

## Summary

# Costs and Benefits of Research Communication: The Dutch Situation

May 2009

This study examines the costs and potential benefits of alternative models for scientific and scholarly publishing in the Netherlands. It is a follow-up of the Australian study '*Research Communication Costs, Emerging Opportunities and Benefits*' (Houghton *et al.* 2006) and the UK/JISC study '*Economic Implications of Alternative Scholarly Publishing Models*'. The Dutch study was commissioned by SURFfoundation and led by Professor John Houghton from the Centre of Strategic Economic Studies at Melbourne's Victoria University and Jos de Jonge and Marcia van Oploo of EIM Business & Policy Research in the Netherlands.

A knowledge economy has been defined as one in which the generation and exploitation of knowledge has come to play the predominant part in the creation of wealth. Scholarly publishing plays a key role in this process as it is central to the efficiency of research and to the dissemination of research findings and diffusion of scientific and technical knowledge. Advances in information and communication technologies are disrupting traditional publishing models, radically changing our capacity to reproduce, distribute, control and publish information. One key question is whether there are new opportunities and new models for scholarly publishing that might better serve researchers and more effectively communicate and disseminate research findings to society as a whole.

This study focused on comparing three alternative models for scholarly publishing, namely: subscription publishing, open access publishing (Gold Open Access) and self-archiving (Green Open Access). To ensure that meaningful comparisons could be made, the self-archiving models explored include the peer review, certification and quality control functions necessary for formal scholarly publishing.

The scholarly communication process model includes five core scholarly communication process activities, namely:

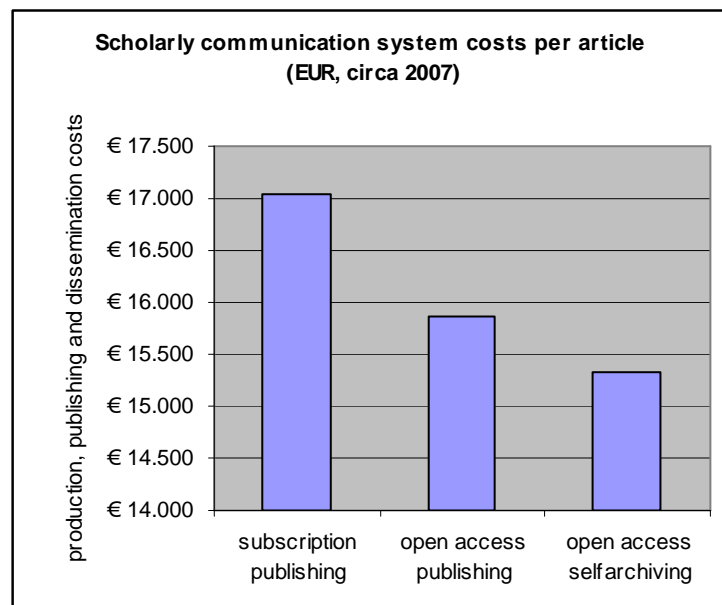
1. Fund research and research communication;
2. Perform research and communicate the results;
3. Publish scientific and scholarly works;
4. Facilitate dissemination, retrieval and preservation; and
5. Study publications and apply the knowledge.

As many of the potential cost savings cannot be fully realised unless there is worldwide adoption of open access alternatives, Houghton's model estimates the impact of a worldwide open access system although it also models the impact of unilateral adoption of alternative open access models by the Netherlands. Furthermore, a distinction is made between impact on the whole of the Netherlands and specifically for the Dutch universities.

## Costs of Scholarly communication

Summing up all the costs involved, Houghton suggests that core scholarly publishing system activities may have cost around € 2.4 billion in the Netherlands during 2007.

Adding up the costs of production, publishing and dissemination in electronic-only format, the average subscription publishing system costs would amount to around € 17,046 per article (excluding Value-Added Tax), average open access publishing costs would amount to € 15,857 per article and average open access self-archiving costs would be € 15,331 per article (including overlay review and production services with commercial margins). At these costs, open access publishing would be around € 1,190 per article cheaper than subscription publishing, and open access self-



archiving with overlay services around € 1,715 per article cheaper.

For the universities, the difference in journal article publishing costs would have amounted to savings of around € 30 million per annum in the case of a shift from subscription access to open access publishing, and even € 43 million based on a shift to open access self-archiving with overlay services. While alternative publishing models for scholarly books are much less developed and costing is more speculative as a result, similar savings would appear to be available from shifting to open access book publishing.

### Impact based on costs and expected benefits

In addition to direct cost differences there are potential system cost savings. In a highly simplified form, the following table summarises the estimated impacts for the Netherlands nationally and for the universities in the Netherlands of unilateral national and worldwide adoption of alternative open access journal/article publishing models, including: (i) 'Green OA' self-archiving in parallel with subscription publishing; (ii) 'Gold OA' or author-pays journal publishing; and (iii) the 'deconstructed' or 'overlay journals' model of self-archiving with overlay services.

