

United we stand, divided we fall. A co-authorship analysis of management scholars in Italy¹

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Abstract

Framing of the research. Collaborations and co-authorships are more and more typical in scientific research. Scientific collaboration has several advantages with regard to productivity, but it also has drawbacks.

Purpose of the paper. In this paper, we analysed the Italian community of management scholars with the aim of investigating their areas of interest, main research themes and publishing journals. Secondly, we carried out a co-authorship analysis to investigate the evolution of their publishing behaviours and co-authorship dynamics.

Methodology. A Scopus search was performed on the 649 Italian management scholars identified for 2019 to collect their Scopus IDs, with each ID uniquely identifying a scholar. A total of 550 Scopus IDs were collected, representing 84.7% of the 649 scholars. We then downloaded all 5,294 publications from these scholars listed in Scopus for the period 2000-2019.

Social network analysis was then applied to co-authorship publication data to analyse co-authorship dynamics and publication behaviour in four time windows. Various co-authorship behaviours were analysed via ego-networks.

Results. Italian management scholars increased their production in either quantity or quality from various perspectives during the period 2000-2019. However, co-authorship dynamics increased greatly during this period, underlining new publishing behaviours (at different job levels).

Research limitations. The analysis is limited to the community of management scholars and contributions found in the Scopus database and does not include books and Italian articles.

Managerial implications. The practice of co-authorship among management scholars may foster improvements in the quality and quantity of scientific research. However, co-authorship also has drawbacks and can lead to bias in research evaluations.

Originality of the paper. The study represents the first long-term analysis of publication production on the Italian management scholars and on their co-authorship behaviour.

Key words: bibliometrics; co-authorship analysis; ego-networks; management scholars; Italy

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1. Introduction

In recent years, there has been ever-increasing pressure on researchers, in general, and in the social and managerial sciences, in particular, to increase publications in top international journals in an increasingly tight timeframe for obtaining jobs in academic and professional fields, individual evaluations and institutional prestige (Levecque *et al.*, 2017; Wieczorek and Mitreęa, 2017). Publications also affect the acquisition of the funds needed for research activities and related facilities in a regime of increasingly scarce resources.

This pressure to publish is even stronger for younger generations, who must compete for academic jobs in an increasingly open and dynamic international, as opposed to national, scenario. However, it should be noted that the national situation has traditionally been both more static and parched in the provision of resources and high-level positions (Van Dalen, 2020; Van Dalen and Henkens, 2012).

In this scenario, collaborations have become an increasingly common avenue to meet demands for increasing the quantity and quality of scientific work (Newman, 2001; Barabasi *et al.*, 2002).

Thus, there have been profound changes in the behaviour of researchers as they have moved from traditional hierarchical and pyramidal structures to increasingly horizontal structures in growing numbers. The imperative of “publish or perish” has become increasingly stringent with the introduction of international evaluation criteria in the educational sector, the ranking of journals, and the widespread use of search engines in the selection and evaluation processes, both in the public and private sectors.

Within this framework, we focus on the Italian community of management scholars with the aim of investigating their areas of interest and behaviour in co-authorship activities. Firstly, using a bibliometric analysis of these scholars’ publications, we explore this community’s main research themes and publishing journals. Secondly, we conduct a co-authorship analysis to examine the evolution of their publication behaviour and co-authorship dynamics.

In particular, a Scopus search was performed on 649 Italian management scholars to collect their Scopus IDs, where each ID uniquely identifies a scholar. The Scopus IDs of 550 management scholars were collected, representing 84.7% of the Italian Ministry of University and Research (MIUR) universe. We then created a peer group of these 550 scholars and downloaded all 5,294 publications associated to them in Scopus for the period 2000-2019.

Next, Social Network Analysis (SNA) was applied to this co-authorship publication data to investigate co-authorship dynamics and publication behaviour in four time windows (2001-2005-2010-2015-2019). Various co-authorship behaviours were then analysed through ego-networks.

