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Director's Note

The EERH is now into its final lap with many projects nearing completion. Outputs are flowing! There are over 60 Research Reports on the Hub web site and a growing collection of Policy Briefs that are designed to 'translate' the results and conclusions of the projects into readily understandable, non-technical language. The up-coming CERF Conference will provide an excellent opportunity to showcase the Hub's wares.

While some projects are winding down, others are starting up. Paul Mwebaze and Robert Gillespie have recently been appointed to take on project leadership roles in valuing biological collections, waste disposal options and temperate marine biodiversity. These short term projects are designed to provide decision makers with highly relevant policy inputs for specific environmental management choices. They are funded through the Hub's 'Emerging Research Issues' budget. Hub activities will wind down toward the end of the year. In that phase, and in preparation for the demise of CERF and the inception of the new National Environment Research Program *cont'd Page 2*

Measuring values of Historic Heritage



The Sydney Opera House, listed on the World Heritage List administered by UNESCO.

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(NERP), DEWHA is in the process of allocating 'transition funds'. The EERH has applied for some of these funds to support a range of projects focused on the priority issues to be addressed by the NERP – biodiversity, the Great Barrier Reef and Northern Australia.

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Measuring Use and Non-Use Values of Historic Heritage places

Professor David Throsby, Macquarie Uni

This project is concerned with the valuation of historic heritage places. Such places include: structures, i.e. the built heritage; monuments; landscapes or cultural sites; and groupings of buildings or sites such as historic town centres. Why is this project being funded through a research funding program that is devoted to *environmental economics*?

The answer lies in the fact that valuation methods used in environmental economics are directly applicable to heritage, because heritage is a paradigm case of what has come to be known in economics as *cultural capital*. This class of asset bears strong similarities with natural capital, the asset class with which environmental economics is concerned. Both are inherited from the past, both impose a duty of care (i.e. raise issues of intergenerational equity), both are characterised by non-use as well as use values, and both are key concepts in defining sustainability. Thus techniques that have been developed in environmental economics for assessing the value of natural resources such as wilderness areas, coral reefs, national parks, etc. are directly applicable to the valuation of cultural heritage.

The motivation for this project in a practical sense has to do with heritage policy. Heritage is owned both privately and publicly. Regardless of ownership, there are likely to be strong public-good or externality elements in the value of heritage, and hence there is an important public interest involved in its conservation and management. In 2005 the Productivity Commission held an enquiry into the built heritage in Australia which raised a number of issues, including how to reconcile public and private interests in this field. An important task of this project is to sort out and rationalise these interests, such that a sensible approach to assessing the full value of heritage can be developed.

The initial tasks of the project, which is just getting underway, are: to define the various types of heritage; to identify classes of stakeholders; to develop a means for classifying attributes or criteria for assessing heritage value; to delineate the types of value of interest; and to specify appropriate valuation methodologies. In regard to the last of these tasks, the project will assess the usefulness of hedonic pricing, contingent valuation and discrete choice modelling, with an expectation that choice modelling will be the major technique to be developed further.

The first stage of the project, which is planned for completion by the end of 2010, involves the development of valuation methodology, the preparation of survey instruments, and a trial application. The second stage will entail refinement of the survey methodology, a large-scale empirical application, and the derivation of principles for benefit transfer. The ultimate objective is to provide a set of transferable monetary estimates of the values of various attributes of historic heritage places, for use in the design of government policies and programs.

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Prof Throsby speaking at the Environmental Economics Research Hub workshop held in Adelaide in February this year



Copenhagen Prediction Market, R Betz & J Cludius, UNSW

On 7 December 2009 at 10 am, two CEEM researchers arrived at the Bella Center, where the United Nations Climate Change Conference was to be held. CEEM was there to both observe the conference first hand as well as to undertake CEEM's research project: The Copenhagen Prediction Market (COPPM), with support from the Environmental Economics Research Hub.

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Regina Betz & Johanna Cludius in Copenhagen Photo: Declan Kuch



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The COPPM is an online trading program, on which participants could buy shares in predicting the various outcomes of the conference. Traders could invest in outcomes such as Australia's 2020 emissions reduction target, the deadline for a legally binding agreement or the magnitude of financial aid to developing countries. As only the shares that correspond to the actual outcome have value at the end, participants buy those shares they think correspond to the right outcome and sell all other shares. Therefore, the market price of the shares provides an indication of the likelihood of these events occurring. Trading was not restricted to people at the conference as anyone who could access the internet was invited to participate. Participation was free of charge and in each market traders stood the chance to have a whole year of their personal emissions offset. These prizes were sponsored by the law company Baker & McKenzie.

