PUBLICATION DELAY AND ARTICLE CITATION: EVIDENCE FROM ACCOUNTING

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ABSTRACT

This study performs an empirical analysis on the relationship between article publication delay and its future citations. We use a sample from top accounting journals, employ multivariate regression analysis, and results reveal an overall negative relationship between article publication delay and future citations. Additionally, we identify a U-shaped relationship; negativity is associated with the lower 87.5% of the distribution range of publication delay, while positivity is observed for the upper 12.5%. According to our findings, enhancing article citation through the review procedure appears unfeasible. Therefore, the review process should prioritize the detection and rejection of low-quality manuscripts. It should also adopt a more flexible, less demanding approach and expedite the acceptance of the remaining manuscripts. The current practice of subjecting submitted manuscripts to stringent and detailed requirements in accounting journals results in prolonged reviews, causing significant publication delays and subsequently lower citations, likely stemming from a loss of relevance or quality.

Keywords: citation, publication delay, review delay, accounting, business, article quality
JEL codes: M00, M40, M41

1. Introduction

Peer reviews have been criticized as being ineffective, scientifically inconsistent, biased, and detrimental to individual careers (Rothwell & Martyn, 2000; Ralph, 2016; Street & Ward, 2019; Coronel, 2020;). Publication delays attributable to review procedures are among the most serious concerns regarding peer review (Björk & Solomon, 2013). The authors state that the slowdown is moderate in natural sciences and technology but much more relevant in the social sciences, specifically in the economics and business fields. Ellison (2002) demonstrates a slowdown in the publishing process over time. He distinguishes between *q*- and *r*-quality and argues that *q* reflects the importance of a study's main contribution and *r* other aspects of quality that are usually improved during revisions and the final stage of paper preparation. Accordingly, the lengthening of the review process does not produce new ideas or knowledge in the field and contributes to few elements of *r*-quality, if any. In addition to the fundamental and substantial changes required by reviewers, costly, time-consuming tasks are involved in manuscript structure and format adjustment. Jiang et al. (2019) identify these as a cause of substantial publication delays and burden upon authors, stating that this time should be devoted to productive scientific activities.

Publication delay is a paramount concern within the academic community, and its impact on research is worth analyzing in terms of the efficiency of the review process (Amat, 2008). Shideler and Araújo (2017) state that publication delay can be used to predict potential article citations. However, analyses of benefits or drawbacks regarding the impact of such delays on future citations are scarce. Few empirical studies have performed correlation analyses between publication delay and journal impact factors (Pautasso & Schäfer, 2010; Khosrowjerdi et al., 2011; Shah et al., 2016) or article citations (Shen et al., 2015; Fiala et al., 2016; Lin et al., 2016). These studies lack consensus and do not elaborate on multivariate analysis controlling for other variables that may affect the journal impact factor or article citation.

The examination of the relationship between publication delay and journal impact factor is beyond of the scope of this study. We aim to empirically analyze the relationship between publication delay and the citation of articles published in accounting journals. Accounting is an interesting field for studying such relationships because publication delays are extremely large. Moreover, academics have raised concerns about the usefulness of accounting journals' demanding requirements and lengthy review processes (Moizer, 2009; Argilés-Bosch & Garcia-Blandon, 2011). Tsang and Frey (2007) criticize progressively inflated review processes for generating extremely lengthy and useless review delays in business journals because of unnecessary requests for changes in successive rounds. They state that this practice dismisses valuable research, does not necessarily strengthen manuscript quality, and results in random acceptance decisions following costly and unwarranted efforts. Consequently, the complexities involved in publication are overwhelming and relevant in the accounting field (Oler et al., 2016; Argilés-Bosch et al. 2023), to the extent that they jeopardize the viability of accounting as an academic research discipline (Fogarty & Markarian, 2007; Gendron & Rodrigue, 2019).

Using a sample of articles published over a period of six years in eight top accounting journals, we find an overall negative relationship between publication delay and future citations. Contrary to arguments regarding the beneficial effects of the review process on the citation of published articles, our results suggest the existence of detrimental effects. The results are similar when considering either the entire publication delay or review delay. All analyses fail to confirm a positive relationship between publication delays and

future citations. In contrast, a significant negative relationship exists in most cases. We also find a U-shaped relationship that is negative for the lower 87.5% and positive for the upper 12.5% of the distribution range of publication delay. A minimal significant increase in the citation of the reviewed manuscripts thus requires extensive review delays.

This study makes several contributions. First, we provide new knowledge in terms of the relationship between publication delay and future citations. Second, we contribute methodologically to the literature. Unlike the six existing empirical studies (Pautasso & Schäfer, 2010; Khosrowjerdi et al., 2011; Shen et al., 2015; Fiala et al., 2016; Lin et al., 2016; Shah et al., 2016), to the best of our knowledge, that analyze univariate relationships through correlation coefficients, of which only three perform the analysis at the article level, we use a multivariate model controlling for other factors that influence article citation. Therefore, this study isolates the specific influence of publication delay better compared to previous studies. Third, we provide research insights into the business field—more precisely, in the accounting discipline—wherein empirical research on bibliometrics is scarce in this regard.

The remainder of the paper is organized as follows: In the next section, we review the literature and formulate a hypothesis, followed by the model formulation, sample description, explanation of results, and the discussion and conclusions.

2. Literature review and hypothesis

There is a bulk of studies analyzing journal impact factors (e.g. Chiappetta Jabbour et al., 2013; Almas et al., 2022), but few of them analyze the relationship between publication delay and journal impact factor or article citation. The few empirical studies on this topic predominantly showcase a negative relationship between publication delay and journal impact factor (Pautasso & Schäfer, 2010) or article citations (Shen et al., 2015; Fiala et al., 2016; Lin et al., 2016). However, Shah et al., (2016) and Khosrowjerdi et al.(2011) find no such relationship. They provide arguments and explanations regarding these results and their corresponding expectations.

Shah et al. (2016) find no correlation between journal impact factors and publication delays for a sample of 19 Indian biomedical journals, which they attribute to the narrow range of the impact factor of these journals and their low number of published issues and articles. They provide no argument for any hypothetical relationship. Similarly, Khosrowjerdi et al. (2011) find no significant relationship for a sample of 26 Persian journals across different disciplines.