This work presents some novelties. First of all, the paper aims to contribute to the debate on co-authorship in the business and management communities (Casanueva and Larrinaga, 2013; Acedo *et al.*, 2006; Beattie and Goodacre, 2004; Merigó *et al.*, 2016). Furthermore, concerning Italy, this research is the first work on the Italian management community with

results that can be compared to Italian economists (Cainelli *et al.*, 2015) and statisticians (De Stefano *et al.* 2013; 2017). Moreover, it is one of the first works to analyse authorship and scientific production across different positions within the university, highlighting a sort of 'generational divide'. The results underline that Italian management scholars have increased either the quantity or quality of their publications from different perspectives in the period 2000-2019. Furthermore, with regard to collaboration strategies, using ego-network analyses, interesting transformations emerged, identifying some different ideal types and highlighting a relevant generational shift. In the first time windows, few collaborative activities emerged and were essentially related to the academic pyramidal structure with the full professor at the top. In the last two time windows, a very dense network of relationships has emerged, characterised by horizontal relationships between young researchers that were often random in nature. In general, co-authorship dynamics increase greatly during the period, underlining new publishing behaviours (at different position levels) that must be considered in the future.

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2. Co-authorship networks analysis

Co-authorship network analysis has been of increasing academic interest in the last decades and has had some seminal contributions. One of the first contributions was made by Newman (2001), who used social network analysis to investigate the characteristics of several large co-authorship networks in biology, medicine, physics, computer science and so on in 1995-1999, verifying also the theory of small worlds (Watts and Strogatz, 1998; Milgram, 1967). Next, Barabasi *et al.* (2002) investigated the dynamics and evolution of co-authorship networks in mathematics and neurosciences, introducing the theory of preferential attachment and scale-free networks. Since then, co-authorship networks have been studied using various approaches and across several disciplines (Glänzel and Schubert, 2004; Kumar, 2015).

The literature on co-authorship analysis has grown exponentially, examining, for instance, the effect of an author's structural position within a co-authorship network on their performance or publication behaviour dynamics. The first bibliometric study to apply social network analysis was done by De Solla-Price (1965), who examined networks for scientific papers. Since then, co-authorship analysis has been used to examine cohesion and connections in scientific communities (Kumar, 2015).

Co-authorship analysis allows researchers to investigate scientific research communities and how they publish and evolve over time. This trend began with Crane's work on the invisible college (1969). The concept of the invisible college refers to a group of scientists interacting and exchanging information from geographically dispersed locations (Price, 1965). These interactions are not necessarily confined to a single discipline. Indeed, science is often characterised by cross-fertilisation between different research areas (Crane, 1969). This form of analysis has largely thrived and been tested on several communities (Casaneva and Larrinaga, 2013; Sedita *et al.*, 2020).

In the last decades, social network analysis has shifted from examining small networks to investigating those with thousands or millions of vertices, while renewed attention has been given to network topologies and dynamics (Newman, 2001; Albert and Barabasi, 2002). Most of these studies focus on macro-level network properties, seeking to describe a social network's global characteristics and conceptualise its overall structural features (Yan and Ding, 2009; Capone and Lazeretti, 2017; 2018).

There has also been research on co-authorship in the social sciences (Glanzel, 2002; De Stefano *et al.*, 2013, 2011, 2017), particularly in the areas of economics and management (Casanueva and Larrinaga, 2013), business process management (Reijers *et al.*, 2009), tourism and hospitality (Hu and Racherla, 2008; Racherla and Hu, 2010) and destination management (Capone, 2016).

Co-authorship is an increasing phenomenon in academia, including the social sciences. In general, the percentage of co-authored papers grew steadily between 1950 and 1994, going from 10% to 70% in this period (Laband and Tollison, 2000). Recent studies have also underlined the increasing relevance of multi-author co-authorships (Van del Leij and Goyal, 2011). This phenomenon is related to the pressure on academics to publish in high-quality journals and is seen as a way to increase both the quality and quantity of scientific research².

Several authors have concluded that the increasing number of authors is due to: specialisation, an increased focus on multi-disciplinary research, synergy, opportunity costs, risk diversification, values of co-authored papers exceeding $1/n$ of the n authors for promotion and evaluation and the chance for social interactions (Cainelli *et al.*, 2015; Medoff, 2003). However, Cainelli *et al.* (2015) also conclude that co-authorships may also have negative effects and a 'dark side' due to: compromises, organisational challenges, control issues, communication costs (Hudson, 1996) and reward structure (a solo article has double the expected citations of multi-author articles) (Hilmer and Hilmer, 2005).

