a 'domestic institution' to be dealt with at the state level. Despite the Constitution guaranteeing citizens the right "to petition the government for a redress of grievances", on May 18, 1836, the House of Representatives adopted a 'gag rule' whereby all petitions relating to slavery would automatically be tabled without consideration. In his 1849 speech *The Southern Address*, senator and vice-president John C. Calhoun emphasised the element of sovereignty and individual freedom of choice (Calhoun, 1849):

"Slavery is a domestic institution. It belongs to the States, each for itself to decide, whether it shall be established or not; and if it be established, whether it should be abolished or not. Such being the clear and unquestionable right of the States, it follows necessarily that it would be a flagrant act of aggression on a State, destructive of its rights, and subversive of its independence, for the Federal Government, or one or more

States, or their people, to undertake to force on it the emancipation of its slaves. ...

It is not for them, nor for the Federal Government to determine, whether our domestic institution is good or bad; or whether it should be repressed or preserved. It belongs to us, and us only, to decide such questions.”

Today, many US congressmen are equally horrified by the idea of supranational bodies having a say in domestic affairs such as US energy consumption, as exemplified in the following quotations:

“It cuts to the heart of our national sovereignty by setting up an international authority that would subject U.S. businesses and industries to its authority and penalties. Never before in the history of this free Nation has that occurred. This is one U.S. Senator that will not allow it to occur.” (Senator Hagel, October 3, 1997, CR, S10310)

“Mr. President, I believe this will be the first time in the history of our country that a President has allowed foreign interests to control and to limit the growth of the American economy. ... Never before have we allowed foreign interests to dictate the amount of energy Americans can use.” (Senator Craig, April 20, 1998, CR, S3245)

“I am not about to give up my freedom to a bunch of unelected officials from other countries. ... within 10 years all of these bodies will be run by corrupt Third World people who are probably going to be bribed by Communist China.” (Representative Rohrabacher, July 27, 2001, CR, H4774)

As sincere as this fear of supranational bodies may be, however, the arguments become suspect if they are not accompanied by proposals for unilateral action. So far, the United States has not set any binding domestic targets for greenhouse gas emissions (PEW, 2004).

### 3.6 Social change will hit other groups

Another argument against social change is that trying to benefit one vulnerable group might harm certain other vulnerable groups. The argument is popular, since it distracts attention from the interests in the status quo of the one who uses the argument. Thus, in the slavery debate it was argued that abolition would be at the expense of women, a point only deemed valid because true emancipation was not to be afforded to women, either. Take, for example, Dew arguing against abolition (Simms, 1852, p.338-9):

“The labor of the slave thus becomes a substitute for that of the woman; ... She is now surrounded by her domestics, and the abundance of their labor lightens the toil and hardships of the whole family. She ceases to be a mere “*beast of burthen*,” ... [W]e behold the marked effects of slavery on the

condition of women ... no longer the slave, but the equal and the idol of man."

Of particular interest in the abolition debate was the argument that slavery was deemed necessary to ensure liberty and equality between the white, male part of the population, as expressed most clearly by an editor of the *Richmond Enquirer* (April 15, 1856):

"In this country alone does perfect equality of civil and social privilege exist among the white population, and it exists solely because we have black slaves," ... "Freedom is not possible without slavery."

Or take Representative (and future governor) Henry A. Wise from Virginia on the house floor on January 26, 1842 (CG, p. 173):

"... wherever black slavery existed, there was found at least an equality among the white population; but where it had no place, such equality was never to be found." ... "The principle of slavery was a leveling principle; it was friendly to equality. Break down slavery, and you would with the same blow break down the great Democratic principle of equality among men."

