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CORNHUSKER ECONOMICS

UNIVERSITY OF
Nebraska
Lincoln

January 6, 2010

University of Nebraska–Lincoln Extension

Institute of Agriculture & Natural Resources
Department of Agricultural Economics
<http://www.agecon.unl.edu/Cornhuskereconomics.html>

Science and the Climate Change Debacle

As I write this on the first business day of 2010, I find myself thinking about the importance of respecting alternative views --- not only alternative political views, but also alternative scientific views. Good science requires that we understand the limits of knowledge and continuously seek the truth through respectful questioning, replication and review. In the climate change debate, which recently culminated in a disappointing and largely ineffective conference in Copenhagen, these salient principles of science were grossly violated. Well respected climate scientists proceeded well beyond the limits of their knowledge and became policy advocates. They demeaned anyone who dared to disagree with their findings or to suggest that limiting CO2 emissions may not be the best policy choice at the present time. Disagreeing with the “experts” became disrespected professional behavior, even within the academic community. This approach has not served the interests of anyone very well.

In the recently published book titled *Super Freakonomics*, Levitt and Dubner address the fallacies inherent in the climate change debate. They accept the clear scientific evidence that the earth is warming and that CO2 emissions contribute to the problem, but take serious issue with those who conclude that the appropriate policy action is necessarily to substantially reduce CO2 emissions as soon as possible. Drawing upon the scientific evidence and the expertise of others they make five major points: 1) changes in CO2 emissions may not solve the problem; 2) current models cannot replicate climate events with enough precision to produce results that have a high probability of being correct; 3) in the future we will

Market Report	Yr Ago	4 Wks Ago	1/1/10
<u>Livestock and Products,</u>			
<u>Weekly Average</u>			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.....	\$85.17	\$81.07	\$83.11
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	102.44	107.76	106.90
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	97.62	95.44	94.47
Choice Boxed Beef, 600-750 lb. Carcass.	143.49	139.48	139.06
Western Corn Belt Base Hog Price Carcass, Negotiated.	51.37	59.81	63.66
Feeder Pigs, National Direct 50 lbs, FOB.	54.13	*	*
Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean.	55.13	62.76	67.76
Slaughter Lambs, Ch. & Pr., Heavy, Wooled, South Dakota, Direct.	*	93.50	*
National Carcass Lamb Cutout, FOB.	259.15	242.98	245.26
<u>Crops,</u>			
<u>Daily Spot Prices</u>			
Wheat, No. 1, H.W. Imperial, bu.	5.53	4.39	4.21
Corn, No. 2, Yellow Omaha, bu.	4.00	3.42	3.90
Soybeans, No. 1, Yellow Omaha, bu.	9.56	10.17	10.20
Grain Sorghum, No. 2, Yellow Dorchester, cwt.	5.48	5.77	6.34
Oats, No. 2, Heavy Minneapolis, MN, bu.	2.10	2.52	2.72
<u>Feed</u>			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	185.00	*	135.00
Alfalfa, Large Rounds, Good Platte Valley, ton.	77.50	82.50	87.50
Grass Hay, Large Rounds, Premium Nebraska, ton.	75.00	*	*
Dried Distillers Grains, 10% Moisture, Nebraska Average.	144.00	120.00	121.50
Wet Distillers Grains, 65-70% Moisture, Nebraska Average.	50.87	42.50	40.75
*No Market			



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have lower cost methods of addressing climate change, as a result of investments in research; 4) it may be less costly to invest in adaptation technologies and strategies, instead of prevention; and 5) if harmful extensive global warming does occur, it may be possible to reverse it at reasonable cost. Although these points may be found invalid over the long-run, they do clearly establish that the socially optimum policy position is not necessarily reduced CO2 emissions, especially in the short-run. In other words, there is a lot of room for well informed and conscientious people to disagree about climate change policy.

Where the scientific community has erred is in assuming that the science which addresses the existence and consequences of climate change can also prescribe the appropriate public policies. Public policy is decided by our elected officials, and they need much more information than what climate science can provide to decide a plan of action.

Policy makers need to consider how likely it is that a large infusion of research funding would produce technologies that materially reduce the cost of slowing or adapting to global warming. Although research success is always uncertain, even the most pessimistic scientist would concede that tremendous progress would occur, for example, if the world invested an additional one trillion dollars per year in energy and climate change research. An investment of this magnitude would increase current research funding by at least one order of magnitude, yet this cost would represent only a small fraction of the annual cost of some of the CO2 cap and trade programs that have been seriously proposed.

Policy makers also need to consider how much could be achieved with an adaptation strategy, as an alternative or complement to a prevention strategy. Maybe future generations would be better served if we placed more emphasis on adapting to climate change, and less on prevention?

Finally, policy makers need to consider the consequences of potential irreversibility. What happens if we delay aggressive action to reduce CO2 emissions in order to afford an aggressive research program that subsequently fails, or if we plan to adapt instead of prevent climate change and adaptation proves more difficult than expected? These developments would present a serious problem if

global warming proves to be irreversible. It turns out, however, that this may not be as big a risk as one might expect because of the geoengineering option. Several reputable scientists have suggested that even with current technology it may be possible to cool the earth by injecting rather small amounts of sulfur dioxide into the stratosphere, a process sometimes called Budyko's Blanket (Caldeira and Wood, 2008). Others believe this to be a crackpot idea (most notably Al Gore), and perhaps that will turn out to be the case. However, the important point is that if there is any chance that this option is technically feasible and affordable today, then surely there is a high probability that it would be possible if a serious need arose within four or five decades, when the problem is expected to become critical.

My crystal ball is no better than anyone else's with respect to climate change, but what is clear to me is that we face a major policy and technical challenge that is much broader than CO2 emission limits and the advisability of a cap and trade program for carbon. Well informed policy decisions will require input on many additional issues, from a very wide range of scientific perspectives and disciplines. The quality and quantity of these inputs will be greatly enhanced if they come from a scientific community that is cooperative, respectful of alternative views, and cognizant of the distinction between a scientific finding and a policy recommendation. If this happens, it will lead to improved policy decisions about climate change and perhaps also help restore the credibility of scientific contributions to other public policy issues as well.

References:

- Levitt, Steven D. and Stephen J. Dubner. 2009. *Super Freakonomics*, Harper Collins, New York City, NY.
- Caldeira, Ken and Lowell Wood. "Global and Arctic Climate Engineering: Numerical Model Studies," *Philosophical Transactions of the Royal Society*, November 13, 2008.

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