Using a sample of 19 ecology journals, Pautasso & Schäfer (2010) find a negative association between publication delay and journal impact factor. They suggest that a negative relationship exists because authors promptly revise manuscripts when requested by reputed journals, and articles sent to journals with higher impact factors may be more focused and concise, thereby requiring less time for journal review as well as resubmission.

The conclusions of analyses of journal impact factors should be cautiously extrapolated to individual articles because top-cited papers are not necessarily published in top journals, and vice versa (Moosa, 2017). Consequently, research at the article level may be more insightful than that at the journal level when analyzing the relationship between publication delay and citation.

Fiala et al. (2016) analyze a sample of 1,541 articles published in three different journals and find that publication delay and citation are uncorrelated for all three journals. However, they neither formulate a hypothesis nor provide an argument to support the lack of correlation. Shen et al. (2015) use five-year data on articles published in Nature,

Science, and Cell and find negative correlations between publication delay and citation. Lin et al. (2016) analyze a larger sample of papers published in Nature, Science, and Physical Review Letters over 10 years and find weak negative correlations between publication delay and citation for all these journals. However, the correlations are more significant and robust for highly-cited papers and disappear for papers with short delays. The results have some variations, depending on the journal.

Shen et al. (2015) and Lin et al. (2016) argue that higher-quality papers require less review time, assuming that reviewers easily recognize their quality, editors accept them for publication after a short review period, and there is a reasonably clear or objective appreciation of its quality. According to this argument, referees find it easier to make faster and more reliable decisions when reviewing high-quality papers. In contrast, precarious manuscripts require amendment, re-vision, and correction, thereby prolonging the review process and requiring more effort and time for final acceptance for publication. Consequently, the review process facilitates the desired increase in paper quality to make it publishable. At the end of the process, all articles should be of sufficient quality to merit similar citations; some require almost no delay, whereas others require a longer but beneficial review procedure. In this context, the expectation of a negative relationship is unclear. An insignificant relationship is more plausible.

Moreover, even good-quality papers may benefit from substantial improvements if the reviewers or editors raise interesting comments. In this case, addressing such comments would increase both publication delay and citations. Consequently, a positive relationship between publication delay and citations can be plausibly expected.

Therefore, it is not immediately apparent that the negative expectation should be attributed to manuscripts of higher quality that deserve a lower delay. Lin et al. (2016) suggest the widespread prevalence of low-quality papers (i.e., with few citations), even with short delays, and question this assumption. The argument remains unvalidated, given the evidence of the randomness of the review procedure. In this vein, Peters & Ceci (1982) and Cole et al. (1981) conclude that there are no objective (or predominantly objective) criteria in the review process to assess the quality of papers and make reliable and accountable decisions about their novelty, contribution, and interest to the academic community. Peters & Ceci (1982) suggest the existence of bias in favor of prestigious authors and institutions. As another example, Gans & Shepherd (1994) highlight the many rejections endured by outstanding economists for relevant papers that later led them to win the Nobel Prize or John Bates Clarke Medal. These rejections substantially delayed the publication of relevant contributions that would have supported the credibility of the authors' findings and made their contributions less novel in certain cases. Campanario (1996) and Nielsen (2009) find similar evidence of referees and editors wrongly rejecting highly-cited articles or those revealing major discoveries in various fields of knowledge. They conclude that the peer review system does not promote innovative ideas or research. According to this argument, randomness is a crucial feature of editors' decisions, and no relationship should be expected between publication delay and future citations. Conversely, Paine & Fox (2018) find that journals effectively identify the most impactful research. However, such identification is not perfect and does not address publication delays.

A negative relationship between publication delay and citation may not necessarily be explained in terms of high/low-quality papers requiring short/long reviews. The loss of quality because of the review process is an alternative and plausible argument for such a negative relationship. De Marchi & Rocchi (2001) state that longer publication delays lead to the loss of novelty and contribution of papers. Accordingly, outdated data may be an impediment to empirical research, particularly in the social sciences and other

disciplines wherein contextual data and timeliness are crucial to a study's relevance and appeal. It is not uncommon for reviewers or editors to raise concerns about outdated data or references as a basis for rejection decisions (Molinié & Bodenhausen, 2010); delays may also render the results of the study outdated and of little use by the time it is finally published (Björk & Solomon, 2013). Researchers who subsequently read these papers may avoid citing them. Indeed, longer delays increase the risk of simultaneous or even prior publication of other articles dealing with similar topics or producing related contributions, which may decrease the possibility of the delayed article's citation. The risk of publication of similar research by other authors and loss of novelty may also be attributable to plagiarism fostered by the review process. Broad & Wade (1982) report some famous cases of plagiarism and conflict owing to dishonest review processes, which usually involve an arbitrary delay in the review process.

An additional argument for the existence of a negative relationship is that peer review may damage the quality of a paper because the reviewers may change or distort the objective and focus of the study or its authors. Moreover, authors' discontentment with the review process (Adler & Liyanarachchi, 2011; Ralph, 2016; Street & Ward, 2019) may arise if they are compelled to accommodate changes in the paper to address comments that they consider unsuitable. A frequent problem is the lack of agreement between reviewers (Petty et al., 1999; Rothwell & Martyn, 2000). In such cases, they may raise and require opposing concerns and courses of action, and the authors' attempts to address such contradictory comments may produce an unfocused or illogical paper. Goodman et al. (1994) perform an experiment scoring 34 items in 111 manuscripts accepted for publication in the *Annals of Internal Medicine* and find that peer review improves the quality of the research report. However, they recognize that the improvement is but modest, with little room for substantial improvement, adding that only the quality of reporting and not that of the completed study can be improved.

Finally, the conditions of anonymity, distance, and lack of interaction between authors and reviewers—as a part of the review process—seriously limit the possibility that the process effectively improves the paper's outcome. While discussion, dialogue, and cooperation are highly beneficial for research, they diminish and lose efficiency when interaction is limited. Under such conditions, the entire process is lengthy and subject to uncertainties and misunderstandings. The final positive effects may come at a high cost in terms of effort and time, rendering the overall balance negligible or even negative.