In the case of the climate debate, Senator Craig argued on the house floor on April 20, 1998, that the Kyoto Protocol would be at the expense of the starving in poor countries:

"One of the potential tragedies of this treaty would be the higher cost of food, not just for those who can afford it but for those who cannot. And remember our Judeo-Christian ethic as a country, the hundreds of millions of dollars of food we send around the world to poor nations, to starving people. Could we afford to send more if it cost more? I doubt it." (S3245)

Similarly, according to Senator Inhofe (July 28, 2003), the Kyoto Protocol would be at the expense of poor minorities in the US:

"[The Kyoto Protocol] affects the poverty rates for Blacks and Hispanics. ... it is discriminatory against these particular individuals. ... Kyoto will cost 511,000 jobs held by Hispanic workers and 864,000 jobs held by Black workers. Poverty rates for minority families will increase dramatically, and because Kyoto will bring about higher energy prices, many minority businesses will be lost. ... Kyoto and Kyoto-like policies developed in this body would cause the greatest harm to the very poorest of Americans." (S10015)

However, the interests of people vulnerable to climate change need not necessarily compete with those of other vulnerable groups. The fact that Blacks and Hispanics are most vulnerable to rising energy prices is not a fact

of nature, but a consequence of deliberate political choices about the organisation of US society, just like US expenditure on development aid – as is proven by the different choices made in many European countries. To recruit the domestic poor of the wealthiest nation in the world and the poor of developing countries in defence of non-ratification of the Kyoto Protocol is intellectually suspect, to say the least.

#### 4. Conclusions

Today, the United States is as dependent on fossil fuels for its patterns of consumption and production as its South was on slavery in the mid-nineteenth century. It may therefore be unsurprising that US congressmen often rationalise fossil fuel use despite climate risk to future generations, just as slavery was rationalised despite ideals of equality. “Errors that slumber peacefully through one age, may be instantly detected in the next, because they are looked at from other points of observation,” the ante-bellum orator Tarbox noted in 1843. Of course we must wait for a future timeframe from which to effectively judge today's public discourse on global warming. By recalling the abolition debates, however, we open a new window on the climate debate, one that I hope will shed new light.

A second reason for entertaining a certain amount of suspicion about the present climate debate is the following. In the case of uncertain risk, of which climate change is a textbook example, there is no uniquely and objectively ‘right’ approach to risk management. Faced with incomplete and often contradictory information, people perceive the world through a cultural filter that affects the way issues are defined and preferences as to how they should be handled (see e.g. Douglas and Wildavsky, 1982; Adams, 1995). One thing that may justifiably be demanded of any intellectual debate, however, is *consistency*. One essential element of judging attitudes towards the management of climate risk, therefore, is to compare them with attitudes expressed in other cases. In this chapter I have argued that this consistency is often lacking in the US congressional debates on the Kyoto Protocol.

In this chapter I have not argued for or against any particular kind of climate policy. What I hope to have made clear, however, is how the kind of reactionary rhetoric employed in the US congressional debates on the Kyoto Protocol, of which many examples have here been cited, is obstructing the dialogue and deliberation that is so essential for well-considered choices in a matter of such potentially historic importance.