As it aggregates the opinion of many different people, the prediction market can be used to generate a forecast about future events, as well as making the outcomes of an ongoing process more transparent and easily understandable. Under certain assumptions share prices on the prediction market can be interpreted as probabilities of these events occurring. For the Copenhagen Conference CEEM wanted to use the prediction market mainly to bring some transparency into the ongoing negotiating process that is often very complex and frequently takes place behind closed doors. As the prediction market poses very simple questions, the multilayered negotiating process can be broken down into some core issues that everyone can understand.

It is debatable whether a forecast of the negotiating outcome generated only two weeks prior to its announcement has any value, for, let's say, investors. But CEEM is envisaging opening another prediction market on the outcomes of the climate change conference in Mexico end of 2010 shortly, with a view to generating a valuable forecast for those negotiations. Since the software proved to be very robust, many people were interested in the Copenhagen Prediction Market and a first analysis of the data is promising, this seems to be a feasible upcoming research project for CEEM.

More than 100 participants registered for the Copenhagen Prediction Market and nearly all of them traded actively. Initially, participants could trade on 16 different markets, but towards the end of the first week of negotiations an additional "Loophole" market was launched, after some heated debate about how developed country targets were inflated by "hot air" or "creative LULUCF (Land Use, Land-Use Change and Forestry) accounting."¹ The most popular markets were the deadline for a legally binding agreement, the Australian 2020 aggregate reduction target and the long-term stabilisation goal.

The final values of the shares were determined by the outcomes of the Copenhagen Climate Conference. These outcomes are based on the Copenhagen Accord, the subsequent submissions of countries to the UNFCCC and decisions taken by the COP and COP/CMP. An independent expert panel selected by the Organisers was consulted and decided on the outcome for those markets where more than one possible interpretation exists.

At the end of the conference, out of the 17 markets, eight valued the winning share highest, seven favoured a different share, one was undecided (prices for all shares on the market were exactly the same) and one market (the "Loophole" market)

Paul Mwebaze: Values of Biological Collections



Paul Mwebaze on a conference visit in Venice prior to taking up his role with the Environmental Economics Research Hub at the ANU.

My interest in environmental economics dates back to 2001 when I enrolled for M.Sc. Agricultural Economics degree at Makerere University (Uganda). In 2004, I was awarded a Commonwealth Scholarship and moved to the UK to study M.Sc. Natural Resource and environmental economics from the University of Greenwich. I continued onto a PhD focussing on the economics of invasive species incursions; trade pathways, optimal control and impacts. My thesis balances the risk (cost) of incursions via contaminated imports against the benefits of trade. I estimate consumer surplus changes using a partial equilibrium model, and use the estimates in a cost-benefit model relating the economic impacts of harmful species to a range of policy measures (tariffs, inspections). Some of these impacts have non-market values.

In between the PhD, I helped FERA (UK Govt Research Agency) win a UNDP environmental economics project in the Seychelles in 2008. Subsequently, I travelled to Seychelles and spent some time there working as environmental economist for the UNDP-GEF project on invasive alien species. I led the project and organised local assistants to gather primary data through survey questionnaires to determine the values of marine biodiversity using market and non-market methods. The subsequent report was well received by the government of Seychelles. The report has helped to convince the authorities there to establish a biosecurity policy.

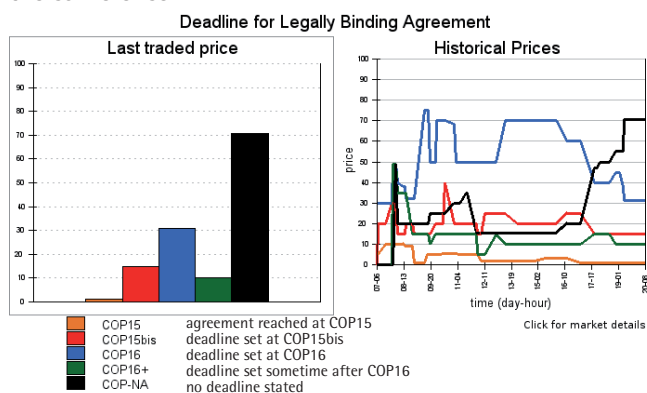
I also contributed to an internal FERA Seedcorn project '*Quantifying the value of ecosystem services: a case study of honeybee pollination in the natural environment*'. I led and directed work to value the pollination services provided by honeybees to apple orchards in the UK using replacement cost, production factor and contingent valuation methods.