The economics and management fields have registered several works on co-authorship analysis. Casanueva and Larrinaga (2013) conducted an analysis of the invisible college of Spanish accounting scholars, investigating the selection of members of Ph.D. panels for the period 1994-2003. They could not confirm the existence of invisible college dynamics, underlining that high-profile scholars do not generate a disproportionate volume of new publications, therefore, the mechanism of preferential attachment was not active in this community. Acedo *et al.* (2006) conducted a co-authorship analysis for management and organisational studies focusing on the main international journals. They pointed out a growing tendency of co-authored papers in the management field, similar to those observed in other disciplines. Beattie and Goodacre (2004) studied publishing patterns in the UK and Irish accounting and finance academic communities across a 2-year period (1998-1999) using data from the British Research Register. They underline the increasing number of co-authorships in the community,

² See Cainelli *et al.* (2015) for a review of the increases in the quality and quantity of publications due to co-authorships.

pointing out that nearly two-thirds of academic articles were co-authored, with 25% of the contributions coming from outside the community. Merigó *et al.* (2016) conducted a bibliometric analysis of business and economics research according to the information found in the ISI Web of Science. They did not include a co-authorship analysis, but they did present the 50 most cited papers in business and economics, the 40 most influential journals, the 40 most relevant institutions and the most influential countries. Nizkad *et al.* (2011) studied scholarly networks for Iranian papers in psychology, management and economics during the period 2000-2009, applying SNA to visualize the co-authorship networks only. Podsakoff *et al.* (2008) presented an interesting analysis of the determinants of university and author impact in the management literature over the past quarter-century. Using bibliometric techniques, the authors examined 30 management journals to identify the 100 most-cited universities and 150 most-cited authors from 1981 to 2004. They confirmed the dynamics of preferential attachments by registering that a relatively small proportion of universities and scholars accounted for the majority of the citations in the field.

Fewer studies of this type have been conducted in Italy. Cainelli *et al.* (2012, 2006) conducted some of the very first work on co-authorship analysis by examining academic economists. Plumper and Radaelli (2004) analysed 89 political science journals indexed in the ISI Web of Science over the period 1990-2002. They investigated the publications and citations of all academics with Italian affiliations, although they did not conduct a co-authorship analysis. The works of De Stefano *et al.* (2011, 2013, 2017) and Fucella *et al.* (2016) were the first co-authorship analyses conducted on the Italian academic community of statisticians and examined intra-network community and scientific performances. Finally, Menardi and De Stefano (2021) presented a community detection analysis, underling the importance of inter-network structure for scientific performances within the Italian community of statisticians.

There are even fewer works on Italian management scholars. For instance, Lazeretti (2001) analysed the use and diffusion of empirical statistical methodologies in management. Lazeretti *et al.* (2014) investigated the invisible college of cluster research, identifying the community's main authors and historical evolution, while Sedita *et al.* (2018) used co-authorship analysis to investigate the development of the leading research themes within the overall community.

Other works have focused on different but still interesting themes in Italy. For instance, Abramo *et al.* (2009) analysed gender differences in research productivity in Italy. Allesina (2011) measured nepotism through shared last names within the Italian Academy. Finally, Bagues *et al.* (2019) analysed the role of predatory journals within the Italian Academy with regard to National Scientific Qualification (ASN).

From the above literature review, it is evident that the role of co-authorship in the scientific performances of academics is becoming more and more central in the debate on scientific productivity (Lee and Bozeman, 2005), recruiting and university evaluations. This work aims to investigate the role of co-authorship in the productivity of Italian management

scholars by examining the quantity and quality of co-authorships (network relational positions, etc.).

3. Research design

To fulfil our research aims, we developed a case study on the publication behaviours and co-authorship dynamics of the community of Italian management scholars.

Co-authorship analysis may be conducted on informal or formal knowledge-exchange channels (Sedita *et al.*, 2020). Ad hoc surveys on the collaborative behaviour of scientists, mail-tracking systems or participation in common research projects, workshops and conferences could potentially provide information on informal knowledge exchanges. Instead, bibliometric or scientometric studies can identify patterns in collaborative work and clusters of specialisations in specific research areas through formal channels.

We adopted the second method, as bibliometrics offers a powerful set of methods and measures for studying the structure and process of scholarly collaborations. Furthermore, it is an increasingly accepted method for examining the sociology of science. From this perspective, bibliometrics can be used to investigate co-authorship dynamics among a group of authors and how the group publishes and evolves over time, including according to changing contexts and rules.

For these reasons, we collected information on 31/12/2019 for all (649) management professors and research assistants in public and private universities in Italy from MIUR. We searched Scopus for these scholars (at work in 2019) and found the Scopus IDs of 550 of them or 84.7% of the MIUR universe³.

We then created a peer group of these 550 scholars and downloaded all 5,294 of their publications from 2000-2019 found on Scopus. We decided to use Scopus database and not the ISI Web of Science database, as Scopus permits the creation of peer groups and the download of peer group publications. Moreover, the Scopus database is typically larger than the ISI Web of Science database, making it preferable (Capone, 2016; Leydesdorff *et al.*, 2010). Finally, Scopus permits all authors and co-authors to be disambiguated via their Scopus IDs.

