

# MONITORING THE TRANSITION TO

OPEN ACCESS

DECEMBER 2017

## ANNEXE 2

# FINANCIAL PROJECTIONS



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# FINANCIAL PROJECTIONS OF THE TRANSITION TO OPEN ACCESS IN THE UK TO 2021

## OPEN ACCESS (OA) OPTIONS

### *Fully-OA and hybrid journals*

The numbers of fully-OA journals have been rising sharply. In 2016, they represented 15.2% of all the journals indexed in the Scopus database, and 12.4% of those used by UK authors. The compound annual growth rate for those fully-OA journals that charge an article processing charge (APC) is over 6%, although the rate for those that do not charge an APC is much lower, at around 0.5%. Nevertheless, if these growth rates were to continue, fully- OA journals would by 2021 represent around 19% of all journals, and 13% of those in which UK authors publish.

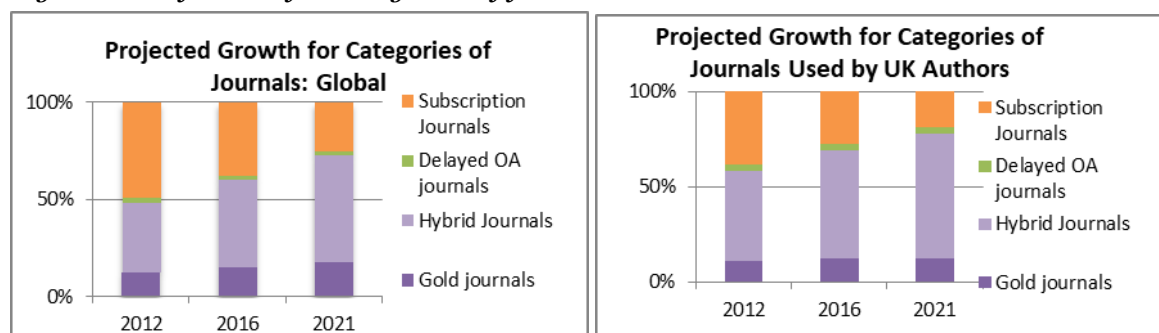
### *Hybrid journals*

The numbers of hybrid journals have been rising even more sharply. In 2016, they represented 45% of all the journals indexed in the Scopus database, and 57% of those used by UK authors. The compound annual growth rate of such journals is over 4%. If such a growth rate were to continue, hybrids would by 2021 represent around 59% of all journals, and 68% of those in which UK authors publish.

### *Subscription-only journals*

The corollary of the growth of OA and hybrid journals is that the numbers of subscription-only journals are falling. In 2016, they represented 38% of all the journals in the Scopus database, and 27% of those used by UK authors. However, those proportions had fallen significantly since 2012, and if the fall continued until 2021, they would then represent only 27% of all journals, and 20% of those in which UK authors publish. Put another way, at least four-fifths of the journals used by UK authors would provide the opportunity for them to choose immediate, Gold OA, and that figure is almost certainly an underestimate: among the journals that are most popular with UK authors in the four broad subject areas we analysed, the percentage is already at least 80%, and significantly higher in three of the four (Figure 1).

Figure 1: Projections for categories of journals to 2021



## Green OA

Nearly 80% of journals allow author accepted manuscripts (AAMs) to be posted on personal websites with no embargo, and this proportion has changed little since 2015. But journals' policies for posting on other sites, such as institutional and subject repositories or other services, have become more complex in response to the further development of scholarly collaboration networks; in some cases, prescribed embargo periods appear to have lengthened. Some two-thirds of journals now allow for posting of AAMs in institutional repositories with an embargo period of 12 months or under. However, it is not clear how policies, and related embargo periods, will develop over the next five years.

