Topics and Methods in Economics, Finance, and Business Journals: A Content Analysis Enquiry

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Abstract

This study analyzes the abstracts and titles of 33,454 business finance, economics, management, and business articles published in ISI (frequently cited) journals during 2013-14. The sample represents 46.4 percent of all papers published in ISI journals in those years, and 52.7 percent of the articles published in the selected categories. The journals were ranked in four Q categories according to their impact factors. The analysis revealed that some topics persisted in all Q groups, but others gained frequency by Q, which suggests that Q1 journals (those with higher impact factors) create trends that are followed by other publications. All Q groups have a methodological approach that is predominantly empirical rather than theoretical. In addition, while the business and management categories privileged case studies, economics studies emphasized panel data analyses. Finally, our study confirms the relevance of the English language in academia.

Keywords: Publish or perish, topics and methods, economics, finance, business and management.

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Introduction

All over the world, researchers are facing increasing pressure to “publish or perish”, and their preferences in terms of what to publish and where are weighed against the interests and trends of the academic editorial market. It has long been reported how journal editors have determined the dissemination of certain ideas and trend topics (e.g., Hamelman and Mazze, 1974; Silverman, 1984; Chan et al., 2005; Bradburry, 2012). Our study shows how recent technological developments could help researchers undertake projects in their fields’ preferred subjects of interest. This is important because the proliferation of academic journals hinders researchers’ ability to choose the most appropriate place for their work. Moreover, in many institutions, tenure and promotion committees have trouble assessing a professor’s academic contribution when analyzing his or her research output (Weston, 1994).

While there are thousands of journals in all academic areas, the competition to be published in the leading ones remains as fierce as ever. Acceptance rates below 5 percent are common in top journals. Danielson and Heck (2010) demonstrated that, in a set of 15 high-impact accounting journals, a relatively small number of authors have published a disproportionate share of the articles. Using data for Ph.D. holders from over 25 years, Zivney and Bertin (1992) determined that less than 5 percent of the sample had published just one article per annum in finance, accounting, economics, and business.

Diamond (1986), Gomez-Mejia and Balkin (1992), Moore et al. (1998), Leahey (2007) and Hamermesh (2018) demonstrated the economic impact of citations for scholars; the better the outlet where they publish, the higher the number of expected citations. Even though the citation data can be biased (Haddad et al., 2014), they are still the main way to capture the influence and value of a research piece. Studies have long reported the link between publication rates and promotion and academic mobility (Skeels and Fairbanks, 1968; Kenny and Studley, 1995; Sabatier et al., 2006; Zeng et al., 2017). Swidler and Goldreyer (1998) went even further and calculated that the present value of an article in a top finance journal ranged between $19,493 and $33,754, with additional returns for subsequent publications.

Given the small odds of publishing in top journals in any field, Danielson and Heck (2014) suggest gaining a better understanding of the “next-best” journals so that both novice and established authors may make more informed decisions about where to submit their academic manuscripts. Through these and other findings (Borokhovich et al., 1995, 1998; Borokhovich et al., 2000), researchers may become aware of prevailing and emerging topics in the literature and align their research agenda accordingly. Following Faria (2003), assistant professors applying for tenure could balance their publication portfolios toward maximizing the number of papers published (prolific), while tenured faculty may gear their publication effort toward the relevance of their papers (influential).

There has been a rapid growth of bibliometric studies in areas such as medicine (Xianliang and Hongyiang, 2012), big data analysis (Akoka et al., 2017), environmental impact (Geng
et al., 2017), engineering (Franceschini and Maisano, 2010), software engineering (Garousi and Mantyla, 2016), and groundwater research (Niu et al., 2014), among many other fields. Within a wider topic-review framework, Chen et al. (2016) applied co-word analysis on projects of China’s National Natural Science Foundation, revealing “hot” topics such as game theory, supply chain management, and data mining. These studies use different methods to perform the analysis, such as counting key words frequency and publications, aggregating the h index of authors or the journal papers, or elaborating a systematic mapping of existence research. In this paper, we are not just counting or aggregating existing information. A simple word count for each category under analysis assumes independence among the different categories a priori. Instead, and as we explained in the methodology section, we calculate probabilities that are further modeled in a hierarchical manner that allows borrowing information of each category in order to have dependence among the four different categories (in our study, impact factor categories: Q1, Q2, Q3, and Q4).

All in all, progress in what is called the “science of science” and a better understanding of the scientific output of any field will significantly affect promotion, tenure and recruitment decisions in academia, as well as the allocation of resources to high-impact research (Zeng et al., 2017). Although there is general agreement that the key factor in publication is contributing something new and interesting to the literature, it is also true that finding an appropriate outlet is not the easy task that young researchers often take for granted.

This study reveals topics and methodological aspects in the finance, economics, management, and business literature during 2013-14. We analyzed the abstracts and titles of 33,454 papers published in 395 ISI journals under four categories: business (68 journals), business finance (61 journals), management (98 journals), and economics (168 journals). Our study reveals that some of the most frequent topics are present in all the Q groups (journal impact factors), but other topics gain frequency by Q groups.

Although we recognize that a trend represents a long-term phenomenon, our results suggest that Q1 journals attract researchers’ attention and create trends that are followed by Q2, Q3, and Q4 publications. Moreover, all Q groups feature topics that also appear frequently in media and other outlets (e.g., financial crisis in finance and economics outlets; job satisfaction in business and management). This helps researchers keep abreast of issues in their disciplines and fosters dialogue between scholars and practitioners. As for methodology, our analysis found more empirical than theoretical studies in business and finance in all Q groups. Case studies predominate in business and management, but not in finance and economics. The latter features panel data analysis. As expected, most papers were published in English, confirmation of the relevance of this language in academia.

Even though our inquiry focused on four areas and a particular time period, it could be replicated in other fields and for any time horizon. The remainder of this paper is organized as follows: first, we present a review of the literature regarding the publication process; we then explain our research methodology and subsequently report and discuss our results. We close with some conclusions.

**Literature Review**

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Why is it so difficult to publish in academic journals? The main reason of course could well be not finding interesting and novel questions to work on. However, other factors might also intervene, such as not being able to find the best outlet for a research piece. Through an opinion survey and content analysis, Bradburry (2012) explored the editorial policies of top accounting and finance journals. He analyzed 66 reviews of 33 manuscripts submitted to the journals and concluded that many papers were submitted prematurely to the wrong journals and were lacking the proper flow of ideas and contributions. Indeed, an important part of the research process is choosing the correct journal, and “selling” the contribution in appropriate ways.