Social network analyses were applied to co-authorship publication data to examine co-authorship dynamics and publication behaviour in four time windows (2001-2005; 2006-2010; 2011-2015; 2016-2019). Finally, co-authorship behaviours were analysed via ego-networks.

³ Not all the Italian management scholars were found in Scopus. Some of them were simply not present in Scopus; others may have had homonyms, making it difficult to identify them; while some others may not have published a paper before 2019.

4. Results

4.1 Descriptive analysis and evolution of publications

Figure 1 presents the evolution of scholarship production by Italian management scholars in the period 2000-2019. Fig. 1a shows the evolution of all publications through time, while Fig. 1b focuses on articles, omitting book chapters and proceedings. Fig. 1c presents the evolution of citations, and Fig. 1d shows the share of contributions published in top percentile Journals, as calculated by CiteScore⁴.

According to all figures, production has increased either from a quantitative point of view or from a quality perspective. The number of contributions published in journals in the Scopus database extraordinarily increased, starting from less than 50 in the first 5 years of the period (2000-2005) and arriving at more than 650 contributions yearly by 2019 (Fig. 1a). If we focus on articles (Fig. 1b), the trend goes from less than 50 articles in 2005 to 550 articles in 2019, confirming the increasing internationalisation of the management community. This growth can also be related to recent recruiting policies, such as the National Scientific Qualification (ASN)⁵ in 2012 and the second University Evaluation Policy in the period 2011-2014 (VQR), which have gotten the community to focus on indexed international journals.

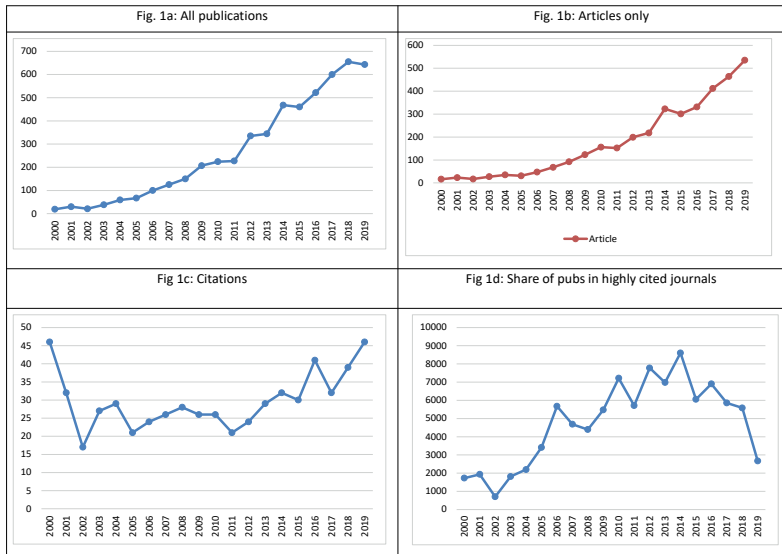
It should also be noted that the increase in quantity was followed by a consequent growth of quality. Fig. 1c underlines the growth in citations of the contributions published by the community.

Examining where the Italian management community publishes, we can also see that their contributions were published in better journals over time. Fig. 1d presents the share of publications in highly cited journals, according to Citescore. In the 2000s, this percentage was around 25%, with a peak of around 30%, whereas, in the following decade, the percentage increased to 45%, oscillating around 40%. Thus, there was also an increase in publication quality.

⁴ Introduced in 2016 by Elsevier as an alternative index to the Impact Factor. Citescore measures the impact of indexed scientific journals, dividing the number of citations received in a given year by the articles in each journal published in the previous four years by the total of articles published in that same periodical in the same four-year period.

⁵ In Italy candidates to associate and full professorships are required to qualify in a national-level evaluation known as the National Scientific Qualification (ANS) (Abilitazione Scientifica Nazionale). See Bagues *et al.* (2022).

