

## Article

# Why Open Access: Economics and Business Researchers' Perspectives

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**Abstract:** Public research policies have been promoting open-access publication in recent years as an adequate model for the dissemination of scientific knowledge. However, depending on the disciplines, its use is very diverse. This study explores the determinants of open-access publication among academic researchers of economics and business, as well as their assessment of different economic measures focused on publication stimulus. To do so, a survey of Spanish business and economics researchers was conducted. They reported an average of 19% of their publications in open-access journals, hybrids or fully Gold Route open access. Almost 80% of the researchers foresee a future increase in the volume of open-access publications. When determining where to publish their research results, the main criterion for the selection of a scientific journal is the impact factor. Regarding open access, the most valued aspect is the visibility and dissemination it provides. Although the cost of publication is not the most relevant criterion in the choice of a journal, three out of four researchers consider that a reduction in fees and an increase in funding are measures that would boost the open-access model.



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**Keywords:** scholarly journal publishing; subscription model; open access model; Gold Route; economics and business; author's perspective

## 1. Introduction

Scientific knowledge needs to be properly disseminated if it is to contribute to improving competitiveness and economic development in any society [1]. In the case of economics and business researchers, publication in books, working papers [2], PhD dissertations, repositories or journals are among the main vehicles for scientific dissemination. This study is focused on articles that are within the open-access publishing model. These types of publications can be accessed through Green Route institutional repositories or through Gold Route scientific journals [3–5]. Among the most relevant repositories in social sciences, especially in economics and business, is Research Papers in Economics (RePEc). Its services are used by Economists Online, EconPapers, Socionet, NetEc, New Economic Papers or the database IDEAS (RePEc/IDEAS). Other prominent repositories belong to the Social Science Research Network (SSRN), arXiv.org, e-Print archive or Social Science Open Access Repository (SSOAR). When publishing through scientific journals, authors select from a wide variety of journals which adhere to different kinds of publishing models. Firstly, there is the traditional subscription model, which charges fees in order to access content. Secondly, one can find the open-access model, mostly where the content is open and authors pay publication fees (Article Processing Charges, APC). However, some of these journals are also free to authors. Finally, there is the hybrid model, with subscription journals in which, once the article is accepted, the author can choose either open-access or subscription publication [6], typically with APC payment for the open-access option.

This study is focused on the publishing decisions of authors in Gold Route open-access journals, where an increase in the volume of publications in recent years has been observed, both in full open-access journals and hybrid journals [7]. According to a study by Piwowar et al. [8] in 2015, at least 28% of all academic literature was open access. The increase in open-access publication Gold Route may be due to different reasons. On the one hand, researchers have been demanding greater accessibility in terms of scientific content, especially those derived from research subsidized by public funds [9]. On the other hand, agreements have been made between publishers, libraries and research institutions aimed at promoting open-access publication. An example of these agreements is the one signed in Spain in May 2021, between the Spanish National Research Council (CSIC) and the Conference of Rectors of Spanish Universities (CRUE) with the publisher Springer Nature.

Additionally, the evolution of the open-access publishing model has been accompanied by the development of open-access policies which have been put into practice at different levels: international, regional or local. These, sometimes, despite being applied in a specific environment, manage to cross borders and so have broader scope than what was originally planned. Many of these measures pursued the objective that, as of the year 2021, 100% of scientific publications financed with public funds are to be in open access. Some of them belong to the Plan S, initiative of “cOAlition S” supported by the European Commission and the European Research Council, or measures directed by the European Commission, such as the 7th Horizon 2020 Framework Programme (Article 29.2). In addition, other outstanding initiatives have been developed outside of Europe, such as AmeliCA, which is a communication infrastructure for academic publishing and open science, emerged in 2018. It is led by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Latin American of Social Sciences (CLACSO) and the Network of Scientific Journals of Latin America, the Caribbean, Spain and Portugal (Redalyc).

These initiatives, aimed at promoting the open-access publishing model, both the Green and Gold Route, also involve co-ordination of different interest groups, publishers, research centers and researchers [10]. Additionally, the role played by libraries in agreements with publishers is relevant. In fact, libraries play a prominent role in the Article Processing Charges negotiation, acting themselves as publishers or working as intermediaries and sources of information for publishers and researchers.

In this study we focus on the perspective of researchers, who play a key dual role, both as publication authors and consumers of published content. This research focuses on various issues. Firstly, there is the importance of researchers’ perspectives regarding the publication model, which has special relevance for drawing up future open-access policies or achieving further development of the existing ones. Secondly, it identifies the main determinants for open-access publishing, which assists in the design of business strategies that respond to consumer demand. Thirdly, it analyzes publication decisions in the discipline of economics and business. Furthermore, the reduction of fees and the increase in financing have been considered as economic incentive measures for publishing in open-access journals. Regarding the reduction of fees, coming from publishers, there are several ways of achieving lower publication costs. These can be made effective by means of agreements between publishers, institutions and libraries. In this sense, this reduction in publication fees is justified if one takes into account the volume of articles published annually, the expected expenditure on open-access publication and the cost of subscription to journals [11]. Likewise, previous studies have shown financial viability for the transition to open-access publication, which also justified the option of reducing publication fees [5,11,12]. With these goals, a survey was carried out regarding scientific publication decisions, aimed at active Spanish academic researchers in the fields of economics and business.

