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Drivers of citations: An analysis of publications in "top" accounting journals

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ABSTRACT

Citation counts are increasingly used to assess the impact and quality of articles, journals, researchers, and research institutions. At the same time, there is an ongoing debate about their usefulness as a performance measure. To understand the actual drivers of this measure in the accounting literature, we empirically investigated which factors affect the citation rates of publications in five "top" journals of the field using a three-step regression to accommodate different theoretical perspectives on citations. Our results show that citation behavior is influenced by both article and author characteristics, suggesting that not only the universalistic but also the particularistic perspective on science is associated with citation behavior in the accounting field. Contrary to previous studies, we identify several particularistic variables as significant, relating to the visibility and position of researchers in the scientific system and to how they promote their research. In addition, the strong effects of the universalistic variables of subject area and research method point to the possibility that the use of citation counts for evaluating performance might create a bias in favor of certain types of research. Overall, our results should urge caution against the uncritical use of citation counts as an indicator of quality and a performance measure.

1. Introduction

Citations, particularly citation counts, have been receiving increasing attention in science. Regarded as part of the formal acknowledgement process of scholarship (Cronin, 1984), citations document the origin and evolution of ideas over time, establishing property rights to knowledge (Merton, 1957; Merton, 1968). Citation counts capture how frequently a certain publication is used in subsequent research or practice and are therefore used as a measure of impact and quality (Christenson & Sigelman, 1985). The use of citation counts in this way has proliferated alongside electronic citation databases such as *Web of Science* and *Scopus*, encompassing both research-related uses, such as the bibliometric study of scientific disciplines (Bricker, 1989; Brown, 1996), and more practical purposes, such as the measurement of performance for academic tenure and promotion decisions (Reinstein, Hasselback, Riley, & Sinason, 2011). As a result, not only individual academic careers but also the academic status of departments, universities, journals, and even countries seem increasingly

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influenced by the number of citations their respective publications generate (Gendron, 2008; Merchant, 2010; Radicchi, Fortunato, & Castellano, 2008; Shadish, Tolliver, Gray, & Gupta, 1995).

For several reasons, citations are apparently attractive as an indicator of academic performance, especially as an alternative or complement to journal rankings. First, journal impact factors are criticized as an indicator for being too aggregated, since the number of citations to articles in a journal varies widely, with many articles receiving few or no citations (Baum, 2011). Measuring the number of citations of an article directly solves this problem. Second, citations appear to reflect objectively the actual productive use of an article, thus seeming to overcome the limitations of subjective evaluation. From an economic perspective, citations arguably reveal preferences in the marketplace for ideas. Finally, a focus on citations could weaken the focus on publication in "top"-ranked journals. Because articles in lower-ranked journals can attract as many citations as articles in higher-ranked journals (Smith, 2004), using citations could liberate a field from the oligopolistic power of a few journals, their editors and the related networks. In this way, citations could encourage researchers to care more about the potential users of their academic work, instead of focusing only on managing a few, powerful gatekeepers.

At the same time, however, using citations could reinforce current performance-measurement practices in academia; these have been criticized for their potential detrimental effects on the sustainability of academic accounting (Hopwood, 2005; Humphrey & Gendron, 2015). In particular, many authors have criticized the negatively reinforcing effects of "objectifying ranking hierarchies" (Humphrey & Gendron, 2015) on progress, diversity, and innovation in accounting research. These measurement practices, it has been argued, decrease the diversity of methods, domains, topics, and national contexts in the field, favoring the English language and creating regional hierarchies, with the United States on top (Hopwood, 2005; Humphrey & Gendron, 2015; Komori, 2015; Messner, 2015; Pelger & Grottke, 2015). For single researchers, the practice has been criticized for fostering a short-term, "paying-off" mentality (Gendron, 2015) and for encouraging researcher docility and compliance with dominant norms and practices. This manifests itself in the predominance of "gap-spotting research" (Alvesson & Sandberg, 2013), which is more likely to lead to a steady flow of publications, while long-term and risky research in the form of potentially "box-breaking studies" (Alvesson & Sandberg, 2014) becomes less attractive.

So, will using citations as a new or additional performance measure solve or prolong these problems? Citations may already be overly influential in today's academic environment, and perhaps their use as an indicator of article quality is as dubious as the use of impact factors as a quality indicator for journals (Humphrey & Gendron, 2015). The use of citations could even generate new mentalities and processes in academia that lead to other, potentially worse long-term effects. To address these issues in the accounting field, reason demands an investigation of what citations actually measure, establishing a solid base of evidence that citations are a good indicator of quality and impact in the field before relying on them institutionally. The evidence is currently neither clear nor comprehensive.

The empirical observation that some publications receive much attention while others are not cited at all has long been established (Lotka, 1926; Simon, 1957), an observation more recently reiterated for publications in journals with high impact factors (Baum, 2011). The reasons why an article is cited, however, remain unclear, and given the aforementioned institutional role played by citation counts, many authors have raised concerns regarding the lack of knowledge about what drives citations in general and in particular, especially with respect to possible differences between research fields (Baldi, 1998; Cozzens, 1985; Cronin, 1984; Shadish et al., 1995). Generally, there have been two competing theoretical perspectives on citation behavior: universalistic and particularistic. From the universalistic perspective, which focuses on the characteristics of individual articles, an article is cited because of its content and presentation (Stremersch, Verniers, & Verhoef, 2007). From the particularistic perspective, which focuses on author characteristics, an article is cited because of the author's reputation, affiliation, or other personal characteristics, such as gender and nationality (Gilbert, 1977; Moed & Garfield, 2004).

Regarding accounting, only limited evidence on the citation process and antecedents of citations exists to date. Reinstein et al. (2011) surveyed authors about the factors that influenced their decisions to cite a publication. Besides the quality of the cited work, they reported as affecting their decision factors such as the author being a friend or colleague and the article being published in a U.S. journal. Van Campenhout and Van Caneghem (2010) investigated whether articles published in the *European Accounting Review* (*EAR*) were cited for their objective contribution or for the characteristics of their authors, with the results suggesting that an article's contribution is more important than its authors' characteristics. These results are inconsistent, however, with previous findings that accounting research has distinct characteristics, such as a stronger national orientation (Brinn, Jones, & Pendlebury, 2001; Jones & Roberts, 2005; Lukka & Kasanen, 1996), a greater hierarchical nature than other major business fields (Swanson, 2004), or control by an "elite" circle of researchers (Lee, 1997; Lee, 1999). These characteristics of accounting cast doubt on the applicability of Van Campenhout and Van Caneghem's (2010) results to a broader sample of journals, including U.S. accounting journals.

Given the limited evidence about the citation process, as discussed above, even as the perceived relevance of citations increases, this study empirically tests a comprehensive set of article and author characteristics to investigate those factors impacting the citation rates of articles published in "top" accounting journals. In doing so, we intend to assess the content validity of this measure, adopting a three-step regression to accommodate different theoretical perspectives on citations. Our sample comprises 500 articles published between 1998 and 2007 in the following five "leading" accounting journals (Bonner, Hesford, Van der Stede, & Young, 2006; Reinstein & Calderon, 2006): *Accounting, Organization and Society* (*AOS*), *Contemporary Accounting Research* (*CAR*), *Journal of Accounting and Economics* (*JAE*), *Journal of Accounting Research* (*JAR*), and *The Accounting Review* (*TAR*). Going beyond previous research, we use data on citation counts from *Thomson Reuters' Social Science Citation Index* (*SSCI*) and *Elsevier's Scopus* to improve our measurement of the dependent variable, *citations*.

Our results challenge previous evidence, demonstrating that citation behavior in "top" accounting journals is influenced by both universalistic and particularistic variables. Significant particularistic variables concern the visibility and position of researchers in the scientific system as well as the extent to which they promote their research. We find, however, no significant gender bias. Concerning the universalistic variables, the results for domain point to the possibility that using citation counts to evaluate performance favors certain types of research; for example, archival studies attract many more citations than studies using other research methods (Bonner, Hesford, Van der Stede, & Young, 2012). Contrary to previous results in the management literature, we find no significant effect of the originality of an article (Judge, Cable, Colbert, & Rynes, 2007). Overall, our results should urge caution against the uncritical use of citation counts as an indicator of quality and impact as well as a measure to evaluate performance.

This study contributes to the accounting literature in several ways. First, it advances the ongoing debate about the content validity and usefulness of citation counts as a measure of scientific impact, particularly as a measure of quality. By providing data on actual citation rates, it complements Reinstein et al.'s (2011) survey regarding the reasons authors state for citing. It also extends Van Campenhout and Van Caneghem's (2010) study by including a substantial number of additional variables, especially those from the particularistic perspective. Both institution- and publication-related reputations drive article citations, along with the authors' promotion via references and paper presentations at conferences and workshops. From the universalistic perspective, we show that an article's domain strongly affects the citation rate, while the originality of the idea presented in a paper does not seem to affect its citation rate. In addition, we document substantial changes in citations over time due to the considerable extension of coverage by the *SSCI* and *Scopus*. Overall, the findings here indicate that the interpretation and use of citations as a measure of quality is neither as promising nor easy as it might appear at first sight.

Second, the paper contributes to the current debate regarding the detrimental effects of current performance-measurement practices on diversity, innovation, and progress in accounting. The results suggest that the choice of a widely used research method, such as archival research, or subject area, such as financial accounting, positively affects citations (Bonner et al., 2012). Moreover, we find originality to have no effect. Hence, measuring performance via citation counts could reinforce the current, problematic situation in terms of diversity and progress. In addition, we observe that researchers' active promotion of articles matters, which could make researchers much more explicitly responsible for the dissemination of their publications and citations (Humphrey & Gendron, 2015). Overall, using citations as a performance measure could not only prolong current problems regarding the sustainability of accounting research but also even generate additional responsibilities and foster new mentalities.

Finally, this study improves our understanding of the scientific discipline of accounting from the perspective of knowledge dissemination. Comparing accounting with other business disciplines, the results indicate that overall its citation patterns are similar to those in operations research (Mingers & Xu, 2010), management (Judge et al., 2007), and marketing (Stremersch et al., 2007) in the sense that its patterns support the claim in the sociology of scientific knowledge that the social dimension of science matters (Longino, 2016). In our descriptive data, we find indicators of accounting research being U.S.-oriented and dominated by an "elite" circle of researchers coming from a few influential PhD-granting institutions, but this is not reflected directly by our model of the drivers of citations. Nevertheless, our results concerning research methods and areas indicate a citation bias towards typical U.S. research. In addition, the fact that the originality of a paper's contributions does not predict citation rates raises questions about the role played by innovation in the discipline—or at least about the adequacy of the used definition of originality for accounting research (Gendron, 2013). Overall, our study echoes many of the concerns raised about the state of accounting research with a focus on knowledge dissemination, warranting a careful – and critical – analysis of the social dimension of accounting research and its effects on the use of the produced knowledge.

The remainder of this paper is structured as follows. In Section 2, we review previous research and develop our conceptual framework and hypotheses. Section 3 describes how we measured the variables, and Section 4 presents our data. In Section 5, we explain our method of analysis and present the results. Section 6 presents our robustness tests. In the final section, we discuss our findings, along with possible limitations and potential directions for future research.

2. Literature review and development of hypotheses

2.1. Background and framework for assessing the drivers of citations

The question "What drives citations?" is closely linked to two fundamental perspectives on science (MacRoberts & MacRoberts, 1996): the universalistic or traditional view on science on the one hand and the particularistic or social constructivist view on science on the other hand. According to the universalistic view, science seeks truth and scientific knowledge is about facts. The content of science is influenced by nature and scientific disputes can be settled by facts, i.e., by questioning nature and letting the real world decide about them. In his functionalist account of the traditional view, the sociologist Merton (1973, p. 270) described the institutions which govern science and contribute to its effective functioning: The "institutional imperatives – universalism, communism, disinterestedness, organized skepticism – are taken to comprise the ethos of modern science." The first two norms are of particular interest for this paper. Universalism implies that the scientific validity of an idea should not depend on who expressed it. Science should not be influenced by the status or other personal attributes of the scientists and there should be equal opportunity for all. This also implies that scientists should not

discriminate others, for example, based on nationality or gender. Communism refers to the imperative of sharing scientific knowledge freely and not claiming property rights to it. In return, scientists who make use of the knowledge established by others should give them credit, especially by citing their work. Ideally, the Mertonian norms safeguard the objectivity of scientific knowledge and the epistemological legitimacy of science.