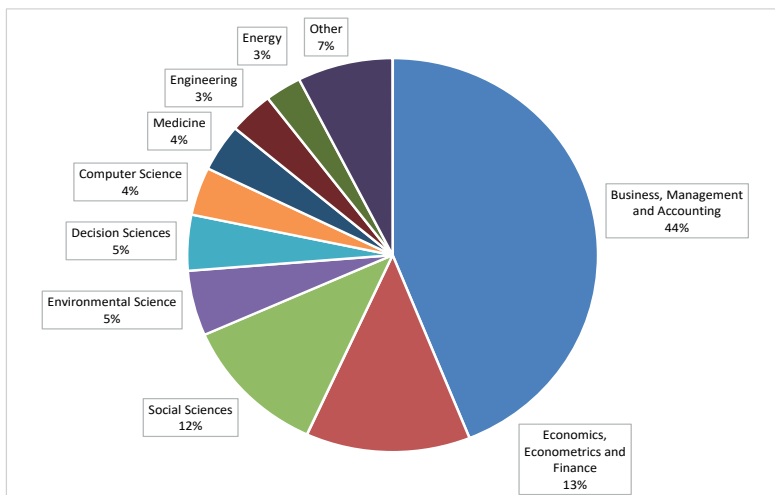
Fig. 1: The evolution of the publications of the Italian Management Scholars, 2000-2019



Source: our elaborations

Figure 2 shows the scientific areas covered by the publications. As can be expected from a heterogeneous and wide community, most publications were in areas such as Business, Management and Accounting (40%) and Economics, Econometrics and Finance (14.9%), but other areas were also covered, such as Medicine (3.9%), Engineering (3.9) and Computer Science (3.7%). Thus, management scholars have been able to contribute to many areas.

Fig. 2: The scientific areas where the management scholars publish



Source: our elaborations

Table 1 lists the most commonly occurring topics classified by the Scopus database for the 5,294 management publications. The first theme, with nearly 180 contributions, concerns innovation and open innovation, both of which have been extremely important in the last decades. Some other important themes are the value co-creation and service economy (tied for 2nd place) and family firms (3rd place). In 4th place, we find some further themes related to innovation, innovation networks and industrial district, while internationalisation and born global follow.

Tab. 1: The topics of the analysed publications

Topic	Pubs
Alliance Portfolios; Absorptive Capacity; Open Innovation	177
Product-service Systems; Service Economy; Value Co-Creation	135
Socioemotional Wealth; Family Firms; Familiness	133
Regional Innovation Systems; Industrial Districts; Innovation Networks	83
International New Ventures; Born Global; Export Performance	81
Cause-Related Marketing; Corporate Social Performance; Corporate Philanthropy	78
Entrepreneurial University; Academic Entrepreneurship; University Technology Transfer	75
Electronic Word-Of-Mouth; Online Reviews; Brand Community	74
ISO 14001; Environmental Management Systems; Eco-Management and Audit Scheme	51
Wine Tourism; Hedonic Price Function; Implicit Price	48
Luxury Brands; Counterfeit; Purchase Intention	47
Container Port; Short Sea Shipping; Seaports	46
Tourism Development; Ecotourism; Destination Management	45
Subsidiaries; Multinational Enterprises; Headquarters	44
Value-Based Pricing; Customer Perceived Value; Industrial Markets	43
Business Model Innovation; Sustainable Business; Digital Transformation	42
Brand Community; Consumer Culture; Netnography	41
Place Branding; Public Diplomacy; Brand Identity	39
Consumer Ethnocentrism; Country of Origin Effects; Country Image	37

Source: our elaboration.

Table 2 presents the main journals in which the Italian management scholars have published. The table shows all journals in the “A” ranking on the ASN list⁶, less four journals highlighted in bold character. This list highlights the importance of publishing in journals with an “A” ranking.

Not all the journals have a similar impact; some journals on the list have small impact factors. So, together with top international management journals, such as *Journal of Business Research*, *Industrial Marketing Management*, *Research Policy*, *Technological Forecasting and Social Change*, *Journal of Business Ethics* and *Strategic Management Journal*, there are also minor “A” ranked journals with smaller impact factors and SJRs (Scimago Journal Rating), such as *British Food Journal*, *TQM Journal*, *Management*

⁶ Under the ASN recruiting policy, journals are classified in classes A (top) to E (bottom).

Decision and Journal of the Knowledge Economy. Oddly, journals with lesser impact are somehow preferred.

To confirm this aspect, the last column of Table 2 shows the journal ratings of the Academic Journal Guide published by the Association of Business Schools (ABS) 2021. In the table, only two journals are classified as 4*, while other journals are classified as 3, 2 and even 1. Thus, while these journals are all in ASN “A” rank, in international rankings, not all are considered top journals. This situation can create opportunistic behaviour, as it incentivises scholars to publish in less important “A” ranked journals, as they have higher acceptance rates and can facilitate recruitment or career advancement.

