Grantham Research Institute on Climate Change and the Environment

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Rt Hon Peter Lilley MP
House of Commons
London
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20 December 2016

Dear Mr Lilley,

I am writing to you in relation to your recent pamphlet on 'The Stern Review: Ten Years On', published by the Global Warming Policy Foundation on 28 October 2016. You may recall that we had several exchanges of correspondence in 2012 and 2013 following misrepresentations you made about 'The Economics of Climate Change: The Stern Review', including your previous pamphlet on 'What is Wrong with Stern? The Failings of the Stern Review of the Economics of Climate Change', published by the Global Warming Policy Foundation on 18 October 2012. I was disappointed to discover that your new document is littered with many of the inaccurate and misleading claims that characterised your earlier attacks on The Stern Review. It is not clear to me why you have chosen to repeat so many erroneous allegations about the Review even though I explained clearly why they were false in my correspondence with you.

It would take a great deal of space to itemise every single mistake in your document, so I will outline here only five of your most egregious misrepresentations.

1. You claim that The Stern Review "applied conventional cost-benefit analysis to projections based on science that he claimed was 'certain'". This is wholly untrue. The Review throughout explicitly acknowledges the uncertainties in the science. For instance, the Introduction states: "We use a consistent approach towards uncertainty. The science of climate change is reliable, and the direction is clear. But we do not know precisely when and where particular impacts will occur. Uncertainty about the impacts strengthens the argument for mitigation: this Review is about the economics of the management of very large risks."

2. You make a series of confused and contradictory claims about the use of discounting in The Stern Review. For instance, on page 5 you state: "Since the harmful effects of global warming were predicted to be far into the future, he [Stern] had to discount over time at a near-zero rate]". However, on page 6, you state: "In a lecture to the American Economic association in 2008, Stern said 'with the benefit of hindsight, my inclination would be [to discount for higher incomes at twice the rate used in the Stern Review]. That would mean using a basic rate of discount of 2.7% pa instead of 1.4% pa used in the Review." In fact, these statements about discounting are all wrong. As I stressed many times in my previous correspondence with you, The Stern Review did not use a single discount rate in the formal economic modelling of climate change impacts outlined in Chapter 6. Chapter 2 of

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Chair:
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the Review discusses discounting in detail and the assumptions that are made. It makes clear that the simplified form of discount rate used in The Review has three components: the elasticity of the marginal utility of consumption; the growth rate of consumption along a particular path; and the pure time discount rate. Page 52 of The Review states that "there is no reason to assume the discount rate is constant", and "will depend on the underlying pattern of consumption for the path being examined". For the 1000 model runs described in Chapter 6, the marginal utility of consumption is assumed to be constant at 1.0 and the pure rate of time preference is assumed to be 0.1% per annum. However, these model runs cover a range of growth rates of consumption, and hence a range of discount rates, between 2001 and 2200. Beyond 2200, the assumption is made that the world instantaneously overcomes the problems of climate change (zero damages and zero adaptation) and for all runs consumption growth is assumed to grow at an arbitrary 1.3% per year. Hence, it is quite wrong for you to claim that The Stern Review only used a single discount rate. The Review explicitly emphasises this point on page 663: "Some previous studies have assumed that the discount rate at any point of time is independent of the scale of the impacts and of the path followed (the future growth trajectory). However, as climate change implies that strongly divergent paths for future growth are possible, the use of a single set of discount rates (over time) for all paths is inappropriate." I should also point out that your paraphrasing of the text of Lord Stern's 2008 paper in the American Economic Review is a complete misrepresentation. The text actually states: "Looking at both γ and η, with the benefit of hindsight, my inclination would be to place the base case from which sensitivity analysis is undertaken farther down the diagonal of Table 2 – that is with higher γ and higher η." As γ refers to the damage function exponent and η refers to marginal utility of consumption, this statement in no way corresponds to your paraphrasing or your claim "That would mean using a basic rate of discount of 2.7% pa instead of 1.4% pa used in the Review".

3. You state: "The Review adopted, without attribution, the UK government's target of preventing atmospheric carbon dioxide exceeding 550 ppm". This is entirely false. The Review did not set a target of preventing concentrations of carbon dioxide from exceeding 550 parts per million. Instead it recommended that the aim of global policy should be to stabilise total atmospheric concentrations of all greenhouse gases, not just carbon dioxide, at between 450 and 550 parts per million of carbon-dioxide-equivalent. It arrived at this conclusion through independent detailed analysis, described in Chapter 13. The Review explicitly states on page 338: "The evidence of the benefits and costs of mitigation at different atmospheric concentrations in our view suggests that the stabilisation goal should lie within the range 450-550 ppm CO_2e".