In a previous article [13], we conducted a similar survey among researchers in the medical field. In the current study, we explored the publication decisions of economics and business researchers and compared our results to the previous ones. It allows us to differentiate between researchers’ decisions in a field where the number and impact of open-

access publications is high and well established, as it is the case of medicine, and in a field where open access is much less relevant and not completely established, as is the case for economics and business. A review of the Journal Citation Report (JCR) database, integrated into the Web of Science, in 2018, shows that 11.7% of indexed journals are open-access journals. In economics and business, for the selected categories, the percentage of open-access publications is 5%, while in the selected categories in medicine the percentage of open-access publications is 15.2%. In the SCImago Journal & Country Rank (SJCR) database, in 2018, 14.4% were open-access journals. In economics and business, open-access journals, for the selected areas, represent 10.3% of the total number of publications. Meanwhile, in selected areas of medicine, the percentage of open-access journals stands at 21.5%. In each case, all countries with journals indexed in the databases were considered.

## 2. Literature Review

A review of the literature suggests that academic researchers are aware of the open-access publication model and value it positively. This notion is supported by Dallmeier-Tiessen et al. [14], within the SOAP project “Study of Open Access Publishing” carried out in 162 countries and 19 research areas, as well as the work of Migheli and Ramello [9] in English-speaking countries, Europe, Asia and Africa; those of Eger, Scheufen and Meierrieks [15] in seven European countries; Zhu [16] in the United Kingdom; or Ruiz-Pérez and Delgado-López-Cózar [17] in Spain. However, there is a difference between the positive opinion of the publication model and the final volume of open-access publications [9,15,18].

In addition, differences are observed in the perception of the open-access publication model, depending on the country [9,14,15,19], research center and discipline [17,18,20–23]. The study has taken research studies carried out mainly in European and North American countries as references. This is due to the similarities observed in the perception of open-access publication in scientific journals, as evidenced by the aforementioned studies.

Furthermore, researchers with greater research experience are more likely to publish in open access [9,14,15,19,20,23]. The main factor in the choice of an open-access journal is the visibility of publications [9,18,23], and the main obstacles are publication costs and sources of funding available to researchers [14,15,18,19]. Other obstacles noted are respect for copyright [21] and perceived quality of open-access publications compared with subscription ones [9,20].

Researchers anticipate a future increase in open-access publications [9,18–20,23], despite believing that there is a need for more information about the open-access publishing model [18,24]. The reasons suggested by the authors are about aspects related to publication culture, policies for encouraging open-access publication or mandates applied in each institution.

The study of open-access publication decisions, according to the discipline to which the author belongs, is relevant for economics and business researchers, due to the fact that, in reference surveys for this study, they have not always been considered individually. Rather, they have simply been included within the area of social sciences [20]. This has been an obstacle to understanding the perspectives of researchers in the fields of economics and business. In Spain, works reviewed include different disciplines [13,17], without focusing on the characteristics inherent to economics and business. A previous study in the same discipline ran a survey in 2012 [9], before institutions established specific aims at extending open access, and without delving into the publication peculiarities in Spain.

The reference studies, focused exclusively on the perspective of economics and business researchers [9], support the results mentioned above, in terms of the existing differences by country, research seniority as a condition for increasing the volume of open-access publications, visibility as the main determinant for open-access publication and the quality perceived as an obstacle to open-access publication. In fact, there is a mismatch between the opinion of economics researchers about the open-access publication model and their final publication decisions. As a result, different transformative agreements have emerged among publishers, institutions and libraries, whose main objectives are to try to increase

the volume of open-access publications in journals, be they hybrid or fully Gold Route, such as the one carried out between the University of Barcelona and Cambridge University Press [25].

### 3. Hypothesis

This study sought to test whether the determinants of open-access publication, of economics and business researchers, follow the same pattern as other disciplines, using a Spanish sample.

