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### **Assessment of the Use of Big Deals Suscription in Spain in the transition to Open Access**

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#### **Abstract:**

*The paper analyzes the evolution of the use of electronic scientific journals in the period between 2007 and 2018 by the academic communities of the public universities of Castille and Leon attached to the BUCLE Consortium (Spain). The time period of the study has been limited to allow the analysis from the moment of the consolidation of the use of journals in electronic format by the academic community, up to the paradigm shift stage that advocates open access to scientific contents. To achieve the aforementioned objective, downloads of articles from scientific journals distributed in the universities of Burgos, León, Salamanca and Valladolid are analyzed by four broad-spectrum providers: Emerald, ScienceDirect, SpringerLink and Wiley. Based on the results of this study, and taking into account its limitations regarding the number of universities analyzed and the number of distributors included, we estimate that the time of big deals, with their strengths and weaknesses, has not yet finished.*

**Keywords:** Academic libraries, Big deals, Consumption of information, Statistics of downloads, Spain.

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## **Introduction**

Scientific journals are currently the most used and valued means of communication to disseminate research results to the rest of the scientific community, so access to them is necessary to be able to know the state and the progress of a discipline and generate new scientific knowledge, given the cumulative nature of science. The subscription of electronic journals has been one of the most important economic items in university libraries. One of the solutions chosen in order to negotiate with the big publishers was the creation of libraries consortia for the joint acquisition of packages of journals (Big deals). This has allowed access to more publications, but it has been proven that many of the journals included in these packages are not of interest to users and therefore don't receive much downloads or citations. Besides, there are many contents in open access through journals or repositories. In this context, it is becoming increasingly necessary to optimize the available economic resources and to select and acquire only the electronic journals that are most useful to researchers.

A Spanish project is aimed at evaluating the performance of the investment in electronic journals made by Spanish consortia, analyzing the use made of them in generating scientific knowledge. Knowing the performance of electronic information involves the connection of the following variables: quantity and quality of content offered, use of content and cost. Accordingly, the use of electronic journals subscribed by the consortia will be analyzed based on the information on downloads and on citation in the scientific production of its researchers and their performance in terms of cost-utilization.

This project also investigates the role of open access resources in the current context of scientific production and communication. Since access to scientific information is not carried out exclusively from the subscriptions of university libraries, it is important to consider the use of payment resources and those that are open access when generating new knowledge. In this sense, we will analyze the citations to contents deposited in institutional repositories and in open access journals in the scientific production of the researchers of the Spanish universities. Based on the results obtained, it will be possible to propose lines of action to follow in the development of collections adapted to the priority research lines of the university community, with the objective of achieving better quality parameters and optimizing the investment in information resources.

## **Partial Aims and Methodology of the Project**

The general objective of this paper is to analyze the evolution of the use of electronic scientific journals in the period between 2007 and 2018 by the academic communities of the public universities of Castile and Leon attached to the BUCLE Consortium. The time period of the study has been limited to allow the analysis from the moment of the consolidation of the use of journals in electronic format by the academic community, up to the paradigm shift stage that advocates open access to scientific contents.

To achieve the aforementioned objective, downloads of articles from scientific journals distributed in the universities of Burgos, León, Salamanca and Valladolid are analyzed by four broad-spectrum providers: Emerald, ScienceDirect, SpringerLink and Wiley.

The universities of Salamanca and Valladolid are considered big universities whereas the universities of Leon and Burgos are between the smallest. Besides, ScienceDirect, SpringerLink and Wiley are multidisciplinary providers that distributed around 2000 titles. Emerald is a package specialized in social sciences that distribute a limited number of journals.

In order to know the effective use of scientific journals, a series of indicators grouped into two blocks have been established:

- a) Downloads of articles from contracted journals.
  - Total annual downloads and rate of growth.
  - Annual downloads by supplier.
  
- b) Titles of used journals.
  - Percentage of titles used by supplier.
  - Representativeness of 50% of downloads on all the subscribed titles and titles used in each university.

The data of downloads studied are those provided by the suppliers of electronic journals to the different libraries of the public universities of Castile and Leon in the 2007-2018 period. The study was carried out from COUNTER Journal Report 1 reports (JR1- Number of Successful Full-Text Article Requests by Month and Journal). These are annual Excel files with detailed download data by month disaggregated by titles of journals.