Moreover, note that the journal where the Italian community publishes most frequently is *Sustainability*, a well-positioned journal with aggressive marketing strategies (Bagues *et al.*, 2019). This journal offers very quick reviews and publishes thousands of articles every year in hundreds of Special Issues.

Finally, it is also interesting to examine the evolution of the most important journals across two decades, namely, 2000-2010 and 2011-2019. Dividing the analysis into these two periods, some journals present in the first decade disappeared in the second, such as *Journal of Management and Governance* and *L'Industria*. From this point of view, the ASN has increased the importance of the so-called “A” journals, which are now crucial in the Italian community, pushing the community, in general, and young researchers, in particular, to improve their scientific production and submit their work to top-quality journals. Unfortunately, some of the journals that disappeared in the second period had a good Italian reputation. For instance, the *Journal of Management and Governance* was published by the Italian Academy for Business Economics (AIDEA) and disappeared in the second period.

Another important journal missing in both periods is *Sinergie - Italian Journal of Management*, which was not included in the analysis because it was finalising its inclusion in the Scopus database (Pastore, 2021)⁷.

It is also interesting to point out the average number of authors per article⁸, underlining the deep changes that the community has faced during the period. In fact, at the beginning of the period, an article had on average two to three authors, while at the end of the period the average had increased to nearly five to six (Figure 3).

⁷ Sinergie - Italian Journal of Management has been included in Scopus since 14th June 2021.

⁸ The average number of authors per article has been calculated for each year by dividing the total number of authors by the total number of articles.

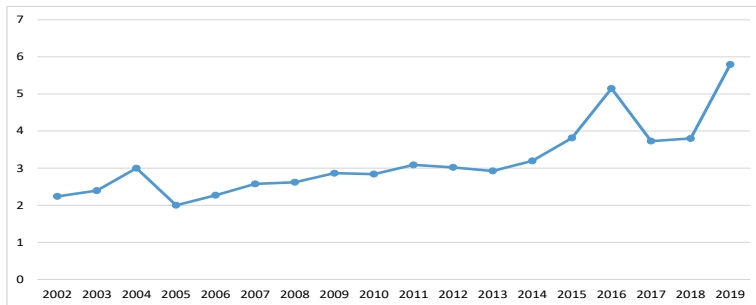
Tab. 2: The main publishing journal

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Pos	Journals	Pubs	SJR (2019)	3ABS Rating 2021
1	Sustainability	83	0.581	Not present
2	Journal of Business Research	78	1.871	3
3	Industrial Marketing Management	62	2.084	3
4	Journal of Cleaner Production	58	1.886	2
5	British Food Journal	56	0.579	1
6	TQM Journal	48	0.658	1
7	Management Decision	47	0.862	2
8	Research Policy	43	3.246	4*
9	Technological Forecasting and Social Change	38	1.815	3
10	Journal of Business Ethics	37	1.972	3
11	Strategic Management Journal	35	8.43	4*
12	Journal of the Knowledge Economy	34	0.576	1
13	European Planning Studies	33	0.953	2
14	Industrial and Corporate Change	33	1.120	3
15	Journal of Management and Governance	29	0.555	1
16	International J. of Globalisation and Small Business	28	0.276	1
17	<i>Journal of Knowledge Management</i>	27	1.752	2
18	Journal of Global Fashion Marketing	25	0.579	1
19	Lecture Notes in Inf. Systems and Organisation	25	1.125	Not present
20	Business Strategy and the Environment	24	1.828	3
21	European Management Journal	24	1.308	2
22	Industry and Innovation	24	1.738	3

Source our elaborations. Journals in bold did not have an “A” ranking on the 2021 ASN list

Fig. 3: The average number of authors per article



Source our elaborations

4.2 A co-authorship analysis through graph and ego-networks: a generational divide

This section investigates the co-authorship dynamics and the different publication behaviours of management scholars in the period.

Publications can be used to identify networks of co-authors and may allow the analysis of co-authorship networks. The $N \times M$ authors per publication matrix is then transformed into the $N \times N$ authors per authors matrix, where a relationship between two authors indicates a co-authorship.

We divide the entire period into four time windows in order to investigate four different co-authorship networks: 2000-2005, 2006-2010, 2011-2015 and 2016-2020 (Table 3). Time windows are common in co-authorship and network analyses, as they avoid outliers and allow to analyse collaborations over longer periods (Sedita *et al.*, 2020; Casanueva and Larrinaga, 2013).