## References

- Adams, J.: 1995, Risk. University College London, London.
- Azar, C. and Schneider, S.H.: 2002, 'Are the economic costs of stabilising the atmosphere prohibitive?', *Ecological Economics* 42 (1-2), 73-80.
- Bush, G.W.: 2001, 'Letter from the President to Senators Hagel, Helms, Craig, and Roberts', March 13, 2001 (<http://www.whitehouse.gov/news/releases/2001/03/20010314.html>)
- Calhoun, J.C.: 1849, 'The Southern Address', in: Crallé, R.K. (ed.), *The Works of John C. Calhoun: A Disquisition on Government and a Discourse on the Constitution and Government of the United States*. Charleston, S. C., 1851, vol. VI, pp. 290-313.
- CG, Congressional Globe: record of the congressional debates of the 23rd through 42nd Congresses (1833-73) (<http://memory.loc.gov/ammem/amlaw/lwceglink.html>)
- CR, Congressional Record (<http://www.gpoaccess.gov/crecord/retrieve.html>)
- Douglas, M. and Wildavsky, A.: 1982, *Risk and culture: an essay on the selection of technological and environmental dangers*, University of California Press, Berkeley.
- EIA (Energy Information Administration): 1998, *Impacts of the Kyoto Protocol on U.S. Energy Markets and Economic Activity*, U.S. Department of Energy, Washington, DC (<http://www.eia.doe.gov/oiaf/kyoto/pdf/sroiaf9803.pdf>)
- EIA (Energy Information Administration): 2004, *International Energy Outlook 2004*, DOE/EIA-0484(2004), Washington, DC.
- EPA (Environmental Protection Agency): 2003, Memorandum August 28, 2003, (<http://www.epa.gov/airlinks/co2petitiongcmemo8-28.pdf>).
- Fankhauser, S. and Tol, R.S.J.: 1996, 'Climate Change Costs – recent advancements in the economic assessment', *Energy Policy* 24 (7), 665-673.
- Hirschman, A.O.: 1991, *The Rhetoric of Reaction: Perversity, Futility, Jeopardy*, Harvard University Press, Harvard.
- Hummel, J.R.: 1996, *Emancipating Slaves, Enslaving Free Men: A History of the American Civil War*, Open Court, Chicago.
- IPCC: 1995, *Climate Change 1995*. Cambridge University Press, Cambridge.
- IPCC: 2001, *Climate Change 2001*. Cambridge University Press, Cambridge.
- Jenkins, W.S.: 1935, *Pro-slavery Thought in the Old South*, University of North Carolina Press, Chapel Hill.
- Lincoln, A.: 1860, *The Complete Works of Abraham Lincoln*, The Tandy - Thomas Co., N.Y., 1905, Vol. V, pp. 343-44.
- Mendelsohn, R. and Neumann, J. (Eds.), 1999. *The Impacts of Climate Change on the US Economy*. Cambridge University Press, Cambridge.
- Meyer, A.: 2000, *Contraction & Convergence: The Global Solution to Climate Change*. Schumacher Briefing No. 5. Green Books, Bristol.
- Miller, W.L.: 1996, *Arguing About Slavery, The Great Battle in the United States Congress*, Alfred A. Knopf, New York.
- Müller, B., 2000. *Congressional Climate Change Hearings: Comedy or Tragedy? A Primer for Aliens* (<http://www.wolfson.ox.ac.uk/~mueller/primer.pdf>).
- Müller, B.: 2001. 'Varieties of Distributive Justice in Climate Change', *Climatic Change* 48 (2-3), 273-288.

- NAS, 1998. Statement by the Council of the National Academy of Sciences regarding Global Change Petition, April 20, 1998 (<http://www4.nationalacademies.org/news.nsf/isbn/s04201998?OpenDocument>)
- NAS, 2001. *Climate Change Science: An Analysis of Some Key Questions*. National Academy Press, Washington, D.C.
- Orr, D.: 2000, '2020: a Proposal', *Conservation Biology* 14 (2), 338-341.
- PEW Center on Global Climate Change: 2004, *Climate Change Activities in the U.S.: 2004 Update*, Arlington ([www.pewclimate.org](http://www.pewclimate.org)).
- RDC, Gales & Seaton's Register of Debates in Congress: record of the congressional debates of the 18th Congress, 2nd Session through the 25th Congress, 1st Session (1824-37) (<http://memory.loc.gov/ammem/amlaw/lwrlink.html>)
- Robinson, A.R., Baliunas, S.L., Soon, W. and Robinson, Z.W.: 1998, *Environmental Effects of Increased Atmospheric Carbon Dioxide*, Oregon Institute of Science and Medicine (<http://www.oism.org/pproject/index.htm>).
- Simms, W.G.: 1852, *The pro-slavery argument; as maintained by the most distinguished writers of the Southern States, containing the several essays on the subject of Chancellor Harper, Governor Hammond, Dr. Simms, and Professor Dew, Charleston, Walker, Richards & Co.* (<http://www.hti.umich.edu/cgi/t/text/text-idx?c=moa;idno=ABT7488.0001.001>)
- Tarbox, I.N.: 1843, *An Address on the Origin, Progress & Present Condition of Philosophy* 4, Utica.
- Tise, L.E.: 1987, *Proslavery: A History of the Defense of Slavery in America, 1701-1840*, University of Georgia Press, Athens.
- U.S. Census: 1860, *Population of the United States in 1860*, pp. 598-599.
- U.S. Census Bureau: 2004, *International Population Reports WP/02, Global Population Profile: 2002*, U.S. Government Printing Office, Washington, DC.
- WEFA (Wharton Econometric Forecasting Associates), 1998. *Global Warming: The High Cost of the Kyoto Protocol*. Eddystone, PA. See executive summary at <http://www.api.org/globalclimate/wefa/exec.pdf>.