Previous studies on researcher perspectives about scientific publication models identify differences in the assessment of the open-access publication model depending on research experience or researcher status [15,20,23]. This is due to the fact that seniority can be associated with greater access to funding for research and publications. This leads to the first hypothesis:

**Hypothesis 1 (H1).** *The greater the research experience, the higher the assessment of experience in open-access publication.*

The literature has identified different obstacles to promoting the open-access publication model. One of the main reasons for non-publication in open access is publication fees [6,26,27]. Thus, a reduction in fees could be an economic incentive measure, promoted by publishers in co-ordination with research centers. From these results, the second hypothesis can be formulated:

**Hypothesis 2 (H2).** *The more relevant the publication costs are for researchers when choosing a journal, the more important the reduction of publication fees is to promote the open-access publication model.*

In line with the second hypothesis, the literature also identifies the increase in funding for open-access publication as an important economic measure [6,26–28], an option where research funding institutions play an important role [6,12]. In line with the previous hypothesis, we also want to study the following:

**Hypothesis 3 (H3).** *The more relevant the publication costs are for researchers when choosing a journal, the more important greater funding is to promote the open-access publication model.*

The increase in open-access publications during the last decade has changed researchers' perspectives on the publication model. This has occurred mainly due to experience and a better understanding of the model [11,29], despite the publication costs and the existence of embargo periods that have been an obstacle to the greater dissemination of scientific publications [3,12,30]. The fourth hypothesis relates experience in open access to perspectives about the future of the model:

**Hypothesis 4 (H4).** *The higher the valuation of the experience in open-access publication, the higher the expectation of a future increase in the volume of open-access publications.*

Finally, it has been found that the main reason for choosing the open-access publication model is greater visibility and dissemination of content [3]. In fact, the Open Access Citation Advantage Service (OACA) (SPARC Europe) kept a list of studies up to date on whether or not there is a citation advantage for open-access articles. According to the published results, for all disciplines, there is a higher citation of open-access articles [31]. In economics articles, studied independently, there is also a higher citation of open-access articles [32], though not always significant [33]. Furthermore, according to some studies, the number of downloads is valued only if it affects the number of citations, since the main determinant in the choice of a journal is the impact factor [5,29]. From these results, the fifth hypothesis arises:

**Hypothesis 5 (H5).** *The main reason for open-access publication is visibility and dissemination, which is more important than other factors, such as the impact factor and the cost of publication.*

## 4. Methodology

### 4.1. Design

The main objective of the study was to understand researchers' perspectives on how to select a given journal, and more specifically, which one when the researcher opts for the Gold Route open-access publication model. To this end, a survey was carried out aimed at academic economists in Spain. In order to identify them, we checked all the Doctoral Schools of Spanish universities included in the Registry of Universities, Centres and Degrees (RUCT), of the Ministry of Education and Vocational Training. A database of academic economists was developed, using the information available for public consultation on the webpages of each Doctoral School. From those webpages, we obtained the email addresses of the different faculty members whose publications are in economics and business journals. Members of other disciplines belonging to these research lines were excluded (for instance, medical doctors who are faculty members of an Economic Doctoral Program, but who are not publishing in economics or business journals).

Google Drive forms were used to create and send the questionnaires. The statistical program used for the analysis of the results was IBM SPSS. Initially, a pre-test was carried out on a total of 22 researchers, allowing for the evaluation of the questions included. The final questionnaire was sent to 3118 researchers, belonging to 63 Doctoral Schools of economics and business. The compilation of the responses was divided into three phases, developed during the course of 2018: the first was started on 16 March, the second on 22 April and the third on 1 June.

### 4.2. Survey

We used the survey available in Reference [13]. The form used for the survey is divided into four sections. The first provides data on the research experience of the respondent, considering the percentage of open-access publications and the assessment of their experience in open-access publication. The measurement was carried out by using by a Likert scale of five points, where 1 provides a minimum score or a very unfavorable opinion and 5 is the maximum score or totally favorable opinion. This first section aimed to test Hypothesis H1, regarding the association between research experience and the assessment of experience in open-access publication.

The second section explores the main determinants in publishing decisions. Questions 4 and 5 evaluate the different selection criteria of the journal, according to the information sources available to the researcher. Question 6 aims to determine the main reason for open-access publication. This section allowed us to test Hypothesis H5, which suggests that the main criterion for choosing the open-access publication model is visibility and dissemination.

The third section studies the effect of economic incentives for open-access publication. Questions 7 and 8 relate to the relevance of the reduction in publication fees or the increase in funding (H2 and H3). Questions 9 and 10 pose two different situations in which the researcher must choose between two journals, one a subscription and the other an open-access journal. In both situations, the author faces publication decisions, the objective of which is to infer his/her priorities as to the two main academic publication models.

Finally, in the fourth section, questions 11 and 12 consider the future of the open-access publication model, evaluating the researchers' perspective on the possible increase in open-access publications. These questions are intended to answer Hypothesis H4.

Additionally, a contact email was made available to the researchers. The objective was to determine their interests and assessment of the open-access publication model. The comments received enrich the responses to the structured survey, and are briefly discussed in the last section (Conclusions).



#### 4.3. Variables

From the survey answers, we extracted a set of variables that are identified in Table 1.