### **Preliminary results of the project**

#### **a) Downloads of articles from licensed journals**

In this section the downloads of articles in the four public universities of Castile and Leon during the 12 years are analyzed.

Figure 1 shows the evolution of the total downloads of journal articles between 2007 and 2018, as well as the annual growth rate. It is essential to point out the continued and significant increase in downloads throughout the twelve-year period analyzed. The number of downloads between 2007 and 2018 has doubled and data from recent years suggest that the growth trend continues. In this sense, it can be observed that the year-on-year growth rate has been positive during the last 6 years and that in 2018 it has reached 13.29%.

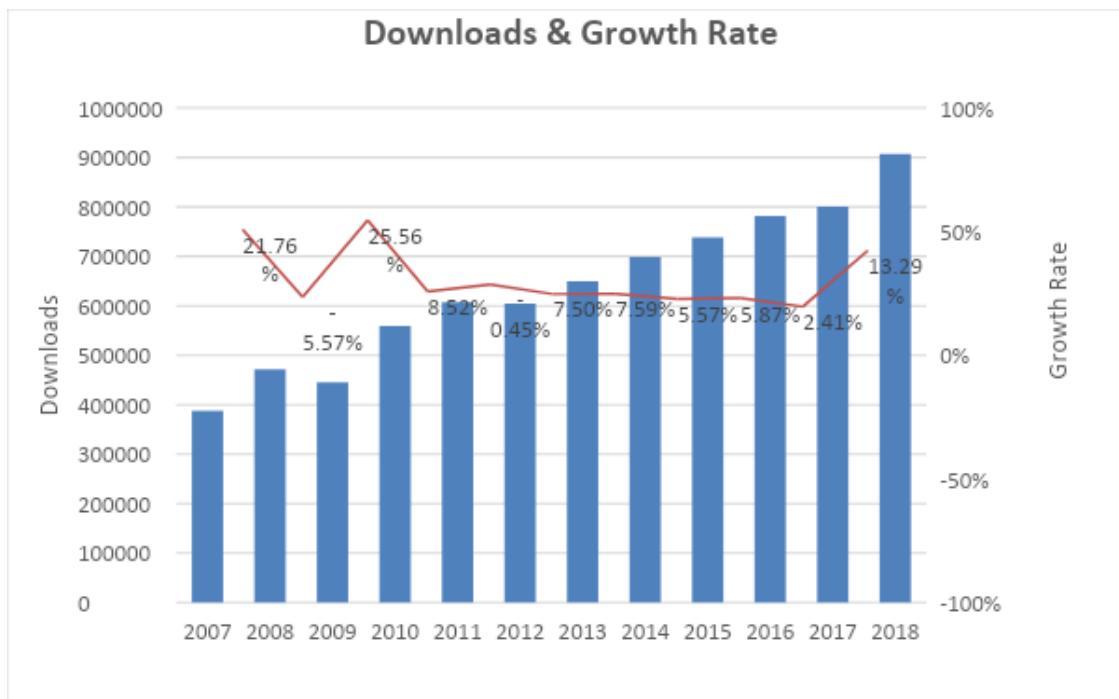


Figure 1. Total downloads and rate of growth

As can be observed in Figure 2, ScienceDirect, package of the Elsevier publishing house, is the provider that distributes the journals of priority use for academics and brings together 75.34% of downloads worldwide, 5.6 times downloads of Wiley, 7.4 those of Springer and more than 70 times those of Emerald.