Macdonald and Kam (2007) argued that the pressure to publish have change the “unit of measurement” of the quality of a paper, not to what is publish in terms of contribution to knowledge but where is publish. Flagg et al. (2011) find that Ph.D. candidates outside of the top rank universities can signal their future research productivity by publishing or having revisions in top-tier journals while still attending the Ph.D. program. Therefore, getting publish or having research projects of interest to the academic editorial markets is of high importance even in the very first steps of the academic career. Even as far away as in Hamelman and Mazze (1974), there are a general call to make sense in terms of the quality and utility of the huge among of scientific publications. Back then, the main approach was to ask experts on each field to provide a “score” about the merit of a set of journals. Later, researchers use citation index to rank journals, and measure the concentration of citations across journals and across disciplines.

Journal editors play an important role in the scientific community as moderators of the scientific “conversation” among scholars. They decide which papers and related topics get published and which do not. Therefore, it is crucial that young researchers be aware of the types of conversations going on in their fields (Silverman, 1984) so that they may balance their interests with those of their peers.

The publication outlet is not only relevant for researchers but also for the higher education institutions. For example, Manning and Barrette (2005) stated that business schools’ accreditation agencies, such as the Association to Advance Collegiate Schools of Business (AACSB) and EQUIS, used measurements of research quality in their accreditation processes. Consequently, some business schools have implemented bonuses and other incentives to push not only the quantity but also the quality of the research output of their faculty, where traditional measures about the research quality is the journal ranking (Theoharakis & Hirst, 2002).

The scientific analysis of journals impact has become a discipline in itself (the science of science) and researchers has developed methods to address the scientific importance of papers and journals. For example, Everett and Pecotich (1991) modeled the importance, similarity, and influence of journals using Poisson and Loglinear models to generate a “map” of journals’ relative characteristics and configurations. In addition, Tahai and Rigsby (1998) study the “durability” journals analyzing the patterns of citations through the years, and using this information to rank journals.

Currie and Pandher (2001) divide the methods to classify journals quality in two groups: the
publication citation-based and the peer assessment methods. The Active Scholar Assessment (ASA) methods they proposed ask scholar to provide relative rankings as an endogenous function of perception of quality and awareness for each journal. They also compare their journal ranking with other sources (e.g. ISI Citation Report) and found a more monotone and less steep descent in both quality and importance after the top ranked journals.

Baden-Fuller et al. (2000) point out a circularity issue when trying to define what a “quality journal” is. For instance, scholar from top universities publish their research in “top” journal, but the classification of “top” universities usually relays where they publish their work. In the same vein, Johnson and Podsakoff (1994), argue that of course, high quality papers appear in high quality journals, but there are considered high quality papers because they were published in high quality journals.

The evaluation of academic productivity in terms of publication is the main drive force to hiring, promoting and compensating academics. Faria (2003) posit a method to classify economist into two groups: those who seek quality (prolific) and those who aim quantity (influential). The quality factor was measure by the number of citations and the quantity factor by the number of publications. Given the difficulty and ever-increasing competition in the publication market, researchers tend to diversify their research portfolio. In Faria (2005) the same issue is tackled but the economists are deciding whether to publish in international or national journals. In the theoretical models of these papers, the best strategy is to find a balance between quality and quantity, and national versus international journals.

In the case of finance, given the diversity of this research field, there is no consensus on how to measure journal quality. Olstethen et al. (2005) analyze 862 survey responses by finance academics worldwide and find no major variations about the perceptions of the top four finance journals. However, using a probit model specification, these authors find that journal quality perceptions for journals other than the top four exhibit significant differences across geographical regions, research interests, level of seniority, and journal affiliation. These findings demonstrate that for the research community is not an easy task to select research outputs outside of the very top journals.

Borokhovich et al. (1998) report that high-quality finance journals favor certain areas or topics, and young researchers’ reference to these highly influences their tenure achievement. In this vein, the authors found that articles about corporate finance were more likely to be published in better-quality journals than papers on financial institutions. Borokhovich et al. (2000) reached similar conclusions when they ranked the quality of papers by using the SSCI’s (Social Sciences Citation Index) impact factors. Papers citing other papers outside the finance field exhibited higher impact factors than those which did not.

Also in the area of finance, but applicable to other fields, Armstrong and Sperry (1994) found a strong link between the ranking of business schools and the quality of their financial research in terms of citations and journal status. Moreover, in their analysis of journal-quality measures, Borokhovich et al. (1995) observed that 20 percent of the institutions accounted for more than 76 percent of the total influence in terms of citations. Although there is theoretical and empirical evidence of the differences in the quantity and quality of research outputs by discipline (Swanson, 2004), the above-mentioned finding could be extrapolated
to researchers and research teams that promote given topics not only in finance but in economics, and business as well (Zeng et al., 2017). In addition, tools such as the Hirsch spectrum are recently being used to assess the academic quality and reputation of journals, authors, and papers (Franceschini and Maisano, 2010)\(^1\).

Following on the citational analysis, many fields have list of the most influential journals and authors. In finance, Alexander and Mabry (1994) produce a list of the fifty most influential articles and authors, and identify topical trends in the finance research agenda. The citational analysis is also important to study the influence of certain disciplines to others. For example, Chandy and Williams (1994) show that management, economics, marketing, and finance disciplines had great influence in the international business disciplines. These analyses can be extended even further to show how individual scholars can influence a research agenda in a given field.

Related discussions also emerge in the management and business studies field. For example, Pierce and Garven (1995) argue that the proliferation of research outputs leads business researchers to deal with the necessity to develop a publishing strategy to achieve an appropriate and timely publication of their papers. Moreover, these authors argue that a low acceptance rate can be seen as a signal of journal quality. In addition, according to Macdonald and Kam (2007), management departments usually create a list of “quality” journals. However, these lists are created using as a benchmark other lists from other management departments, creating an endogenous relationship between the journal list and the quality of the journal: are the lists compose of “quality” journals, or the journal is of high “quality” because is in the list? However, these lists of journals allow researchers, especially young researchers from lower-rated institutions to make informed decisions when deciding where to submit their work (Geary et al., 2004).

According to Manning and Barrette (2005) the lists of ranked journals developed by prestigious business schools are follow by others. However, in business schools, due to the inherent diversity in research subjects and methods, there is no a generally accepted ranking of journals in term to measure research quality. Moreover, the diversity present in business and management fields are not restricted to topics and research interest, but also a great diversity is present in terms of languages, cultures, countries, and more importantly research methodologies. For example, management fields’ use surveys based research more than finance field (Baker et al., 2007).