Given the above arguments, we hypothesize that the negative effects of peer review outweigh the positive effects, that is, the positive effects are rarely higher than the negative effects. Therefore, we propose the following hypothesis:

H1. There is a negative or insignificant relationship between article publication delay and future citation.

3. Empirical model

To test our hypothesis, we formulate the following model in which article citation (*CIT*) depends on publication delay (*PUBDEL*) and a series of control variables (*CONTROL*), some of which have been used in previous studies (Stremersch et al., 2007; Mingers & Xu, 2010; Didegah & Thelwall, 2013; Liang et al., 2015; Bornmann et al., 2014; Meyer et al., 2018) as factors that influence citation:

$$CIT_i = \beta_0 + \beta_1 \cdot PUBDEL_i + \sum_{n=2}^{N} \beta_n \cdot CONTROL_i + \varepsilon_i, \quad (1)$$

where i refers to a given article, β is the parameter to be estimated, and ε is the error term.

The dependent variable is the number of citations recorded in the Web of Science (WoS) database as of April 4, 2021.

The variable of interest is the number of days from submission to online or early-access publications (*PUBDEL*1). This indicates the number of days by which publication was delayed, that is, the duration for which the article was unavailable to the reader. We also consider the number of days from submission to acceptance (*PUBDEL*2) as an alternative measure. We do not consider the delay from submission to issue publication because most journals make articles available online before publication.

All variable definitions can be found in the Appendix.

Given that most recent articles have fewer citation opportunities, we control for the number of days from online or early access to the download date (*TIME*) of article citation.

We also control for some articles' characteristics. The number of pages (*NPAGES*) and references (*NREF*) in the article are indicators of its complexity and achievement, which positively affects its future citation, and are stressed as important determinants of accounting manuscripts' success (Brinn & Jones, 2008). The words in the abstract, title, and keywords are crucial elements for article search and a preliminary assessment of its worthiness, which may influence its selection for further citation. *NWABS*, *NWTITL,* and *NKEYW* measure the number of words in the abstract, title, and keywords, respectively.

The number of authors (*NAUTH*) of the article and dummies indicating (with values 1 and 0 otherwise) that one of the authors is a top author (*TOPAUTH*) or affiliated with a top university (*TOPUNIV*) control for the likely quality of the article, driven by collaborations between various co-authors and the expertise of successful authors and universities. We consider top authors as those co-authoring 16% of all articles published in the selected journals over the study period, based on the WoS records. In total, 66 authors—less than 2% of all authors—fulfill this requirement. We do not consider a higher share of published articles because the subsequent increase in the number of authors renders the required additional effort inviable. We believe that 16% of all articles being published by less than 2% of all authors is a representative measure of the top authors in the field. As WoS does not offer data on top affiliations in accounting or for a set of articles, we rank the top 65 affiliations in our sample, which amounts to 60% of all contributions (a higher share than that of top authors) but only 7% of all affiliations in the sample. We also control for the country affiliation of one of the co-authors of each article in our sample, using dummies with a value of 1 for the respective country and 0 otherwise, as follows: The United States (*USA*), China (*CHINA*), Canada (*CANADA*), the United Kingdom (*UK*), Australia (*AUSTRAL*), the Netherlands (*NETHER*), Singapore (*SINGAP*), and Germany (*GERMAN*) are the top eight country affiliations both in our sample and for the sample of articles published in the top four accounting journals over a decade in a study by Argilés-Bosch et al. (2023).

Dummies with a value of 1 if an article has been published in a given journal and 0 otherwise control for specific editorial and review journal characteristics. The corresponding journals and subsequent variables are listed in the Appendix.

Given that the topic addressed in an article may also influence its citation, we include variables controlling for article topic. We perform a topic modeling analysis called latent Dirichlet allocation (LDA) (Blei et al., 2003) using the articles' abstracts, titles, and keywords. Based on the most likely words related to each topic, we identify 22 accounting topics. The variables *TOPIC*1–*TOPIC*21 (*TOPIC*22 is the default topic) measure the prevalence of the corresponding topics in each article. Moreover, we control for the

degree of the article's focus using the Herfindahl index of the proportions of these 22 topics (*HERTOPIC*); thus, higher values indicate more focused or specialized articles. We additionally control for the number of topics with a load higher than 0.1 (*NTOPIC*), which indicates the number of topics predominantly covered in each article.

The inclusion of all these variables (48 independent variables) enables us to control for a wide array of factors influencing citations and isolate the specific influence of publication delay.

To avoid biased results owing to influential cases, we winsorize all continuous variables at 1% in each tail.

4. Sample

We select a set of homogeneous accounting journals ranked in Q1 in WoS over the last three years (2017, 2018, and 2019) of available data at the start of this study (April 2021). We apply this selection criterion because the impact factor is calculated using three years of data. The journals meeting this condition are as follows: *Journal of Accounting Research* (JAR), *Accounting Auditing and Accountability Journal* (AAAJ), *The Accounting Review* (TAR), *Critical Perspectives on Accounting* (CPA), *Journal of Accounting and Economics* (JAE), *British Accounting Review* (BAR), *Management Accounting Research* (MAR), and *Accounting Organizations and Society* (AOS). We use Python libraries to web scrape available data for the last six years from the websites of these journals as of April 4, 2021. Six years is the span necessary for building the five-year impact factor index. We relax the selection criterion to only three years because only six accounting journals meet the selection criterion for the last six years in Q1 in WoS, which would substantially limit the resulting sample.

We use the corresponding acronyms to identify the journal's dummy variables.

With the downloaded raw data, including the abstract, title, authors, affiliations, and keywords, we elaborate the metrics of the necessary variables for our study. As submission and online or early access dates cannot be successfully downloaded in the web scraping process for TAR and AAAJ for most years, this information has been manually collected from the information on the first pages of the corresponding articles.