**Table 1.** Variables obtained from the survey.

	Variable	Description	Survey Question	Values
Relevance of different criteria when selecting a journal	RE	Researcher experience	Q1	<6, (6, 18), >18
	OAPR	Rate of OA publications of the researcher, in %	Q2	[0, 100]
	OAEA	Assessment of OA publication experiences	Q3	1 to 5
	IFSC	Impact factor of the journal	Q4	1 to 5
	JTSC	Journal topic	Q4	1 to 5
	CPSC	Costs associated to publication in the journal	Q4	1 to 5
	PMSC	Publishing model of the journal (OA/Subscription)	Q4	1 to 5
	NASC	Number of articles per year in the journal	Q4	1 to 5
	FRSC	Frequency of the journal	Q4	1 to 5
	RRSC	Rejection rate of the journal	Q4	1 to 5
Reasons to OA publications	VDOA	Visibility and diffusion	Q6	1 to 5
	IFOA	Impact factor of OA journals	Q6	1 to 5
	AROA	Academic recognition	Q6	1 to 5
	CPOA	Costs associated to publication in OA	Q6	1 to 5
Measures to boost OA	PFEI	The researcher considers that a reduction in publication fees would boost OA	Q7	1(Yes)/0(No)
	HFEI	The researcher considers that higher funding would boost OA	Q8	1(Yes)/0(No)
Subjective equivalence between OA and subscription journals	EQIF	Impact factor required to consider an OA journal equivalent to a subscription journal with IF = 1	Q9	0.25, 0.5, [ ... ], 1.75, 2
	EQPC	Willingness to pay for an OA journal instead of a subscription journal with similar IF and publication costs of 2500€	Q10	0, 500, [ ... ], 2500, 3000
	OAF	The researcher considers that OA will increase in the future	Q11	1(Yes)/0(No)
	OAI	The researcher considers (s)he has enough information about OA	Q12	1(Yes)/0(No)

## 5. Results

### 5.1. Descriptive Analysis

The questionnaire was sent to 3118 Spanish academic researchers in the fields of economics and business, of which 221 valid responses were received (response rate 7.1%).

Among those who responded, 63.9% had more than 18 years of research experience and 33.3% between 6 and 18 years. The extensive participation of researchers with considerable experience is due to the fact that the survey was sent to researchers from doctoral schools. The percentage of open-access publications per researcher is 19.0% on average (SD = 23.88). Regarding the rating given to open access, on a Likert scale from 1 to 5, the mean rating is 3.53 (N = 188, SD = 1.20).

The survey reveals that the most relevant aspect when choosing a journal is its “Impact Factor” and the topic, followed by costs associated with publication (see Table 2). The publication model “Open Access/Subscription” is rated with the lowest relevance.

**Table 2.** Assessment of the selection criteria of a journal and reasons to publishing as open access.

		N	Mean	Standard Deviation
Relevance of different criteria when selecting a journal	IFSC	221	4.39	0.95
	JTSC	221	4.37	0.81
	CPSC	220	3.16	1.31
	PMSC	221	2.46	1.24
	NASC	220	2.66	1.23
	FJSC	218	2.67	1.22
	RRSC	221	2.66	1.06
Reasons for OA publication	VDOA	212	4.06	1.16
	IFOA	212	3.65	1.32
	AROA	212	3.38	1.24
	CPOA	212	2.99	1.35

For the researchers, the most important aspect of the open-access model is its visibility and dissemination. The impact factor of an open-access journal is the second aspect in terms of importance, followed by academic recognition. It is interesting to note that when opting for open-access costs associated with publication become less relevant (see Table 2).

In a hypothetical choice, if the subscription journal has an impact factor equal to 1, the researcher is asked for the impact factor required for the open-access journal to be chosen as the first option. The data indicate that the researcher requires a mean impact factor of 1.20 (SD = 0.44, confidence interval 95%: 1.14 to 1.26) ( $n = 221$ ). In a second hypothetical choice, the researcher must choose between two journals, one a subscription journal and the other an open-access journal, both in the same field, with the same academic recognition and impact factor. If the subscription journal has a cost of publication of 2500€, the researcher must indicate the preferred cost for the open-access journal to be chosen as the first option. In this case, the researcher requires a cost of 1508€ from the open-access journal (SD = 1042, confidence interval 95%: 1371 to 1645) ( $n = 221$ ). Note therefore that, when choosing a journal as the first option, the researcher requires that the open-access journal has a greater impact factor (20% higher) and a lower cost of publication than a subscription journal (39.7% lower). For the study of differences in publication decisions between medical and economics and business researchers, the publications cost of 2500€ has been set taking into account the publication costs of medical and economics journals, in subscription and open-access journals.

Regarding the economic measures that could be used to encourage open-access publication, 78.5% of researchers consider as relevant a reduction in publication rates and 77.6% an increase in funding for publication. Finally, 78.7% foresee that the volume of open-access publications will increase in the future, despite the fact that 77.3% believe that researchers do not have enough information about the open-access publication model. This does not

mean that there is not enough information available in the system, but that, if there is, it is not available to the researcher.