Another empirical regularity observed in the discussion of the quantity and quality of research output in the management field, is the concentration of articles from universities and individuals. As stated in Swanson (2007) higher concentration occurs when journals acquire goods, which in this case are research articles, from fewer suppliers, which in this case are

\(^1\) According to the authors, their paper “introduces the Hirsch spectrum (h-spectrum) for analyzing the academic reputation of a scientific journal. h-Spectrum is a novel tool based on the Hirsch (h) index. It is easy to construct: considering a specific journal in a specific interval of time, h-spectrum is defined as the distribution representing the h-indexes associated to the authors of the journal articles. This tool allows defining a reference profile of the typical author of a journal, compare different journals within the same scientific field, and provide a rough indication of prestige/reputation of a journal in the scientific community. h-Spectrum can be associated to every journal” (2010, pg. 66).
universities and individual researchers. Using the Herfindahl-Hirschman indices, they find that privately sponsored journals are more concentrated by school than association-sponsored journals. For the case of the main 14 business journals, 10 association-sponsor journals are less concentrated than any of the four privately sponsored journal. Much of the higher concentration in the privately sponsor journals arises from faculty members at private schools publishing a high proportion of the journal articles. These findings are important because in business areas the high concentration found could imply that faculty at many schools find very difficult to produce a research output comparable to their peers in other disciplines.

For those researchers that do not be part of editorial boards, it is even more difficult to find an appropriate outlet for their research. For example, Chan et al. (2005) rank schools with international business orientation using as a predictor the presence of faculty in the editorial boards of the leading international business journals. Among their findings, the top institutions share some characteristics such as faculty getting publish in top ranked journals.

Regarding trend topics in the literature, Danielson and Heck (2014) showed that authors in the highest productivity percentile were most likely to publish their latest articles in journals that had recently raised their impact factors. In the case of finance and business finance, they found that top academics were publishing in relatively new journals such as *Financial Management* and the *Financial Analysts Journal*, and in new specialized publications such as the *Journal of Financial Markets*, the *Journal of Corporate Finance*, and the *Journal of Financial Intermediation*.

Literature reviews are other method widely used in the academic community, to identify possible trends and areas for new contributions. For example, Lu (2003) reviews the strategic management literature and highlight areas in which key contributions are made and, more importantly, where new research questions could be push forward. Lu (2003) also identify the main institutions and researchers and examine the diversity of contributions in management research.

Some authors (Griffith et al., 2008) use Delphi study (panel of experts) to determine the future research agenda in the field of international business. With this methodology expert on the field respond to what are the main problems to be address and the most important empirical regularities to be explained. This in part could move the field to address specific topics and create research trends.

Bibliometric studies represent another methodology that has been used to targeting the most prolific and influential articles, authors and trends. For example, Pasadeos et al. (1999) found through this process the most important authors and most cited papers in the public relations scholarly literature. Moreover, through this method they can also identify and measure paradigms and topical diversity. Using bibliometric studies can also be of interest to find how certain areas of knowledge are organized around topics and paradigms (Vieira and Teixeira, 2010). Badua et al. (2011) use bibliometric analysis to describe the evolution in term of content in the field of accounting. Using this methodology, they were able to understand better the evolution of content and context of this literature. Issa (2016) uses bibliometric together with semi-structured interviews with editors, editorial boards, and selected authors to show that research in economics finance, and entrepreneurship have important influence.
in the published research with emerging economies orientation. He finds a small percentage of papers tackling theoretical issues and that many of the papers reviewed have a quantitative approach. Overall, new technological developments, such as the one we present in this paper, could be of help for scholars in developing a publication strategy in the publish and perish environment.

**Methodology**

**Data Collection**

We developed a set of Python scripts to build the data set through a crawling process. Some journals offer an API (Application Programming Interface) which allows downloading of metadata related to each paper from the publishers’ web sites. These APIs offer various search services using key words, time spans, and other fields, through certain filters. However, since not all journals provide APIs, we had to build specific scripts to download the information for those lacking APIs.

We run our Python scripts in a Linux virtual machine provided by Amazon Web Services (cloud platform). The Linux machine had 32GB of RAM, 2 virtual cores, and 30GB of solid-state disk (SSD).

**Data Set**

We defined as the unit of analysis 72,129 abstracts and article titles that represent the universe of all papers published during 2013-14 in ISI journals. The four different categories covered business (120 journals), business finance (94 journals), management (192 journals), and economics (344 journals). However, because of the API restrictions mentioned above, it was impossible to collect this full corpus.

Using the crawling process, we collected 33,454 abstracts and titles, or approximately 46.4 percent of the full target data set. Table 1, Panel A, shows the distribution of journals by category; Panel B shows the distribution of papers by publisher; and Panel C shows the distribution of papers by category.

**INSERT TABLE 1 HERE**

We structured all the abstracts and titles as a corpus in a single text document, removing special characters such as HTML tags, punctuation marks, and mentions. These elements were tokenized in English bigrams (the most frequent two-word combinations). Then, we built a “bigram matrix” equivalent to a “term-document matrix,” where each abstract for a given journal category (business, economics, business finance, and management) was considered a “document.” The entries in each cell of this matrix corresponded to the presence/absence of each specific bigram in each journal abstract.

The journals were ranked in quartiles that reflected the statistical distribution of their impact factors. We then applied the Multinomial Inverse Regression (MNIR) method, described by Taddy (2013), modeling the journal impact factors corresponding to the abstracts. As Taddy mentions, the journal impact factor is a variable that proxies importance, and therefore it is
directly linked to the abstract’s content.

Content analysis is not new. It has been widely explored methodologically, employing regressions, support vector machines, and neural networks (Pang and Lee, 2008) in various disciplinary contexts, including the tracing of ideology in political texts (Yu et al., 2008), or of negative/positive nuances in economics and finance (Tetlock, 2007; Loughran and McDonald, 2011). For additional details on the MNIR method, and its R package, and for insight on related methodological drawbacks, see Taddy (2013).

Analysis Procedure: A Bayesian Approach

Jurafsky and Martin (2008) analyze each document (abstract or title) as an exchangeable set of tokens (uni-grams or, more generally, n-grams). When dealing with text corpora, tokens can be understood as regular stemmed words. For example, the words “taxation”, “taxes”, and “taxing” all become “tax”. For consistency, we use the same notation as in Taddy (2013), where the vector
\[ x_j = (x_{ij1}, \ldots, x_{ijp})' \]
is the vector of counts of the \( p \) possible tokens, or in our case of the bigrams. We define the empirical frequencies
\[ f_j = x_i / m_i \]
where \( m_i = \sum_{j=1}^{p} x_{ij} \).