We apply the LDA procedure to build topic variables. LDA is an unsupervised machine-learning procedure based on a probabilistic model that allows for the automatic uncovering of latent topics within large corpora of documents (Blei et al., 2003). The input of LDA is a predefined number of topics k and a document-term matrix that includes the frequency of each term in each document as elements. As in Chen et al.'s (2020) study, we assign a double weight to terms in titles and keywords relative to terms in abstracts. The output of the LDA model comprises a document-topic matrix that includes the prevalence (proportion) of each topic for each document. These topic prevalence variables are included in Equation (1). In addition, LDA produces a topic-term matrix that includes the most likely words that co-occur for each topic. These co-occurring words are used to interpret each topic and assign descriptive labels. Hence, we estimate the LDA model with 22 topics through Gibbs sampling. The output of this search comprises a list of topics, which we do not detail in the Appendix for simplicity.

We obtain data from 2,080 articles; 1,534 articles have data on submission and early or online access dates, allowing the evaluation of publication delay. The number of observations with data for all variables included in Equation (1) is slightly lower: 1,525. Panels A and B in Table (1) display the number of articles by year and journal. TAR and AAAJ publish more articles than the other journals (see Panel A), and AAAJ and MAR have a lower number of observations based on data on publication delays (see Panel B),

with respect to the lower number of published articles in the case of MAR. AAAJ has been disclosing data on publication delays since the end of 2019.

(Insert Table 1 here)

Panel C of Table 1 displays the median number of citations per article, publication year, and journal as of April 4, 2021. The table also shows the mean values for the entire period. The mean of the citations received by all articles in our sample until the download date is 12.37. The median is six, with few differences across journals. Although our sample includes accounting journals with the highest impact factor, the number of citations is low compared to articles published in the science field. The articles published in previous years naturally have more citations as of the download date than those recently published.

Table 2 shows the descriptive statistics for the (winsorized) variables in Equation (1). The publication delay is as high as 659.80 days on average (1.8 years) from submission to online or early access. It should be noted that almost all delays (636.53 days) are attributable to the procedures ranging from submission to acceptance. The mean number of pages is 23.58, which is larger than in the articles published in scientific journals but similar to those published in the social sciences field. On average, the articles focus on two main topics (see variable *NTOPIC*). The mean number of authors is 2.48. The maximum (winsorized) number of authors is 5, but the non-winsorized maximum is 19 (not displayed, as in all variables). The top 66 and 65 authors and universities contribute to 16% and 60% of the articles in our sample, respectively. Anglo-Saxon affiliations are the most predominant in top accounting journals, and US-, UK-, and Australian-affiliated authors contribute to 47%, 22%, and 14% of the published articles in this sample, respectively.

Finally, 16% of the articles in the sample are those published in 2020.

(Insert Table 2 here)

We do not display a correlations table because of the numerous independent variables. The highest Pearson correlation coefficient between independent variables is 0.63 (between two dummies: *TOPIC19* and *AAAJ*), and 0.62 and -0.59 are the second and third highest, respectively (between *NPAGES* and *JAR*, and *HERTOPIC* and *NTOPIC*, respectively); none of them are high enough to raise serious concerns about collinearity. The highest variance inflation factors (VIF), 4.17, is far below the threshold of 10 considered to cause collinearity (Midi et al., 2010), and below the more conservative value of five. The correlation between *PUBDEL*1 and *PUBDEL*2 is high (0.99) and significant ($p < 0.01$), which confirms that both provide similar measurements; therefore, we do not include them together in the same regression. We prefer to perform our basic analysis using *PUBDEL*1 because it measures the entirety of publication delay.

5. Results

The dependent variable in our model contains count data, has an excess of zero counts, and the number of articles with a high number of citations is small compared to those with low citations. Therefore, we perform our main analyses using zero-inflated Poisson regression[1]. We use *PUBDEL*1, *TIME,* and a dummy (*PY*2020; indicating a given article's publication in 2020 with a value of 1 and 0 otherwise) as variables predicting zero citations in the required logit model. We also estimate Poisson regressions with the whole sample and a subsample excluding articles with zero citations and an ordinary least squares (OLS) regression with logarithmic transformation of the dependent variable

[1] The corresponding instruction in STATA is: zip *depvar* [*indepvars*], inflate(*varlist*)

(lnCIT), which excludes articles with zero citations. As our models present heteroscedasticity, we perform all estimations with robust standard errors. Table 3 shows the results of these estimations in Columns (1), (2), (3), and (4).

Essentially, all estimations in Table 3 present significant goodness-of-fit. Focusing on the main results in Column (1), the coefficient of the experimental variable *PUBDEL*1 is negative and significant at $p < 0.05$, which supports H1. As the independent variables in our model control for various article characteristics, including some proxies for quality, this significant coefficient suggests that articles with higher publication delays receive fewer citations because such delays may render these articles less noteworthy to be cited by the academic community. This may be because they lose relevance, become outdated or vague, or undergo disorganization. We perform repeated estimations (not disclosed), dropping some of the control variables related to article quality, such as *TOPAUTH* or *TOPUNIV*, or even dropping all control variables; the coefficient of *PUBDEL*1 remains negative and significant at $p < 0.05$.

(Insert Table 3 here)

The coefficients of most variables are significant ($p < 0.1$), with the expected sign. Citations increase with longer periods from publication to data export. The estimates for some of our variables suggest that article quality is positively related to citations. Articles with a higher number of pages, cited references, and authors also receive more citations, probably because they are more elaborate, well written, or contain interesting points that deserve citation. A more concise title is also related to more citations, probably because the objective of the study is more clearly outlined. Top authors and affiliations are also related to more citations. Except for China, the country of affiliation is not significantly related to citations. A likely explanation for this surprising result is that most articles with Chinese affiliations are also co-authored by USA authors (68 out of 122, with a significant positive association between Chinese and USA affiliations at $p < 0.05$) and by co-authors affiliated with top universities (88 out of 122, with a significant positive association between Chinese and top university affiliations at $p < 0.01$). Thus, most Chinese-affiliated authors recorded in our sample co-author with authors affiliated with top universities and institutions in the USA.