To explore the impacts of enhanced access on social returns to R&D 'accessibility' and 'efficiency' are introduced as negative or friction variables. The impact on returns to R&D has been calculated by reducing the friction by increasing accessibility and efficiency. The reported increased returns to R&D expenditure are for public sector and higher education R&D spending, and are expressed as annual increases in current values.

#### Estimated impact in € millions per annum, circa 2007:

		worldwide (national)	unilateral (national)	worldwide (universities)	unilateral (universities)
Gold OA publishing	benefit	€ 211	€ 115	€ 159	€ 18
	net cost	-€ 133	-€ 37	-€ 107	-€ 32
Green OA self-archiving	benefit	€ 129	€ 68	€ 83	€ 44
	net cost	-€ 50	€ 11	-€ 30	€ 18
OA self-archiving with overlay production and peer review services	benefit	€ 215	€ 119	€ 164	€ 90
	net cost	-€ 137	-€ 41	-€ 111	-€ 37

#### The estimated savings

- **'Gold OA' open access publishing** for journal articles might bring net system savings of around € 133 million per annum nationally in the Netherlands in a worldwide open access system, or € 37 million if the Netherlands adopted open access unilaterally (based on 2007 prices and levels of publishing activity), of which around € 107 million and € 32 million, respectively, would accrue in the universities.
- **Open access self-archiving without subscription cancellations** (i.e. 'Green OA') would save around € 50 million per annum nationally in a worldwide Green OA system, of which around € 30 million would accrue in the universities. In a unilateral situation, an additional cost of € 11 million would result in a benefit of € 68 million.
- The **open access self-archiving with overlay services model** explored is necessarily more speculative, but a repositories and overlay services model may well produce similar cost savings to open access publishing.

The analysis summarised in this report compares three scholarly publishing models as if they were alternatives. In reality, of course, there are a number of variations and hybrids (e.g. delayed open access, open choice/author choice, etc.) and the models co-exist in various mixes in different fields of research. Nevertheless, these three models do have some key defining characteristics, and these characteristics have cost implications for producers, intermediaries and the users and consumers of content. They also have implications for the efficiency of research, the accessibility of research findings and their impacts, and, thereby, for returns to investment in R&D.

#### Conclusions

The costs, benefits and impacts of alternative scholarly publishing models demonstrate that research and research communication are major activities and the costs involved are substantial. Preliminary analysis of the potential benefits of more open access to research findings suggests that different publishing models can make a material difference to the returns realised, as well as the costs faced. It seems likely that more open access would have substantial net benefits in the longer term and, while net benefits may be lower during a transitional period they are likely to be

positive for both open access publishing and self-archiving alternatives (i.e. Gold OA) and for parallel subscription publishing and self-archiving (i.e. Green OA). Both open access publishing and self-archiving with overlay services appear to be more cost-effective systems for scholarly publishing, with cost savings available throughout the scholarly communication process (i.e. in funding, performing, publishing, disseminating and preserving research). Nevertheless, a shift from a user-side to producer-side system for funding scholarly publishing implies a greater concentration of costs and diffusion of benefits, with costs concentrated among the most intensive producers of scholarly content and benefits diffused across many users.

### **Costs and Benefits per stakeholder**

The report also gives implications for funders, researchers, the universities and research institutions, publishers and the publishing industry, research libraries, government and central agencies. The costs and benefits are varied for these different stakeholders.

From the perspective of universities and research institutions the enabling and support of self-archiving through the operation of institutional repositories offers a number of potential benefits. This will not only provide greater support to research, but also provide a platform for hosting and showcasing the institutions' research and maintain a more complete record of it, which can assist the institution in research management and reporting functions. There are also potential benefits in hosting teaching and learning materials alongside research materials in integrated institutional repositories. Consequently, research institutions may see the operation of institutional repositories as an integral part of their operations, and given the relatively modest costs, it is unlikely that anything more than 'facilitational' central funding support would be required.

Given the potential benefits, government and agency initiatives might focus on reducing the barriers to innovation in scholarly publishing models. This might involve:

- Ensuring that research reporting and evaluation is not a barrier to innovation (e.g. by developing and using metrics that support innovation in scholarly publishing, rather than relying on traditional evaluation metrics that reinforce and reward traditional publishing models and behaviours);
- Ensuring that there is funding for author or producer side fees (e.g. encouraging all research funders to make explicit provision for publication charges, and encouraging higher education and research institutions to establish funds to support publishing fees);
- Encouraging and funding the further development of institutional and/or subject repositories to enable author self-archiving; and
- Supporting advocacy initiatives to inform and educate funders, researchers and research managers about the potential impacts of alternative publishing models.

There is likely to be uncertainty during the coming years whether the transition towards more open access to research findings through open access publishing and/or self-archiving will take place. If this is the case, there will still be uncertainty regarding the direction and speed of this transition. This may well provide difficulties in shifting budgetary allocations around the system in such a context. Moreover, some of the savings and benefits resulting from alternative publishing models cannot be realised until some time after the costs have been met. Consequently, it seems inevitable that central allocations will be required at the funder, institutional and, perhaps, national levels.