The traditional view on science is challenged by social constructivism. The sociology of scientific knowledge views science as a social activity, thus scrutinizing social influences on scientific knowledge (Longino, 2016). Accordingly, this sociology, especially its so-called strong program (e.g. Barnes, 1977; Bloor, 1976), emphasizes that scientific knowledge is determined not by facts alone but also depends on social norms, institutions, values, beliefs, and practices. Related research agrees about the potential of social aspects to influence science and scientific knowledge. In the philosophy of science, Lakatos (1970) and Kuhn (1962) addressed the community aspects of scientific change. Other studies have used ethnographic methods to investigate research in laboratories, for example by uncovering which social factors influence the acceptance of something as a scientific fact (Latour & Woolgar, 1986). Furthermore, feminist approaches have discussed a potential gender bias in the content of science (Harding, 1992).

These different streams of research have in common that they challenge the traditional view of science by which scientists seek truth and scientific knowledge as facts. The sociology of scientific knowledge highlights the contingency of scientific knowledge on the social dimension of its production. Thereby it raises concerns about the objectivity of scientific knowledge and the epistemological legitimacy of science, because the social dimension of science might induce biases and distortions. However, acknowledging that social aspects play a role in the production of scientific knowledge does not necessarily imply a position of relativism, and a number of philosophical approaches have attempted to maintain science's objectivity and legitimacy in the face of these challenges (Kitcher, 1995; Longino, 2016).

The two distinct perspectives on science mirror two fundamental theoretical perspectives on citation behavior: the universalistic and the particularistic. From the universalistic perspective, related to the traditional view of science, academics cite texts that are relevant for their topics and provide useful background for their research (Case & Higgins, 2000; Leimu & Koricheva, 2005). Science is seen as being based on specific norms enforced by internal rewards and sanctions (Cole & Cole, 1973; Merton, 1957). The norms of openness, emotional neutrality, and distance are believed to guide academics' evaluation of the usefulness of past research for their own work (Merton, 1957). An author's rank, gender, and nationality are irrelevant characteristics for this evaluation (Baldi, 1998); a publication is cited because it offers an original contribution to science and fulfills high standards of quality in its design, execution, and presentation (Judge et al., 2007). The primary drivers of citations are content, usefulness, scientific rigor, and the quality of a paper's presentation (Boyd, Finkelstein, & Gove, 2005; Mingers & Xu, 2010). Overall, from the universalistic perspective, it matters *what* and *how* something is said.

The particularistic perspective has challenged these notions with claims that could be related to concepts from the sociology of scientific knowledge. From this perspective, academics use citations mainly as a tool for persuasion (Gilbert, 1977), rather than as indicators of an idea's substance or benefit (Cole & Cole, 1973). Authors select citations that they consider to be "authoritative," meaning written by eminent or prominent authors (Moed & Garfield, 2004), or "strategic," such as work from editors or colleagues who are likely selections as referees (Leimu & Koricheva, 2005). Latour (1987) described choices of citations as a "political" process, centered on a cited author's personal status not the quality or scientific contributions of the research per se (Judge et al., 2007). The location of a cited paper's author within the hierarchical structure of an academic field drives citations more than the intellectual content of the article itself (Baldi, 1998; Podsakoff, MacKenzie, Bachrach, & Podsakoff, 2005), resulting, among other effects, in a tendency to cite nationally (Lukka & Kasanen, 1996) and to vilify work by female authors (Davenport & Snyder, 1995). From this perspective, it matters specifically *who* says something.

Evidence from different disciplines supports both perspectives. Stewart (1983) analyzed the number of citations received by articles published in several journals of geophysics, revealing universalism to be the central underlying principle in the allocation of credit. For astrophysics, Baldi (1998) developed a network-analytic model to assess how the characteristics of both citing and cited papers influence an author's citation patterns, further supporting the universalistic interpretation of citation allocation. An examination of the demography literature by Van Dalen and Henkens (2005) identified three signals as important for receiving citations, namely author reputation, journal reputation, and present rate of citation, finding journal reputation to play a dominant role. Shadish et al. (1995) tested citation behavior in psychology, showing that authors cited someone's work mainly for universalistic reasons, especially when it was perceived as high quality, supported a claim they were making, or used a relevant methodology or theory.

More recently, similar studies have been published in the field of business. Stremersch et al. (2007) studied which factors predicted citation frequency in five major marketing journals, finding that both universalistic (awards as a proxy for quality, article length) and particularistic (editorial board membership, institutional ranking) factors were important predictors of citation frequency in marketing. Presentation factors played only minor roles in citation counts. Judge et al. (2007) looked at the impact of article content (universalism), author characteristics (particularism), and the perceived quality of the journal (mixed predictors) on citation frequency in journals of strategic management, establishing that universalistic and mixed characteristics most influenced citation allocation. At the level of individual variables, they found that journal characteristics, such as impact factor and perceived quality, best predicted high citation counts. Of the particular variables, the prestige of an author's institution significantly predicted citation rates. Mingers and Xu (2010) found similar results for papers published in six well-known journals of operations research. Regarding accounting, only one European journal has been investigated. There, effects on citation rates were documented only for a limited number of variables (Van Campenhout & Van Caneghem, 2010), suggesting that an article's objective contribution is more important than its author's characteristics.

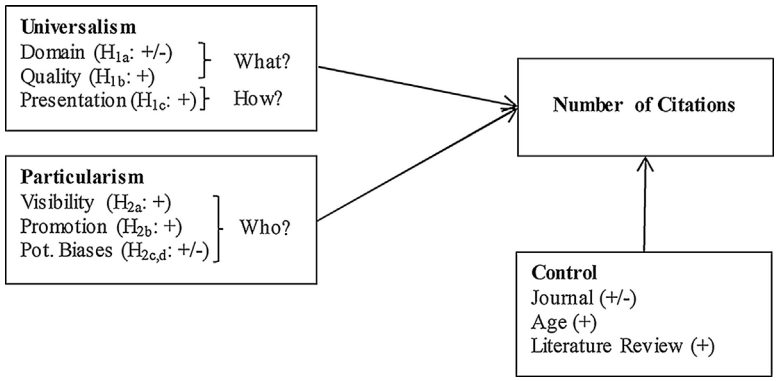

Fig.1. Research framework.

Finally, no studies in finance and economics have explicitly compared the two perspectives. Still, there is evidence about some factors of citation rates. These areas are of particular interest since work published in *JAE* and *JAR* is influenced in large part by these disciplines. Hamermesh (2015) comprehensively studied citations in economics, documenting substantial differences in citations across journals, authors, articles, sub-fields, and institutions. Card and DellaVigna (2013) reported a relative increase in the shortage of space in "top" economic journals since 1970, finding more citations for articles that are longer and have more coauthors. Johnson (1997) showed that publication outlet, the publication-related reputation of an author, number of references in an article, and number of coauthors positively affect citations, while also finding a negative bias towards women. Smart and Waldfogel (1996) used citations to look for discrimination in journals of finance and economics, finding no evidence for gender bias and little evidence concerning bias between fields while documenting that papers with authors from well-reputed institutions receive many more citations. Chung, Cox, and Mitchell, 2001 investigated citation patterns in financial journals over 25 years, finding a strong concentration of a few "top" authors and "elite" journals. They showed that citation rates rise sharply over the first three years after publication and decline gradually afterwards. Haddad, Chan, and Chow, 2014 surveyed authors in "leading" finance journals about the attributes of articles and their authors that might affect their citation decisions, documenting a tendency to base decisions to cite on author-related attributes, such as being highly cited, well known, or a member of the editorial board; these results add evidence for the particularistic perspective. In this vein, a recent study in finance found that editorial board members, on average, are heavily cited (Chan, Chang, & Chang, 2013).

The two competing perspectives described above constitute our basic framework. We substantially extend the set of variables investigated from both perspectives in comparison to Van Campenhout and Van Caneghem (2010). In order to formulate and test hypotheses about the influence of both perspectives on citation behavior, we distinguish among several dimensions for each perspective. In addition, we control for a number of variables that previous research has documented. Fig. 1 provides an overview of the different dimensions and how they relate to the two basic theoretical perspectives. In the following, we introduce several dimensions and their corresponding possible drivers of citations, outlining some arguments concerning their expected effects (see for an overview Table 1).

2.2. Universalistic perspective

According to the universalistic perspective, it matters primarily *what* and *how* something is said. We distinguish three dimensions within this perspective: (1) domain, (2) quality, and (3) presentation.

Regarding the first dimension, domains may differ in terms of subject area (i.e., field of study, such as *financial* or *managerial* accounting) and/or research methods (e.g., *archival* or *analytical*). King (1987) argued that citation rates depend on the field of study and that larger domains typically gain more citations than do smaller domains, as they attract more interest. Still, a narrow field or a general topic can be of large interest. In addition, he documents that the citation counts vary, depending on the number of citations a typical paper has and to what extent the publications are covered by the citation databases. Other characteristics of domains that affect citations include their relevance for other domains (Stewart, 1983), their maturity (MacRoberts & MacRoberts, 1996; Stremersch et al., 2007), and their citation practices (Mingers & Xu, 2010; Van Dalen & Henkens, 2005). Following King (1987), one might expect articles in mainstream areas, such as *financial* accounting, using empirical tests based on large archival data (Bonner et al., 2012; Merchant, 2010) to accumulate more citations than articles addressing non-mainstream areas with less commonly used methods, but other characteristics such as relevance, maturity, and specific citation practices might also point in the other direction.

Concerning the second dimension, quality, one of the most important associated concepts is the *originality* of an article's contribution (Judge et al., 2007). Merton (1957, p. 639) stated that the "institution of science" gives recognition and esteem to those "who have made genuinely original contributions to the common stock of knowledge". Previous studies (Beyer, Chanove, & Fox, 1995; Gottfredson, 1978) have found *originality* to be a good predictor of a publication's perceived quality.

Table 1
Overview of drivers, arguments and effects.

Driver	Underlying Argument	Effect
Universalistic perspective		
Domain		
Subject area*	Financial accounting is most prominent in accounting (Merchant 2010) and larger domains attract more citations (King 1987), but also differences due to relevance, citation practices and maturity (Stremersch et al., 2007)	+/–
Research method*	Archival research is very frequent in accounting (Merchant 2010) and larger domains attract more citations (King 1987), but also differences due to relevance, citation practices and maturity (Stremersch et al., 2007)	+/–
Quality		
Originality*	Science gives recognition to the originality of a contribution (Merton 1957)	+
Award for article*	Reflects quality judgments of a group of scientists (Stremersch et al., 2007)	+
Length	Given scarce journal space article length reflects quality judgments of reviewers and editors (Stremersch et al., 2007)	+
Presentation		
Clarity of structure*	Accessibility of content is increased (Murray 2009)	+
Figures and tables*	Means to promote and support ideas in the text (Judge et al., 2007)	+
Readability*	Readability of text affects degree of use (Flesch 1948)	+
Particularistic perspective		
Visibility and position		
Publication-related reputation (past publication record, author award, editorship)*	Past publications, author awards and editorships are indicators for visibility and position, well-known authors receive disproportionately more citations "Matthew effect" (Merton, 1968) and editors might be cited for strategic considerations (Latour 1987)	+
Institution-related reputation		
Affiliated institution	Institutional "Matthew effect" (Medoff 2006) and social ties (Mingers & Xu 2010)	+
PhD-granting institution*	Social ties and signal of competence (Brown 1996)	+
Promotion		
Number of references	Direct and indirect reciprocity as reasons for citing (Nowak 2006)	+
Number of institutional workshops*	Intensive interchange between the presenting author and an institution's faculty, who have read the paper (Brown 2005)	+
Number of conferences*	Interchange between the presenting author and the conference attendees (Brown 2005)	+
Number of acknowledged individuals*	Authors acknowledge individuals for different reasons, including strategic behavior (Brown 2005)	+
Potential bias		
U.S. system*	U.S. orientation of accounting disadvantages international authors (Lukka & Kasanen 1996)	+
Gender*	Vilification of work by female authors (Davenport & Snyder 1995)	–
Control		
Journal*	Both indicator of a paper's quality and tool of persuasion (Judge et al., 2007; Mingers & Xu 2010)	+/–
Age	Possibilities to cite paper increase	+
Demeaned age square	Possibilities to cite paper increase	+
Literature review*	Summary of previous results as valuable and convenient resource for current research (Mingers & Xu 2010)	+

Notes: The drivers marked with an asterix are new in this study compared with the study of *EAR* by Van Campenhout and Van Caneghem (2010).