All journals are associated with fewer citations than the JAE (the default journal), probably because the JAE, which is also classified in the "Economics" category in the Journal Citation Reports, is usually an accounting journal with a higher impact factor that is closely followed by economists.

At the end of Column (1) in Table 3, the estimates of the independent variables of the logit model (inflate panel) indicate that the number of days from online or early access to the download date (*TIME*) is the most important factor influencing zero citations.

The results in Columns (2)–(4) are the same as those in Column (1). Most importantly, for the purpose of our study, the coefficient of the experimental variable *PUBDEL*1 is negative and significant in all cases, thus reinforcing and providing robust (to different estimation methods and subsamples of articles receiving at least one citation) support for our hypothesis.

We repeat all estimations with *PUBDEL*2, the number of days from submission to acceptance, instead of *PUBDEL*1. The results (not tabulated) are qualitatively the same as those displayed in Table 3, which suggests that the delay from submission to acceptance mostly conveys the negative relationship between publication delay and citations.

As previously discussed, a negative relationship between publication delay and future citations may reveal a loss of relevance and quality because of the review process. However, it may also be driven by high-quality articles needing less review attention and,

therefore, less publication delay. To shed light on the factors conveying such a negative relationship, we split the sample into subsamples of different percentiles of low delay and the corresponding subsamples above these percentiles. We begin with the lowest percentage of delays. Articles with the lowest delays are likely to be recognized as high-quality articles that need less review attention and deserve higher future citations. However, the data in Panel A of Table 4 do not support this argument. There are no significant differences in citations between the subsamples of the lower 5%, 10%, and 20% percentiles of delay and the corresponding subsamples above these percentiles. In fact, the median citation of 5% of articles with less delay is lower than that of the remaining articles (significant at $p < 0.05$). When we split the sample by the median delay, there are significantly fewer citations in the subsample of more-delayed articles than for the less-delayed articles; however, the argument of the high quality of top selected manuscripts is not validated by the data in Panel A. On the contrary, they suggest a loss of quality because of the review process. It seems that the reviewers of top exclusive manuscripts, deserving the lowest 5%, 10%, or 20% of review attention, are not effective in identifying the impact of their research; instead, other factors unrelated to quality, such as authors' prestige, may play a role in the review process. Panel B of Table 4 shows that articles co-authored by top authors have lower publication delays. Reviewers do not usually know who the authors are, unlike the editors. Data in the same panel reveal that articles co-authored by top authors also receive more citations than those co-authored by non-top authors. Whether prestige or quality drives the association in the specific case of top authors cannot be ascertained. However, our results suggest that the loss of quality and randomness play crucial roles.

(Insert Table 4 here)

We repeat the estimations of Equation (1) by splitting our sample into subsamples above and below the median citation and by top and non-top universities or authors. The results (not displayed) do not follow a clear pattern. The variable of interest *PUBDEL*1 shows a negative and significant coefficient in the subsamples of top universities, non-top authors, and citations above the median. In the remaining subsamples, the coefficient is not significant. Overall, we find reinforced support for our hypothesis of a negative relationship or no relationship between publication delay and citations. All the results indicate no positive effect of publication delay on article citations.

Finally, we suspect the existence of a nonlinear relationship between publication delay and future citations. We argue, and our results suggest, that adverse effects of publication delays on future citations arise from loss of relevance, outdatedness, disorganization of the paper, etc. However, it is generally assumed that review comments may benefit the manuscript. A rational assumption is that although a review is beneficial, the review process becomes detrimental after a certain delay. Thus, a turning point in the beneficial effects of the review process is expected. Given this, it is possible to determine an optimum publication delay. For this purpose, we test the linearity assumption of the relationship by adding the squared term of *PUBDEL*1 (*PUBDEL*1*SQ*) to Equation (1). Table 5 shows the corresponding results for the main estimation (zero-inflated Poisson) in Column 1 and additional estimations with Poisson, Poisson restricted to observations with at least one citation, and OLS in Columns 2, 3, and 4, respectively. For simplicity, only the coefficients of our variables of interest, *PUBDEL*1 and *PUBDEL*1*SQ*, are shown.

(Insert Table 5 here)

We first focus on Column 1, where the significant positive sign of the squared term reveals the existence of a nonlinear relationship; surprisingly, such a relationship is convex rather than concave. There is a minimum citation point instead of a maximum. The minimum point is attained at 1,057.7 days (2.9 years) of publication delay (-

0.0008292 / 2 ·3.92e-07) and a decrease of 0.44 citations (– 0.0008292 · 1,057.7 + 3.92e-07 · $1{,}057.7^2$ = –0.44). This minimum point is placed at the lower 87.5% of the distribution range of the variable *PUBDEL*1. Only in the upper 12.5% (100 – 87.5%) distribution range of the variable does the relationship between this variable and future citations become positive. Such a U-shaped relationship suggests that publication delay is detrimental to future publications (as revealed in the results in Table 3). The interaction and communication limitations of the review procedure render the process so ineffective that after long review delays, the relationship may revert to a positive one. Extrapolating the positive trend of this upper distribution tail, one citation would entail 2,973 days (8.1 years) of publication delay (the publication delay at which: – 0.0008292 · 2,973 + 3.92e-07 · $2{,}973^2$ = 1), far above the maximum delay in our sample, which is 1,764 days (see data in Table 2) or 4.8 years, a delay that nevertheless produces negative citation effects (– 0.0008292 · 1764 + 3.92e-07 · 1764^2 = - 0.24). Even with the extant extensive delays in accounting, there are negative effects on future article citations. The results in Columns (2), (3), and (4) are similar to those in Column (1); therefore, the corresponding minimum points and delays required for generating one citation are also similar. The results estimating the nonlinear relationship with *PUBDEL*2, instead of *PUBDEL*1, offer similar results to those in Table 5.

