

**IAP Stern Review Discussion**

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# **Talking About Risk**

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# A Problem of Risk Management

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*“...it was clear that the modelling framework used by this Review had to be built around the economics of risk. Averaging across possibilities conceals risks. The risks of outcomes much worse than expected are very real and they could be catastrophic. Policy on climate change is in large measure about reducing these risks. They cannot be fully eliminated, but they can be substantially reduced.”*

# Projected Impacts of Climate Change

Global temperature change (relative to pre-industrial)

0°C

1°C

2°C

3°C

4°C

5°C

## Food

*Falling crop yields in many areas, particularly developing regions*

*Possible rising yields in some high latitude regions*

*Falling yields in many developed regions*

## Water

*Small mountain glaciers disappear – water supplies threatened in several areas*

*Significant decreases in water availability in many areas, including Mediterranean and Southern Africa*

*Sea level rise threatens major cities*

## Ecosystems

*Extensive Damage to Coral Reefs*

*Rising number of species face extinction*

## Extreme Weather Events

*Rising intensity of storms, forest fires, droughts, flooding and heat waves*

## Risk of Abrupt and Major Irreversible Changes

*Increasing risk of dangerous feedbacks and abrupt, large-scale shifts in the climate system*

## PART II: The Impacts of Climate Change on Growth and Development

Figure 6.5 a. Baseline-climate scenario, with market impacts and the risk of catastrophe.

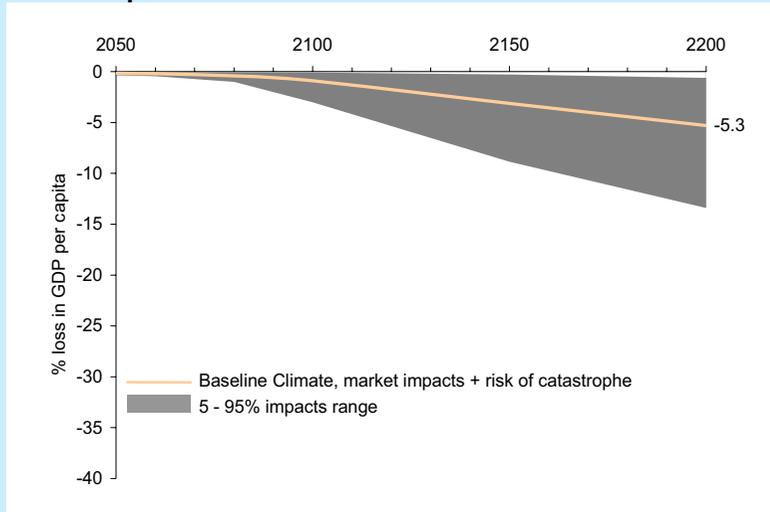


Figure 6.5b. High-climate scenario, with market impacts and the risk of catastrophe.

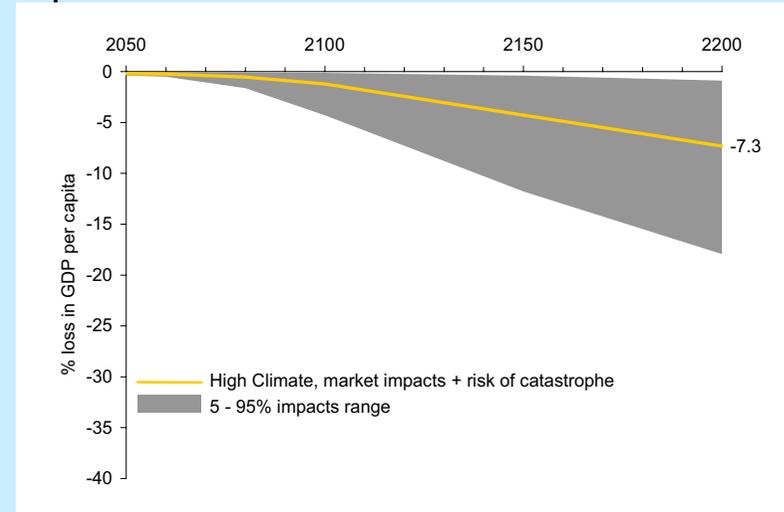


Figure 6.5c. High-climate scenario, with market impacts, the risk of catastrophe and non-market impacts.