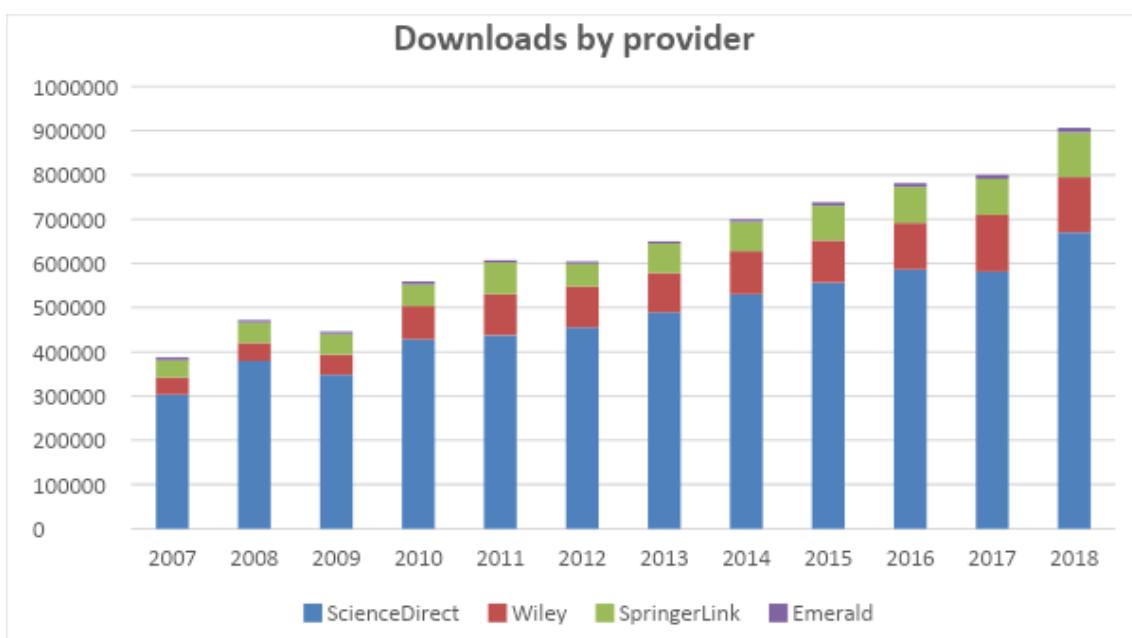


Figure 2. Downloads by provider

In keeping with its smaller size, Emerald downloads are limited, as can be seen in figure 2. Moderate global figures are observed in all years, but they increase decisively since 2015, exceeding 10,000 downloads in the whole of the universities for the first time in 2018. The total downloads of Emerald in the analyzed period are close to 80,000 downloads (79,697), and only represent 1.04% of the total.

In the case of Springer and Wiley, we also observe a tendency to increase downloads, although with some notable changes. It is worth noting the increase experienced in the use of Wiley since 2010 with some moderate punctual retreat. The global downloads of this provider in the four universities during the set of the analyzed years exceeds one million (1,025,537), which represents 13.4% of the total. In the case of Springer, there is a significant increase in 2011, a further decrease until 2015 and a decided growth from this year. The statistics show that downloads reach 781,518 (10.21%) during this period in the set of universities.

If we consider the evolution of the global data of these two suppliers, we observe that during the first three years the use collected from the journals of both suppliers is parallel, although slightly greater by Springer. Since 2010, however, Wiley's downloads are significantly higher than Springer's.

### b) Journals used

This section examines the specific use of the collections subscribed from the data of titles used in the packages studied, as well as the representativeness in terms of downloads of the preferred titles within the total of the titles hired and the titles used. The analysis is limited to the 2010-2018 period, since these are the years in which there are complete data disaggregated of downloads of each title in the four universities.