Each of the possible \( n \) documents (33,454 abstracts or titles) will be related to a content variable \( y_i \) which can be ordered into discrete increasing categories. Modeling the conditional distribution of \( y_i | x_i \) can be computationally prohibitive. The approach in Taddy (2013) allows the collapse of token counts as
\[ x_{ij} = \sum_{y_i=y} x_i \]
for every content category \( y \in Y \). The basic multinomial inverse regression (MNIR) can then be written as in Taddy (2013):

\[ x_{ij} \sim MN(q_{ij}, m_{ij}) \]

where \( x_{ij} \) is a \( p \)-dimensional multinomial distribution with size parameter vector \( m_{ij} = \sum_{y_i=y} m_i \) and probabilities \( q_{ij} = [q_{ij1}, \ldots, q_{ijp}]' \). The Sufficient Reduction Score \( z_i \) defined by Taddy (2013) is computed as \( z_i = \psi f_i \). Intuitively the text sentiment variable \( z_i \) gives the “average” factor loading contribution of document \( i \).

Therefore, the text content score reduction variable \( z_i \) is computed as the inner product between the multinomial inverse regression factor loadings \( \psi = (\psi_1, \ldots, \psi_p)' \) from each token (or n-gram counts) and the empirical frequencies \( f_i \) from the token counts (Taddy, 2013). This reduction score is similar in philosophy to Altman’s \( z \) score, which gives a quantification of a company’s credit quality that results in a credit rating or scoring (Altman, 1968). The higher the \( z \) score, the higher the contents of bigrams with large factor loadings (\( \psi \)). We select the most important bigrams on the basis of their decreasing order of probability of appearance, as in Equation (1) of Taddy (2013).

It is worthwhile to highlight that a simple word count for each category assumes independence among the different categories a priori. As suggested in Taddy (2013), a more promising strategy is to use text-specific dimension reduction based upon the multinomial implied by exchangeability of token counts. As shown in Taddy (2013), a topic model treats documents as drawn from a multinomial distribution with probabilities arising as a weighted combination of “topic” factors. These probabilities are further modeled in a hierarchical
manner that allows borrowing information of each category in order to have dependence among the four different impact factor categories (Q1, Q2, Q3, and Q4). A previous method that is similar in spirit is the one proposed by Blei, Ng and Jordan (2003) used during Trump’s political campaign (Gautrais et al., 2017).

**Results**

The abstract bigrams collected from all Q journals were ordered from the most to the least frequent. We had a total of 2,942 bigrams for business finance journals, 2,280 for economics journals, 3,667 for management journals, and 4,879 for business journals. For the Q1 journals, we then determined the first 31 bigrams that referred to topics and methodological approaches. Subsequently, we looked for those bigrams in Q2, Q3, and Q4 journals and found that some were consistently present among those most frequent in all categories. For instance, in business finance, the bigram *financial crisis* was the most frequent in Q1, Q2, and Q3 journals, and it was the 5th most frequent in the Q4 journals. We categorized topics in Q2, Q3, and Q4 journals as persistent when their number was close to that of the bigram in the Q1 rank (less than 10 numbers in difference).

Some bigrams gained frequency from the Q4 to the Q1 journals. For example, in the economics category, *health care* was the 257th most frequent bigram in Q4 journals; 57th in the Q3 journals; 15th in the Q2 journals; and 2nd in the Q1 journals. Table 2 lists the persistent topics and the topics that gained presence as the journal quality increased. It also displays bigrams associated with methodological issues such as *empirical evidence, case study, panel data, and structural equations*, among others.

**INSERT TABLE 2 HERE**

Tables 3-6 show the most frequent bigrams for Q1, Q2, Q3, and Q4 papers in the business finance, economics, management, and business categories, respectively. For each Q1 bigram, we compared its respective frequency in Q2, Q3, and Q4 papers.

**Topic Patterns**

Some of the most frequent topics persist in all Q groups, but others lose frequency by category, which suggests that Q1 and Q2 journals attract researchers’ attention and create trends that are followed by Q3 and Q4 publications. For example, in the business finance category, we found 10 persistent topics within the 22 most frequent Q1 bigrams: *financial crisis, stock market, exchange rates, corporate governance, earning management, stock returns, interest rates, stock price, cash flow, and information asymmetry*. For the same set of journals, the 10 topics within the 22 most frequent Q1 bigrams that lost frequency in Q2, Q3, and Q4 journals were: *monetary policy, risk management, financial reporting, credit risk, systematic risk, accounting research, integrated reporting, banking sectors, financial market, and management accounting*. For instance, *systematic risk*, which is the 11th most frequent

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2 We chose 31 bigrams as a cutoff point to be able to collect at least the 20 most frequent bigrams regarding topics published in business finance, economics, management, and business. We consider this spectrum of topics wide enough for the reader to have a global appreciation of the most important topics discussed in each of the fields we study.
Q1 bigram in the business finance journals, ranks only 21st in the Q2 journals, 73rd in Q3 journals, and 300th in Q4 publications (Table 3).

These topic patterns occurred in the economics category as well. There, the 11 persistent topics within the 31 most frequent bigrams for Q1 publications were: financial crisis, economic growth, labor market, human capital, monetary policy, exchange rates, developing countries, stock market, business cycle, interest rate, and economic development. For the same set of journals, the 9 topics out of the 31 most frequent bigrams that lost frequency by Q category were: health care, United States, European Union, climate change, health insurance, risk aversion, oil price, stock returns, and credit risk. For example, European Union is the 8th most frequent bigram in the Q1 journals, ranks 21st in the Q2 journals, 50th in Q3 publications, and 182nd in the Q4 papers (Table 4).

**INSERT TABLES 3 AND 4 HERE**

In the management category, 10 topics persisted within the 26 most frequent Q1 bigrams: supply chain, firm performance, new product, social capital, job satisfaction, human resource, resource management, decision making, product development, and business model. As was the case for business finance and economics journals, the frequency of some bigrams decreased from Q1 to Q4 publications. The 10 topics which showed that tendency within the 26 most frequent Q1 bigrams were: ERP environment, human capital, financial performance, corporate social, performance measurements, project management, strategic management, competitive advantages, social responsibility, and product innovation. For example, human capital, ranked 7th in Q1 journals, 12th in Q2 journals, 46th in Q3 publications, and 165th in Q4 papers (Table 5).

**INSERT TABLES 5 AND 6 HERE**

In the business category, there were only 5 persistent topics within the 26 most frequent Q1 bigrams: new product, firm performance, product development, business model, and value creation. Unlike the more focused categories, of the 26 most frequent Q1 bigrams, 15 registered decreasing frequencies in Q2, Q3, and Q4 journals: supply chain, ERP environment, family firms, corporate social, chain management, human capital, social capital, social responsibility, financial performance, social media, job satisfaction, product innovation, small-medium sized, strategic management, and customer satisfaction (Table 6).

These results indicate the persistence of some topics and the emergence of others, which could help scholars align their research agenda with the trends in their fields. In this regard, assistant professors applying for tenure and aspiring to publish in top journals could redirect their efforts to finding alternative publication outlets, while tenured professors could become aware of new topics of interest and relevance vis-à-vis journal impact factors (Qs); and business, finance, and economics practitioners could keep abreast of their disciplines’ knowledge frontiers.