However, it is essential to highlight that the coefficients associated with the experimental variables exhibit a relatively low magnitude. Considering the mean publication delay of 659.8 days, the adverse impact on citations appears to be minimal when juxtaposed with the mean citations of 12.37 observed for articles within our sample. Specifically, there is a decrease of 0.139 citations (calculated as 0.000211 · 659.8) and 0.38 citations (computed as -0.000829 · 659.8 + 3.92e-07 · 659.8^2), as per the coefficients presented in Column (1) of Tables 3 and 5, respectively. It is noteworthy that these negative effects are comparable in importance to the positive effects attributed to *TOPAUTH* and *TOPUNIV* on citations (0.17 and 0.18, respectively), as per the corresponding coefficients in Column (1) in Table 3, which are similar to the corresponding coefficients in Column (1) in Table 5 (not disclosed for simplicity).

6. Discussion and conclusions

This study empirically examines the relationship between publication delay and future citations. We scrape data from eight top accounting journals, formulate a model explaining future citations, and find a negative relationship between the two variables. The results are robust to the different estimation methods. The relationship persists in the subsamples of articles co-authored by authors affiliated with top universities and by non-top authors, as well as in the subsample of articles receiving high citations. However, we do not find a relationship in the opposite subsamples of non-top universities, top authors, and articles receiving few citations. In the entire sample and in all subsamples, we find negative or non-significant relationships. These results suggest that the negative association is not driven by high-quality articles, which require little review attention.

On the contrary, our results suggest that the review process is detrimental to article citation in most cases; it does not seem to increase the citation of the submitted papers substantially, and randomness plays a crucial role in both the review process and citation outcome. We also find a U-shaped relationship, where publication delay is associated with fewer citations for the lower 87.5% of the distribution range of publication delay in our sample, and a positive association exists for the upper 12.5% of its distribution range. This U-shaped relationship suggests that the review process is ineffective in producing beneficial effects on paper citation. A substantial change in citation of a submitted manuscript through the review process would require considerable time, even longer than

the extant delays in the accounting field. According to our results, a single additional citation would require 8.1 years of review time.

Based on these findings, we infer the following: First, the review process should be restricted to discarding manuscripts perceived as of notorious low-quality and acting as a mere filter for notoriously deficient research; it should be flexible in accepting manuscripts with potential contributions. Second, in addition to outdatedness, excessive concerns and re-addressing may lead to disorganization and an absence of focus, which may be inappropriate for manuscripts with no apparent signs of inferior quality. Accounting journals should review the manuscripts that are not discarded faster than they are at present to speed up knowledge generation and dissemination and avoid outdated articles. Third, reviewers and editors should be aware that more comprehensive discussions open to the whole academic community are more beneficial for knowledge advancement than discussions restricted to a few reviewers and editors. Fourth, the current high rejection rates should be lowered to avoid the arbitrary or biased assessment of a few reviewers who may set aside interesting future contributions. The risk of losing potential contributions to knowledge advancement faced by the academic community is too great to rely exclusively on the discretionary judgment of two or three reviewers. The current review practices in the accounting field produce high rejection rates[2], with a sizable share of research never reaching a wider academic audience. A knowledge advancement attitude should allow for potentially strong contributions that are likely unnoticed by the few reviewers and editors involved in the review process, reach such researchers, and substantially improve their work through successive steps of research during the interaction. Research may be academically useful even when it is not fully realized. An article may contribute to a field of knowledge despite containing the deficiencies assessed by the reviewer.

Further research may overcome such hypothetical deficiencies and produce substantial knowledge advancement, which would never have been attained, or been substantially delayed, had the first study been rejected for publication. As mentioned, there is evidence of outstanding contributions having been repeatedly rejected for publication that have afterward been recognized as major discoveries (Gans & Shepherd, 1994; Campanario, 1996; Nielsen, 2009) but with considerable publication delay and immeasurable harm to knowledge advancement. Many other rejected articles may never reach the academic community and may have definitively hindered seminal contributions. Adair (1982) states that, acknowledging the risk of losing valuable contributions, *Physical Review* and *Physical Review Letters* adopted a policy of higher acceptance rates. With more or less important consequences, the extant high rejection rates, demanding review procedures, and publication delays in the accounting field may produce adverse rather than beneficial effects on the quality of published research and the state of knowledge. Lengthy review procedures coupled with high rejection rates in the accounting field pose the risk of huge shares of potentially valuable research never reaching discussion and dissemination in academia following some highly probable rejections, which is harmful to knowledge advancement in the discipline.

This study has some limitations. First, it would be interesting to assess measures of article quality rather than citations limited to a few years after publication. As highlighted

[2] As an example, the last two sets of editorial data disclosed by the JAE reveal a rejection rate as high as 92% (Holthausen et al., 2021; Core et al., 2022), which implies that such a huge percentage of research may be temporarily or permanently impeded from dissemination in academia; the tiny percentage of accepted papers need an average of 636 days to be accepted and 659 days to be accessible online, according to data in our sample (see Table 2). The corresponding data are very similar for the JAE: 626 and 644 days respectively (not tabulated data).

by Milne (2002) and Locke & Lowe (2002), the quality of research is an elusive and complex concept. Further research should use alternative measures of article quality and a larger span of future years of citation. Moreover, we use a limited sample of top accounting journals. Future researchers may consider a wider sample of journals from different fields of knowledge, primarily in the social sciences, where publication procedures are characterized by high delays.

Competing interests

No funding was received for conducting this study, and the authors have non-financial interest, and no competing interests to disclose.

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Appendix

Definition of variables

Variable	Definition
Dependent variables	
CIT	Number of citations recorded in the WoS database as of April 4, 2021
ln*CIT*	Natural logarithm of number of citations
Independent variables	
*PUBDEL*1	Number of days from submission to online or early access publications
*PUBDEL*1*SQ*	The square of *PUBDEL*1
*PUBDEL*2	Number of days from submission to acceptance
TIME	number of days from online or early access to the download date (April 4, 2021)
CONTROL	Control variables
NPAGES	Number of pages
NWABS	Number of words in the abstract
NWTITL	Number of words in the title
NKEYW	Number of keywords
NREF	Number of references
HERTOPIC	Herfidahl index of the proportion of 22 topics in each article
NTOPIC	Number of topics predominantly dealt with in each topic (proportion above 0.1)
NAUTH	Number of authors
TOPAUTH	Indicator variable equaling 1, and 0 otherwise, if one authors is a top-66 authors of the articles published between 2015 and 2020 in the 8 journals of the sample, according to WoS records
TOPUNIV	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to a top-65 institutions of the sample
USA	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to a US institution
CHINA	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to a Chinese institution
CANADA	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to a Canadian institution
UK	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to a UK institution
AUSTRAL	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to an Australian institution
NETHER	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to a Dutch institution
SINGAP	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to a Singaporean institution
GERMAN	Indicator variable equaling 1, and 0 otherwise, if one of the authors is affiliated to a German institution
JAR	Indicator variable equaling 1, and 0 otherwise, if the article is published in *Journal of Accounting Research*
AAAJ	Indicator variable equaling 1, and 0 otherwise, if the article is published in *Accounting Auditing and Accountability Journal*