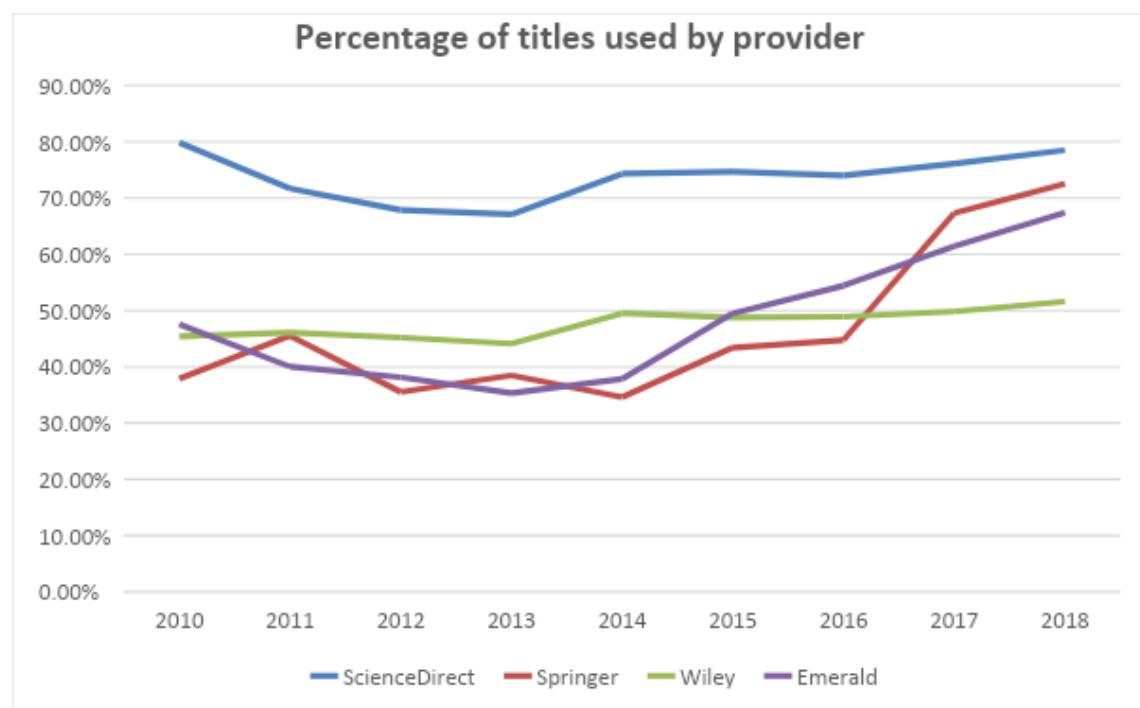


Figure 3. Percentage of titles used by provider

If we look at the evolution of the titles used by suppliers (Figure 3), only ScienceDirect offers journals that are mostly of interest to the universities under study, with percentages of use that range between 67% and 79% of the titles hired. In the case of the remaining suppliers, the titles that receive some download do not reach, in most of the analyzed period, 50% of the titles subscribed. However, there has been an increase in the dispersion of use in the Emerald and Springer packages in the last years studied, especially since 2015 in the case of Emerald and since 2016 more markedly in Springer.

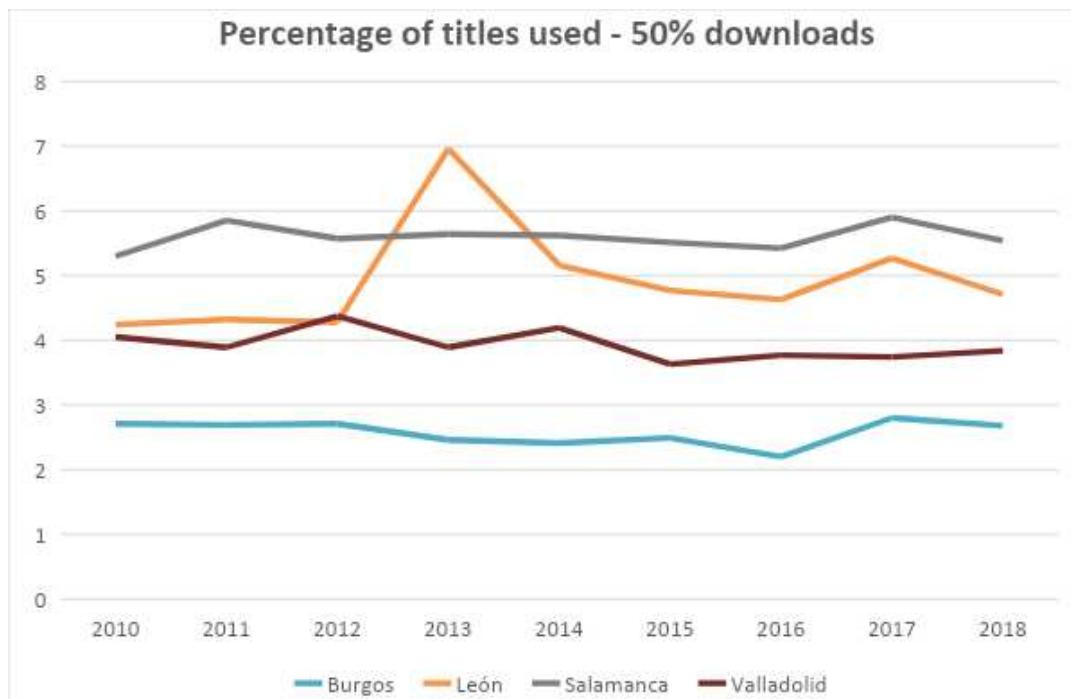


Figure 4. Percentage of titles used-50% of downloads

The data obtained by finding the percentage of titles used that satisfy half of the information demand of the universities studied (Figure 4) clearly show the concentration of use in a certain number of titles that tend to be very reputable titles, such as it has been found in previous studies (Rodríguez-Bravo, Alvite-Díez, 2006a, 2006b, Rodríguez-Bravo, Alvite-Díez, Barrionuevo-Almuzara, 2012). With less than 6% of the titles used, 50% of the demand would be satisfied.