Furthermore, our findings reveal that certain topics and issues that are discussed in the media and other public outlets are also present in the academic literature. For instance, financial crisis and themes related to corporate scandals such as earnings management, integrated reporting, and corporate governance are topics within the business finance and economics
categories and are persistently covered in media, while corporate social responsibility, job satisfaction, human capital, new products, and product development are the kind of topics found in the business and management fields. Thus the academic literature reacts to issues of public concern, creating a two-way dialogue between scholars and practitioners.

Methodological Approaches and Other Issues

Our content analysis inquiry also revealed certain patterns of methodological approach. In the business finance category, bigrams such as find evidence, empirical evidence, empirical results, and data set suggest a preference for empirical research that is common to all Q ranks.

The economics category also displays a consistent preference for empirical research in all Q groups, as revealed by bigrams such as using data, find evidence, data set, and empirical results. Furthermore, these category abstracts provide more methodological details by including the bigrams panel data, per capita, general equilibrium, time series, statistical significant, and empirical analysis among the most frequent bigrams.

In the management category, the third bigram in all Q ranks is case study, indicating the prevalence of this methodology within the field. Moreover, the frequencies of bigrams such as data collected, structural equation, using data, and empirical evidence further confirm a preference for empirical studies. The business category displays a similar pattern. Case studies represent the most frequent research methodology, and bigrams such as empirical evidence, structural equation, data collected, and using data confirm an inclination for empirical inquiry, as was the case in all the other categories. Overall, methodological approaches in our sample of abstracts tend to be centered in empirical research; however, some categories show particularities.

Even though our full sample of abstracts leaned toward empirical research, the various field categories showed certain specificities. While the economics studies employed panel data sets and time series, management and business studies developed case studies. Interestingly, we found no bigram evidence of theoretical research. Finally, an expected higher frequency of papers written in the English language validates the relevance of this language in academic research.

These findings are useful to faculty facing tenure-track challenges and pressures to publish or perish because they reveal the methodological approaches most likely to be published. Theory-oriented scholars could realize their harder path to publication, while young management and business researchers could undertake case studies to increase their publishing possibilities. In addition, across all fields, authors would understand the academic relevance of the English language.

Analysis of Title Bigrams

We complemented our analysis by examining the presence of bigrams in papers’ titles. In general, we found consistent results in terms of the topics and their Q rankings. For example, bigrams such as corporate governance, financial crisis, and exchange rate were among the most frequent for titles in the business finance journal set, and they remained persistent in all Q categories.
As for the bigrams that gained frequency from Q4 to Q1 publications, we determined that health care, oil price, and health insurance reflected this tendency in the economics journals, as had been the case in the abstracts’ data set. In addition, we found methodological bigrams in some titles, such as panel data in economics, case study in management, and literature review in business, although with less frequency.

Although our findings for the titles’ data set were, in general, consistent, we determined that six bigram topics gained frequency and remained persistent in all Q ranks. They were: financial reporting, credit risk, and global financial in business finance journals; and corporate social responsibility, and family firm in business journals.

The analysis also revealed new high-frequency bigram topics in all categories, including emerging market, mutual fund, and hedge fund in the business finance journals; crude oil, systematic risk, and climate change in economics journals; corporate governance, sustainable development, and venture capital in management journals; and, socioemotional wealth, top management, and corporate governance in business journals. Table 7 lists the 20 most frequent title bigrams per category.

**INSERT TABLE 7 HERE**

**Conclusions and discussion**

What should I research? What is of interest to editors? What is the most appropriate methodology for a given project or research question? What are my peers publishing? What are the current hot topics in the literature? Which subjects are Q1 and Q2 journals publishing? Are there any subject differences between the Q1, Q2 publications and the Q3, Q4 ones? These are some of the questions that research-oriented professors must consider at some point in their academic career. In many cases, the answers are left to imagination or trusted to intuition, albeit they represent relevant decisions for academic productivity and professional development. The methodology we use in this paper, that depart from the most traditional surveys and expert opinions, could support researchers in answering this set of questions in any fields and not only the ones under analysis in our study.

For the period under analysis, our study determines topics present in all ISI journals and Q ranks and suggests their consolidation as pertinent subjects within the fields. Moreover, it shows how certain topics gain frequency by Qs, which suggests that Q1 and Q2 journals raise awareness of emerging and relevant topics, and set trends that are followed by editors and authors in Q3 and Q4 publications. Our findings also stress the relevance and predominance of certain methodologies. Business, finance, and economics favor empirical research over theoretical inquiries, making it easier to publish the former. And while many economists employ panel data in their research, business and management scholars formulate structural equations, and develop case studies.

These findings are valuable for different reasons. For example, they could support young doctoral students (and their supervisors), and young scholars in streamline their research agenda from a broad set of possible topics of their interest, to those with more visibility and likelihood of publication. This is not only relevant in terms of subjects, but also in terms of methodological issues. For instance, following our results, a young researcher in the
economics field will know that publishing theoretical work will be more difficult than empirical oriented papers.

The previous reasoning leads us to another contribution of this methodology, which is to facilitate scholars to develop their research and publications agenda in a more conscious and strategic way. To have a proper research and publication strategy allow professors to concentrate efforts in their research agenda around subjects and methodologies depending on the visibility and impact aims. Furthermore, more establish researchers could also find useful this kind of methodologies in order to validate their beliefs regarding where the academic discussions are focusing on. That is, which topics are consolidated and which emerge as new ones in their fields. They also can do a similar assessment regarding applicable methodologies for their work.

Even the editors of Q3 and Q4 journals could find this methodology and analysis useful in terms of gearing their journals towards certain topics that are being published by Q1 and Q2 journals, and that could help the journals to gain a better positioning among researchers in their fields. Overall, our paper shows the relevance of content analysis to help researchers face the challenges of their academic career and editors to do a better editorial management of their journals.

Lastly, our analysis raise venues for future research. For example, could be interesting to analyze the research outlets of professors after they get tenure to identify possible changes in terms of quantity and influence of their publications. Another valuable analysis would be to perform this study in the same fields and same methodology we apply, with the aim to identify time patterns with a time horizon of 5 or 10 years, a period long enough to identify changes in methodologies, topics and trends in these fields. Finally, this method could be used to find regional or geographical analysis with the aim to identify differences in terms of topics and methods for several research fields.