TAR	Indicator variable equaling 1, and 0 otherwise, if the article is published in *The Accounting Review*
CPA	Indicator variable equaling 1, and 0 otherwise, if the article is published in *Critical Perspectives on Accounting*
JAE	Indicator variable equaling 1, and 0 otherwise, if the article is published in *Journal of Accounting and Economics* (the default journal)
BAR	Indicator variable equaling 1, and 0 otherwise, if the article is published in *British Accounting Review*
MAR	Indicator variable equaling 1, and 0 otherwise, if the article is published in *Management Accounting Research*
AOS	Indicator variable equaling 1, and 0 otherwise, if the article is published in *Accounting Organizations and Society*
*TOPIC*01 to *TOPIC*22	Proportion of topics 01 to 22 in the article
*PY*2020	Indicator variable equaling 1, and 0 otherwise, if an article has been published in 2020

Table 1. **Sample. Number of articles and citations per article recorded in WoS as of April 4, 2021. Detail by year and journal**

	Year							
Journal	2015	2016	2017	2018	2019	2020	All years	
Panel A: number of articles downloaded								
JAR	27	32	32	34	32	30	187	
AAAJ	49	48	70	82	104	57	410	
TAR	85	70	60	85	88	88	476	
CPA	64	32	38	40	34	31	239	
JAE	33	45	40	43	38	35	234	
BAR	28	28	35	36	35	36	198	
MAR	16	24	21	16	16	16	109	
AOS	39	39	35	35	37	42	227	
Total	341	318	331	371	384	335	2080	
Panel B: number of articles with data on days from submission to online or early-access publications								
JAR	26	25	32	33	31	29	176	
AAAJ	0	0	0	0	3	53	56	
TAR	84	70	59	70	71	56	410	
CPA	52	26	36	31	32	28	205	
JAE	25	40	40	43	38	35	221	
BAR	26	28	34	36	35	36	195	
MAR	4	12	13	13	15	16	73	
AOS	14	39	33	35	35	42	198	
Total	231	240	247	261	260	295	1534	
Panel C: median (mean in the last row) number of citations per article								
JAR	31	16	12	8	2	0	7	16.16
AAAJ	23	11.5	12	5	2	1	5	10.08
TAR	16	21.5	14	6	3	0	7	12.74
CPA	14.5	10	8.5	4	3	2	6	11.3
JAE	24	23	11	7	2	0	8	16.05
BAR	10.5	12	9	5.5	3	1	5	10.3
MAR	25.5	15.5	10	5	2	1	7	13.72
AOS	16	12	11	6	2	1	6	11.11
Total	19	14	11	6	2	1	6	12.37

Table 2. **Descriptive statistics (*TOPIC*01 to *TOPIC*22 excluded for simplicity)**

Variables	Observations	Mean	Std. dev.	Min	Max
CIT	2080	12.37	17.30	0.00	102.00
*PUBDEL*1	1534	659.80	337.99	34.00	1764.00
*PUBDEL*2	1688	636.53	339.72	15.00	1765.00
TIME	1582	1326.78	662.76	179.00	2563.00
NPAGES	2080	23.58	9.14	6.00	54.00
NWABS	2080	178.24	64.90	62.00	398.00
NWTITL	2080	11.48	4.06	3.00	22.00
NKEYW	2080	4.68	1.57	1.00	9.00
NREF	2080	73.52	32.53	17.00	184.00
HERTOPIC	2063	0.24	0.09	0.10	0.50
NTOPIC	2063	2.00	0.67	1.00	4.00
NAUTH	2080	2.48	0.97	1.00	5.00
TOPAUTH	2080	0.16	0.37	0.00	1.00
TOPUNIV	2080	0.60	0.49	0.00	1.00
USA	2080	0.47	0.50	0.00	1.00
CHINA	2080	0.06	0.24	0.00	1.00
CANADA	2080	0.08	0.27	0.00	1.00
UK	2080	0.22	0.41	0.00	1.00
AUSTRAL	2080	0.14	0.35	0.00	1.00
NETHER	2080	0.04	0.20	0.00	1.00
SINGAP	2080	0.03	0.17	0.00	1.00
GERMAN	2080	0.03	0.18	0.00	1.00
JAR	2080	0.09	0.29	0.00	1.00
AAAJ	2080	0.20	0.40	0.00	1.00
TAR	2080	0.23	0.42	0.00	1.00
CPA	2080	0.11	0.32	0.00	1.00
JAE	2080	0.11	0.32	0.00	1.00
BAR	2080	0.10	0.29	0.00	1.00
MAR	2080	0.05	0.22	0.00	1.00
AOS	2080	0.11	0.31	0.00	1.00
*PY*2020	2080	0.16	0.37	0	1