## 5.2. Multivariate Analysis

We first tested most of our hypotheses using contingency tables. Table 3 associates the experience of the researchers and their assessment of open-access publishing, that our first hypothesis (H1) predicted would be positively related. The data show that researchers with the greatest experience are those who more frequently assess open access with the highest value: researchers with more than 18 years of experiences represent 77.5% of the researchers who rate their experience in open-access publication with a 5, 56.5% of those who rate it with a 4 and 60% of those who rate it a 3. However, although there is a positive association between the variables, it is only weakly significant (Chi-square test:  $X^2(8) = 14.488$ ,  $p = 0.070$ ), and not significant at 5%; thus, we reject H1.

**Table 3.** Assessment of experience in open-access publishing (1 to 5) according to years of experience.

	1	2	3	4	5	Total
<6 years	0	0	3	0	2	5
6–18 years	4	5	15	30	7	61
>18 years	14	10	27	39	31	121
TOTAL	18	15	45	69	40	187

Result 1: Although there is a positive association between the greatest research experience and the highest evaluation of the experience in open-access publication, the association is not statistically significant.

The second hypothesis (H2), considers that a reduction in publication charges in open access has more relevance the more important publication costs are for the researcher. The results obtained in the contingency table (Table 4) indicate a positive association between the variables, for a 95% confidence (Chi-square test:  $X^2(4) = 22.396$ ,  $p = 0.000$ ), being statistically significant, so Hypothesis H2 is accepted.

**Table 4.** Relevance of the cost of publication in choosing the journal (1 to 5), compared with the reduction of open-access fees as an incentive measure (YES/NO).

	1	2	3	4	5	Total
NO	15	12	9	6	5	47
YES	19	19	51	48	34	171
TOTAL	34	31	60	54	39	218

Result 2: For academic researchers of economics and business in Spain, the more important publication costs are when choosing a journal, the more likely the researcher considers reduction of fees as an important economic measure in promoting open-access publications.

The third hypothesis (H3) relates the importance of higher funding as a measure of economic incentive to open-access publication with the relevance of publication costs for the researcher's decision (Table 5). The results show a positive association between the variables, for a 95% confidence (Chi-square test:  $X^2(4) = 16.908$ ,  $p < 0.005$ ), a statistically significant association, so Hypothesis H3 is accepted.

**Table 5.** Relevance of the cost of publication in choosing the journal (1 to 5), compared with the increase in funding for open-access publication as an incentive measure (YES/NO).

	1	2	3	4	5	Total
NO	14	10	15	4	6	49
YES	20	21	45	50	33	169
TOTAL	34	31	60	54	39	218



Result 3: For academic researchers of economics and business in Spain, the more important publication costs are when choosing a journal, the more likely the researcher considers higher funding as an important economic measure in promoting open-access publications.

When evaluating the cost of publication in open-access journals, as a selection criterion for journals, and the increase in funding, as a measure of economic incentive for open-access publication (Table 6), a positive association is observed between the two variables, statistically significant, for a 95% confidence (Chi-square test:  $X^2(4) = 13.342$ ,  $p = 0.010$ ).

**Table 6.** Relevance of the cost of publication in choosing an open-access journal (1 to 5), compared with the increase in funding for open-access publication as an incentive measure.

	1	2	3	4	5	Total
NO	15	12	11	8	2	48
YES	24	27	44	35	33	163
TOTAL	39	39	55	43	35	211

The fourth hypothesis (H4) analyzes researchers' opinion on the future evolution of the open-access publication model (Table 7). Researchers (92.5%) with a higher assessment of their experience in open-access publication (5-point Likert scale) predict a more successful future for the publication model, at 95% confidence (Chi-square test:  $X^2(4) = 14.200$ ,  $p = 0.007$ ). The association between the two variables is positive and statistically significant, so Hypothesis H4 is accepted.

**Table 7.** Assessment of the experience in open-access publication (1 to 5), compared to the opinion on the future increase of open-access publication (YES/NO).

	1	2	3	4	5	Total
NO	8	4	12	10	3	37
YES	10	10	31	59	37	147
TOTAL	18	14	43	69	40	184

Result 4: For academic researchers of economics and business in Spain, the higher they assess their experience in open-access publication, the more they consider open access will increase in the future.

### 5.3. Determinants of Open-Access Publications

In this section, we use the information in our survey to explore which factors determine the frequency of open-access publications, how researchers evaluate their experience with that model and the characteristics that make for a more likely positive expectation on the future evolution of open access.