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Table 1. Data Set

Panel A. Distribution of journals according to category

| Area            | Journals (Population) | Journals (Sample) | Sample Coverage (%) |
|-----------------|-----------------------|-------------------|--------------------|
| Business        | 120                   | 68                | 56.7               |
| Economics       | 344                   | 168               | 48.8               |
| Business Finance| 94                    | 61                | 64.9               |
| Management      | 192                   | 98                | 51.0               |
| Total           | 750                   | 395               | 52.7               |

Panel B. Distribution of papers by publisher

| Publisher                                | Papers (count) |
|------------------------------------------|----------------|
| ACAD MANAGEMENT                          | 13             |
| ACADEMIC PRESS INC ELSEVIER SCIENCE      | 875            |
| AMER ACCOUNTING ASSOC                     | 26             |
| AMER MARKETING ASSOC                      | 16             |
| ELSEVIER GMBH, URBAN & FISCHER VERLAG    | 38             |
| ELSEVIER SCI LTD                          | 1413           |
| ELSEVIER SCIENCE BV                       | 5206           |
| ELSEVIER SCIENCE INC                      | 1243           |
| ELSEVIER SCIENCE SA                       | 667            |
| EMERALD GROUP PUBLISHING LTD              | 1363           |
| INFORMS                                   | 449            |
| PERGAMON-ELSEVIER SCIENCE LTD             | 749            |
| PHYSICA-VERLAG GMBH & CO                  | 200            |
| ROUTLEDGE JOURNALS, TAYLOR & FRANCIS     | 2780           |
| SAGE PUBLICATIONS INC                     | 1096           |
| SAGE PUBLICATIONS LTD                     | 682            |
| SPRINGER                                  | 4770           |
| SPRINGER HEIDELBERG                       | 745            |
| SPRINGER WIEN                             | 109            |
| SPRINGER/PLENUM PUBLISHERS                | 77             |
| UNIV CHICAGO PRESS                        | 305            |
| WALTER DE GRUYTER GMBH                    | 1002           |
| WILEY PERIODICALS, INC                    | 325            |
| WILEY-BLACKWELL                           | 9305           |
| Total                                    | 33454          |

Panel C. Distribution of papers by category

| Area            | Papers (count) |
|-----------------|----------------|
| Business        | 5,693          |
| Economics       | 14,677         |
| Business Finance| 5,752          |
| Management      | 7,339          |
| Total           | 33,454         |
| Business Finance | Bigrams Classification | Q1 most frequent bigrams | Bigrams Classification | Q1 most frequent bigrams | Business Finance | Bigrams Classification | Q1 most frequent bigrams |
|------------------|-----------------------|--------------------------|-----------------------|--------------------------|------------------|-----------------------|--------------------------|
| financial crisis | Persistent            | using data               | Methodological        | supply chain             | Persistent       | supply chain          | Gain-frequency           |
| stock market     | Persistent            | health care              | Gain-frequency        | future research          | Paper structure  | future research       | Paper structure          |
| monetary policy  | Gain-frequency        | financial crisis         | Persistent            | case study               | Methodological   | erp environ           | Gain-frequency           |
| risk management  | Gain-frequency        | united states            | Gain-frequency        | firm performance         | Persistent       | family firms          | Gain-frequency           |
| exchange rate    | Persistent            | panel data               | Methodological        | erp environ              | Gain-frequency   | new product           | Persistent               |
| corporate governance | Persistent       | economic growth          | Persistent            | data collected            | Methodological   | corporate social      | Gain-frequency           |
| earnings management | Gain-frequency     | find evidence            | Methodological        | human capital             | Gain-frequency   | chain management      | Gain-frequency           |
| financial reporting | Gain-frequency      | european union           | Gain-frequency        | new product              | Persistent       | human capital         | Gain-frequency           |
| credit risk      | Gain-frequency        | empirical evidence       | Methodological        | social capital            | Persistent       | social capital        | Gain-frequency           |
| stock returns    | Persistent            | labor market             | Persistent            | job satisfaction          | Persistent       | social responsibility | Gain-frequency           |
| systemic risk    | Gain-frequency        | data set                 | Methodological        | human resource            | Persistent       | firm performance      | Persistent               |
| find evidence    | Methodological        | climate change           | Gain-frequency        | financial performance    | Gain-frequency   | case study            | Methodological           |
| accounting research | Gain-frequency     | human capital            | Persistent            | corporate social          | Gain-frequency   | financial performance | Gain-frequency           |
| interest rate    | Persistent            | monetary policy          | Persistent            | structural equation       | Methodological   | social media          | Gain-frequency           |
| integrated reporting | Gain-frequency     | exchange rate            | Persistent            | using data                | Methodological   | job satisfaction      | Gain-frequency           |
| stock price      | Persistent            | developing countries     | Persistent            | resource management       | Persistent       | product development   | Persistent               |
| cash flow        | Persistent            | health insurance         | Gain-frequency        | performance measurement  | Gain-frequency   | product innovation    | Gain-frequency           |
| banking sector   | Gain-frequency        | risk aversion            | Gain-frequency        | project management        | Gain-frequency   | small mediumsized     | Gain-frequency           |
| empirical evidence | Methodological       | stock market             | Persistent            | strategic management      | Gain-frequency   | strategic management  | Gain-frequency           |
| financial market | Gain-frequency        | per capita               | Methodological        | competitive advantage     | Gain-frequency   | empirical evidence    | Methodological           |
| management accounting | Gain-frequency | general equilibrium       | Methodological        | social responsibility    | Gain-frequency   | structural equation   | Methodological           |
| information asymmetry | Persistent          | business cycle           | Persistent            | product innovation        | Gain-frequency   | business model        | Persistent               |
| business cycle   | Gain-frequency        | interest rate            | Persistent            | empirical evidence        | Methodological   | data collected        | Methodological           |
| default risk     | Gain-frequency        | time series              | Methodological        | decision making           | Persistent       | using data            | Methodological           |
| firm value       | Persistent            | oil price                | Gain-frequency        | product development       | Persistent       | customer satisfaction | Gain-frequency           |
| mutual fund      | Gain-frequency        | stock returns            | Gain-frequency        | business model            | Persistent       | value creation        | Persistent               |
| environmental reporting | Gain-frequency     | empirical results         | Methodological        | social media              | Gain-frequency   | competitive advantage | Gain-frequency           |
| data set         | Methodological        | statistically significant | Methodological        | risk management           | Gain-frequency   | human resource        | Gain-frequency           |
| global financial | Gain-frequency        | empirical analysis       | Methodological        | survey data               | Methodological   | literature review     | Methodological           |
| abnormal returns | Methodological        | credit risk              | Gain-frequency        | case studies              | Methodological   | mediumsized enterprises | Gain-frequency           |
| fair value       | Gain-frequency        | economic development     | Persistent            | job performance           | Gain-frequency   | sustainable supply    | Gain-frequency           |
Table 3. Most Frequent Bigrams in Abstracts for Q1, Q2, Q3, and Q4 Papers in Business Finance