## Summary

In the introduction to *Arguing About Slavery*, William Lee Miller describes the resistance to the abolition of slavery in the Southern United States in the mid-nineteenth century:<sup>1</sup>

“Slavery was integral to the life and culture, as John C. Calhoun kept saying, of an entire region, of eleven states (in 1835) of the Union – of almost half of the nation. When a “pecuniary interest” has that magnitude, it is a formidable opponent indeed. Rationalizations are supplied, positions are softened, conflicts are avoided, compromises are sought, careers are protected, life goes on. Don’t try to change what can’t be changed. Adapt to it.”

“Suppose today some dominant industry, built into the lives and fortunes of a great many people – to a degree of the whole nation – were found to be morally repugnant; what difficulties there would then be in extracting it from the nation’s life!”

In fact, we do have such a dominant industry today. The large-scale burning of fossil fuels, an energy source applied to *replace* human labour, is closely interwoven with almost every facet of modern production and consumption. Increasingly, the burning of fossil fuels is considered morally repugnant because we are passing on its costs – climate-change induced damage to health and property – to future generations. And as Miller anticipates, this industry is rationalised in public and political debate as slavery was one-and-a-half centuries ago.

Today, of course, the former rationalisation of slavery is easily exposed, while we must wait for a future time frame from which to effectively judge today's public discourse on global warming. “Errors that slumber peacefully through one age, may be instantly detected in the next, because they are looked at from other points of observation,” as the antebellum orator Tarbox noted in 1843. Still, I believe the validity of a wide range of arguments for or against climate policy can already be judged today.

The main objective of this thesis is not to champion why we should or should not care about future generations, though I will indeed discuss this topic. Although the moral worth of slaves was publicly questioned at the time of the abolition debates, the analogous question of why we should care about future generations is virtually lacking in the present climate debate. Although highly debated among moral philosophers, our duties to posterity

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<sup>1</sup> Miller, W.L.: 1996, *Arguing About Slavery*, The Great Battle in the United States Congress, Alfred A. Knopf, New York, p. 11.

remain more or less uncontested in both public and political debate. The main target of this thesis is therefore the kind of rhetorical rationalisation of the status quo which gives the impression that we do care about future generations but nevertheless justifies business-as-usual. The objectives are the following:

- to argue that *in theory* the validity of arguments for or against climate policy depends upon their consistency with the general standards of conduct deemed acceptable for handling risks to others, as laid down in tort law, for example;
- to show by means of examples that *in practice* this consistency test is able to disqualify a variety of oft-used arguments in the climate debate.

In chapter 1, I first sketch the circumstances that go to explain why the status quo – the continued burning of fossil fuels – is rationalised the way that it is. I first discuss the ‘inconvenient truth’ about climate change. Knowledge about the risk of climate change due to human activities is ever increasing. Despite this knowledge, however, the deliberate human activities to curb the emission of greenhouse gases are still negligible. The political and social inertia is not surprising. Social change is generally induced by face-to-face confrontation between those in the better and worse position or by the former being ‘bothered’ by the latter. In the case of climate change, those in the worse position are future generations. We cannot be touched by the face of future generations, however, nor can they bother us. Moreover, tackling the problem of climate change will be costly. This combination of circumstances – high present costs of climate policy, benefits for future generations, and their absence in public debate – largely explains the rationalisation of the status quo.

Although the idea is quite uncontested that future generations will experience damage to property and health due to our present acts, the idea is more controversial that this damage involves *wrongful harms*, i.e. violations of future generations’ rights to bodily integrity and personal property. It is not self-evident to consider damage to the health and property experienced by future generations a wrongful harm to them, in the same way as we consider, for example, trans-national air pollution a wrongful harm to contemporaries living across the border. Both the identity and the entitlements of future people depend upon our present acts complicating the idea that we could presently violate their rights. In chapter 2, I discuss these issues and I argue that although future generations’ entitlements to property originate in our present entitlements, the principles of self-ownership and self-determination require us to take ‘reasonable care’ of the products of future labour. Furthermore, I conclude that in spite of the theoretical

problems, such as Parfit's non-identity problem, governments are justified to address climate risks by appealing to the rights of future generations to bodily integrity and personal property.