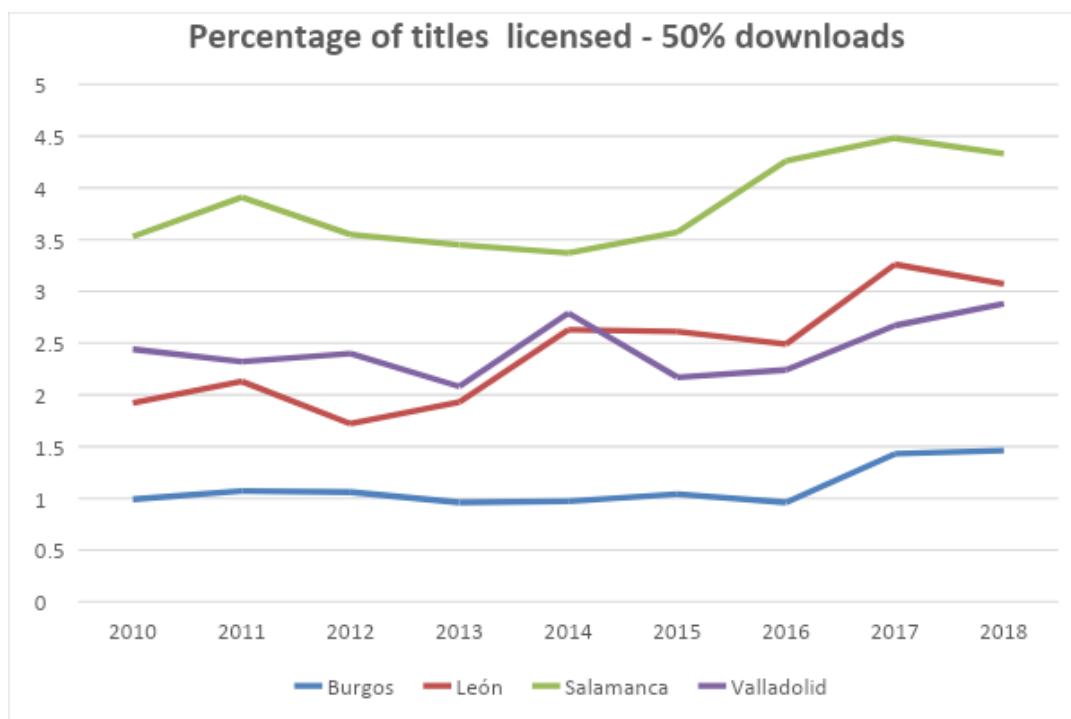


Figure 5. Percentage of titles subscribed-50% downloads

If we look at the subscribed journals from which 50% of the downloads are derived (figure 5), we can appreciate that are large universities, with major academic communities and different sectors of knowledge, who can better monetize the wide range of content offered by these big deals that the Consortium of Castile and Leon has hired. The data obtained, which we consider may be representative of the situation of other geographic areas, call into question the current system of distribution of electronic content, through multidisciplinary packages.

## Discussion

In this study we have analyzed the downloads in the universities of Castile and Leon from journals articles of the four big deals of Elsevier, Emerald, Springer and Wiley, who were subscribed in our country at the beginning of the XXI century and that most of the Spanish academic libraries have kept contracted until the present.

The data of downloads, which we consider indicators of the use that the universities makes of electronic journals, show how from 2007 to 2018 downloads of articles have increased gradually and even decisively in 2018, a fact that seems to point to a future of greater intensity of use. This situation occurs independently of the fact that the number of faculty and students has declined in the studied interval and despite the proliferation of journals in open access, repositories and platforms such as Sci-Hub, which are generating new forms of access to scientific information and increasingly have more weight in the academic community (Himmelstein et al., 2018, González-Solar, Fernández-Marcial, 2019, Nicholas et al., 2019).

Based on the results of this study, and taking into account its limitations regarding the number of universities analyzed and the number of distributors included, we estimate that the time of big deals, with their strengths and weaknesses, has not yet finished. In fact, this work shows that the communities of the public universities of Castile and Leon have increased the number of downloads and potentially the reading and citation of the contents distributed in the aforementioned packages.