On completing the PhD in September 2009, I took up the position of Research Fellow at the Natural Resources Institute (NRI), University of Greenwich, where I contributed to the growth of NRI's growing portfolio of work in the fisheries and aquatic resources sector as well as to help strengthen the research, teaching and consultancy capacity. I conducted research on the governance of fish and aquatic resources. Specific work included: control of IUU fishing; fish trade, markets; standards (voluntary & non-voluntary) and policy development in UK/Africa context.

Since April 2010, I joined the Crawford School of Economics and Government as a Post-Doctoral Fellow on the project '*values of biological collections*'. This project is to identify and recommend economic models to consider the range of potential values of biological collections, including costs and benefits, and to provide direction for an improved contribution of biological collections to knowledge development and innovation. The key methodology involves the development of a conceptual framework for the valuation and analysis of impact and policy options associated with Australia's biological collections. We will also undertake an empirical study to estimate the value of potential policy changes associated with Australia's biological collections using market and non-market methods.

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had to be decided by a lottery. Looking at three of the busiest markets, one can see how prices tracked the developments at the conference.



The "Deadline" market tells the tale of the possible inclusion of a deadline for a legally binding agreement in the final text over the course of the negotiations. A deadline at COP16 was contained in earlier drafts of the Copenhagen Accord, but was dropped during the final hours of negotiations, a pattern clearly visible in the historical price chart. In this case, the Copenhagen Prediction Market had indeed absorbed this new piece of information and made it visible to everyone that the deadline for a legally binding agreement had been dropped.

HUB THEME LEADER CONTACTS

Theme A.
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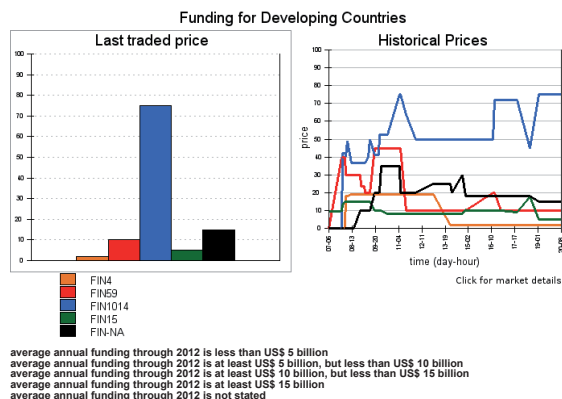
Theme C.
Advancing Australia's capability for social and economic analysis of environmental issues at the regional scale
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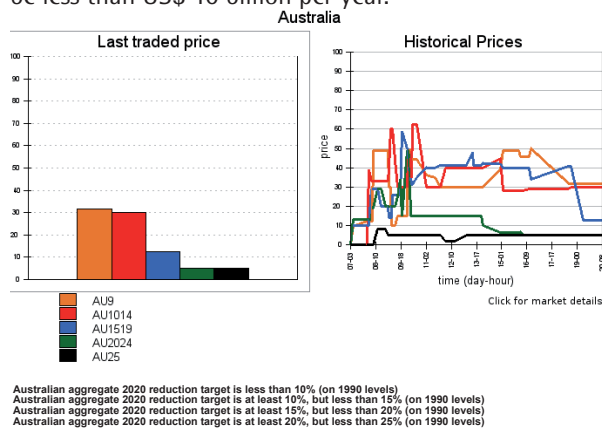
Theme D.
Valuing environmental goods and services
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Already during the first days of the conference the "Funding for Developing Countries" market clearly favoured an average amount of at least US\$ 10 billion, but less than US\$ 15 billion per year through 2012. This reflects the funding pledges that developed countries had made during the first days of the conference, creating an early price spike on the "Funding" market and keeping this share at a high level from then onwards. Again, the prediction market highlighted the way things were on this one issue in a simple and easily understandable fashion. However, the wording of the Copenhagen Accord calling for funding "approaching USD 30 billion for the period 2010 – 2012"² prompted the expert panel to select "average annual funding through 2012 is at least US\$ 5 billion, but less than US\$ 10 billion" as the winning share, as this "will most likely be less than US\$ 10 billion per year."



Now that Australia has submitted a whole target range, the outcome had to be decided in consultation with the expert panel as well. The experts agreed that, "in case a target range is given; only the lower end of this range can be viewed as a commitment." Therefore, the winning share on this market is "Australian aggregate 2020 reduction target is less than 10% (on 1990 levels)." The high volatility at the start of the market, followed by a rather calm period, might reflect the fact that no single target seemed to be emerging for Australia. An expectation that proved right in the end.

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