If climate damage involves wrongful harms to future generations, there are two obvious ways to handle the risk of climate change: regulation, which requires a potential injurer to take measures to prevent the harm from occurring, and tort law, which seeks to deter the harm by making a potential injurer liable for the costs of the harm should it occur. In chapter 3, I argue that it is more straightforward to handle the risk of climate change through regulation than through tort law, i.e. making people liable for climate damage. Although a duty of care can be established, tort lawsuits are problematic in the case of climate change because there will be few cases in which plaintiffs are able to prove that the defendant's negligent conduct was the cause of the harm to the plaintiff. If such a causal relationship can be established, the defendants will probably already be defunct. However, although regulation seems better equipped to handle the risk of climate change, the argumentation on which regulation is based should be consistent with the reasonable man standards from tort law. Although regulation and tort law may differ methodologically, the formal requirement of justice assumes that types of reasoning that are considered unreasonable under negligence tort law must likewise be unreasonable for regulating the emission of greenhouse gases. Therefore, the point of view of reasonable man has implications for how future benefits and present costs are weighed up in cost-benefit analysis, how expectations about technological progress are dealt with, and how scientific uncertainty and controversy are handled.

In chapters 4 and 5, I apply the idea of handling risk to future generations according to the reasonable man standard to one topic in particular: the social discount rate, which is commonly used in cost-benefit analysis of climate policy. According to mainstream economics the necessity of climate policy is reduced because future generations are emphatically remote from us and much wealthier. I argue that such arguments would be considered unacceptable, however, in the case of risk to contemporaries. Under current law, neither geographic distance nor differences in wealth between risk creator and risk bearer play any part in establishing a standard of 'reasonable care'. Therefore, consistency with the general standards of conduct in the case of risk to others requires a much lower discount rate than commonly advocated. In chapter 4, it is argued that the social discount rate should be equal to society's marginal propensity to save times the long-term market rate of return on private investment. In chapter 5, concrete numbers are added: it is concluded that the social discount rate is about half a percent, the product of a twenty percent savings rate and a two to three percent risk-free rate of return on alternative investments.

In chapter 6, I explore similarities between the rationalisation of slavery in the abolition debates and the rationalisation of ongoing emissions of greenhouse gases in the US congressional debates on the Kyoto Protocol. Today, the United States is as dependent on fossil fuels for its patterns of consumption and production as its South was on slavery in the mid-nineteenth century. That US congressmen tend to rationalise fossil fuel use despite climate risks to future generations just as Southern congressmen rationalised slavery despite ideals of equality is perhaps unsurprising, then.

# Nederlandse samenvatting

## *Argumenteren over klimaatverandering*

*Toetsing van de omgang met risico's van klimaatverandering voor toekomstige generaties aan de maatschappelijke normen van betamelijkheid in het geval van risico's voor de nu levenden.*

In de inleiding van *Arguing About Slavery*, beschrijft William Lee Miller de weerstand tegen de afschaffing van de slavernij in de Zuidelijke Verenigde Staten in het midden van de negentiende eeuw.<sup>1</sup>

“Slavernij was verweven met het leven en de cultuur, zoals John C. Calhoun bleef zeggen, van elf staten (in 1835) van de Unie – van bijna de helft van het land. Wanneer een “geldelijk belang” zo groot is, is het met recht een geduchte tegenstander. Rationalisering wordt aangevoerd, posities worden afgezwakt, conflicten worden vermeden, compromissen worden gezocht, carrières worden beschermd, het leven gaat door. Probeer niet te veranderen wat niet veranderd kan worden. Pas je aan.”

“Stel je voor dat men tegenwoordig een dominante industrie, verweven met het leven en het fortuin van een grote groep mensen – tot op het punt van het gehele land – moreel verwerpelijk zou gaan vinden; wat voor problemen er dan zouden zijn om het uit het land's leven te verwijderen!”

In feite hebben we tegenwoordig zo een dominante industrie. Het grootschalige verbruik van fossiele brandstoffen – een energiebron die juist is ingezet om menselijk arbeid te *vervangen* – is sterk verweven met bijna elk facet van onze huidige productie en consumptiepatronen. Steeds meer wordt het verbruik van fossiele brandstoffen als moreel problematisch gezien omdat we de kosten – schade aan gezondheid en eigendommen door klimaatverandering – afwentelen op toekomstige generaties. En, zoals Miller anticipeert, wordt deze praktijk in het publieke en politieke debat generationaliseerd zoals slavernij anderhalve eeuw geleden.