Firstly, we consider which factors are relevant for determining the frequency of open-access publications. In the first model, Equation (1), we estimate whether the frequency of publication in open access is associated to the subjective equivalence between open-access journals and subscription journals:

$$OAPR = \alpha + \beta_1 * EQIF + \beta_2 * EQPC \quad (1)$$

Next we study whether the frequency of publication in open access is associated with the valuation of the different criteria when choosing a journal. The main idea here is to explore whether the more relevant the publishing model is, the more frequent the publication in open access is. Thus, in the second model, Equation (2), we estimate as follows:

$$OAPR = \alpha + \beta_1 * IFSC + \beta_2 * JTSC + \beta_3 * CPSC + \beta_4 * PMSC + \beta_5 * NASC + \beta_6 * FRSC + \beta_7 * RRSC \quad (2)$$

Finally, we combine all the correlates in third model. The results of the OLS regression of the previous models are in Table A1 (Appendix A), which shows that the percentage of open-access publications is higher when the impact factor required to the open-access journal (EQIF) is less relevant, and the publication model (PMSC) is more important. The rest of the determinants in the selection of the journal, such as the number of articles published annually (NASC) or the periodicity of the journal (FRSC), may influence the percentage of open-access publications; however, the association is weak (only significant at 10%). Meanwhile, the rest of the factors do not seem to have a robust effect.

Next, we explore the determinant of the assessment of open-access publication experience. In the fourth model, Equation (3), we study if such an assessment is associated with the relevance given to the different journal selection criteria. The model we estimate is as follows:

$$OAEA = \alpha + \beta_1 * IFSC + \beta_2 * JTSC + \beta_3 * CPSC + \beta_4 * PMSC + \beta_5 * NASC + \beta_6 * FRSC + \beta_7 * RRSC \quad (3)$$

We also study whether the assessment of the open-access experience is associated with the valuation given to the different reasons for open-access publishing. In this case, Equation (4), we explore the fifth model:

$$OAEA = \alpha + \beta_1 * VDOA + \beta_2 * IFOA + \beta_3 * AROA + \beta_4 * CPOA \quad (4)$$

Finally, we also consider the combination of both models in sixth model.

The analysis of models (4)–(6) is shown in Table A2 (Appendix B). Visibility and diffusion of the open-access publication model (VDOA) is significantly related to the assessment of experience in open-access publication ( $p$ -value < 0.05). The impact factor (IFOA) or academic recognition of open-access publications (AROA) present a weaker association ( $p$ -value < 0.1). The periodicity of the publications (FRSC), when considering the two models, may also be related to the assessment of the experience in open-access publication; however, the evidence remains weak ( $p$ -value < 0.1). As was the case when studying the rate of open-access publications, the choice of the open-access publishing model is associated with the relevance given to the publication model (PMSC,  $p$ -value < 0.01), considering the subscription and open-access publication models.

Finally, we also explore the determinants of a positive expectation about the future of open-access publishing. With this aim, we estimate three Logit models in which the dependent variable is the probability of considering that open access is will grow in the future (OAF). We propose the following specifications:

$$Pr(OAF) = F(\alpha + \beta_1 * OAPR + \beta_2 * EQEA + \beta_3 * EQIF + \beta_4 * EQPC) \quad (5)$$

$$Pr(OAF) = F(\alpha + \beta_1 * IFSC + \beta_2 * JTSC + \beta_3 * CPSC + \beta_4 * PMSC + \beta_5 * NASC + \beta_6 * FRSC + \beta_7 * RRSC) \quad (6)$$

and

$$Pr(OAF) = F(\alpha + \beta_1 * VDOA + \beta_2 * IFOA + \beta_3 * AROA + \beta_4 * CPOA) \quad (7)$$

with  $F(z) = \frac{e^z}{1+e^z}$ .

In the seventh model, Equation (5), we explore whether general considerations of the researcher regarding open access (the relative considerations of the model with respect to subscription model, the frequency of publication in open access of the researcher and the assessment of her/his experience) are associated to her/his perspectives on the future of the publishing model. In the eighth model, Equation (6), we study if the relevance given to the different factors that determine the selection of a journal is related to such an expectation. Finally, the ninth model relates expectations with the relevance given to the different reasons for opting for open access, Equation (7). We consider all the factors together in the tenth model and report the results in Table A3 (Appendix C). We find significant relations in three groups of variables. Firstly, considering the percentage of open-access publications,

the assessment of the experience through the publication model, and analysing the impact factor and the cost of the open-access journal (column 7). Secondly, when assessing the determinants of the open-access publication (column 9). Thirdly, when considering the joint analysis of all publication determinants (column 10). However, the  $p$ -value is greater than 0.05 ( $p$ -value < 0.1) in the analysis of the publication determinants when evaluating the two models (column 8).

If the publication determinants are analyzed separately, the following is observed:

- The positive association between the assessment of experience in open-access publication and the forecast of a future increase in the volume of open-access publications (column 7) ( $p$ -value < 0.05).
- Researchers who most value the publication model, as a determining factor in the selection of a journal, foresee a future increase in the volume of open-access publications (column 8) ( $p$ -value < 0.05).
- When selecting the main determinants of open-access publication, researchers who most value the visibility and cost of open-access publication forecast a greater future increase in publications (column 9).
- The joint analysis of the independent variables shows the visibility of open-access publications as the most relevant aspect in the choice of journal (column 10) ( $p$ -value < 0.01).