4. You state: "Although substantially higher than the losses projected by most environmental economists, the threat of losing 5% of future GDP, as predicted by The Review, did not provoke great public alarm. So in subsequent lectures Stern drops references to lost GDP and emphasises the threat of mass migration and conflict." This is untrue on several counts. First, the Review made very clear throughout that the results of formal economic modelling were only part of the evidence that was taken into account. This was emphasised, for instance, in the 'Summary of Conclusions', which states: "The Review has assessed a wide range of evidence on the impacts of climate change and on the economic costs, and has used a number of different techniques to assess costs and risks. From all of these perspectives, the evidence gathered by The Review leads to a simple conclusion: the benefits of strong and early action far outweigh the economic costs of not acting." It goes on to state: "Using the results from formal economic models, the Review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more." Second, The Review emphasises the potential for migration and conflict throughout. For instance, it states on page 98 in Chapter 2, on 'How Climate Change will Affect People Around the World': "While there is some evidence in individual sectors for

disproportionate increases in damages with increasing temperatures, such as heat stress, the most powerful consequences will arise when interactions between sectors magnify the effects of rising temperatures. For example, infrastructure damage will rise sharply in a warmer world, because of the combined effects of increasing potency of storms from warmer ocean waters and the increasing vulnerability of infrastructure to rising windspeeds. At the same time the science is becoming stronger, suggesting that higher temperatures will bring a growing risk of abrupt and large-scale changes in the climate system, such as melting of the Greenland Ice Sheet or sudden shift in the pattern of monsoon rains. Such changes are still hard to predict, but their consequences could be potentially catastrophic, with the risk of large-scale movement of populations and global security." The Review also warns that the economic modelling of climate change impacts, described in Chapter 6, does not include migration and conflict. It states on page 188 that "there are potentially worrying 'social contingent' impacts such as migration and conflict, which have not been quantified explicitly here". Third, you allege that Lord Stern no longer mentions GDP, so I have enclosed his paper which was published by the 'Proceedings of the Royal Society' last year, demonstrating that you are wrong. But it also states: "While the arguments that the costs of inaction greatly exceed the costs of action, which were strong at the time of the Review, are still stronger now, we have since greatly deepened our understanding of the dynamics of economic change and international interactions. Performed in a sensible way, and tailored to the structural and ethical basics of the problem, a benefit-cost analysis can be misleading. If, for instance, the future potential consequences of climate change are quantified only in terms of a single dimension (e.g. consumption or GDP), the scale of damage and disruption to human lives can be overlooked. Consider, for instance, trying to describe the Second World War only in terms of its impact on global GDP, without referring to the millions of lives that were lost."

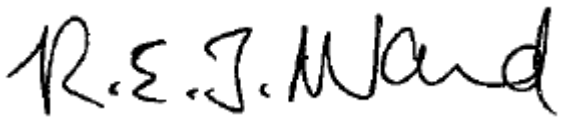
5. You state that "even in the worst case shown in the Stern Review, people in developing countries are still expected to be far better off a century or two ahead than now". You continue: "In his worst case, the negative impacts – both economic and non-economic – of global warming are equivalent to a 37% loss of income per head relative to what incomes would have been without any global warming. Nonetheless, people in developing countries are still expected to have average levels of wellbeing more than 6 times their current incomes by 2100 and 20 times by 2200, when their incomes will be two-thirds higher than incomes of people in the industrialised world today." You attempt to justify this statement by citing your error-strewn 2012 pamphlet for the Global Warming Policy Foundation. But as I pointed out in my previous correspondence, you have made some inaccurate assumptions, and Table 1 in your 2012 pamphlet misrepresents content of The Stern Review. First, the Table is described as "Stern's Estimate of the Worst Cost of Global Warming", but contains figures for "net welfare per capita" that are not found in The Review and are not consistent with it. For instance, your claim that per capita income levels in developing countries will be 20 times higher than today in 2200 assumes that income increases constantly regardless of how big the impacts of climate change could be, and follows a single growth path of 2.2% per year between 1990 and 2100 and 1.5% per year between 2100 and 2200. In fact, The Review's formal economic modelling actually involved calculations of consumption, not income, and even if the two variables are assumed to be simply correlated, The Review points out in several places why the assumption of exogenous growth is wrong. For instance, on page 182, The Review states: "…consumption growth is allowed to vary in future in systematic ways. Traditionally, economic appraisal of projects and policies has taken a simplified approach to this basic welfare-economics framework. Consumption is simply assumed to grow at a certain rate in the future, with uncertainty entering the projection only to the extent that there will be perturbations around this assumed path. In our case, however, climate change could substantially reduce consumption growth in the future, and so two probabilistic model runs with different climate impacts produce different growth rates. So the simplified approach will not work here.

Instead, we have to go back to the underlying theory, which implies that consumption paths must be valued separately along each of the model's many (1000, say) runs."

There are many more serious errors in your document, many of which are repeated from your 2012 pamphlet and which I highlighted in my previous correspondence with you. Given your failure to take account of the previous correspondence, it is hard to reach any other conclusion than your misrepresentations of The Stern Review are wilful rather than accidental.

Contrary to your assertion, The Stern Review has withstood detailed expert scrutiny over the past 10 years, and its main finding, that the costs of climate change mitigation and adaptation are much less than the risks of impacts of unmanaged climate change, remains as accurate today as it was at the time of publication. By contrast, the fundamental flaws in your pamphlet render the conclusions completely inaccurate and misleading, and I urge you to withdraw it immediately. I am copying this letter to Lord Lawson of Blaby and Dr Benny Peiser, respectively the Chair and Director of the Global Warming Policy Foundation, as your pamphlet breaches Charity Commission guidelines which specify that campaign materials should not be inaccurate or misleading.

Yours sincerely,



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