According to Newman and Cooper (1993), exploratory studies are likely to receive more citations than studies that merely refine or extend existing knowledge. As a result, we expect studies that are more original to receive more citations.

The quality of an article might also be reflected in peer judgements, such as receiving some "official" recognition by a scientific committee. Awards reflect the quality judgment made by a group of experienced scientists, typically from the same discipline. Awards for a paper were found to be positively related to citation frequency (Stremersch et al., 2007). Hence, we expect an award-winning article to accumulate more citations than papers without awards.

The *length* of an article is another important characteristic. Although at first sight *length* might appear to belong to the presentation dimension of the universalistic view, most comparable studies consider it to be an aspect of quality (Stremersch et al., 2007; Van Campenhout & Van Caneghem, 2010). Given sparse journal space, it is argued, editors and reviewers encourage authors to shorten their papers, with *length* allotted according to the paper's contribution. Given that our sample comprises "top" journals, this issue of scarce publication space seems particularly relevant. In addition, longer articles can present more ideas and findings and present them more convincingly. As a result, other authors can better relate to the presented work, which can also increase citation frequency (Ayres & Vars, 2000; Baldi, 1998; Bornmann & Daniel, 2008; Judge et al., 2007). We therefore assume a paper with a higher page count is of higher quality and thus will receive more citations.

The third dimension representing the universalistic perspective is a paper's quality of presentation. Research must be comprehensible to be useful (Beyer et al., 1995; Judge et al., 2007; Merton, 1968). Good presentation reduces the effort

required to access the information and reuse it in another paper. Based on previous research, we investigate three aspects related to expositional quality that might affect citation probability. First, readers prefer articles that are well structured and include signposts and signals, which are easier to understand (Murray, 2009). Hence, we expect that clearly structured articles will be more frequently cited (Judge et al., 2007; Stremersch et al., 2007). Second, using *figures and tables* can enhance expositional quality and may therefore increase citations (Stremersch et al., 2007). Third, text *readability* is considered to be an important aspect of a paper's quality of presentation (Flesch, 1948; Murray, 2009); we expect that papers that are easier to read will receive more citations than papers that are harder to read (Stremersch et al., 2007).

Overall, these considerations concerning the three universalistic dimensions lead to the following first hypothesis:

HYPOTHESIS 1. *Universal characteristics predict the number of citations an article receives in that (a) belonging to a certain domain can affect the number of citations in either direction and that (b) the quality and (c) the presentation of a paper positively impact the citation rate.*

2.3. Particularistic perspective

From the particularistic perspective, the impact of an article is mainly influenced by *who* its authors are. Following previous research (Stremersch et al., 2007), we address two dimensions: (1) a researcher's visibility and position in the stratified scientific system and (2) his or her personal promotion of the paper. Concerning the first dimension, Merton (1968) described the famous "Matthew effect," which can also be observed for citations: well-known authors receive disproportionately more citations than less-renowned authors.[1] Two aspects shape a researcher's visibility and position in the scientific system. First, there are publication-related factors establishing his or her reputation: (1) his or her record of past publications, (2) awards granted for his or her past scientific achievements, and (3) his or her current and past *editorship* of one of the "top" accounting journals. Previous research has established all three factors as significantly influencing an author's status in the highly stratified system of science (Boyd et al., 2005; Everett, 2008; Merton, 1968; Stremersch et al., 2007; van Dalen & Henkens, 2005). Besides this reasoning related to the "Matthew effect," we assume that editors will be cited more frequently for strategic reasons (Latour, 1987).

Second, the visibility and position of a researcher in the scientific system might be enhanced by institutional factors. Prior research has suggested that the reputation of the institution with which an author is currently affiliated positively influences citation accumulation. Medoff (2006) wrote of a "Matthew effect" related to the prestige of an author's institution. Being affiliated with an "elite" institution offers, besides increased visibility, many other advantages, such as social ties and perceived competence (Cole & Cole, 1967; Crane, 1972), and this has been found to positively affect publication and citation success (Brown, 1996; Judge et al., 2007; Lee, 1995; Mingers & Xu, 2010). A similar line of reasoning can be applied to the institution from which an author received his or her PhD, but, to our knowledge, this factor has been investigated in accounting only with respect to authors of highly influential papers (Brown, 1996). Thus, we expect authors employed by a "prestigious" university as well as graduates of "elite" doctoral programs to receive more citations than their colleagues from less "prestigious" institutions.

The second dimension of the particularistic perspective is promotion, which includes two aspects. First, a common belief is that including references in an article triggers reciprocity (Gilbert, 1977; Stremersch et al., 2007). This component of enhancing promotion can take the form of direct reciprocity, when one scientist returns the favor directly to another scientist, or indirect reciprocity, when an author cites an article because its author has cited somebody else, typically someone belonging to the former author's scientific network (Nowak, 2006). Therefore, we expect that a higher *number of references* attracts a higher number of citations. Second, authors can promote their research in various ways; for example, they might send a paper to a single fellow researcher for commentary or present and discuss a paper with colleagues in more formal formats, such as workshops, seminars, and conferences. Brown (2005) showed that circulating a paper among peers for individual comments, in institutional workshops, and at conferences positively affects both the probability of a manuscript's acceptance for publication and its subsequent citation count.

The particularistic perspective also suggests that an author's country affiliation and gender might affect citation rates (Baldi, 1998; Crane, 1972; Judge et al., 2007; Lee & Williams, 1999). Both biases have been investigated and reported with respect to the peer review process (Lee, Sugimoto, Zhang, & Cronin, 2013). Given the often-claimed strong U.S. focus in the accounting discipline (Lukka & Kasanen, 1996), we expect articles whose authors are not affiliated with the United States via a U.S. PhD program or institution to face a disadvantage (Stremersch et al., 2007). Thus, we include the authors' degree of affiliation with the *U.S. system* in our model as a possible driver of citations. A gender bias, following the feminist critique of science (Harding, 1992), has been demonstrated in some fields of research, with articles authored by female scientists accumulating fewer citations (Baldi, 1998; Davenport & Snyder, 1995). Therefore, we expect papers by male or U.

[1] Merton used this term to denote a general pattern of the allocation of credit for scientific contributions. For him the "Matthew effect consists in the accruing of greater increments of recognition for particular scientific contributions to scientists of considerable repute and the withholding of such recognition from scientists who have not yet made their mark." (Merton, 1968, p. 58). Merton expected an increase in the number of publications to amplify this effect – a development that can be observed.

S.-affiliated authors to be cited more frequently than papers by female or non-U.S.-affiliated authors. These considerations inform our second hypothesis:

HYPOTHESIS 2. *The particularistic characteristics of an author influence the number of citations in that (a) the visibility of authors, (b) their promotion of the article, (c) being closely affiliated with the U.S. system, and (d) being male positively influence citation count.*

2.4. Controls

We control for three additional factors that may drive citation frequency. First, previous research has suggested that the *journal* in which an article is published is a good indicator of a paper's quality as well as being a potential tool for persuasion (Gilbert, 1977). The positive effect of this indicator on citations has been well documented empirically (Judge et al., 2007; Mingers & Xu, 2010); we therefore expect to find this effect in accounting, as well, and control for it. Second, we controlled for the article's *age*, because the time available to cite an article is positively related to the number of citations (Judge et al., 2007; Shadish et al., 1995). Third, there is evidence that literature reviews attract more citations than do other articles (Mingers & Xu, 2010), so we also controlled for whether or not an article is a *literature review*.

3. Measurement of the variables

3.1. Measures

3.1.1. Dependent variable

The dependent variable is the number of citations accrued by an article between January 1998 and December 2015. Though previous studies used only one database, we preferred to use two different measures to reduce potential measurement error. To construct our dependent variable, we retrieved, as a first step, the respective citation counts for each article from the *SSCI* and *Scopus* in February 2016. As a second step, we adjusted the raw count of citations in two ways. First, as the *SSCI* has been recording *CAR* only since 2001 and since *Scopus* omitted one of the *JAR* articles in our sample, we estimated missing data for *CAR* and the *JAR* article based on the citations in the other respective database. Second, since both data sources have increased their journal coverage over time, younger publications collect counted citations from a larger number of journals. To account for this database extension, we calculated a citation growth index for each publication year in our sample based on all articles recorded in the databases for the years 1998 to 2007 and divided articles' citation counts by their respective indices. In a third step, we did a logarithmic transformation to reduce skewness (from 4.74 to −0.35) and kurtosis (from 35.75 to 0.46) in the distribution.

3.1.2. Independent variables: universalistic perspective

Above, we established three dimensions within the universalistic perspective: domain, quality, and the presentation of an article. Regarding domain, subject areas were categorized, following the *Accounting Research Directory (ARD)*,[2] as *financial* accounting, *managerial* accounting, *tax*, *audit*, *information systems*, or *mixed*. The research methods also follow the *ARD* main classifications: *archival*, *analytical*, *empirical*, *opinion survey*, and the residual category *other*.[3] We used dummy variables for both.

The quality of an article is represented by *originality*, award, and *length*.[4] We measured *originality* on a scale from 1 (refinement) to 4 (explorative) based on criteria inspired by Newman and Cooper (1993), as follows. A study was classified as a refinement when the linkage of independent variables and dependent variable was established in previous literature. The next two levels of the scale are minor and major extensions of existing knowledge. A minor extension is defined as pairing an existing dependent variable with a new independent variable, while a major extension requires either the combination of several independent variables that have demonstrated a relationship with the dependent variable in isolation or the introduction of new moderator variables to an existing variable relationship. Finally, the explorative category entails "research plots that explore a fundamental change in part of an existing nomological network" or "import from another field of study a relationship explored at one level of analysis and examine it at a second level" (Newman & Cooper, 1993, p. 520).[5]

To identify whether a paper in the sample received an award, we examined the acknowledgments section of every article, along with the archives of the *American Accounting Association* (*AAA*), *European Accounting Association* (*EAA*), *Canadian*

[2] Vasarhelyi and Berk (1984) created the *ARD* to facilitate research conducted by academics and practitioners in accounting. This directory taxonomically categorizes major articles published since 1963. Over the years, both its content and its scope have evolved to now encompass 12 scholarly accounting journals. Many research papers, such as Brown, Gardner, and Vasarhelyi (1987), Vasarhelyi, Bao, and Berk (1988), Bricker (1989), and Brown (1996), have referred to it.

[3] The *ARD*'s scheme for classifying research methods shows three particular characteristics: (1) *analytical* includes also computer-based simulations and individual opinions like the early *a-priori*-papers, (2) *empirical* includes case, field, and experimental studies, and (3) *archival* covers also literature reviews.

[4] Contrary to earlier studies (e.g., Van Campenhout and Van Caneghem (2010)), position in the journal was not included as a variable. At least for some of the investigated journals, it is debatable whether articles are positioned in an issue according to their perceived impact or quality.

[5] This measure is inspired by a positivistic approach, which underlies the majority of the investigated articles. The application of this measure to articles from a different origin, such as interpretative or critical studies, required a transfer of its criteria to the new context. For example, if an article addressed a new topic, we classified it as explorative.