Figure 4 presents some measures of the four sub-periods. For instance, the average degree (number of ties for each author) goes from 1.5 in the first period to 2.5 in the last. As highlighted previously, the number of co-authors tended to grow during the full period⁹.

The overall number of publications went from 234 in 2000-2005 to 2.420 in 2016-2019, indicating a huge growth. Also the number of (unique) authors goes from 336 to 5.996, underlining one more time, the enormous number of collaborations. Furthermore, the maximum number of co-authors in the first period was 13, while in the last window, it almost doubled reaching 20¹⁰.

Tab. 3: The four different windows of analysis

Period	Pubs	Authors (unique)	Co-authors	Avg. Degree	Max co-authors
2000-2005	234	223	336	1,5	13
2006-2010	806	705	1248	1,8	20
2011-2015	1834	1521	3391	2,2	15
2016-2019	2420	2367	5696	2,5	20

Source: our elaborations

Finally, Social Network Analysis was applied to the co-authorship networks in the four sub-periods. Figure 4 presents the co-authorship networks in the four time windows. Each node represents an author, while a line represents a co-authorship.

First of all, it is possible to investigate the evolution of the community in the four sub-periods. In the first window (2000-2005), the figure is characterised by small sub-networks that are mainly composed of isolated research groups. Collaborations are more stable and are developed among the same scholars in regular research groups.

In the second period (2006-2010), the structure has begun to change and stable groups of researchers are no longer the majority. The overall network is not yet fully connected, but a large macro network is starting to appear in the middle of the figure. The dimension of the network is increasing, perhaps indicating a widening of collaborations, most likely with international scholars.

The last two time windows (2011-2015 and 2016-2019) emphasize the growing complexity of the management community with the appearance of a large and wide macro-network of collaborations, not only with local

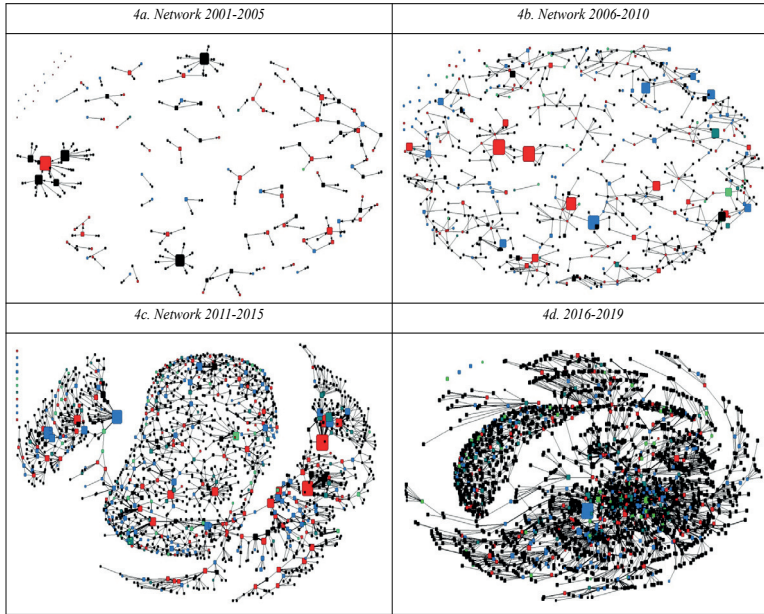
⁹ We remind that the average number of authors per article is different from the average degree. If three authors publish three articles, always collaborating together, the average number of authors per article is 3 (i.e., $9/3=3$), while the average degree is 2 since each author has 2 co-authorship ties with others.

¹⁰ This article with more than 20 authors is published in *Research Policy* and concerns an EU survey on inventions and inventors.

and national scholars but also with international scholars and other communities. The community of management scholars appears now as a wide and large community, where there is an increasing propensity toward collaborations and co-authorships. Stable and continuous collaborations are not as visually evident as before. The figure highlights how the community has changed its co-authorship behaviour over time (Fig. 4).

