

## News and Views

### ***When smart people make dumb mistakes***

Herman E. Daly

School of Public Affairs, University of Maryland, Van Munching Hall, College Park MD 20742- 1821, USA

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Errors made by ignorant or stupid people, even when corrected, usually do not enlighten us very much. However, errors made by very intelligent and highly educated people often reveal a flaw in the state-of-the-art thinking on a subject, and therefore can be highly enlightening. I would like to consider one such enlightening error. It has been made by at least three leading economists, people who are at the top of the profession and Deservedly command the respect of all economists.

1. In Science magazine's report of a U.S. National Academy of Science study on climate change and greenhouse adaptation, Yale University economist Nordhaus (1991) is quoted as saying: 'Agriculture, the part of the economy that is sensitive to climate change, accounts for just 3% of national output. That means there is no way to get a very large effect on the US economy'.
2. In his book, *Small is Stupid*, Oxford University economist Beckerman (1995) also tells us that greenhouse-gas induced climate change is no worry because it affects only agriculture and agriculture is only 3% of GNP. Beckerman elaborates, 'even if net output of agriculture fell by 50% by the end of the next century this is only a 1.5% cut in GNP'.
3. In *Foreign Affairs*, Schelling (1997), former Harvard University economist and past president of the American Economic Association, elaborates a bit more: 'in the developed world hardly any component of the national income is affected by climate. Agriculture is practically the only sector of the economy affected by climate, and it contributes' only a small percentage — 3% in the United States — of national income. If agricultural productivity were drastically reduced by climate change, the cost of living would rise by 1

or 2%, and at a time when per capita income will likely have doubled'.

It is not true that agriculture is the only climate-sensitive sector of developed economies — just ask the insurance companies! But that is not the error that I want to discuss. The error that concerns me here is to measure the importance of agriculture by its percentage of GNP. Surely these distinguished economists know all about the diamonds–water paradox, diminishing marginal utility, and inelastic demand for necessities. Imagine an economy in which GNP consisted of water and diamonds, with water so abundant that its price was almost zero. GNP would consist, say, of 99% value of diamonds and 1% value of water. Imagine that climate change causes a drought. The marginal utility of water and its price become very high, and the terms of trade of diamonds for water moves drastically against diamonds. Now GNP might well be 99% value of water and 1% value of diamonds. With this in mind it should be evident that in the event of a climate-induced collapse of agriculture the price of food would skyrocket and the percentage of GNP going to agriculture, which is really not a constant of nature, could easily rise from 3 to 90%. The terms of trade between agricultural and non-agricultural products would shift wildly in favour of agriculture. Clearly the percentage of the gross national product derived from agriculture measures, at best, the importance of marginal (very small) changes in agricultural output. Certainly it cannot apply to Beckman's '50% fall', or Schelling's 'drastic reduction', or Nordhaus' unqualified 'no way'.

The assumption required by the 'only 3% argument' therefore is that climate change will have only a marginal physical effect on agricultural output. The mere 3% of agriculture in GNP adds no evidence or reason for complacency beyond the bald and dubious assumption that any climate change will be obligingly marginal in its effect on physical quantity of agricul-

tural output — too small to significantly affect the price of agricultural goods, even in the face of inelastic demand. One way of looking at the error is therefore that it represents an elementary failure to distinguish marginal from non-marginal change.

Another related dimension of the error is that it treats all parts of GNP as substitutable, not only at the margin, but on the average and on the whole. If GNP declines by 3% due to a collapse of agriculture, that will presumably be no problem if GNP simultaneously increases by 3% due to growth in information technologies. A dollar's worth of anything is considered indifferently substitutable for a dollar's worth of anything else. The same for a 100 billion dollar's worth. Although money is indeed fungible, real goods and services are not. We measure real GNP in monetary units, but GNP is certainly not money. A dollar is a piece of paper or a book-keeping entry; a dollar's worth of food is a physical quantity of something necessary to support life. The fungibility (being of such a nature that one part or quantity may be replaced by another equal part or quantity in the satisfaction of an obligation <oil, wheat, and lumber are *fungible* commodities) of dollars does not imply the fungibility of food and, say, information services. Unless we first have enough food we just will not be interested in information services. If I am hungry, I want a meal, not a recipe. And I will trade all my recipes and any other information I have for just one plate of real food.

True, agriculture accounts for only 3% of GNP, but it is precisely the specific 3% on which the other 97% is based! It is not an indifferently fungible 3%. That is why agriculture is classed

## References

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as primary production. The foundation of a building may be only 3% of its height, but that does not mean that we can abolish the foundation if we only add 3% to the top of the building. Yet some economists confuse fungibility of money with fungibility of real wealth, and proclaim publicly that they don't care if we produce computer chips or potato chips, as long as the dollar value is the same. While that may be roughly true for small changes at the margin, it is completely false applied to large changes, to averages, or to totals.

But it is still hard to understand how such distinguished economists could make such an egregious mistake. In all three cases the mistake was part of a larger defence of economic growth. Could it be that, because the argument led to the 'right' conclusion, it was exempted from the discipline of passing the test of elementary economics? The 'right conclusion' is that economic growth is the solution to all our problems, including climate change, and that the solution cannot possibly induce the problem. Is the test of an argument that it leads to the desired conclusion? Not really, but if we are totally committed to the conclusion (economic growth is always good), then naturally we will be suspicious of any arguments that undermine that conclusion. And we may also look too indulgently on doubtful arguments that support the undoubted conclusion. I am not at all sure that this explains the error. But I am sure that the error cannot be attributed to ignorance or stupidity, and this is the only remaining explanation that I can think of.