Academic Accounting Association (*CAAA*), and *Accounting and Finance Association of Australia and New Zealand* (*AFAANZ*). Receiving an award was coded as 1; otherwise, the dummy variable was coded as 0 (Stremersch et al., 2007). Article *length* is the third variable potentially indicating quality, measured, to account for the relative scarcity of journal space, as the square root of the ratio of the page count of an article to the total number of pages devoted to articles published in that respective journal in the same year (Judge et al., 2007; Mingers & Xu, 2010; Van Campenhout & Van Caneghem, 2010).[6]

Article presentation was captured by the variables *clarity of structure*, *number of figures and tables*, and *readability*.[7] First, following Judge et al. (2007), the clarity of a paper's basic presentation was measured on a scale from 1 (poor structure) to 4 (clear and comprehensive structure). Setting this score required the evaluation of five criteria, as follows: (1) does the paper overall have a comprehensive structure?; (2) does it contain a description of its structure that "leads" a reader through its text?; (3) are the single paragraphs well structured?; (4) do the authors follow the "one point, one paragraph" rule?; and, finally, (5) does the text contain many "signal" words (e.g., "first," "second," "however," "thus," "therefore"). These criteria were evaluated individually on a scale of 1–3, before an overall judgment was made for the paper. Second, the extensive use of figures and tables can enhance an article's presentation, and we measured this as a simple count of the *figures* and *tables* in an article (Stremersch et al., 2007; Van Campenhout & Van Caneghem, 2010). The third variable, *readability*, was quantified using the Flesch reading ease formula (Stremersch et al., 2007), which evaluates the reading ease of a text in contemporary English language based on word and sentence length (Flesch, 1948). The Flesch reading ease score is scaled from 0 (hard to read) to 100 (easy to read).

3.1.3. Independent variables: particularistic perspective

In evaluating the author-specific factors of the articles, we could not follow other studies in the fields of business or management and focus only on the characteristics of the first author (Leimu & Koricheva, 2005; Mingers & Xu, 2010). Such an approach seems inappropriate for accounting, because, especially in the U.S. context, authors' names typically appear in alphabetical order.[8] Therefore, we derived an article's author-specific measures from the characteristics of all its authors, combined as described below for each variable.

We assessed five variables to test whether authors' visibility and position in the stratified system of science predict citation frequency, measured as follows. First, researchers' past records of publication were measured by the number of papers previously published in one of the five journals included in our study (Mingers & Xu, 2010; Stremersch et al., 2007). Each paper was assigned the past publication record of its most prolific coauthor. Second, if any researcher received a major award, this was coded as 1 (otherwise 0). Third, if any author was or is an editor or an editor-in-chief of one of the five "top" journals included in the study, this was coded as 1 (otherwise, that includes being acknowledged as an associate editor or an editorial board member, 0) (Stremersch et al., 2007; Van Campenhout & Van Caneghem, 2010).[9]

On a conceptual level, these different variables reflect the publication-related visibility and position of an author in the scientific system, as both awards and editorships relate to the high-quality and -quantity of past publications. This reasoning is supported statistically. We conducted a principal-component analysis with all the independent variables, in which all three variables loaded appropriately and were significant ($p < 0.01$). The indicator reliabilities for all scales were greater than 0.75, and factor reliability with 0.81 as well as Cronbach's alpha at 0.65 were acceptable. An average variance extracted of 0.58 supported the applicability of the factor. Finally, the factor is distinctly defined, as we found no cross-loadings. We consider the statistical support as being strong, as the three indicators are not part of a psychometric instrument, but occur naturally. Based on these conceptual and statistical considerations we combined the three publication-related variables into a single factor measuring *publication-related reputation*.

Fourth, the reputation of the institutions with which the authors are affiliated was documented based on a ranking (Judge et al., 2007; Mingers & Xu, 2010; Van Campenhout & Van Caneghem, 2010), the *Academic Ranking of World Universities* (*ARWU*) (ShanghaiRanking Consultancy, 2016), which is international and comprehensive (Leimu & Koricheva, 2005), covering the 600 most "prestigious" universities worldwide. When institutions were not included in the *ARWU* ranking, we estimated their *ARWU* rank based on their position in the *Financial Times Global MBA Ranking* or the *Times Higher Education World University Rankings*. If no rank could be found, we coded the institution's rank as 601. In the end, we assigned the article the rank of the highest-regarded institution of any coauthor of the article, inverting the rank so that the highest-ranked institution had the highest score. Fifth, the coding of the reputation of *PhD-granting institutions* drew on the results of the study by Brown (1996), who identified the 25 most "prestigious" PhD programs in accounting. Values were assigned according to their ranks (Baldi, 1998); unranked departments were coded with 26. Each article was assigned the inverted rank of the best-regarded PhD program completed by any of its coauthors.

[6] Previous studies have taken the raw number of pages without correcting for differences in the scarcity of journal space. We also tested the model with raw numbers; qualitatively, the results remained the same.

[7] Depending on the subject area and the research method as well as the "established norms" with regard to presenting the research and its findings, these measures may induce a bias in favor of data-driven research. In our regression we control for this potential bias by using fixed-effect models on the subject area and the research method.

[8] In our sample, 78.2% of multi-authored articles used alphabetical order (*AOS*: 63.9%, *TAR*: 85.6%).

[9] We rely on the journals' use of these two terms. The usage of these terms has changed over time (Endenich & Trapp, 2018). For some of our journals, we can see an increase in the number of editors over time. As we use a factor based on three variables and given the factor's reported statistical properties, this increase should not strongly affect the results of our model. We also conducted sensitivity analyses with different specifications of the variable editorship and the other variables in this factor, which led to overall similar statistical properties.

Promotion by an article's authors was measured by four components, as follows. The *number of references* is a simple count of the number of references listed in each article's bibliography (Judge et al., 2007; Stremersch et al., 2007). Extending previous research that used a simple count of the number of authors (Baldi, 1998; Stremersch et al., 2007; Van Campenhout & Van Caneghem, 2010), we followed (Brown, 2005) and measured promotion through the variables *number of institutional workshops*, *number of conferences*, and *number of acknowledged individuals*. For each variable, we used a simple count taken from each paper's acknowledgments section.

Finally, the variables examining potential biases were coded as follows. To establish an article's affiliation with the *U.S. system*, we calculated the fraction of authors who received a PhD from U.S. universities and the percentage of authors who were affiliated professionally with U.S. institutions. We consider these two aspects to be interdependent, so we multiplied them to obtain the coded variable. *Gender* was coded as the percentage of female scientists among all the authors of an article.

3.1.4. Control variables

In addition to the universalistic and particularistic predictors, we controlled for additional factors that could affect citations. First, we used a fixed-effects model to control for differences in journal quality. We chose *CAR* as the reference as it has the lowest mean citations, allowing for easier interpretation. Second, time dependence in citations was handled by a linear *age* term, representing the number of years passed since each article was published, along with a quadratic, demeaned age term.[10] *Literature reviews* were coded as 1, while all other types of articles were coded 0 (Judge et al., 2007; Mingers & Xu, 2010).

3.2. Classification of articles

We coded all variables, most of which rely on hard criteria, with the required information explicitly stated in the reviewed articles. Although the process for hard criteria was straightforward, following the recommendations of Cooper (2009), we ensured this was done correctly by rechecking.

Only two classifications were subjective to some extent: *originality* of idea and *clarity of structure*. To overcome the drawbacks associated with self-classified items, we implemented a multi-step process to minimize inter-rater bias (Cooper, 2009). We drew on the existing literature to define the classification criteria, on the basis of which two authors independently coded the first 25 articles before discussing the results to achieve consensus. Where consensus was not reached, a third author was consulted as part of a process to adjust and refine the classification criteria. We then categorized another 25 articles, and the inter-rater reliability for these 50 articles was measured by Cohen's kappa, which yielded sufficiently high values (0.85 for the *originality* of the idea, 0.72 for *clarity of structure*).[11] The remaining articles were classified based on the developed classification criteria.

4. Sample and descriptive statistics

4.1. Sample

We examined a random set of articles appearing in five accounting journals, *AOS, CAR, JAE, JAR*, and *TAR*, previously found to be consistently perceived as the "leading" international journals of accounting research (Ballas & Theoharakis, 2003; Bonner et al., 2006; Reinstein & Calderon, 2006). This sample comprises journals edited in the United States (*JAE*, *JAR*, *TAR*), Canada (*CAR*), and Europe (*AOS*) as well as different research orientations. To derive our random sample of 500 articles, we downloaded from the *SSCI* and *Scopus* all material published in these journals between 1998 and 2007, eliminating any material that was not qualified as an "article," "proceedings paper," or "review." We then assigned a random number from a uniform distribution, selecting the 500 articles with the lowest number for our sample. In this way, we included 33% of all relevant papers in our sample. To evaluate the correspondence between our sample and the larger population, we looked at descriptive statistics, frequency charts, and one-sample Wilcoxon signed rank tests. Median citations were on the same level (SSCI: Mdn = 27, $p < 0.947$; Scopus: Mdn = 41,$p < 0.702$).[12] We chose a sample from the period between 1998 and 2007 for two reasons: first, articles from this period have had enough time to gain appreciation by the community and incorporation in subsequent research, and second, they are said to have accumulated most of their citations and could have become the common stock of disciplinary knowledge (Merton, 1968). Table 2 presents the resulting number of articles per journal and database.

[10] Demeaning (centering) the quadratic age term solves the problem of collinearity between the two age terms in regression models using both of them (Aiken, West, & Reno, 1991). *Demeaned age square* was calculated as the square of the difference between the article's age and the average age of all articles.

[11] Generally, a value of kappa > 0.70 is seen as an acceptable measure for inter-rater reliability. Landis and Koch (1977) considered a kappa value between 0.61 and 0.80 to be substantial, with measures above 0.81 almost perfect agreement.

[12] Still, given the skewed distribution of citation counts, random samples may miss some of the absolutely top-cited papers, thus affecting the mean and the standard deviation of the sample and, to a lesser extent, other measures, such as the median or the fraction of articles with zero cites.

Table 2
Citation statistics per journal and database.

Database	Journal	N	Minimum	Maximum	Zero cites (%)	Mean	Median	Std. deviation
Scopus	AOS	104	1	324	0.00%	62.87	43	63.09
	CAR	87	0	719	2.30%	38.07	19	80.03
	JAE	89	0	1056	1.12%	104.33	48	152.28
	JAR	99	2	308	0.00%	58.83	38	63.11
	TAR	120	3	383	0.00%	61.91	45	63.24
SSCI	AOS	104	1	214	0.00%	35.80	23	37.44
	CAR	59	0	71	3.39%	19.37	16	16.62
	JAE	89	0	662	1.12%	68.16	29	100.04
	JAR	100	0	213	2.00%	39.35	24	43.21
	TAR	120	1	272	0.00%	41.33	32	41.37

Notes:
N indicates the number of articles. Zero cites (%) shows the fraction of the articles that received no citations.
Minimum, maximum, mean, median, and std. deviation refer to citations.
Differences in N between the SSCI and Scopus are due to missing records.
The SSCI indexes CAR since 2001 and Scopus misses one of the sample's publications in JAR 1999.

4.2. Descriptive statistics

4.2.1. Dependent variable

Table 2 also provides information about the citation statistics for each journal and for both databases. The table indicates that the number of citations greatly varies in the five "top" accounting journals investigated here. While some articles have no citations at all, few accumulate them in large numbers. Inspecting the average number of citations per article for each journal reveals how citation rates differ by journal. Though *Scopus* consistently records more citations on average than does the *SSCI*, rankings of these five journals in terms of average number of citations are, with the notable exception of *AOS*, consistent between the data sources.

Fig. 2 shows how articles, on average, pick up citations over time, with each line representing the articles published in a given year. Their slopes show three trends. First, the average citation count is increasing year-over-year. Second, on the whole, younger papers seem to pick up citations at a higher rate than older ones. Third, average citation count grew especially fast in 2014 and 2015. The second and third observations reflect the extensions of the two databases since 1998. The historical development of the Thomson Reuters' five-year journal impact factors as well as additional analysis of our data revealed that *AOS* especially profits from this increase in coverage.

