

## Ward,RE

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**From:** Ann Norman <anorman@jepjournal.org>  
**Sent:** 14 March 2014 15:10  
**To:** Ward,RE  
**Subject:** Re: Errors in Tol (2009)

Dear Bob,

I hear you and I have been instructed not to be a go-between. I am, in effect, a secretary. Professor Tol was told to publish and correction and give us data and the editors are deciding whether what they have is an acceptable response to the complaint. And right now that is where it stands. I do wish this would be solved quickly and satisfactorily, but there is nothing I can do at this point except reiterate your concerns, which I will do.

I hope it all works out for you,

Ann

On Mar 14, 2014, at 10:53 AM, <[R.E.Ward@lse.ac.uk](mailto:R.E.Ward@lse.ac.uk)> wrote:

Dear Ann,

How will it be possible for the journal to publish an erratum if nobody is going to be able to check the aggregations.?

Best wishes,

Bob

Bob Ward

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**From:** Ann Norman [mailto:[anorman@jepjournal.org](mailto:anorman@jepjournal.org)]  
**Sent:** 14 March 2014 14:50  
**To:** Ward,RE  
**Subject:** Re: Errors in Tol (2009)

He was told to send us his data and he did send something, but I do not believe that there is anything there about the aggregations. I may be wrong.

Ann

On Mar 14, 2014, at 10:43 AM, <[R.E.Ward@lse.ac.uk](mailto:R.E.Ward@lse.ac.uk)> wrote:

Dear Ann,

Thanks for the update. Does that mean that the journal will not be requiring Professor Tol to make available the data for his aggregations so that they can be checked for further errors?

Best wishes,

Bob

Bob Ward

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**From:** Ann Norman [mailto:[anorman@jepjournal.org](mailto:anorman@jepjournal.org)]

**Sent:** 14 March 2014 13:52

**To:** Ward,RE

**Subject:** Re: Errors in Tol (2009)

Well we can hardly move faster than once a quarter since we are a quarterly journal. We do have a correction that is currently scheduled to run in the Spring issue. I cannot promise beyond the shadow of a doubt that it will run in the Spring issue, but it should. In the meantime, you should do whatever you think best.

Ann

On Mar 14, 2014, at 9:35 AM, <[R.E.Ward@lse.ac.uk](mailto:R.E.Ward@lse.ac.uk)> wrote:

Dear Ann,

I am afraid that the paper by Tol has again been cited in the media, in a letter in today's edition of the Financial Times:<http://www.ft.com/cms/s/0/1ea981d0-aac9-11e3-83a2-00144feab7de.html?siteedition=uk#axzz2vv3Gtzgl>

I am very disappointed that the journal is being so slow to correct the paper which means that the errors continue to be propagated further. It not only damages the public debate but also harms the reputation of the journal.

Is there any news on when an erratum will be published? Or do I need to submit a paper to the journal listing the errors?

Best wishes,

Bob

Bob Ward

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**From:** Ann Norman [mailto:[anorman@jepjournal.org](mailto:anorman@jepjournal.org)]

**Sent:** 03 March 2014 17:06

**To:** Ward,RE

**Subject:** Re: Errors in Tol (2009)

Will do!

On Mar 3, 2014, at 12:04 PM, <[R.E.Ward@lse.ac.uk](mailto:R.E.Ward@lse.ac.uk)> wrote:

Hi Ann,

Many thanks for the update. Please let me know when a resolution has been reached.

Best wishes,

Bob

Bob Ward

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**From:** Ann Norman [mailto:[anorman@jepjournal.org](mailto:anorman@jepjournal.org)]  
**Sent:** 03 March 2014 17:03  
**To:** Ward,RE  
**Subject:** Re: Errors in Tol (2009)

Dear Bob,

Sorry, it looks like the dataset I have is not exactly the dataset you were asking for. I am not able to release anything I have at this time, so it looks like we are closing in on a resolution of the situation, but there is no complete resolution yet.

That is all I know,

:?

Ann

On Mar 3, 2014, at 10:24 AM, [R.E.Ward@lse.ac.uk](mailto:R.E.Ward@lse.ac.uk) wrote:

Dear Ann,

It has been a few weeks since I contacted you about the errors in Tol (2009), so I was wondering whether there has been any progress on corrections and on making the underlying data available.