## TAKE-UP OF OA OPTIONS

### *Publishing on Gold OA terms*

UK authors published in total just under 162,000 articles in 2016, and that number has been increasing by approximately 3% a year. In 2016, 29.5% of UK-authored articles (48,000) were published on immediate Gold OA terms in fully-Gold or hybrid journals; that number has been growing at approximately 30% a year (much faster than the global rate of growth). It seems unlikely that such a rapid rate of growth will be sustained over the next two to three years, but if it were to be, then well over 90% of UK-authored articles would be published on Gold OA terms by 2021. Even if the growth rate were to be halved, then more than 50% of UK-authored articles would be published on Gold OA terms by 2021, as shown in Figure 2. Even with that halving of the UK growth rate, the UK would remain ahead of the world average in take-up of Gold OA if global growth rates were to be sustained at their current level, as shown in Figure 3.

*Figure 2: Projection for take-up of immediate Gold OA and subscription-based publishing for UK-authored articles at half the current growth rate*

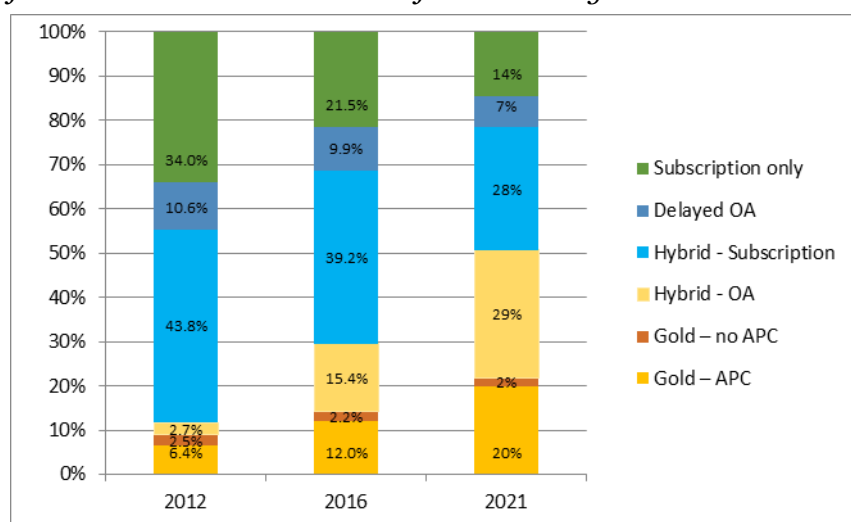
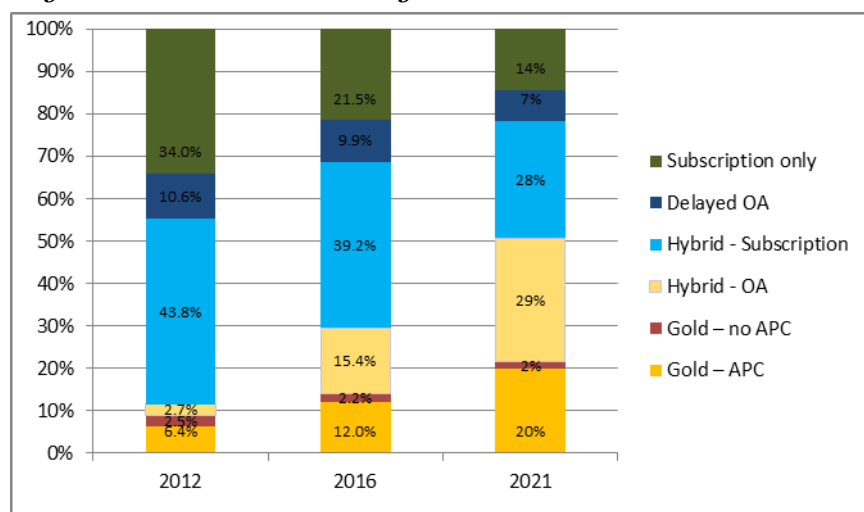


Figure 3: Projection for take-up of immediate Gold OA and subscription-based publishing at global level and at current growth rates



### Proportion of articles accessible after 12 months via Gold or Green OA

In our 2015 report, we found that 25% of global articles were accessible via either Gold or Green OA (and in line with journal policies) within 12 months of publication. In our current report, that proportion had risen to 31%, implying a growth rate of a little over 10% a year. If such a growth rate were to continue to 2021, 50% of all global articles would be accessible within 12 months.