| Q1 most frequent bigrams | Q2 most frequent bigrams | Q3 most frequent bigrams | Q4 most frequent bigrams |
|--------------------------|--------------------------|--------------------------|--------------------------|
| financial crisis         | financial crisis         | financial crisis         | real estate              |
| stock market             | stock market             | stock market             | stock market             |
| monetary policy          | exchange rate            | exchange rate            | financial crisis         |
| risk management          | corporate governance     | corporate governance     | exchange rate            |
| exchange rate            | earnings management      | earnings management      | corporate governance     |
| corporate governance     | monetary policy          | stock returns            | earnings management      |
| earnings management      | stock returns            | find evidence            | stock returns            |
| financial reporting      | financial reporting      | financial reporting      | implied volatility       |
| credit risk              | find evidence            | interest rate            | find evidence            |
| stock returns            | credit risk              | monetary policy          | empirical results        |
| systemic risk            | interest rate            | stock price              | interest rate            |
| find evidence            | stock price              | cash flow                | stock price              |
| accounting research      | cash flow                | empirical evidence       | cash flow                |
| interest rate            | risk management          | credit risk              | stochastic volatility    |
| integrated reporting     | empirical evidence       | real estate              | empirical evidence       |
| stock price              | information asymmetry    | information asymmetry    | option prices            |
| cash flow                | firm value               | firm value               | stock markets            |
| banking sector           | data set                 | empirical results        | financial reporting      |
| empirical evidence       | provide evidence         | data set                 | information asymmetry    |
| financial market         | abnormal returns         | abnormal returns         | institutional investors   |
| management accounting    | systemic risk            | stock markets            | firm value               |
| information asymmetry    | financial market         | institutional investors   | trading volume           |
| business cycle           | stock prices             | stock prices             | time series              |
| default risk             | risk aversion            | risk aversion            | data set                 |
| firm value               | liquidity risk           | liquidity risk           | monetary policy          |
| mutual fund              | default risk             | trading volume           | credit risk              |
| environmental reporting  | global financial         | using data               | panel data               |
| data set                 | mutual fund              | united states            | abnormal returns         |
| global financial         | United States            | financial markets        | monte carlo              |
| abnormal returns         | financial markets        | exchange rates           | option pricing           |
| fair value               | banking sector           | financial institutions   | developing countries     |
| return volatility        | investor protection      | systemic risk            | strong evidence          |
| commodity futures        | stock options            | stock options            | systemic risk            |
Table 4. Most Frequent Bigrams in Abstracts for Q1, Q2, Q3, and Q4 Papers in Economics

| Bigram | Bigram | Bigram | Bigram |
|--------|--------|--------|--------|
| 1 using data | economic growth | monetary policy | monetary policy |
| 2 health care | using data | exchange rate | exchange rate |
| 3 financial crisis | panel data | economic growth | economic growth |
| 4 united states | monetary policy | panel data | interest rate |
| 5 panel data | financial crisis | financial crisis | panel data |
| 6 economic growth | exchange rate | human capital | human capital |
| 7 find evidence | united states | using data | time series |
| 8 european union | labor market | labor market | financial crisis |
| 9 empirical evidence | find evidence | interest rate | labor market |
| 10 labor market | human capital | find evidence | productivity growth |
| 11 data set | data set | united states | labour market |
| 12 climate change | empirical evidence | time series | empirical results |
| 13 human capital | developing countries | data set | using data |
| 14 monetary policy | interest rate | developing countries | general equilibrium |
| 15 exchange rate | health care | empirical evidence | developing countries |
| 16 developing countries | time series | empirical results | social welfare |
| 17 health insurance | general equilibrium | general equilibrium | find evidence |
| 18 risk aversion | stock market | stock market | united states |
| 19 stock market | per capita | per capita | monte carlo |
| 20 per capita | empirical results | productivity growth | data set |
| 21 general equilibrium | european union | business cycle | empirical evidence |
| 22 business cycle | business cycle | labour market | fiscal policy |
| 23 interest rate | risk aversion | monte carlo | stock market |
| 24 time series | statistically significant | statistically significant | real estate |
| 25 oil price | empirical analysis | long run | per capita |
| 26 stock returns | climate change | empirical analysis | long run |
| 27 empirical results | economic development | economic development | business cycle |
| 28 statistically significant | equilibrium model | risk aversion | tax rates |
| 29 empirical analysis | long run | equilibrium model | central bank |
| 30 credit risk | exchange rates | social welfare | statistically significant |
| 31 economic development | stock returns | central bank | empirical analysis |
| 50 crude oil | income inequality | central bank | empirical analysis |
| 182 capital flows | production function | production function | european union |
### Table 5. Most Frequent Bigrams in Abstracts for Q1, Q2, Q3, and Q4 Papers in Management