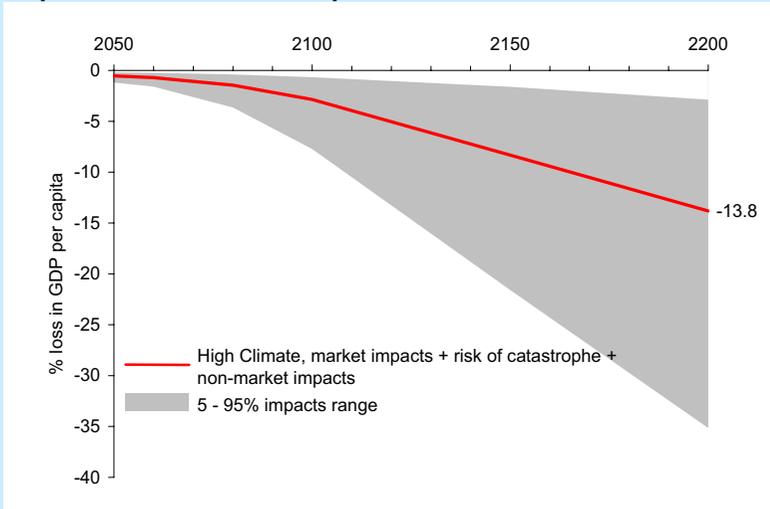


Figure 6.5d. Combined scenarios.

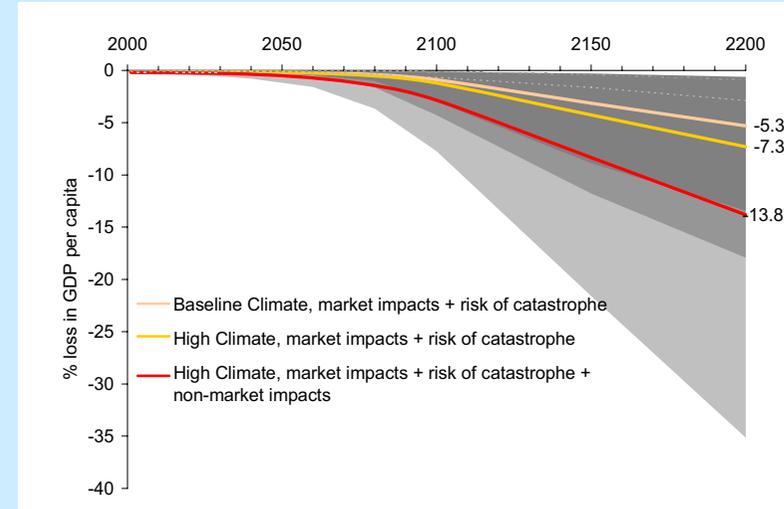


Figure 6.5a-d traces losses in income per capita due to climate change over the next 200 years, according to three of our main scenarios of climate change and economic impacts. The mean loss is shown in a colour matching the scenarios of Figure 6.4. The range of estimates from the 5<sup>th</sup> to the 95<sup>th</sup> percentile is shaded grey.

# The Heroic Assumptions

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## ■ Detailed Climate Effects

- regional rainfall patterns
- storm intensity
- abrupt change

## ■ Adaptation

## ■ Rate of Technological Change

## ■ Rate and Breadth of Economic Development

## ■ Valuation of Non-Market Impacts

# Alternative Strategies for Scientific Interventions

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## Strategy #1.

- Produce a bottom line answer!
- Go all the way using the best estimates and modeling choices available, no matter how unreliable.
- Make the best ethical judgments possible, so long as you are explicit.
- Turn the crank and spit out a cost number and a benefit number.

## Strategy #2.

- Say what you know.
- Inform the discussion as far as science reliably can, but no farther.
- Unpack the key points that must be addressed.
- The public debate will assess and evaluate all of the imponderables and value judgments.

## A Conscious Choice

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*“The large uncertainties in this type of modeling and calculation should not be ignored. The model we use, although it is able to build on and go beyond previous models, nonetheless shares most of their limitations. In particular, it must rely on sparse or non-existent observational data at high temperatures and from developing regions. The possibilities of very high temperatures and abrupt and large-scale changes in the climate system are the greatest risks we face in terms of their potential impact, yet these are precisely the areas we know least about, both scientifically and economically...”*

## A Conscious Choice (cont.)

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*“In interpreting these results, economic models that look out over just a few years are insufficient. The impact of GHGs emitted today will still be felt well over a century from now. Uncertainty about both scientific and economic possibilities is very large and any model must be seen as illustrative. Nevertheless, getting to grips with the analysis in a serious way does require us to look forward explicitly. These models should be seen as one contribution to that discussion. They should be treated with great circumspection. There is a danger that, because they are quantitative, they will be taken too literally. They should not be. They are only one part of an argument. But they can, and do help us to gain some understanding of the size of the risks involved, an issue that is at the heart of the economics of climate change.”*