These results support those obtained in the reference surveys, carried out in other countries and in different disciplines.

Result 5: The relevance given to visibility and dissemination (VDOA) is the only robust factor explaining the expectation regarding future growth of the open-access publishing model, which allows us to accept hypothesis H5. The rest of factors are not robustly associated with the forecast of the future increase in open-access publications.

We compare now the results obtained in the survey conducted with economics researchers with those obtained in the directed to medical researchers [13], using as null hypothesis that decisions are similar in both fields.

The results show that the impact factor required of open-access journal is higher in medicine than economics (Table 8). Moreover, the impact factor and the publication cost are also higher in medicine, when considering subscription and open-access model. Nevertheless, the publication cost required of the open-access journal is more valued by economics researchers.

**Table 8.** Difference of means, Student's  $t$ -test, economy/medicine ( $p < 0.05$ ).

Variable	T	Sig.	Difference of Means
IF required OA	3.791	0.000	0.149 (medicine > economy)
Impact factor	2.806	0.005	0.206 (medicine > economy)
Publication cost	2.307	0.021	0.254 (medicine > economy)
Number of articles per year	4.379	$1.413 \times 10^{-5}$	0.435 (economy > medicine)
Periodicity	4.066	$5.452 \times 10^{-5}$	0.407 (economy > medicine)
Rejection rate	2.882	0.004	0.264 (economy > medicine)
Publication cost OA	1.983	0.048	0.237 (economy > medicine)

## 6. Conclusions

The results obtained indicate that, as experience in open-access publication increases, the researchers' assessment of the publication model improves. However, this relationship is not statistically significant. Hence, the first hypothesis is not accepted. Even so, incentive measures aimed at researchers, with the aim of increasing open-access publication, both Green and Gold Route, can be a way of improving the valuation of the publication model. Therefore, it could be considered in the design of publication strategies carried out by different interest groups, publishers, research institutions, libraries and authors.

The second and third hypotheses consider the reduction in publication fees and the increase in financing as possible incentives for a greater impetus for the open-access publication model. H2 and H3 are accepted. Furthermore, these researchers believe that

the publication cost is a determining criterion in open-access publication decisions. This relationship is supported by the results obtained in previous studies [15,23].

The result of the fourth hypothesis, “academic researchers of economics and business in Spain believe in a future increase in the volume of open access publications”, is positive. It is interesting to highlight the results of the regression analysis, where one observes that the percentage of open-access publications is higher if the impact factor required of the open-access journal is less relevant, and when the open-access model acquires more importance for the researcher. This result should be taken into account in the evaluation of the open-access publication model.

Regarding the fifth hypothesis, the main determinant in the selection of an open-access journal is visibility. H5 is accepted. In this case, there is a recognition of the volume of citations received, downloads and presence in research social networks [3,30,34]. In addition, the relevance of the impact factor in academic researchers’ publication decisions is evident [5], over and above the publication cost. The comments gathered from the researchers who participated in the survey indicate that the search for academic promotion, professional recognition and access to research funding involves the need for publication in high-impact-factor journals.

Additionally, in the analysis of the results obtained, the limitations of the study should also be pointed out. Among them are the following:

- The response rate obtained in the survey was 7.1%. In future studies, the use of different participation incentives should be considered, in order to increase this response percentage.
- There should be an evaluation of other open-access publication routes, such as self-archiving in institutional repositories, the Green Route.
- The results of the survey reflect the opinion of researchers in 2018. From this date to the present, numerous actions have been taken to boost the publication model. Among the most relevant are Plan S (cOAlition S initiative) [35–37], AmeliCA’s proposals and CRUE Spanish Universities’ actions during the 2019–2020 period.

For this reason, having assessed the initiatives carried out in the 2018–2021 period to promote Green Route and Gold Route open-access publication, there should be another study about researchers’ perspectives on the open-access publication model. Another possible line of research, considering the low participation of Early Career Researchers (ECRs) in this study, may be to analyze their attitudes towards open-access publication in scientific journals, as a way of increasing their presence and visibility within their discipline. Furthermore, the researcher’s opinions should be differentiated according to the institution to which they belong, so the publication costs should be analyzed in each of them, in search of greater transparency in terms of the total publication costs.

It would also be interesting to assess the impact of social networks on scientific publication decisions, with regard to visibility and academic recognition. This question could be related to the open debate on the evaluation criteria of individual research, without being linked to the journal impact factor. This factor directly affects researchers, their academic and research activity, and the search for new indicators based on scientific content, which must be periodically updated. These proposals find support in the San Francisco Declaration on the evaluation of research (2012), the Leiden Manifesto (2015) [38] and communication infrastructures such as AmeliCA, among other institutions. New evaluation metrics in which parameters such as the views, downloads, discussions, recommendations and citations are taken into account [39], as well as the open use of research data, focus attention on academic social networks, as a means of determining publication decisions in a more positive way. Using these metrics would constitute an invaluable source of information on the subject, which, in turn, would open up future ways of economic research that allow the scientific publications market to advance towards a more circular economy, respecting copyright and maintaining the quality of scientific publications.