Best wishes,

Bob

Bob Ward

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**From:** Ann Norman [mailto:[anorman@jepjournal.org](mailto:anorman@jepjournal.org)]  
**Sent:** 28 January 2014 18:17  
**To:** Ward,RE  
**Subject:** Re: Errors in Tol (2009)

Right. There have been only a few cases in my work here, where it came down to that: the JEP applying pressure. You are right that a cooperative approach is always preferable. To tell you the truth I am just an intermediary in this, but I will definitely follow this issue to its conclusion and keep you informed. Presumably the editors will write to you directly once they get up to speed.

Ann

On Jan 28, 2014, at 12:59 PM, [R.E.Ward@lse.ac.uk](mailto:R.E.Ward@lse.ac.uk) wrote:

Dear Ann,

Many thanks for your message. My preferred way of dealing with this would have been for a co-operative approach by the author, but he does not seem minded to do this. Any help you can provide will be greatly appreciated.

Best wishes,

Bob

Bob Ward

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**From:** Ann Norman [mailto:[anorman@jepjournal.org](mailto:anorman@jepjournal.org)]  
**Sent:** 28 January 2014 15:07  
**To:** Ward,RE  
**Cc:** Timothy Taylor; David Autor  
**Subject:** Re: Errors in Tol (2009)

Dear Professor Ward,

It is true that there is a data availability policy that requires all JEP authors to make their data available to other researcher for replication purposes, and it was in effect in 2009.

We recently published a 4-page "Correction" on a paper about disability insurance (if I am remembering correctly). These things happen. I hear you and we will look into this to see if there is any data that should be shared, and to post a correction if things are as you say.

I am forwarding this to Managing Editor Timothy Taylor and Editor David Autor.

Thanks,

Ann

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On Jan 28, 2014, at 9:00 AM, <[R.E.Ward@lse.ac.uk](mailto:R.E.Ward@lse.ac.uk)> wrote:

Dear Dr Norman

I am writing to draw your attention to a number of small but significant errors in a paper which was published by the 'Journal of Economic Perspectives' in 2009. I believe they require not only prompt correction but also action by the author to make available details of the calculations he carried out so the rest of his data may be replicated and verified. The paper is now being cited in the media and in policy debates, so the errors could be causing quite widespread damage.

The paper is 'The Economic Effects of Climate Change', by Richard S. J. Tol, which was published in volume 23, number 2, pages 29-51. The errors occur in Table 1 on page 31 and Figure 1 on page 35, as well as in the accompanying commentary in the text of the paper.

Specifically, Table 1 purports to compile the results published by other authors, but contains two clear mistakes in the column labelled 'Impact (% of GDP)', which are also wrongly plotted in Figure 1. These are:

1. The Nordhaus 1994b paper, which is listed in the references as 'Expert opinion on climate change' and published in 'American Scientist', found that a rise of 3°C in global average temperature by 2090 would result in a loss of between 0 and 21 per cent of gross world product, with a mean value of 1.9 per cent and a mode of 3.6 per cent, as shown in Figure 2 in the paper. However, Table 1 of Tol (2009) indicates that the paper found a loss of between 0 and 30 per cent, with a mean of 4.8 per cent. In fact, these figures correspond exactly to the results in Figure 3 of the Nordhaus 1994b paper, which provides the estimates of the likelihood of a high-consequence event from global warming. It seems that Tol (2009) accidentally mixed up the two, and used the wrong numbers.
2. The Nordhaus 2006 paper, which is listed in the references as 'Geography and macroeconomics: new data and new findings' and published in the 'Proceedings of the National Academy of Sciences', presents an estimate of impacts from two scenarios, one which considers warming only and one which includes mid-continental drying as

well. On page 3516 of the paper, Nordhaus states that the scenarios are drawn from the IPCC TAR and “have been rescaled to correspond to a 3°C global average equilibrium increase”. However, Table 1 of Tol (2009) wrongly lists the Nordhaus 2006 paper as relating to a warming of 2.5°C.