For UK-authored articles, we found in 2015 that 32% were accessible via either Gold or Green OA within 12 months. In our current report, that proportion had risen to 54%, implying a growth rate of around 30% a year. As noted above, it seems unlikely that such a rate would be sustained over the next years; if it were, then all articles would be accessible within 12 months by 2019. Even if the rate were halved, all articles would be accessible within 12 months by 2021.

## FINANCIAL IMPLICATIONS: ESTIMATED CURRENT LEVELS OF EXPENDITURE ACROSS THE HIGHER EDUCATION SECTOR

### APC expenditure across the higher education sector

We do not have any reliable data on APC expenditure across the entire higher education sector in the UK, but we can make estimates using two different methodologies.

#### Numbers of UK-authored articles attracting an APC in principle

Scopus data indicates that a little under 162,000 articles were published by UK authors in 2016, and our study indicates that 27.4% of them (thus, 44,000) were published on OA terms in fully-OA or hybrid journals that charged an APC.

However, UK universities would not have paid APCs from central funds for anything like that number of articles, for a number of reasons:

- Some of the articles were published by authors from outside the university sector (in research institutes, hospitals, and other organisations in the public, voluntary and commercial sectors).
- Over half of all UK-authored articles involve collaboration with authors overseas, and a significant but unknown proportion of those articles would have had a corresponding author from outside the UK.
- A significant proportion of APCs (estimated at 20%) are paid not from university central funds but from funds held directly by principal investigators (PIs) and others.

It is difficult to estimate the impact of each of these factors, but it may be reasonable to assume that APCs were paid from university central funds for between 60% and 70% (26,000 to 30,000) of the total of 44,000 UK-authored articles for which an APC was charged by the publisher.

### *Numbers of APCs paid from central university sources*

Our study shows that 37 universities together made 11,914 APC payments from central sources in 2016. Data from Scopus indicates that authors in these universities published 87,000 articles that year, or approximately 54% of all the articles published by authors with a UK affiliation. This implies that APCs were paid in respect of approximately 14% (12 of the total of 87) of the articles published by authors in the 37 universities.

There seems no good reason to assume that APC payments would have been made at different rates in other universities. A simple calculation therefore suggests that UK universities across the entire sector paid APCs from central sources for just under 23,000 articles.

### *Overall numbers of APCs paid in the UK higher education sector*

The two methodologies outlined above suggest that UK universities met from central sources APCs for between 23,000 and 30,000 articles in 2016. We note that these estimates are considerably higher than the number of APCs (9,509) reported by RCUK as having been met from its block grants in 2016. Hence we are inclined to the lower of the two estimates.

However, we must also take account of the estimated 20% of APCs paid direct by PIs and others, which also represent a burden on the higher education and research sectors. Hence we arrive at a figure of approximately 29,000 articles (18% of all UK-authored articles) for which an APC was paid from sources within the UK higher education sector.

### *Amounts paid in APCs*

The average level of APCs recorded for UK universities in 2016 was £1,969: for hybrid journals £2,095, and for fully-OA journals £1,640. Since the balance of APC payments is now 70:30 in favour of hybrids, the total amount paid can be calculated as £56.7 million.

Again, we recognise that this sum is somewhat higher than might be suggested by sources cited in chapter 4 of our report. Some of the discrepancy might be explained by differences in timing, since the number of articles published as open access, and the number of payments, are both rising rapidly. Nevertheless, we suggest an estimate of approximately £50 million as the total amount paid from the higher education sector in 2016.

### *Amounts paid in subscriptions*

For the sample of 37 universities for which we have data, subscription expenditure with seven of the larger publishers was roughly £56 million in 2016. Estimates suggest that these publishers account for approximately 70% of total subscription expenditure, and therefore total expenditure on subscriptions for these 37 universities amounted to £80 million. If those universities account for approximately half of all university expenditure on subscriptions, then overall subscription expenditure in the higher education sector amounted to approximately £160 million. This is in line with data from SCONUL statistics.