For future studies, given the limitations of the use of surveys, additional research methods are proposed to determine the researchers' perspective. These could be focus groups with researchers from each discipline or one-on-one interviews with reference researchers.

Finally, studies and initiatives aimed at achieving greater promotion of both Green and Gold Route open-access publication model should be noted. Examples of these initiatives are the 7th Horizon 2020 Framework Programme, the "Recommendation (UE) 2018/790 of the European Commission, on access to scientific information and its preservation", the Declaration of "Amsterdam Conference Open Science" (2016) [40], the Open Access 2020 initiative based on the Berlin Declaration (2015) and Plan S. However, the vision of all these international projects is not only open access to scientific content, but the vision is "Open Science" itself. All economic research aimed at achieving an approach to this ambitious challenge is a great contribution to science, in its widest sense.

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## Appendix A

**Table A1.** Correlates of OAPR (open-access publication rate). Regression by Ordinary Least Squared (OLS). \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

	(1)	(2)	(3)
EQIF	−7.17 ** (2.93)		−4.66 * (2.81)
EQPC	−0.00 (0.00)		0.00 (0.00)
IFSC		0.87 (2.02)	1.18 (2.04)
JTSC		0.30 (2.15)	0.43 (2.15)
CPSC		−0.29 (1.26)	−0.15 (1.27)
PMSC		7.88 *** (1.49)	7.65 *** (1.51)
NASC		4.03 * (2.40)	4.18 * (2.42)
FRSC		−3.90 (2.46)	−4.25 * (2.48)
RRSC		−0.38 (1.56)	−0.23 (1.57)
Constant	28.23 *** (4.45)	−3.52 (11.11)	0.61 (11.54)
R <sup>2</sup>	0.03	0.17	0.19
F	3.06	6.01	5.01
N	209	208	205

## Appendix B

**Table A2.** Correlates of OAEA (open-access experience assessment). Regression by Ordinary Least Squared (OLS). \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

	(4)	(5)	(6)
IFSC	0.06 (0.10)		−0.08 (0.11)
JTSC	−0.03 (0.11)		−0.04 (0.11)
CPSC	−0.00 (0.06)		−0.04 (0.08)
PMSC	<b>0.53 ***</b> (0.07)		<b>0.46 ***</b> (0.08)
NASC	0.04 (0.12)		0.07 (0.12)
FRSC	−0.22 * (0.12)		−0.23 * (0.12)
RRSC	0.08 (0.08)		0.08 (0.08)
VDOA		<b>0.27 ***</b> (0.09)	<b>0.21 **</b> (0.09)
IFOA		0.04 (0.08)	<b>0.14 *</b> (0.08)
AROA		−0.04 (0.09)	−0.15 * (0.08)
CPOA		0.10 (0.07)	0.04 (0.08)
R <sup>2</sup>	0.27	0.08	0.31
F	9.21	3.99	7.03
p-value	0.00	0.00	0.00
N	186	186	185

## Appendix C

**Table A3.** Determinants of the “future increase in open access publications”. Logistic regression; \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

	(7)	(8)	(9)	(10)
OAPR	0.01 (0.01)			0.01 (0.01)
OAEA	<b>0.50 **</b> (0.18)			0.21 (0.23)
EQIF	−0.74 (0.47)			−0.63 (0.56)
EQPC	−0.00 (0.00)			0.00 (0.00)
IFSC		−0.09 (0.26)		−0.42 (0.39)
JTSC		−0.17 (0.26)		−0.11 (0.36)
CPSC		0.13 (0.14)		−0.18 (0.23)
PMSC		<b>0.42 **</b> (0.18)		0.44 (0.28)
NASC		0.19 (0.29)		0.43 (0.35)



Table A3. Cont.

	(7)	(8)	(9)	(10)
FRSC		−0.27 (0.29)		−0.62 * (0.37)
RRSC		−0.01 (0.17)		−0.05 (0.26)
VDOA			0.65 *** (0.17)	0.82 *** (0.26)
IFOA			−0.11 (0.18)	0.18 (0.25)
AROA			0.04 (0.19)	−0.13 (0.26)
CPOA			0.30 ** (0.14)	0.34 (0.23)
R <sup>2</sup>	0.10	0.06	0.12	0.26
Log likelihood	−78.65	−104.36	−94.02	−64.17
LR statistic	17.85	13.06	26.61	45.91
Prob (LR statistic)	0.00	0.07	0.00	0.00
N	175	212	208	173

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