4.2.2. Independent variables

Table 3 presents the descriptive statistics for the independent variables. The descriptive statistics of the control variables show that the average article in the sample has had 12.50 years to generate citations. Only 2% of all articles are *literature reviews*. Concerning the variables for the universalistic perspective, articles in the sample are distributed across domains as follows. For subject area, a plurality (49%) of the articles address issues in *financial* accounting, followed by *managerial* accounting (21%) and *audit* (18%). Just above half use *archival* studies as their research method, followed by studies using an *empirical* (23%) or an *analytical* approach (21%). The average paper represents a minor extension of previous research (*originality* = 1.99 of 4.00). One percent of all articles in the sample received an award, and the average paper occupies 3% (the square of the reported *length*) of a journal's yearly space. The average paper is clearly structured (*clarity of structure* = 2.83 of 4.00), has a bit more than five *figures* and *tables*, and is hard to read (*readability* = 33.63 of 100.00).

Particularistic variables have the following characteristics. *Publication-related reputation* varies around a mean of 0, with *JAE* having on average authors with the highest reputation (0.17), while *AOS* has the lowest values for this measure (-0.29). On average, the "most prestigious" of all institutions with which papers' authors are affiliated ranks at position 58 (of 601), and the best-regarded of all PhD programs completed by the average paper's authors ranks at position 16 (of 26) (1 divided by the reported *affiliated institution* resp. *PhD-granting institution*). The papers have 43.8 references and acknowledge 3.40 institutional workshops, 1.06 conferences, and 7.36 individual scientists on average. Most authors have a strong affiliation with the *U.S. system*. An additional examination of the data shows that 81% of the 1,054 authorships in the sample have a PhD from a U.S. institution and that 74% of named affiliations are to an American institution. Twenty-four percent of all authors are female.

Table 3 shows that article and author characteristics differ across journals. For some independent variables, these variations are considerable. *JAE* and *JAR* strongly focus on *financial* accounting, whereas the subject areas in *TAR*, *CAR*, and especially *AOS* are more balanced. The studies published in *AOS* and, to a lesser degree, in *CAR* apply various research methods more evenly than do the studies published in *JAE* and *TAR*. On average, the authors of articles in *JAE* have finished much more "prestigious" PhD programs than those published in the other journals.

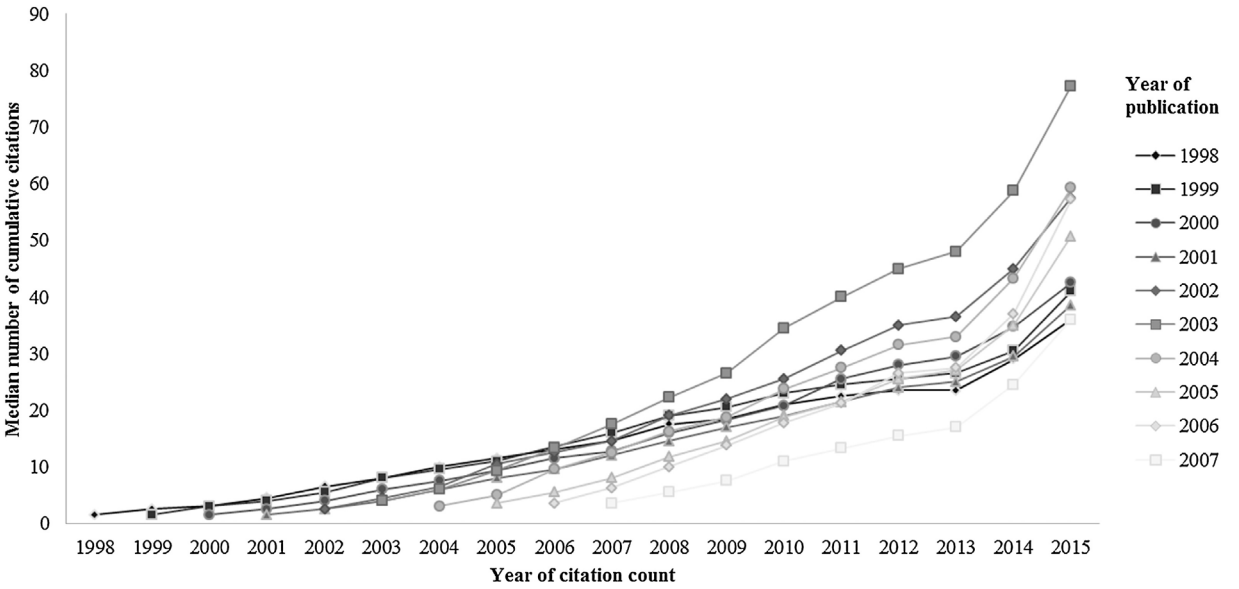

Fig. 2. Median number of cumulative citations over time.

5. Analysis

5.1. Model

We use a linear regression, adopting a three-step approach with fixed-effects models. Model 1 isolates and assesses the impact of the controls on the number of citations. In Model 2, the universalistic variables are added to test this perspective on citations. Changes in explanatory power indicate support for Hypothesis 1 (H_1). Model 3 tests the entire model, including the particularistic variables. Analyzing the impact of these additional variables on explanatory power offers insight into Hypothesis 2 (H_2). Multicollinearity diagnostics (Belsley, Kuh, & Welsch, 1980) show no issues with the model concerning eigenvalues or variance inflation factors, so it appears that multicollinearity does not affect the coefficient estimates. The correlation matrix is provided in Table 4.

5.2. Hypothesis testing

Table 5 reports the results of the regression analysis.

Model 1 tests the relationship between the number of received citations and the control variables (journal, *age* of an article, and *literature review*). As Table 5 indicates, the explanatory power of this model is 15%; all three factors strongly and significantly influence the number of citations. Compared with *CAR*, the coefficients of all journals are positive and highly significant. Article's linear *age* also has a strong and significant influence on the number of citations. While these two effects hold for all three models, the strong and significant effect on the citations of an article being a *literature review* holds only for the first two models.[13]

Model 2 includes the universalistic predictors to test the effect of this theoretical perspective on citation rates (H_{1a}; H_{1b}; H_{1c}; Table 5). Adding this variable set increased the model's explanatory power by 19 percentage points, a significant impact ($p < 0.01$). In the domain dimension (H_{1a}), all but two variables are significant and positively related to citation frequency. Regarding subject area, only *information systems* did not significantly differ from the reference subject area, *tax*. Concerning the research method, for which we took *analytical* as the reference, only the residual category *other* did not turn out to be significant. These effects also hold in the third model, albeit with slightly smaller coefficients (and a reduced level of significance for the *empirical* research method). Examining the quality dimension (H_{1b}) shows that only *length* significantly drove citation frequency, while for an article's presentation (H_{1c}), no variable showed a strong or significant impact.

Model 3 includes the particularistic predictors to test the hypothesis of whether article citation rates are driven by researchers' visibility and position in the sciences, promotion of the article, or potential biases (H_{2a}; H_{2b}; H_{2c}; H_{2d}; Table 5).

[13] We suspect that the *literature review* variable is not significant in the last model because our sample has only nine literature reviews (seven in *AOS*, two in *JAE*) and because the variable strongly correlates with the variable *number of references*, introduced in the last model. This is supported by the observation that excluding the variable *number of references* from the last model identifies a strong and significant effect of the *literature review* variable. Excluding the *literature review* variable, meanwhile, reduces R^2, but the *number of references* remains significant.

Table 3
Descriptive statistics of the independent variables.

Drivers	**Mean**	AOS	CAR	JAE	JAR	TAR	**S. D.**	AOS	CAR	JAE	JAR	TAR	**Min**	AOS	CAR	JAE	JAR	TAR
Control variables																		
Age	**12.50**	12.91	12.30	12.94	12.82	11.71	**2.82**	2.65	3.02	2.94	2.67	2.67	**8.00**	8.00	8.00	8.00	8.00	8.00
Demeaned age square	**7.97**	7.21	9.17	8.81	7.25	7.76	**7.12**	6.43	7.36	7.05	7.37	7.18	**0.25**	0.25	0.25	0.25	0.25	0.25
Literature review	**0.02**	0.07	0.00	0.02	0.00	0.00	**0.13**	0.25	0.00	0.15	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00
Universalistic perspective																		
Domain																		
Subject area																		
Financial	**0.49**	0.20	0.40	0.70	0.64	0.51	**0.50**	0.40	0.49	0.46	0.48	0.50	**0.00**	0.00	0.00	0.00	0.00	0.00
Managerial	**0.21**	0.39	0.18	0.12	0.14	0.21	**0.41**	0.49	0.39	0.33	0.35	0.41	**0.00**	0.00	0.00	0.00	0.00	0.00
Tax	**0.06**	0.03	0.06	0.06	0.04	0.09	**0.23**	0.17	0.23	0.23	0.20	0.29	**0.00**	0.00	0.00	0.00	0.00	0.00
Audit	**0.18**	0.17	0.31	0.10	0.15	0.16	**0.38**	0.38	0.46	0.30	0.36	0.37	**0.00**	0.00	0.00	0.00	0.00	0.00
Information systems	**0.01**	0.04	0.01	0.00	0.01	0.00	**0.11**	0.19	0.11	0.00	0.10	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00
Mixed	**0.06**	0.16	0.03	0.02	0.02	0.03	**0.23**	0.37	0.18	0.15	0.14	0.18	**0.00**	0.00	0.00	0.00	0.00	0.00
Research method																		
Archival	**0.52**	0.15	0.55	0.74	0.55	0.62	**0.50**	0.36	0.50	0.44	0.50	0.49	**0.00**	0.00	0.00	0.00	0.00	0.00
Analytical	**0.21**	0.20	0.21	0.21	0.31	0.12	**0.40**	0.40	0.41	0.41	0.46	0.32	**0.00**	0.00	0.00	0.00	0.00	0.00
Empirical	**0.23**	0.49	0.23	0.02	0.13	0.23	**0.42**	0.50	0.42	0.15	0.34	0.42	**0.00**	0.00	0.00	0.00	0.00	0.00
Opinion survey	**0.04**	0.13	0.01	0.01	0.01	0.04	**0.21**	0.34	0.11	0.11	0.10	0.20	**0.00**	0.00	0.00	0.00	0.00	0.00
Other	**0.01**	0.02	0.00	0.01	0.00	0.00	**0.08**	0.14	0.00	0.11	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00
Quality																		
Originality	**1.99**	2.02	1.90	1.84	2.01	2.14	**0.92**	0.89	0.90	0.92	0.99	0.89	**1.00**	1.00	1.00	1.00	1.00	1.00
Award for article	**0.01**	0.00	0.00	0.00	0.02	0.03	**0.11**	0.00	0.00	0.00	0.14	0.18	**0.00**	0.00	0.00	0.00	0.00	0.00
Length	**0.17**	0.17	0.19	0.18	0.17	0.16	**0.04**	0.03	0.04	0.05	0.03	0.03	**0.07**	0.09	0.08	0.07	0.10	0.09
Presentation																		
Clarity of structure	**2.83**	2.71	2.87	2.81	2.68	3.03	**0.76**	0.79	0.78	0.75	0.71	0.69	**1.00**	1.00	1.00	1.00	1.00	1.00
Figures and tables	**5.39**	5.67	5.29	5.47	4.99	5.49	**3.12**	3.50	3.10	2.66	3.72	2.45	**0.00**	0.00	0.00	0.00	0.00	0.00
Readability	**33.63**	30.00	35.37	29.07	39.47	34.02	**10.68**	11.60	10.03	11.30	10.07	7.02	**0.00**	0.00	16.82	0.00	25.17	18.37
Particularistic perspective																		
Visibility																		
Publication-related reputation*	**0.00**	−0.29	−0.10	0.17	0.13	0.09	**0.81**	0.73	0.71	0.87	0.79	0.86	**−0.82**	−0.82	−0.82	−0.82	−0.82	−0.82
Institution-related reputation																		
Affiliated institution	**0.06**	0.03	0.03	0.10	0.09	0.07	**0.15**	0.08	0.03	0.19	0.19	0.15	**0.00**	0.00	0.00	0.00	0.00	0.00
PhD-granting institution	**0.17**	0.06	0.13	0.34	0.19	0.14	**0.24**	0.07	0.18	0.36	0.25	0.20	**0.04**	0.04	0.04	0.04	0.04	0.04
Promotion																		
Number of references	**43.80**	70.54	34.15	38.55	30.82	42.33	**28.17**	37.95	14.88	26.57	15.86	17.70	**0.00**	11.00	6.00	3.00	5.00	0.00
Number of institutional workshops	**3.40**	1.04	2.70	3.49	4.30	5.12	**3.58**	1.86	2.34	3.39	3.35	4.44	**0.00**	0.00	0.00	0.00	0.00	0.00
Number of conferences	**1.06**	0.69	1.39	1.30	1.02	0.98	**1.49**	1.09	1.95	1.81	1.41	1.04	**0.00**	0.00	0.00	0.00	0.00	0.00
Number of acknowledged individuals	**7.36**	4.09	7.01	8.25	8.29	9.00	**5.78**	3.80	5.22	6.23	5.48	6.31	**0.00**	0.00	0.00	0.00	0.00	0.00
Potential bias																		
U.S. system	**0.68**	0.28	0.69	0.82	0.78	0.84	**0.43**	0.42	0.42	0.34	0.35	0.32	**0.00**	0.00	0.00	0.00	0.00	0.00
Gender	**0.24**	0.23	0.18	0.23	0.19	0.35	**0.34**	0.37	0.28	0.29	0.28	0.40	**0.00**	0.00	0.00	0.00	0.00	0.00