### *Amounts paid in APCs and subscriptions*

A reasonable estimate of the total amounts paid from within the UK higher education sector in 2016 for both APCs and subscriptions would therefore seem to be of the order of £210 million.

## **FINANCIAL PROJECTIONS**

The scholarly journals market continues to change rapidly, and any projection is necessarily highly speculative. This is especially so because the available data does not allow us to project the implications of any further development of offsetting deals. Nevertheless, based on the estimates outlined above for total expenditure in the UK higher education sector on APCs and subscriptions (themselves subject to wide margins of error), some projections are presented below, based on assumptions about:

- the rate of increase in the number of articles published by UK authors
- the proportion of such articles for which an APC is paid from within the UK higher education sector
- rates of increase in the levels of subscriptions paid by UK universities
- rates of increase in the average level of APCs actually paid

### *Number of articles and APCs paid*

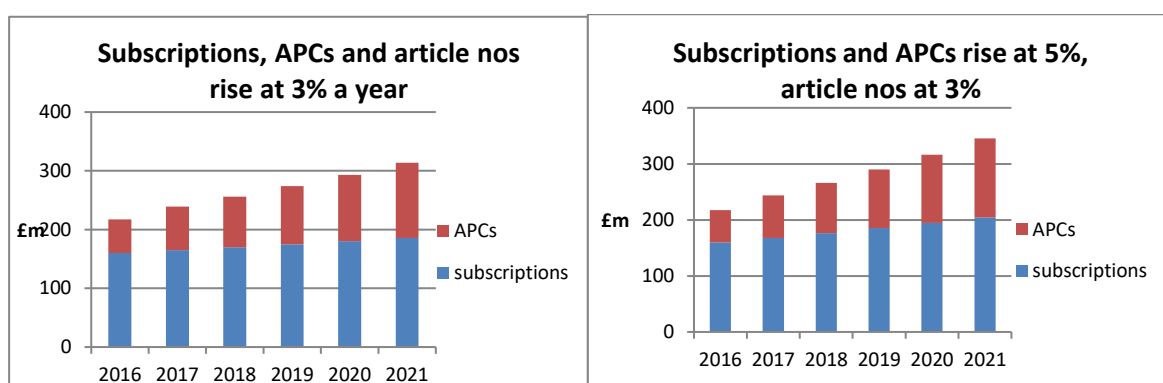
Analysis of the SCOPUS database suggests that the number of articles published by UK authors is continuing to rise at 3% a year. If that trend continues, the number will rise from 162,000 in 2016 to 188,000 in 2021. Our projections outlined in section 2 of our report suggest that the proportion of those articles published on Gold OA terms will rise to just over 50% by 2021, but in section 3 we estimated that for only between 60% and 70% of Gold OA articles is an APC actually paid from within the UK higher education sector. It is assumed in

the projections below that the proportion of all articles for which an APC is paid from within the UK higher education sector rises from the 18% estimated for 2016 to 30% in 2021.

### *Levels of subscriptions, and of average APC payments*

The data gathered from Freedom of Information requests indicates that UK universities' expenditure on subscriptions continues to rise, and the projections below are based on continuing increases of 3% and 5% a year. Our study indicates that average APCs have also continued to rise, and that they reached £1,969 in 2016. Again, the projections below (Figure 4) are based on continuing increases of 3% and 5% a year.

*Figure 4: Projected increases in subscription and APC expenditure from the UK higher education sector*



### *Projected total expenditure*

Figure 4 indicates that the lower rate of increase results in a rise in expenditure from approximately £210 million to approximately £315 million by 2021, while with the higher rate of increase, expenditure rises to approximately £345 million. In broad terms, therefore, based on the assumptions outlined above, a rise from 30% to 50% in the proportion of articles published on Gold OA terms would be accompanied by a rise of between 45% and 60% in total expenditure on APCs and subscriptions. Again, it must be stressed that the assumptions are not predictions, and that changes in behaviour and pricing, in particular relating to offsetting arrangements, may render them invalid.