

A Bottom-up Accounting Approach to the Costs of Adaptation

A Note to the OECD GFSD on the Economic Benefits of Climate Change Policies

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Given the considerable difficulties encountered by those attempting to measure the benefits of climate change policies (OECD 2004) it is suggested that an alternative or complimentary approach might be developed on the adaptation policy side by empirical studies on the present costs of adaptation to current climate variability and extremes.

How much is now being spent on activities that can be classified as “adaptation to weather and climate? If such amounts can be estimated on a reasonably consistent basis this would give a baseline measure of adaptation costs. Presumably the current costs of adaptation would include all the activities that are used to reduce the impacts of weather on economic activities. There are a great many such activities, and to a large extent they may be presumed to be cost-effective otherwise they would not be carried out. A few examples may serve to illustrate the point. Air conditioning is used to provide a comfortable home and work environment for people in hot climates or hot seasons. Where exposure to heat waves is considered to be a risk to human life and health the use of air conditioning is being expanded. Heat-health forecasting and warning systems are being installed in major cities, and some cities are beginning to provide “cool spaces or refuges” at public expense where those exposed to dangerous levels of heat can go to take shelter. These are weather/climate adaptation costs.

Similarly at the world’s major airports in cold climates or cold seasons considerable efforts are made to keep planes flying, and flying on schedule by such means as runway snow and ice clearing, and the de-icing of the planes themselves. Forecasts and warnings are also employed in an attempt to minimize the costs of disruption. The litany of adaptation measures in agriculture, water resources management, health protection, hydro-electrical energy production, coastal and flood plain land use, the design and standards for infrastructure and so forth is clearly very large.

It should not be beyond the skill of statisticians and accountants however to devise efficient data collection strategies, perhaps on a sample basis, in order to arrive at estimates of the current costs of adaptation to weather and climate. Furthermore information gathered from archival and historical budget and financial data, supplemented by information and judgements of experts and practitioners could be used to identify the direction of trends in these costs. In some cases it may be possible to estimate the amount of increase or decrease for some years into the past.

It is a small but highly significant step to then examine these costs in the light of projected climate changes (including climate variability and extremes). If such an approach were developed and applied with sufficient rigour then some metrics would begin to emerge of the costs of adaptation now and into the future. One merit of such results would be the knowledge that they are based more firmly on observed behaviour, and depend to a lesser degree on assumptions about what adaptation choices will be exercised by those at risk.

A very preliminary exercise along these lines was carried out in Canada in 1993-94 (Herbert and Burton 1994). We found that the costs of adaptation at that time were in the order of \$11 billion CAD. The survey was based on a limited amount of statistical data and some key informer interviews in seven sectors. The estimates of adaptation cost are listed in Table 1 together with a judgement about their likely trend under conditions of climate change.

The paper reporting this very preliminary analysis was rejected by several journals. Reviewers generally did not disagree with the approach but raised searching questions about the methodology and insisted on a much more rigorous and tested approach. Nevertheless the paper in its

unpublished state enjoyed some recognition in Canada and was widely quoted for a time in government reports. It also received a small amount of international attention.

Table 1. Estimated Costs of Adaptation to Canada's Current Climate and Trends under climate change

Sector.	Cost (billions)	Trend.
Transport	1.6	potential for some decrease
Construction	2.0	uncertain
Agriculture	1.4	increase
Forestry	0.4	increase
Water	0.8	increase
Household expenditures	5.3	net decrease
Emergency Planning	0.1	increase
Weather information	0.1	potential for some decrease
Total	11.653,454	? probable net increase

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Funds have not been forthcoming to repeat or improve upon this experimental exercise, and to our knowledge no others have adopted the approach. Perhaps it is fatally flawed or perhaps there are other reasons! A time to reconsider?

References

Herbert, Deborah, and Burton, Ian. 1994. "Estimated Costs of Adaptation to Canada's Current Climate and Trends under Climate Change" unpublished paper, Atmospheric Environment Service, Toronto.

OECD, 2004. The Benefits of Climate Change Policies. Analytical and Framework Issues. OECD. Paris.