De rationalisatie van slavernij in vroegere tijden is vandaag de dag natuurlijk makkelijk bloot te leggen. Om het huidige publieke discours over het versterkte broeikas effect effectief te kunnen beoordelen, moeten we echter op een toekomstig tijdperk wachten. “Dwalingen die vredig door het ene tijdperk kunnen sluimeren, kunnen in het volgende instantaan worden opgemerkt, omdat ze vanuit een ander gezichtspunt worden bekeken,” zoals

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<sup>1</sup> Miller, W.L.: 1996, *Arguing About Slavery, The Great Battle in the United States Congress*, Alfred A. Knopf, New York, p. 11.

de redenaar Tarbox in 1843 voor de Amerikaanse burgeroorlog opmerkte. Toch geloof ik dat de geldigheid van een breed scala aan argumenten voor of tegen klimaatbeleid ook nu al kan worden beoordeeld.

Dit proefschrift heeft niet als hoofddoel te verdedigen waarom we wel of juist niet voor toekomstige generaties moeten zorgen, ook al zal ik dit onderwerp wel bediscussiëren. Ten tijde van de debatten rond de afschaffing van de slavernij werd de morele waarde van slaven publiek betwist. De analoge vraag naar waarom we zouden moeten zorgen voor toekomstige generaties ontbreekt echter vrijwel volledig in het huidige klimaatdebat. Hoewel hevig bediscussieerd onder ethici, blijven onze plichten jegens het nageslacht zo goed als onbetwist in zowel het publieke als het politieke debat. De focus van dit proefschrift ligt daarom op het soort retorische rationalisatie van de *status quo*, die de indruk wekt dat we ons om toekomstige generaties zorgen maken, maar desalniettemin *business-as-usual* rechtvaardigt. De doelen zijn de volgende:

- te beargumenteren dat *in theorie* de validiteit van argumenten voor of tegen klimaatbeleid afhangt van hun consistentie met de maatschappelijke standaarden van betamelijkheid bij de omgang met risico's voor anderen, zoals bijvoorbeeld neergelegd in wetgeving omtrent de onrechtmatige daad;
- te laten zien door middel van voorbeelden dat *in de praktijk* deze consistentietest in staat is een scala van vaak gebruikte argumenten in het klimaatdebat te diskwalificeren.

In hoofdstuk 1 schets ik eerst de omstandigheden die verklaren waarom de *status quo* – het voortdurende verbruik van fossiele brandstoffen – wordt gerationaliseerd zoals dat gebeurt. Eerst bediscussieer ik de 'ongemakkelijke waarheid' over klimaatverandering. De kennis over het risico van klimaatverandering ten gevolge van menselijke activiteiten neemt alleen maar toe. Desondanks zijn de opzettelijke inspanningen om de emissies van broeikasgassen te verminderen nog steeds verwaarloosbaar. De politieke en sociale traagheid zijn niet verrassend. Maatschappelijke veranderingen worden over het algemeen inganggezet door oog-in-oog confrontaties tussen hen in de betere en hen in de slechtere positie, of doordat de eersten door de laatsten worden 'gehinderd'. In het geval van klimaatverandering zijn diegenen in de slechtere positie toekomstige generaties. Toekomstige generaties kunnen ons echter noch emotioneel raken door hun aangezicht, noch kunnen zij ons hinderen. Daarbij komt dat de aanpak van klimaatverandering kostbaar zal zijn. Deze combinatie van omstandigheden – hoge huidige kosten van klimaatbeleid, baten voor toekomstige generaties en hun afwezigheid in het maatschappelijk debat – verklaren grotendeels de rationalisatie van de *status quo*.