Table 3 (*continued*)

Drivers	**Med**	AOS	CAR	JAE	JAR	TAR	**Max**	AOS	CAR	JAE	JAR	TAR
Control variables												
Age	**12.50**	13.50	12.00	13.00	13.00	11.00	**17.00**	17.00	17.00	17.00	17.00	17.00
Demeaned age square	**6.23**	6.23	6.27	6.27	2.26	6.23	**20.29**	20.29	20.29	20.29	20.29	20.29
Literature review	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	0.00	1.00	0.00	0.00
Universalistic perspective												
Domain												
Subject area												
Financial	**0.00**	0.00	0.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Managerial	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Tax	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Audit	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Information systems	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	1.00	0.00	1.00	0.00
Mixed	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Research method												
Archival	**1.00**	0.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Analytical	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Empirical	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Opinion survey	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Other	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	1.00	0.00	1.00	0.00	0.00
Quality												
Originality	**2.00**	2.00	2.00	2.00	2.00	2.00	**4.00**	4.00	4.00	4.00	4.00	4.00
Award for article	**0.00**	0.00	0.00	0.00	0.00	0.00	**1.00**	0.00	0.00	0.00	1.00	1.00
Length	**0.17**	0.17	0.18	0.17	0.17	0.16	**0.31**	0.24	0.27	0.31	0.24	0.26
Presentation												
Clarity of structure	**3.00**	3.00	3.00	3.00	3.00	3.00	**4.00**	4.00	4.00	4.00	4.00	4.00
Figures and tables	**5.00**	6.00	5.00	5.00	5.00	5.00	**18.00**	14.00	15.00	14.00	18.00	12.00
Readability	**33.68**	32.57	34.93	30.37	36.73	33.25	**86.83**	51.30	86.83	59.14	66.01	57.44
Particularistic perspective												
Visibility												
Publication-related reputation*	**−0.22**	−0.65	−0.30	−0.02	0.04	−0.07	**2.93**	2.24	1.81	2.67	2.24	2.93
Institution-related reputation												
Affiliated institution	**0.02**	0.01	0.01	0.03	0.03	0.02	**1.00**	0.50	0.13	1.00	1.00	1.00
PhD-granting institution	**0.06**	0.04	0.07	0.20	0.10	0.06	**1.00**	0.50	1.00	1.00	1.00	1.00
Promotion												
Number of references	**38.00**	67.00	33.00	32.00	29.00	40.00	**264.00**	264.00	71.00	149.00	80.00	100.00
Number of institutional workshops	**2.50**	0.00	2.00	2.00	4.00	4.00	**21.00**	12.00	8.00	11.00	15.00	21.00
Number of conferences	**1.00**	0.00	1.00	1.00	0.00	1.00	**12.00**	5.00	12.00	8.00	8.00	5.00
Number of acknowledged individuals	**7.00**	4.00	6.00	7.00	8.00	8.00	**30.00**	22.00	22.00	29.00	23.00	30.00
Potential bias												
U.S. system	**1.00**	0.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Gender	**0.00**	0.00	0.00	0.00	0.00	0.25	**1.00**	1.00	1.00	1.00	1.00	1.00

Notes: *Factor score

Table 4
Correlations.

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1.	Citations	–																
2.	AOS	0.04	–															
3.	CAR	−0.22	−0.24	–														
4.	JAE	0.14	−0.24	−0.21	–													
5.	JAR	−0.01	−0.26	−0.23	−0.23	–												
6.	TAR	0.03	−0.29	−0.26	−0.26	−0.28	–											
7.	Age	0.27	0.07	−0.03	0.07	0.06	−0.16	–										
8.	Demeaned age square	0.02	−0.06	0.08	0.05	−0.05	−0.02	−0.03	–									
9.	Literature review	0.17	0.19	−0.06	0.02	−0.07	−0.08	0.01	−0.09	–								
10.	Financial	0.05	−0.29	−0.08	0.20	0.15	0.03	0.02	−0.04	−0.07	–							
11.	Managerial	−0.01	0.23	−0.03	−0.10	−0.09	−0.01	−0.07	0.00	0.04	−0.51	–						
12.	Audit	0.03	0.00	0.16	−0.09	−0.03	−0.03	0.08	0.01	−0.02	−0.45	−0.24	–					
13.	Tax	−0.14	−0.06	0.00	0.00	−0.03	0.09	0.04	0.03	−0.03	−0.24	−0.13	−0.11	–				
14.	Information systems	−0.02	0.12	0.00	−0.05	−0.01	−0.06	−0.01	0.07	−0.01	−0.11	−0.06	−0.05	−0.03	–			
15.	Mixed	0.02	0.24	−0.04	−0.07	−0.08	−0.06	−0.10	0.01	0.16	−0.24	−0.13	−0.11	−0.06	−0.03	–		
16.	Archival	0.19	−0.37	0.03	0.21	0.03	0.11	−0.06	−0.01	0.01	0.35	−0.25	−0.16	0.08	−0.11	−0.08	–	
17.	Analytical	−0.24	−0.01	0.00	0.01	0.13	−0.12	0.11	0.04	0.08	0.02	0.05	−0.07	−0.04	−0.01	0.03	−0.53	–
18.	Empirical	−0.03	0.32	0.00	−0.23	−0.11	0.00	−0.02	−0.02	−0.07	−0.35	0.15	0.28	−0.05	0.07	0.06	−0.56	−0.28
19.	Opinion survey	0.09	0.23	−0.07	−0.07	−0.08	−0.01	−0.04	0.01	−0.03	−0.17	0.22	−0.02	−0.01	0.07	−0.01	−0.22	−0.11
20.	Other	0.02	0.09	−0.04	0.03	−0.04	−0.04	0.01	−0.03	−0.01	−0.02	−0.04	−0.04	−0.02	0.23	0.09	−0.08	−0.04
21.	Originality	0.08	0.01	−0.05	−0.08	0.01	0.09	0.03	0.05	−0.10	−0.08	0.08	0.00	0.06	0.10	−0.07	−0.08	−0.10
22.	Award for article	0.07	−0.06	−0.05	−0.05	0.04	0.11	−0.05	0.01	−0.01	0.08	−0.01	−0.05	−0.03	−0.01	−0.03	0.11	−0.06
23.	Length	0.33	−0.04	0.15	0.10	−0.04	−0.15	0.22	0.08	0.12	0.06	−0.02	−0.06	−0.01	−0.01	0.01	0.15	−0.07
24.	Clarity of structure	0.13	−0.08	0.03	−0.01	−0.10	0.15	−0.01	0.01	0.03	−0.05	0.08	−0.01	0.01	0.03	−0.04	0.03	−0.19
25.	Number of figures and tables	0.19	0.05	−0.02	0.01	−0.06	0.02	−0.11	−0.04	−0.05	0.02	−0.02	−0.03	−0.01	0.10	0.01	0.32	−0.38
26.	Readability	−0.09	−0.17	0.07	−0.20	0.27	0.02	0.17	0.16	−0.06	0.10	−0.08	−0.03	0.03	0.00	−0.05	0.03	0.23
27.	Publication-related reputation	0.10	−0.18	−0.05	0.09	0.08	0.06	−0.13	−0.02	0.10	0.11	−0.01	−0.08	−0.05	−0.04	−0.03	0.04	−0.01
28.	Affiliated institution	0.14	−0.13	−0.12	0.10	0.09	0.04	−0.02	−0.06	0.06	0.15	0.00	−0.14	−0.04	−0.04	−0.03	0.02	0.11
29.	PhD-granting institution	0.04	−0.23	−0.07	0.32	0.05	−0.06	0.08	−0.04	0.02	0.23	−0.03	−0.15	−0.08	−0.04	−0.09	0.11	0.09
30.	Number of references	0.26	0.49	−0.16	−0.09	−0.23	−0.03	−0.18	−0.07	0.42	−0.13	0.13	−0.09	−0.07	0.07	0.24	−0.09	−0.14
31.	Number of institutional workshops	0.14	−0.34	−0.09	0.01	0.13	0.27	−0.11	−0.06	−0.09	0.12	0.00	−0.08	0.02	−0.02	−0.14	0.18	−0.16
32.	Number of conferences	0.13	−0.13	0.10	0.08	−0.01	−0.03	−0.10	0.05	−0.02	0.01	0.02	0.02	−0.02	0.00	−0.06	0.10	−0.10
33.	Number of acknowledged individuals	0.13	−0.29	−0.03	0.07	0.08	0.16	−0.08	−0.02	−0.06	0.05	−0.03	0.02	0.09	−0.08	−0.15	0.15	−0.11
34.	U.S. system	−0.07	−0.48	0.00	0.15	0.12	0.21	0.02	0.00	−0.11	0.25	−0.17	−0.10	0.10	0.00	−0.17	0.22	−0.01
35.	Gender	0.02	−0.02	−0.08	−0.02	−0.08	0.18	−0.06	−0.03	0.01	0.01	0.01	−0.07	0.04	−0.01	0.04	0.03	−0.14

Notes: $N = 500$. Absolute values greater than 0.088 are significant at the 5 percent level and absolute values greater than 0.116 are significant at the 1 percent level (two-sided tests).

Table 5
Step-wise regression of citation counts on control, universalistic and particularistic variables.