In addition, two further likely mistakes occur in the column labelled ‘Impact (% of GDP)’. These are:

1. The Plambeck and Hope (1996) paper, which is listed in the references as ‘PAGE95 – An updated valuation of the impacts of global warming’ and published in ‘Energy Policy, presents an estimate of the regional impacts of global warming of 2.5°C. These are calculated from the PAGE95 model which incorporates regional impact factors listed in Table 3 on page 789 as percentage GDP loss due to global warming of 2.5°C. Seven regions are listed, for which the ‘most likely’ values of the impact factors range from 0.00 to 6.60 per cent. Plambeck and Hope (1996) do not cite a global aggregate value for GDP loss due to global warming of 2.5°C. However, Table 1 of Tol (2009) indicates that Plambeck and Hope (1996) found that the global impact on GDP of global warming of 2.5°C was 2.5 per cent, with an “uncertainty” of -0.5 to -11.4. This result was obtained through the calculations carried out by Tol (2009) and is almost certainly wrong. Indeed, Figure 1 of Tol (2009) plots the result for Plambeck and Hope (1996) as -2.5 per cent of GDP, and a later paper by Tol (‘On the uncertainty about the total economic impact of climate change’, published in ‘Environmental and Resource Economics’ in 2012) similarly lists Plambeck and Hope (1996) as estimating the global impact of global warming of 2.5°C to be a change in GDP of -2.5 per cent.
2. The Hope (2006) paper, which is listed in the references as ‘The marginal impact of CO<sub>2</sub> from PAGE2002: an integrated assessment model incorporating the IPCC’s five reasons for concern’ and published in ‘The Integrated Assessment Journal’, estimates the marginal impacts of a 10 per cent reduction in carbon dioxide emissions. These are calculated from the PAGE2002 model which incorporates regional impact factors listed in Table 5 on page 24 as percentage GDP loss due to global warming of “2.5°C above the tolerable level in each impact sector in the EU, with regional multipliers for other regions”. Apart from the EU, regional weight factors are provided for seven other regions, with mean values ranging from -0.35 for Eastern Europe and the Former Soviet Union (the only regional impact factor implying a positive change in GDP) to 2.5 for India. It is important to note that nowhere in the paper does Hope (2006) provide an estimate of the global impact of global warming relative to present day or pre-industrial levels. However, Table 1 of Tol (2009) indicates that Hope (2006) found that the range of global impact on GDP of global warming of 2.5°C was 0.9 per cent, with an “uncertainty” of -0.2 to 2.7. This result obtained from the calculations of Tol (2009) is unlikely to be accurate, given the information provided in the Hope (2006) paper.

I have been able to verify that five other values (for Nordhaus (1994a), Fankhauser (1995), Tol (1995), Nordhaus and Boyer (2000), and Tol (2002)) listed in Table 1 and plotted in Figure 1 of Tol (2009) are correct. However, the four remaining data points (for Nordhaus and Yang (1996), Mendelsohn et al. (2000), Maddison (2003), and Rehdanz and Maddison (2005)) were derived by Tol using his own calculations based on the other authors’ work, so I have been unable to verify their accuracy.

I exchanged e-mail messages with Professor Tol in October 2013 about these issues and he eventually confirmed that each represented errors in Table 1 and Figure 1 of Tol (2009). However, he has still not expressed any intention of providing a corrigendum to correct these small errors. Nor has he responded to my request for him to make available the details of his calculations so that I might verify the data he presented in the paper. Therefore, I have been left with no other choice but to write to you at the ‘Journal of Economic Perspectives’.

I suggest not only that Professor Tol correct these small errors without any further delay, but also that he makes available immediately the details of his own calculations used to derive the unverified results for the four studies, so that their accuracy can be checked. The curves fitted to the data in Figure 1 will also need to be re-plotted, and the commentary in the text will need to be amended to reflect the updated analysis. Although these multiple errors appear to be the result of sloppiness rather than a concerted effort to misrepresent other authors’ work, I note that the effect of correcting the data would be that only one data point indicates any significantly positive impact of global warming on global GDP.

Finally, I would point out that Professor Tol’s reluctance to correct these basic errors in his work is in stark contrast to the positive attitude adopted by Carmen Reinhart and Kenneth Rogoff when they recently learned of similarly sloppy mistakes in their 2010 paper on ‘Growth in a Time of Debt’. I do hope that Professor Tol can be persuaded to adopt a more constructive approach to addressing the mistakes in his paper, which are having an impact not just on his reputation but also that of the ‘Journal of Economic Perspectives’.

Yours sincerely,

Bob Ward

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