Dát toekomstige generaties door onze huidige uitstoot van broeikasgassen schade zullen ondervinden aan eigendom en gezondheid staat nauwelijks ter discussie. Meer controversieel is echter de idee dat deze schade een schending inhoudt van de rechten van toekomstige generaties op lichamelijke integriteit en persoonlijk bezit, net zoals bijvoorbeeld grensoverschrijdende luchtvervuiling verwijtbare schade oplevert voor mensen die niet in een andere tijd, maar over de grens wonen. In het geval van toekomstige generaties hangt immers zowel hun identiteit als hun bezit van ons huidige handelen af. In hoofdstuk 2 bediscussieer ik deze onderwerpen en beargumenteer ik dat, hoewel het bezit van toekomstige generaties uit ons huidig bezit voortkomt, de principes van zelfeigendom en zelfbepaling van ons eisen een redelijke mate van zorg te nemen ten aanzien van de vruchten van toekomstige arbeid. Daarbij concludeer ik dat ondanks theoretische problemen, zoals Parfit's non-identiteitsprobleem, overheden gerechtvaardigd zijn om klimaatrisico's aan te pakken met verwijzing naar de rechten van toekomstige generaties op lichamelijke integriteit en persoonlijk bezit.

Als klimaatschade verwijtbaar handelen jegens toekomstige generaties inhoudt, heeft de overheid twee manieren om deze schade te voorkomen: regulering, waarbij de overheid een potentiële veroorzaker van schade direct prikkelt of dwingt maatregelen te treffen, bijvoorbeeld via voorschriften en belastingen, en aansprakelijkheidswetgeving, waarbij de overheid een potentiële veroorzaker *indirect* prikkelt door deze aansprakelijk te stellen voor de schadekosten mochten deze optreden. In hoofdstuk 3 beargumenteer ik dat het meer voor de hand ligt om het risico van klimaatverandering via regulering aan te pakken dan via aansprakelijkheidswetgeving. In het geval van klimaatverandering zijn onrechtmatige daad rechtzaken problematisch omdat er weinig gevallen zullen zijn waarin de eisers in staat zullen zijn te bewijzen dat de nalatigheid van de beklagden de oorzaak was van de schade voor de eiser. Als zo een causale relatie al zou kunnen worden vastgesteld, zijn de beklagden bovendien waarschijnlijk al overleden. Hoewel regulering dus beter in staat lijkt om het risico op klimaatverandering aan te pakken, behoort de argumentatie achter dergelijke regulering wel consistent te zijn met de standaard van de 'redelijke mens' uit de wetgeving ten aanzien van de onrechtmatige daad. Hoewel regulering en het aansprakelijkheidsrecht methodisch kunnen verschillen, vereist rechtvaardigheid in formele zin dat typen argumentatie die onredelijk worden gevonden binnen de rechtspraak omtrent de onrechtmatige daad evenzeer onredelijk moeten zijn voor de regulering van broeikasgasemissies. Vandaar dat het gezichtspunt van de 'redelijke mens' implicaties heeft voor hoe toekomstige baten en huidige kosten worden gewogen in kosten-batenanalyse, hoe wordt omgegaan met verwachtingen van technologische

voortgang, en hoe wordt omgegaan met wetenschappelijke onzekerheid en controverse.

In de hoofdstukken 4 en 5 pas ik het idee om de risico's voor toekomstige generaties volgens de 'redelijke mens' standaard aan te pakken toe op één specifiek onderwerp: de maatschappelijke discontovoet die wordt gebruikt in kosten-batenanalyse ten behoeve van het klimaatbeleid. Volgens het gangbare economische denken wordt de noodzaak van klimaatbeleid verminderd doordat toekomstige generaties emotioneel van ons zijn verwijderd en daarbij veel rijker. Ik beargumenteer dat dergelijke argumenten als onredelijk zouden worden beschouwd in het geval van risico's voor tijdgenoten. Volgens het huidige recht zijn noch geografische (emotionele) afstand, noch verschillen in rijkdom relevant bij de bepaling wat een redelijke mate van zorg is in het geval van risico's voor anderen. Daarom vereist consistentie met de algemene normen van maatschappelijke betamelijkheid een veel lagere discontovoet dan normaal wordt bepleit. In hoofdstuk 4 beargumenteer ik dat de maatschappelijke discontovoet gelijk zou moeten zijn aan de maatschappelijke spaarquote maal het lange termijn markttrendement op private investeringen. In hoofdstuk 5 worden daar concrete getallen aan toegevoegd: ik concludeer dat de maatschappelijke discontovoet ongeveer een halve procent zou moeten bedragen, het product van een 20% spaarquote en een twee tot drie procent risicovrij rendement op alternatieve investeringen.