		Model 1		Model 2		Model 3	
Driver	Exp. sign	Coefficient	Std. error	Coefficient	Std. error	Coefficient	Std. error
Control variables							
Journal							
AOS	+/–	0.17***	0.07	0.20***	0.07	0.12*	0.08
JAE	+/–	0.26***	0.07	0.26***	0.07	0.23***	0.07
JAR	+/–	0.17***	0.07	0.25***	0.07	0.20***	0.07
TAR	+/–	0.25***	0.07	0.29***	0.06	0.23***	0.07
Age	+	0.27***	0.01	0.27***	0.01	0.36***	0.01
Demeaned age square	+	0.05	0.00	0.05	0.00	0.07*	0.00
Literature review	+	0.16***	0.17	0.14***	0.16	0.06	0.17
Universalistic perspective							
Domain							
Subject area							
Financial	+/–			0.32***	0.09	0.29***	0.09
Managerial	+/–			0.28***	0.10	0.25***	0.09
Audit	+/–			0.31***	0.10	0.30***	0.09
Information systems	+/–			0.05	0.21	0.05	0.20
Mixed	+/–			0.18***	0.12	0.16***	0.12
Research method							
Archival	+/–			0.29***	0.06	0.27***	0.06
Empirical	+/–			0.17***	0.07	0.12**	0.07
Opinion survey	+/–			0.17***	0.12	0.13***	0.11
Other	+/–			0.06	0.27	0.05	0.26
Quality							
Originality	+			0.02	0.02	0.01	0.02
Award for paper	+			0.03	0.18	0.01	0.18
Length	+			0.25***	0.61	0.15***	0.64
Presentation							
Clarity of structure	+			0.05	0.01	0.05	0.01
Number of figures and tables	+			0.05	0.03	0.03	0.03
Readability	+			−0.06	0.00	−0.05	0.00
Particularistic perspective							
Visibility and position							
Publication-related reputation	+					0.11***	0.03
Institution-related reputation							
Affiliated institution	+					0.10***	0.14
PhD-granting institution	+					−0.05	0.09
Promotion							
Number of references	+					0.21***	0.00
Number of institutional workshops	+					0.09**	0.01
Number of conferences	+					0.07*	0.01
Number of acknowledged individuals	+					0.05	0.00
Potential bias							
U.S. system	+					−0.09**	0.05
Gender	–					0.00	0.06
R-square		0.15		0.34		0.41	
R-square change				0.19***		0.07***	

Notes:
Coefficients are beta standardized.
N = 500. * p < 0.1. ** p < 0.05. *** p < 0.01 (two-sided tests).

This expansion significantly increases the model's explanatory power (change in R^2: seven percentage points; $p < 0.01$).[14] For the individual variables, six of the nine predictors are significant, of which five are positively related to citation frequency. The results for the visibility dimension (H_{2a}) indicate that citation frequency is significantly higher if an author has a strong *publication-related reputation* and is affiliated with a well-reputed institution. However, we find no evidence that the reputation of the *PhD-granting institution* drives citation success. Within the promotion dimension (H_{2b}), the *number of references* and, to a lesser degree, the *number of institutional workshops* and *conferences* acknowledged in the article affect citations. Concerning potential biases (H_{2c}), only proximity to the *U.S. system* showed a significant and small, albeit negative effect on citations.

Overall, we partially confirm Hypothesis 1 that citation behavior is influenced by the domain and the "intrinsic quality" of a paper, as represented by the variables operationalizing the universalistic perspective. From this perspective, an article's subject area, research method, and *length* seem to predict citation behavior. We also find support for Hypothesis 2 that

[14] If we had chosen the particularistic perspective as our second model, the change in R^2 would have been 15 percentage points.

citations are associated with the characteristics of papers' authors and their efforts to promote their papers. Authors' visibility is most strongly defined by their *publication-related reputation*. Promotional activities also seem somewhat important, with the *number of references* and the *number of institutional workshops* of particular relevance.

6. Robustness

We conducted several robustness tests. First, we tested the models with different measurements for the dependent variable, using the logarithmized mean citation counts without any adjustments for the continual extension of the databases, along with the mean-adjusted mean of citation counts.[15] The results remain mostly consistent across perspectives and single variables, with the noticeable exception of a decreased coefficient for the linear *age* term. The explanatory power decreases in both cases for the third model from R^2 = 0.41 to R^2 = 0.37.

Second, we tested our models using different measurements for the independent variables, using simple instead of normalized counts of pages to align with previous studies (Stremersch et al., 2007; Van Campenhout & Van Caneghem, 2010). The results showed that *length* remains significant when recorded as a raw score, but its impact increased from 0.15 ($p < 0.01$) to 0.19 ($p < 0.01$) in the third model. A similar test was conducted for the variable reputation of the *PhD-granting institution*. Instead of assigning numbers according to a ranking, we coded the variable as a binary with the value of 1 if the PhD-granting department was among the "top" 25 and 0 otherwise. The variable remained non-significant, with the results indicating no change in the models' explanatory power.

Third, we tested our models with modified samples.[16] One might argue that *AOS* could differ from the rest of the sample given its dissimilar geographical origin and content, so we tested the models again, excluding all *AOS* articles. Once again, the results remained the same in the first two models, but variations occurred in the third model, especially concerning the variables reflecting promotion and potential biases. The level of impact and significance slightly increased for the acknowledged *number of institutional workshops,* but the *number of conferences* was no longer significant. The impact of *U.S. system* halved and lost its significance. Following the line of reasoning above, we split the sample into articles in U.S. journals (*JAE, JAR, TAR*) and articles in journals published outside the U.S. (*AOS, CAR*). The test results of the subsamples showed some differences in the second and third model when compared to those of the full sample: The level of impact dropped and lost its significance for the *subject areas* in the non-U.S. sample, whereas only a slight increase of impact could be observed for the U.S. sample. With regard to the particularistic variables, variations occurred especially concerning those reflecting promotion and potential biases. For the U.S. sample, the level of impact increased for the *number of institutional workshops* and the *number of acknowledged individuals* and decreased for the *number of references* and the *number of conferences*. While the *number of conferences* lost its significance, the *number of acknowledged individuals* became significant. The results of the non-U.S. sample showed the opposite pattern: The level of impact increased for the *number of references* and the *number of conferences* and decreased for the *number of acknowledged individuals* and the *number of institutional workshops*, which also lost its significance. The variable *U.S. system* lost impact and its significance in the non-U.S. sample, whereas it remained on the same level for the U.S. sample.

Finally, we tested our models with a different statistical method. Following Stremersch et al. (2007) and Mingers and Xu (2010), we addressed the problem that the number of citations is a counted variable with a highly skewed distribution by using the negative binomial specification on the regression. Again, the results remained qualitatively consistent across perspectives and single variables.

7. Discussion and conclusion

We empirically tested the effects of a comprehensive set of article (i.e., universalistic) and author (i.e., particularistic) characteristics on citation rates in order to investigate which factors drive citations of articles published in "top" accounting journals. Shedding light on this topic is critical because citation counts are increasingly used and discussed in accounting research as a performance measure. Contrary to the conclusion drawn by Van Campenhout and Van Caneghem (2010) that only universalistic characteristics matter for citation counts, we identified a number of additionally relevant particularistic variables related to the visibility and position of researchers in the scientific system as well as to how they promote their research. In addition, the results suggest that the domain of an article also drives citations. Overall, the results show that using citation counts may present bias towards certain types of research, so we warrant caution against their uncritical use as an indicator of quality and impact as well as a performance measure.

Our study contributes to the accounting literature in several ways. First, it comprehensively investigated the antecedents of citation frequency in the accounting literature, reviewing the underlying theoretical facets of this measure. Because we identify and quantify the predictors of citations, this paper advances the ongoing debate regarding the content validity and usefulness of citation counts for evaluating the quality of accounting research. In this respect, by providing data about actual citation rates, it complements the survey by Reinstein et al. (2011), which among other things identified personal

[15] The mean-adjusted mean is calculated as the mean number of citations over the two databases, weighted by the mean number of citations for all articles recorded in the database in order to account for the differences between databases. We also did a logarithmic transformation to reduce skewness in the distribution.

[16] Given the number of predictors in our model and the reduction in sample size we suggest interpreting subsample models with caution, although they provide interesting indications.

acquaintance with one of the authors of an article published in a U.S. journal as a reason for citation. Moreover, by showing that not only universalistic but also several particularistic variables matter, we challenge the generalizability of the results reported by Van Campenhout and Van Caneghem (2010), disputing whether their findings for the *EAR* apply to a broader set of journals. We find that particularistic variables, such as one of the authors having a high *publication-related reputation* or being affiliated with a "prestigious" institution, positively impact the number of citations. We further find that promotion efforts drive citations, as measured by the *number of references*, the *number of institutional workshops*, and the *number of conferences* acknowledged in the article. Apart from methodological differences, these results may have diverged due to our inclusion of articles from North American journals, which increases the variance in the data with respect to social ties and reputation. By contrast, the reputation of *PhD-granting institution* and *gender* did not significantly influence citation rates, while having a strong affiliation with the *U.S. system* slightly decreased citations. Overall, this study supports the claim of the sociology of scientific knowledge with respect to accounting: that the social dimension of science matters (Longino, 2016).

Furthermore, and extending Van Campenhout and Van Caneghem (2010), we find large differences in citation rates not only by journal but also for different subject areas and research methods. The latter two universalistic variables account for 40% of the overall variance explained by our third model. Untabulated results indicate that *financial*, *managerial* and *mixed* accounting research receive more than the average citation count in our sample. Similarly, *archival* studies also accumulate more than the average number of citations, whereas *empirical* and *analytical* research studies are below average. In addition, we document that the considerably increased coverage of the *SSCI* and *Scopus* databases in recent years has led to an increase of citations beyond the well-known effect that citations accumulate over time (see Fig. 2). Unfortunately, the *SSCI* does not publicize which journals are indexed over which period of time, but *Scopus*' journal list includes 43 journals with "accounting" in their title since 2000, of which 13 are published inside the U.S. This considerable growth further clouds the picture, with our findings overall indicating that the interpretation of citation count as a measure of quality and impact is not as straightforward as it might appear at first sight.

As a corollary, this study provides further evidence questioning the usability of journal impact factors in accounting. First, following the critique in other disciplines, we show that citation counts within the investigated journals vary strongly and that their distribution is skewed (Baum, 2011). Second, our analysis of the content validity of the "citations" measure raises questions about their use as an input for calculating journal impact factors. For example, our results suggest that citations are strongly driven by domain, which are not evenly represented among the selected journals. This implies that journal impact factors will vary with the journals' various coverages of different domains.

Regarding performance measurement, we show that using citations—and, as a consequence, journal impact factors—sensibly requires either limiting comparisons to those between rather similar outlets, papers, and authors or making quite profound adjustments to at least account for the different effects reported above. We retain doubt about whether such adjustments are practical or even feasible. These findings and their practical consequences support the importance of actually reading and assessing papers oneself, a task that some might have hoped would be avoidable by using citations and journal impact factors. However, although citations seem to offer no shortcut for assessing quality compared with reading an article (Humphrey & Gendron, 2015), they still enable researchers and other scientific stakeholders to learn who has used a cited article and why it was read. At least in principle, then, by following the path described by citations, authors may discover their articles' specific impacts within the scientific system. The simple fact of being cited might also strengthen scientific authors' intrinsic motivation.

Second, these results can inform the current critical debate about the detrimental effects of journal rankings and related performance measurement practices on the accounting field and academia in general, documenting the large influences of research method and subject area. Hence, using citations as a performance measure could further decrease diversity and impede innovation in accounting research, as young researchers, especially, may feel pressure to lean towards mainstream research when making career choices, especially early ones (Messner, 2015), and as institutions design their PhD programs to match (Merchant, 2010; Pelger & Grottke, 2015). The overall low contribution to the model by the universalistic variables other than domain also indicates that citations fail to capture what most expect from such a performance measure. In particular, we find no evidence for the effects of the *originality* variable, although Judge et al. (2007) found, in the discipline of management, that more explorative research designs tend to attract more citations. Finally, our results provide no direct evidence for discrimination against the work of female researchers in accounting with respect to citation counts. However, when understanding gender as a concept instead of as a variable describing a particular type of author, accounting can be seen to embody a gender bias. The "preponderance of accounting research that examines market reactions" and "hard" methodologies (Young, 2015, p. 71), which is also reflected by our sample (see Table 3), exhibits the strong influence of masculine values. Overall, citations might induce similar effects as with journal rankings, which have been criticized for their "tendency to marginalize certain types of research contributions" (Gendron, 2013, p. 1), thus posing a threat to the sustainability of accounting research (Humphrey & Gendron, 2015).