| Q1 most frequent bigrams | Q2 most frequent bigrams | Q3 most frequent bigrams | Q4 most frequent bigrams |
|-------------------------|--------------------------|--------------------------|--------------------------|
| supply chain            | supply chain             | supply chain             | human resource           |
| future research         | future research          | future research          | service quality          |
| case study              | case study               | case study               | case study               |
| firm performance        | data collected           | human resource           | future research          |
| erp environ             | human resource           | data collected           | job satisfaction         |
| data collected          | firm performance         | job satisfaction         | quality management       |
| human capital           | job satisfaction         | structural equation      | data collected           |
| new product             | new product              | firm performance         | structural equation      |
| social capital          | social capital           | service quality          | time series              |
| job satisfaction        | structural equation      | new product              | firm performance         |
| human resource          | resource management      | social capital           | decision making          |
| corporate performance   | decision making          | resource management      | decision making          |
| structural equation     | using data               | empirical evidence       | equation modeling        |
| using data              | empirical evidence       | product development      | supply chain             |
| resource management     | financial performance    | equation modeling        | united states            |
| performance measurement | product development      | united states            | customer satisfaction    |
| project management      | business model           | business model           | social capital           |
| strategic management    | survey data              | using data               | new product              |
| competitive advantage   | case studies             | survey data              | empirical evidence       |
| social responsibility   | competitive advantage    | case studies             | product development      |
| product innovation      | empirical research       | empirical research       | business model           |
| empirical evidence      | social responsibility    | customer satisfaction    | survey data              |
| decision making         | transformational leadership | transformational leadership | case studies               |
| product development     | equation modeling        | information technology   | knowledge sharing        |
| business model          | product innovation       | knowledge sharing        | transformational leadership |
| social media            | united states            | literature review        | using data               |
| risk management         | information technology   | knowledge management     | previous research        |
| survey data             | corporate social         | financial performance    | information technology   |
| case studies            | job performance          | information systems      | financial crisis         |
| job performance         | project management       | competitive advantage    | health care              |
| operations management   | customer satisfaction    | human capital            | economic growth          |
| firm size               | organizational citizenship| human resources          | human capital            |
|     | Q1 most frequent bigrams | Q2 most frequent bigrams | Q3 most frequent bigrams | Q4 most frequent bigrams |
|-----|--------------------------|--------------------------|--------------------------|--------------------------|
| 1   | supply chain             | supply chain             | future research          | future research          |
| 2   | future research          | future research          | new product              | business model           |
| 3   | erp environ              | new product              | case study               | case study               |
| 4   | family firms             | case study               | business model           | productivity growth      |
| 5   | new product              | firm performance         | data collected           | data collected           |
| 6   | corporate social         | corporate social         | product development      | new product              |
| 7   | chain management         | family firms             | firm performance         | stochastic frontier      |
| 8   | human capital            | human capital            | structural equation      | product development      |
| 9   | social capital           | product development      | supply chain             | technical efficiency     |
| 10  | social responsibility    | social responsibility    | using data               | managerial implications  |
| 11  | firm performance         | social capital           | human capital            | structural equation      |
| 12  | case study               | business model           | social responsibility    | family business          |
| 13  | financial performance    | data collected           | family business          | distance function        |
| 14  | social media             | structural equation      | corporate social         | using data               |
| 15  | job satisfaction         | using data               | social capital           | service innovation       |
| 16  | product development      | job satisfaction         | decision making          | empirical results        |
| 17  | product innovation       | product innovation       | product innovation       | firm performance         |
| 18  | small mediumized         | small mediumized         | survey data              | panel data               |
| 19  | strategic management     | financial performance    | job satisfaction         | decision making          |
| 20  | empirical evidence       | empirical evidence       | value creation           | corporate governance     |
| 21  | structural equation      | value creation           | corporate governance     | financial crisis         |
| 22  | business model           | strategic management     | empirical results        | factor productivity      |
| 23  | data collected           | social media             | equation modeling        | information technology   |
| 24  | using data               | survey data              | united states            | efficiency scores        |
| 25  | customer satisfaction    | customer satisfaction    | small mediumized         | returns scale            |
| 26  | value creation           | equation modeling        | special issue            | survey data              |
| 27  | competitive advantage    | competitive advantage    | empirical evidence       | exchange rate            |
| 28  | human resource           | united states            | information technology   | cost frontier            |
| 29  | literature review        | special issue            | data set                 | technical change         |
| 30  | sustainable development  | decision making          | competitive advantage    | new venture              |
| 31  | sustainable supply       | equation modeling        | equation modeling        | corporate governance     |
## Table 7. Most Frequent Topics and Methodology Bigrams in Paper Titles of Q1 Journals by Category

### Panel A

| Business Finance | | Economics | |  |
|------------------|------------------|-----------|------------------|------------------|
| **Q1 most frequent bigrams** | **Bigrams Classification** | **In comparison with Abstracts’ bigrams** | **Q1 most frequent bigrams** | **Bigrams Classification** | **In comparison with Abstracts’ bigrams** |
| corporate governance | Persistent | Already identified | european union | Gain-frequency | Already identified |
| financial crisis | Persistent | Already identified | health care | Gain-frequency | Already identified |
| stock market | Persistent | Already identified | economic growth | Persistent | Already identified |
| systemic risk | Gain-frequency | Already identified | stock market | Persistent | Already identified |
| exchange rate | Persistent | Already identified | panel data | Methodological | Already identified |
| monetary policy | Gain-frequency | Already identified | financial crisis | Persistent | Already identified |
| stock return | Persistent | Already identified | monetary policy | Persistent | Already identified |
| corporate bond | Gain-frequency | New | labor market | Persistent | Already identified |
| accounting research | Gain-frequency | Already identified | exchange rate | Persistent | Already identified |
| emerging market | Persistent | New | crude oil | Gain-frequency | New |
| mutual fund | Persistent | New | systemic risk | Gain-frequency | New |
| risk management | Gain-frequency | Already identified | venture capital | Gain-frequency | New |
| hedge fund | Gain-frequency | New | oil price | Gain-frequency | Already identified |
| earnings management | Persistent | Already identified | stock return | Gain-frequency | New |
| financial reporting | Persistent | Identified as gain-freq. | empirical evidence | Methodological | Already identified |
| management accounting | Gain-frequency | Already identified | human capital | Persistent | Already identified |
| credit risk | Persistent | Identified as gain-freq. | climate change | Gain-frequency | New |
| business cycle | Gain-frequency | Already identified | health insurance | Gain-frequency | Already identified |
| global financial | Persistent | Identified as gain-freq. | global financial | Gain-frequency | New |
| asset prices | Gain-frequency | New | new evidence | Persistent | New |
Table 7. Continues

| Panel B | Management | Business |  
|---------|------------|----------|  
| Q1 most frequent bigrams | In comparison with Abstracts’ bigrams | Q1 most frequent bigrams | In comparison with Abstracts’ bigrams |  
| 1 supply chain | Persistent | supply chain | Gain-frequency |  
| 2 corporate social | Gain-frequency | corporate social | Persistent | Identified as gain-freq. |  
| 3 social responsibility | Gain-frequency | social responsibility | Persistent | Identified as gain-freq. |  
| 4 firm performance | Persistent | family firm | Persistent | Identified as gain-freq. |  
| 5 case study | Methodological | new product | Persistent | Already identified |  
| 6 new product | Persistent | firm performance | Persistent | Already identified |  
| 7 literature review | Methodological | New | social capital | Gain-frequency | Already identified |  
| 8 project management | Gain-frequency | venture capital | Persistent | New |  
| 9 business model | Persistent | sustainable development | Gain-frequency | New |  
| 10 human resource | Persistent | corporate governance | Persistent | New |  
| 11 risk management | Gain-frequency | top management | Gain-frequency | New |  
| 12 social capital | Persistent | business model | Persistent | Already identified |  
| 13 corporate governance | Persistent | New | literature review | Methodological | Already identified |  
| 14 sustainable development | Gain-frequency | New | social media | Gain-frequency | Already identified |  
| 15 venture capital | Persistent | New | socioemotional wealth | Gain-frequency | New |  
| 16 sustainable supply | Gain-frequency | New | human capital | Gain-frequency | Already identified |  
| 17 citizenship behavior | Gain-frequency | New | research agenda | Paper structure | New |  
| 18 strategic management | Gain-frequency | product development | Persistent | Already identified |  
| 19 product development | Persistent | strategic management | Gain-frequency | Already identified |  
| 20 research agenda | Paper structure | New | empirical evidence | Methodological | Already identified |  

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