In hoofdstuk 6 onderzoek ik parallellen tussen de rationalisatie van slavernij in de debatten rond de afschaffing daarvan en de rationalisatie van voortdurende emissies van broeikasgassen in de debatten van het Amerikaanse congres over het Kyoto Protocol. Tegenwoordig is de Verenigde Staten voor haar consumptie en productiepatronen even afhankelijk van fossiele brandstoffen als haar Zuiden van de slavernij was anderhalve eeuw geleden. Het is dan ook misschien niet verbazend dat de Amerikaanse congresleden het gebruik van fossiele energie ondanks de klimaatrisico's neigen te rationaliseren, zoals de Zuidelijke congresleden slavernij rationaliseerden ondanks de gelijkheidsidealen.

## Acknowledgements

First of all I would like to thank Govert den Hartogh, who supervised my work on my doctoral thesis. Govert was kind enough to underwrite my research proposal and gave me a haven at the University of Amsterdam's Ethics research group. With my highly interdisciplinary research with a strong economic component I was pretty much the odd man out, so I thank Govert for constantly hammering home the importance of the ethical dimension. I am above all grateful for his finely-honed insights. I generally manage, in my misguided way, to uphold the illusion for myself that I can stand my own in debate with anyone. In Govert's case, though, I soon realised his thinking would always remain miles ahead of mine.

I am also very grateful to the Netherlands Organisation for Scientific Research (NWO). It was NWO that honoured my research proposal under their *Ethics, Research & Public Policy* programme, allowing me to fulfil a long-held wish to return to academia to get my teeth into some research.

There are two other parties without whose support that research would not have been feasible: my former (and once again current) employer CE Delft and the Dutch Ministry of Housing, Spatial Planning and the Environment (VROM). Because of a shortfall of 45,000 Euro in funding, shortly after the go-ahead from NWO my research nearly had to be called off altogether. Frans Rooijers, director of CE Delft, was willing to provide a written guarantee that in the course of the three-year research period I would manage to find the required additional funds. That guarantee I appreciate all the more because I know Frans was averse to letting me go at all. That CE Delft always puts the individual interests of its staff above its organisational interests is something for which I have enormous respect.

Happily, several weeks later the guarantee given by CE Delft could be shredded, when VROM signalled they were willing to provide an additional grant of 45,000 Euro. I am consequently also very grateful to Ronald Flipphi, Jip Lenstra and Erwin Mulders at that ministry.



# Curriculum vitae

*Die Umwelt ist alles, was der Fall ist.*

I was born in Amsterdam on 26 July, 1966. Before the age of six I had already decided I would devote the rest of my life to physics. That ‘rest of my life’ lasted until completion of my doctoral studies in 1994.

Around the age of sixteen I decided that life was like a salmon swimming upstream against the current of nature, which moves from order to growing disorder. And what better way to express oneself as a human being than by bringing order to the phenomena around one as a physicist?

At the age of twenty-one, however, environmental issues began to absorb my full attention. The question arose, and did so forcefully, of whether there was in fact any point in making a contribution to physics if there was no prospect of a healthy future in which such a science could advance. Although my love of physics in no way declined, I did not feel the true solution to our environmental ills lay in discoveries to be made in physics or engineering. What was required was a change in *our way of thinking*. While working on my doctoral studies I therefore took up philosophy, obtaining a degree in environmental philosophy in 1995.

Having gained my PhD in physics, I set out looking for a job in which I could do something to help resolve the environmental crisis. The economics department of the environmental consultancy CE Delft invited me to come along for an interview. In my letter I had included one sentence on the importance of economic understanding for resolving our environmental problems, although I myself lacked any such understanding. Over the past fifteen years I have been given the opportunity to become an environmental economist at CE Delft, though with no diploma to show for it.

From the age of twenty-one I have lived as an environmental ascetic, in accordance with my belief in Kant’s categorical imperative, that one should act only according to such rules as one might wish the whole world to endorse. At the same time I came out for my ideals, proactively. When I was about twenty-five I decided you can also come out for your ideals by living them, without thrusting them on those around you. Following my marriage at the age of thirty I came to realise that in a situation of cohabitation – at any scale – when elaborating one’s own life one must seek compromises when those with whom one lives hold different ideas.

Living with others in accordance with your principles with respect for other kinds of principles held just as dearly by those around you remains for me one of the greatest challenges in life.

Since 2005 we own a car.