Table 3. **Citations depending on publication delay and control variables**

Variables	(1) Zero inflated Poisson	(2) Poisson	(3) Poisson *CIT* > 0	(4) OLS ln*CIT*
*PUBDEL*1	-0.000211**	-0.000190**	-0.000210**	-0.000188**
	(9.77e-05)	(9.64e-05)	(9.64e-05)	(7.73e-05)
TIME	0.00118***	0.00129***	0.00117***	0.00131***
	(4.79e-05)	(4.42e-05)	(4.63e-05)	(4.10e-05)
NPAGES	0.0126**	0.0123**	0.0125**	0.0136***
	(0.00548)	(0.00545)	(0.00542)	(0.00484)
NWABS	-0.000942	-0.000860	-0.000942	-0.000455
	(0.000750)	(0.000741)	(0.000740)	(0.000660)
NWTITL	-0.0173**	-0.0187**	-0.0171**	-0.00876
	(0.00763)	(0.00764)	(0.00756)	(0.00632)
NKEYW	0.0159	0.0204	0.0148	0.000788
	(0.0194)	(0.0195)	(0.0193)	(0.0167)
NREF	0.00449***	0.00494***	0.00440***	0.00449***
	(0.00119)	(0.00119)	(0.00118)	(0.000942)
NAUTH	0.117***	0.125***	0.116***	0.103***
	(0.0282)	(0.0284)	(0.0280)	(0.0263)
TOPAUTH	0.173**	0.177**	0.173**	0.109
	(0.0689)	(0.0690)	(0.0684)	(0.0677)
TOPUNIV	0.181***	0.172***	0.178***	0.194***
	(0.0608)	(0.0610)	(0.0602)	(0.0534)
HERTOPIC	0.467	0.458	0.477	0.711*
	(0.455)	(0.456)	(0.451)	(0.405)
NTOPIC	0.0274	0.0182	0.0281	0.0690
	(0.0495)	(0.0497)	(0.0490)	(0.0458)
USA	-0.138	-0.133	-0.137	-0.181**
	(0.0914)	(0.0907)	(0.0908)	(0.0778)
CHINA	0.190*	0.168	0.190*	0.156*
	(0.113)	(0.113)	(0.113)	(0.0943)
CANADA	-0.122	-0.128	-0.123	-0.0843
	(0.104)	(0.105)	(0.103)	(0.0823)
UK	-0.0614	-0.0464	-0.0640	-0.0444
	(0.0828)	(0.0830)	(0.0820)	(0.0733)
AUSTRAL	-0.0704	-0.0622	-0.0696	-0.0926
	(0.0944)	(0.0957)	(0.0938)	(0.0867)
NETHER	0.0278	0.0440	0.0258	-0.0423
	(0.121)	(0.119)	(0.120)	(0.124)
SINGAP	-0.0889	-0.0760	-0.0884	-0.0893
	(0.124)	(0.122)	(0.123)	(0.123)
GERMAN	-0.0531	-0.0323	-0.0597	0.0631
	(0.163)	(0.163)	(0.161)	(0.128)
JAR	-0.330**	-0.326**	-0.326**	-0.329**
	(0.141)	(0.142)	(0.140)	(0.135)
AAAJ	-1.669***	-1.822***	-1.591***	-1.051***
	(0.241)	(0.242)	(0.237)	(0.193)

TAR	-0.425***	-0.432***	-0.420***	-0.427***
	(0.0933)	(0.0941)	(0.0926)	(0.0861)
CPA	-0.898***	-0.924***	-0.884***	-0.870***
	(0.161)	(0.159)	(0.159)	(0.136)
BAR	-0.890***	-0.928***	-0.875***	-0.736***
	(0.147)	(0.145)	(0.145)	(0.124)
MAR	-0.589***	-0.604***	-0.569***	-0.533***
	(0.190)	(0.184)	(0.186)	(0.155)
AOS	-0.354**	-0.358**	-0.348**	-0.294**
	(0.147)	(0.146)	(0.146)	(0.123)
*TOPIC*01 to TOPIC 21	Yes	Yes	Yes	Yes
Constant	0.596	0.322	0.629*	0.123
	(0.374)	(0.370)	(0.370)	(0.313)
Total Observations	1,525	1,525	1,355	1,355
Zero observations	170	170		
Wald chi2(48)	1754.17***	2232.21***	1814.51***	
Pseudo R2		0.4836	0.4402	
R-squared				0.526
F(48, 1306)				41.29***
Inflate				
*PUBDEL*1	-2.64e-05			
	(0.000323)			
TIME	-0.00397***			
	(0.000756)			
*PY*2020	-0.260			
	(0.438)			
Constant	1.227*			
	(0.696)			

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. **Median citations per article splitting the sample by different percentiles of delays, and by top and non-top authors**

Variables	Subsamples		Mann-Witney test
Panel A. Citations per article by subsamples of percentiles of low and high delays			
	(1) Subsample of delays below the median	(2) Subsample of delays above the median	
Median *CIT* splitting by 5% delay (190 days)	2	6	***
Median *CIT* splitting by 10% delay (278 days)	4	6	
Median *CIT* splitting by 20% delay (387 days)	5.5	6	
Median *CIT* splitting by 50% delay (608 days)	7	5	**
Panel B. Citations and publication delay per article by subsamples of non-top and top authors			
	(1) Subsample of non-top authors	(2) Subsample of top authors	
Median *PUBDEL*1	618	548	***
Median *CIT*	5	9	***

*** p<0.01, ** p<0.05, * p<0.1 (the Bartlett's tests reveal unequal variances in all pairs of samples)

Table 5. **Citations depending on publication delay and control variables. Nonlinear relationship (for simplicity only the coefficients of *PUBDEL*1 and its squared term *PUBDEL*1*SQ* are shown)**

Variables	(1) Zero inflated Poisson	(2) Poisson	(3) Poisson *CIT* > 0	(4) OLS ln*CIT*
*PUBDEL*1	-0.000829***	-0.000781**	-0.000829***	-0.000638**
	(0.000317)	(0.000314)	(0.000313)	(0.000265)
*PUBDEL*1*SQ*	3.92e-07*	3.76e-07*	3.92e-07**	2.72e-07*
	(2.01e-07)	(1.99e-07)	(1.99e-07)	(1.51e-07)
CONTROLS	Yes	Yes	Yes	Yes
Constant	0.735*	0.452	0.767**	0.223
	(0.392)	(0.387)	(0.388)	(0.323)
Observations	1,525	1,525	1,355	1,355
R-squared				0.527
Zero obs	170	170		
Wald chi2 49	1841.76***	2322.51***	1905.51***	
F (49, 1305)				40.65***
Pseudo R-squared		0.4852	0.4423	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1