In the last two decades of the 21st century, the formula of the big deal has allowed consolidating the collections to the libraries of large universities and has facilitated the availability of a volume of content never imagined to small and medium-sized institutions. As Sanville (2001) pointed out, download statistics have made it possible to know what contents were really needed by academics.

We believe that the model has been sustained for two decades because the complete commercialization of a publisher's products smoothes the publisher-library-user relationship. Publishers are facilitated to give out their entire catalog, both titles that have acceptance and others. As Shu et al. (2018) argued the large commercial publishers have increased their portfolio of journals through mergers and purchases of other publishers, as well as through the creation of new journals. This has allowed them to increase the sales of secondary journals in the big deals, turning the academic publication into a very profitable business.

For libraries the model has made it possible to overcome the crisis of the journals experienced in the 90s, increase the size of their collections by obtaining an average price per subscribed journal lower than what was paid with paper subscriptions. Likewise, both publishers and libraries make it easier for them to maintain a more stable relationship without annual or detailed title-by-title negotiations. The library has eliminated administrative work, although the management of licenses of electronic resources is far from simple, as is its negotiation (University of California, 2019, Williams, 2010).

Perhaps this inertia may have been based on the recognized acceptance of these packages by researchers. The needs of academics are very diverse, even those belonging to the same area of knowledge. However, the hiring of clonal collections in all universities regardless of the volume of staff, the degrees they teach and the areas of knowledge that comprise them has been questioned for some time. It has repeatedly been advocated the possibility of an offer tailored to the needs of each institution (ICOLC, 2010).

As it has been confirmed in this study, as well as in other works (Rodríguez-Bravo, Alvite-Díez, 2006a, 2006b, Rodríguez-Bravo et al., 2008, Rodríguez-Bravo, Alvite-Díez, 2011), the universities of Castile and Leon use a limited number of titles of the subscribed packages and make a small number of downloads for most of them. The data we have analyzed show that large universities, with more users and a greater diversity of knowledge areas, such as Salamanca and Valladolid, are more likely to monetize these subscriptions than smaller ones such as Burgos and León.

However, differences are observed, the academic community of Salamanca makes a more intense use than that of Valladolid. Likewise, when we have observed the data that link downloads with faculty, we have been able to confirm the higher relative use made by researchers from the smaller universities.

Although a priori the demand for information is elastic, the search for information is concentrated in a limited number of reputable titles linked to obtaining stability and / or promotion in the academy. Therefore, a large part of the titles sold by suppliers collect little or no use.

With respect to the packages studied, Elsevier's electronic content provider, ScienceDirect, is of priority use in the four universities analyzed, with downloads that exceed those of the other three suppliers combined. The volume of content and the thematic coverage we believe is not a reason for this consolidated preference given that the Wiley and Springer products are also multidisciplinary and the universities of Castile and Leon have subscribed a fairly similar amount of titles in the three suppliers. We think that the reason must be related to the quality of the distributed content, an issue already addressed in the literature (Rodríguez-Bravo, Alvite-Díez, Barrionuevo-Almuzara, 2012), but in which it would be necessary to continue investigating.

We think that the big deal has been a convenient model for libraries that, with a shortage of staff to dedicate to use evaluations, have chosen to maintain these subscriptions despite their limited use even in times of crisis such as the one that has been experienced in our country during the period studied. In this sense, it is striking that the libraries of Castile and Leon have maintained a similar number of subscribed titles, with some variations, in the successive renewals of contracts.

At the present moment we believe that it is necessary to consider the sustainability of the model as it is being done in countries around us. There is a perception that the current subscription systems of electronic journal packages -big deals- are losing utility while the price of their subscription continues to increase.

In recent times, some countries and regions have opted to abandon the hiring of ScienceDirect, the supplier of Elsevier journals, in the conviction that it is not as profitable as it was because many contents are available in open access and others can be accessed through platforms like Sci-Hub. Schonfeld (2019) points out that in the mature markets there is a decrease in the numbers of downloads of the suppliers due to the leakage of accesses to these pirate platforms. In fact, publishers are trying to curb them by resorting to content syndication. The universities of California, Sweden and Germany have not reached agreements recently for the renewal of the subscription to ScienceDirect with Elsevier. This situation has been presented in France with Springer. Likewise, in February 2018, the Canadian Association of Research Libraries published a report that rated subscription costs as unsustainable and required a coordinated national approach against rising journal prices (Kwon, 2018).

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