In addition, using citations as a performance measure may place new demands on individual scientists and their mindsets. Our results indicate that authors can actively promote the citation of their research, both by increasing the number of publications they cite – and thereby triggering direct and indirect reciprocity (Nowak, 2006) – and by asking individuals for feedback on their papers or by going to institutional workshops and conferences. While the first effect has also been documented for other disciplines (Judge et al., 2007; Mingers & Xu, 2010), the second effect confirms and complements Brown's (2005) findings for accounting. This could change the expectations of scientists' behavior. While the traditionally dominant requirement was to ensure that researchers shared their newly created knowledge with their colleagues, citations might

"confer on them much more explicit responsibilities over the dissemination of their articles and the enhancement of article downloads and citation rates" (Humphrey & Gendron, 2015, p. 63). The entrepreneurial attitude and required market orientation of authors thereby induced stand in contrast to the docility expected from researchers in the context of the disciplinary power exerted by journal rankings and performance-measurement systems using those journals. The hunt for citations might fortify the current short-term mentality and boost gap-spotting research (Alvesson & Sandberg, 2013; Humphrey & Gendron, 2015).

Third, this study improves our understanding of the accounting discipline, especially concerning the dissemination of accounting knowledge. The results identify similarities and differences between accounting and other business disciplines as well as between accounting and science in general. Important factors influencing citation rates across scientific disciplines are the number of pages, *number of references*, reputation of the institution to which a researcher is affiliated, journals, and whether or not a publication is a *literature review*. Among business disciplines, citation behavior in accounting research seems to be similar to operations research (Mingers & Xu, 2010), management (Judge et al., 2007), and marketing (Stremersch et al., 2007), all of which back the claim of the sociology of scientific knowledge regarding the relevance of the social dimension of science (Longino, 2016). A specific similarity with marketing also seems to exist, as past publication record and editorship increase citations in marketing, variables that are part of the factor *publication-related reputation* here. In addition to those variables identified by earlier research, this study highlights the importance of specific promotion variables.

This study complements many existing concerns raised about the state of accounting research both by mainstream and by critical researchers with a focus on knowledge dissemination. Our descriptive data support the observations of Merchant (2010) and others that accounting research, to a large extent, comprises articles in mainstream areas, such as *financial* accounting, that use empirical tests based on large *archival* data (see also Hopwood, 2005; Lukka & Kasanen, 1996; Williams & Rodgers, 1995). This is particularly true for *JAR* and *JAE*, and true of *TAR* to a lesser degree. In addition, we find evidence that supports the portrayal of accounting as U.S.-oriented (Jones & Roberts, 2005) and controlled by an "elite" circle of researchers from a few influential PhD-granting institutions (Lee, 1999). However, we find no direct evidence that these factors drive citation rates. Still, our results concerning domain indicate a bias towards research that is typical of the U.S., taught at influential U.S. PhD-programs. Thus, the results of this study also warrant a careful, critical analysis of the social dimension of accounting research, alongside its effects on the use of the produced knowledge.

Like any study, this research is not free of limitations. First, although we were rigorous in building the database and relied on explicit criteria, coding two of the variables involved some subjectivity (*originality* of an idea and *clarity of structure*). The coding of the other variables (research method, subject area) relied primarily on the classifications of third parties. Thus, some of the measures used to operationalize the independent variables could have limited applicability. Second, as mentioned above, it would be interesting to investigate more thoroughly whether the way in which the originality of an idea is measured applies to accounting, because the concept was adopted from other fields. As Gendron (2013, p. 1) argued, the very concept of research contribution can be described as "unstable, ambiguous, contradictory and relative." Alongside the adequacy of the definition and subsequent measurement of originality in accounting research, this may raise questions about the role of innovation in accounting.

Third, in this analysis, we mainly concentrated on article and author attributes established and previously investigated in other disciplines in order to offer a comprehensive test of the competing universalistic and particularistic theoretical perspectives. Doubtlessly, there are additional factors we could have considered, and although we followed previous research in allocating each predictor to a certain perspective, several variables might conceivably reflect multiple characteristics. Given the high explanatory power of the models and the results of the robustness tests, however, we are confident about the overall validity of the findings.

Fourth, causality cannot be proven in our research design and several causal links might exit. One could argue that researchers cite an article, because it was written by a "high quality researcher", who has the potential to produce remarkable papers. Who would qualify as a "high quality researcher"?: Someone with a considerable number of papers in "high quality" journals, someone chosen by a "prestigious" journal as one of its editors, and/or someone with a "prestigious" scientific award. Thus, in our model a "high quality researcher" scores high on the factor *publication-related reputation*. In addition, researchers might use such author characteristics as a heuristic for choosing "high quality" literature to cite.

Fifth, the results only represent a snapshot; new citations are being accumulated every day. Since we included articles that have arguably passed their peak in the citation-accumulation process, we do believe the results are reasonably robust. Finally, the results are limited to the set of journals included here. We decided to focus on the drivers of citations in "top" accounting journals. Whether articles appearing in lower-ranked or specialized journals follow these same patterns remains a question for future research.

In addition to addressing the above limitations in future research, this paper provides several new directions for forthcoming studies. One possible next step could be to extend this study to other publication outlets, such as books, and to compare the results. Rerunning the regression based on citation counts taken from Google Scholar would be a possible option in this regard. Further, given the accumulating evidence across different areas and disciplines, a meta-analysis of existing studies could be valuable to discover commonalities and differences with respect to the drivers of citations in different management disciplines and in other sciences more generally. Moreover, it would be worthwhile obtaining more empirical evidence on the uses of citations as performance measures and relating citation-based performance measures to other measures of impact and quality. Furthermore, studying the influence of online portals and repositories, such as the Social Science

Research Network or Academia, might be interesting. Finally, investigating the content validity of the newly proposed "altmetrics" (Priem, Taraborelli, Groth, & Neylon, 2010) and relating them to citations might increase our understanding of both.

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Appendix A

Table A1
Coding sample.

Independent variables and drivers	Measurement description	Articles 1	2	3	4	5
Independent variable						
Mean citation count	Average number of citations the article has received until end of December 2015 from AOS, CAR, JAE, JAR, and TAR in the SSCI and Scopus	101.50	46.00	75.50	10.50	5.00
Corrected mean citation count	Mean citation count of the article divided by the citation growth index for its publication year. The index is calculated by dividing the average citation count recorded in the SSCI and Scopus of all articles in AOS, CAR, JAE, JAR, and TAR published in the respective year by the corresponding average citation count of all articles published in the year 1997.	42.10	26.40	36.50	10.50	2.30
Controls						
Journal						
AOS	Dummy: 1 (if the article is published in AOS) or 0 (if otherwise)	1	0	0	0	0
CAR	Dummy: 1 (if the article is published in CAR) or 0 (if otherwise)	0	1	0	0	0
JAE	Dummy: 1 (if the article is published in JAE) or 0 (if otherwise)	0	0	1	0	0
JAR	Dummy: 1 (if the article is published in JAR) or 0 (if otherwise)	0	0	0	1	0
TAR	Dummy: 1 (if the article is published in TAR) or 0 (if otherwise)	0	0	0	0	1
Age	Count of number of full years since publication year	10	14	12	17	8
Demeaned age square	Square of the difference between an article's age and the average age of all articles	6.27	2.24	0.25	20.21	20.29
Literature review	Dummy: 1 (if the article is a literature review) or 0 (if otherwise)	0	0	0	0	0
Universalistic perspective						
Domain						
Subject area						
Financial	Dummy: 1 (if the article belongs to the subject area of financial accounting) or 0 (if otherwise)	0	0	1	0	0
Managerial	Dummy: 1 (if the article belongs to the subject area of managerial accounting) or 0 (if otherwise)	1	0	0	0	1
Tax	Dummy: 1 (if the article belongs to the subject area of tax) or 0 (if otherwise)	0	0	0	1	0
Audit	Dummy: 1 (if the article belongs to the subject area of audit) or 0 (if otherwise)	0	1	0	0	0
Information systems	Dummy: 1 (if the article belongs to the subject area of information systems) or 0 (if otherwise)	0	0	0	0	0
Mixed	Dummy: 1 (if the article belongs to more than one subject area) or 0 (if otherwise)	0	0	0	0	0
Research method						
Archival	Dummy: 1 (if the article uses the research method archival) or 0 (if otherwise)	0	0	1	0	0
Analytical	Dummy: 1 (if the article uses the research method analytical) or 0 (if otherwise)	0	0	0	1	1
Empirical	Dummy: 1 (if the article uses the research method empirical) or 0 (if otherwise)	1	1	0	0	0

(*continued on next page*)

Table A1 (*continued*)

Independent variables and drivers	Measurement description	Articles 1	2	3	4	5
Opinion survey	Dummy: 1 (if the article uses the research method opinion survey) or 0 (if otherwise)	0	0	0	0	0
Other	Dummy: 1 (if the article uses an other research method than above) or 0 (if otherwise)	0	0	0	0	0
Quality						
Originality	The originality score is obtained by a judgment on whether the article is a refinement (1), a minor extension (2), a major extension (3) to the existing body of research, or explorative (4) (Newman & Cooper 1993).	2	3	2	2	2
Award for article	Dummy: 1 (if the article recieved an award) or 0 (if otherwise)	0	0	0	0	0
Length	Square root of the division of the count of the article's number of pages and the count of the journal's number of pages devoted to articles in the year of the article's publication	0.20	0.18	0.16	0.11	0.17
Presentation						
Clarity of structure	1 = poor structure to 4 = very clear and comprehensive structure; criteria such as (1) overall organizational structure of the text, (2) metadiscourse, (3) structure of major part, (4) "one point, one paragraph" rule, and (5) signaling words	2	4	3	2	3
Figures and tables	Count of the number of figures and tables in the article	6	5	6	0	4
Readability	The Flesch reading ease score is calculated as follows: 206.835 − [.846 x (number of syllables per 100 words)] − [1.015 x (average number of words per sentence)]	38.98	24.3	19.95	62.83	56.39
Particularistic perspective						
Visibility						
Publication-related reputation	Factor score based on the publication record of the most prolific author, a dummy variable for author award (1 if any author has recieved an award or 0 otherwise), and a dummy variable for editorship (1 if any author was/is an editor/editor-in-chief or 0 otherwise)	0.33	−0.04	0.04	−0.56	−0.74
Institution-related reputation						
Affiliated institution	1 divided by the rank of the highest-regarded affiliated institution of any coauthor of the article. Affiliations are ranked from 1 to 600 based on ARWU. Non-listed affiliations are assigned a comparable rank according to FT Global MBA Ranking or THE World University Rankings, resp. 601 if not listed in any of these three rankings.	0.10	0.07	0.02	0.01	0.11
PhD-granting institution	1 divided by the rank of the highest-regarded PhD-granting university of any coauthor of the article. The ranking is based on Brown (1996). Unlisted departments were given a rank of 26.	0.04	0.04	0.25	0.05	0.50
Promotion						
Number of references	Count of the number of references in the article	99	30	55	6	36
Number of institutional workshops	Count of the number of institutions where the paper was presented in a workshop attended by its faculty and PhD students as acknowledged in the article (see Brown 2005)	0	0	7	4	3
Number of conferences	Count of the number of venues where the paper was presented in a format other than workshops as acknowledged in the article (see Brown 2005)	1	7	0	0	0
Number of acknowledged individuals	Count of the number of people acknowledged in the paper without a specific attribution (see Brown 2005)	7	17	14	7	9
Potential bias						
U.S. system	Product of the fraction of U.S. institutions among all the institutions the article's authors are professionally affiliated with and the share of the article's authors with a PhD from an U.S. university	0.00	1.00	1.00	1.00	1.00
Gender	Percentage of female researchers among the article's authors	0.00	1.00	0.50	0.00	0.00

Notes:
1: Quattrone, P.; Hopper, T. (2005): A 'time-space odyssey': management control systems in two multinational organisations.
2: Kadous K. (2001): Improving jurors' evaluations of auditors in negligence cases.
3: DeFond, M.L.; Hung, M.Y. (2003): An empirical analysis of analysts' cash flow forecasts.
4: Sansing, R. (1998): Valuing the deferred tax liability.
5: Ray, K. (2007): The retention effect of withholding performance information.

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