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Fig. 4: The co-authorship networks in four sub-periods



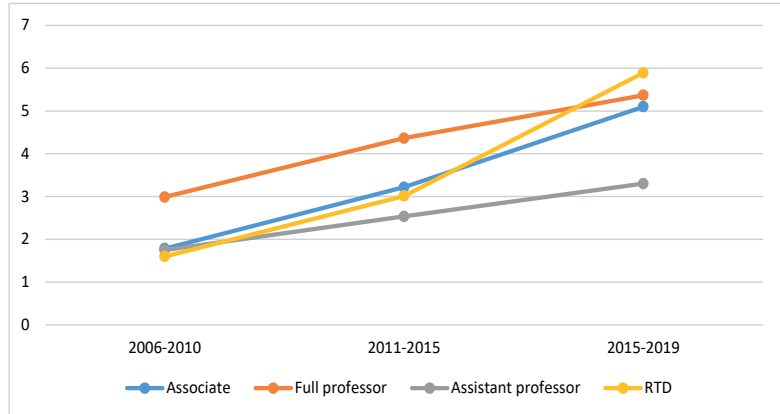
Source: our elaborations. Legend: Red nodes: full professors; Blue nodes: associate professors; Dark green nodes: permanent assistant professors; Light green nodes: fixed-term assistant professors.

Finally, Figure 4 highlights the changes in the prevailing roles across the time windows. In fact, in the first two time windows, the largest nodes and those with more collaborations belonged to full professors (red nodes) and some important associate professors (blue nodes). Besides, in the last two periods largest nodes represent more associate professors (blue nodes) and fixed term assistant professors (light green nodes) (RTD).

This phenomenon is also highlighted in Figure 5, where the average degrees for the various job positions are compared across the last three time windows. In the first sub-period, full professors had more co-authorships than those in other job positions. This effect gradually fades away, and in the last period, the fixed-term assistant professors have more co-authorships than both the associate and full professors. This phenomenon most likely highlights the urgent need for those in the most precarious jobs to publish at all costs, pushing them to expand collaborations to “publish and not perish”. We remind, in fact, that fixed-term assistant professors (so called ‘RTD’) is a temporary position before permanent professorships and it is

particularly critical because it has a fixed duration (3-5 years), after which the candidates that are not confirmed with a higher position are forced to leave the university.

Fig. 5: The evolution of average degree among different job positions



Source: our elaboration

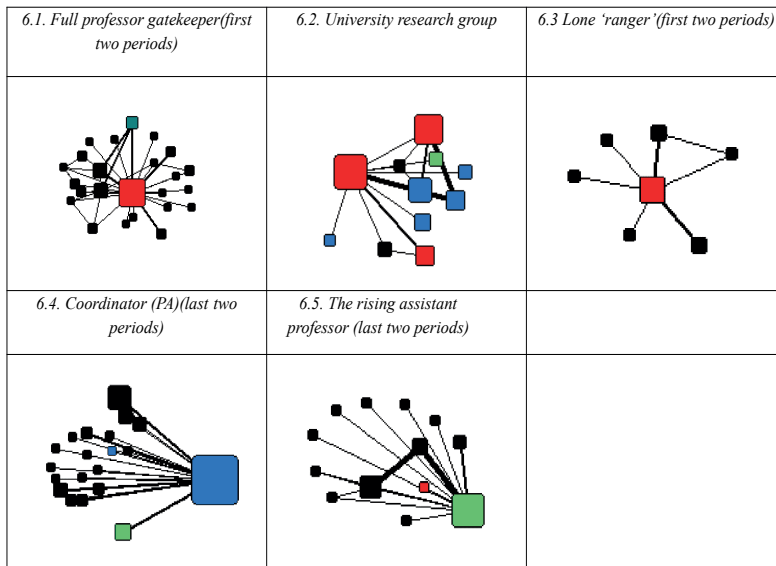
In order to further highlight this ‘*generational divide*’ in terms of position ego-networks were investigated. An ego-network is a network consisting of a focal node (“ego”) and the nodes to which it is directly connected (called the “alter” nodes) and the bonds if any between the ego and alters. These networks are also known as personal networks or ego-centric networks (Freeman, 1982). An ego-network can be obtained by extracting a sub-network from a full network and allows researchers to focus on the relationships within that single network.

This analysis does not aim to be representative of the entire community and is not generalisable. However, it can highlight some ideal types of behaviours in the various periods (Capone *et al.*, 2018). In order to identify different behaviours in the establishment of publishing co-authorships, all ego-networks of management scholars were analysed and the ideal types of the most common structures were identified for the different periods.

Figure 6 highlights some ego-networks. Some networks typical of the first two periods are presented in the first row. Figure 6.1 depicts a full professor as the research director of a research group composed of assistant professors and other external collaborations (probably PhDs, research fellows and foreign scholars). This ego-network is mostly present in the first two time windows. Figure 6.2 presents an ego-network that can be found in all periods, that is developed at a single university with local collaborations. This network is composed of full professors, associate professors, assistant professors and probably some PhD students (PhDs) or research fellows. Figure 6.3 highlights another characteristic ego-network present in this community, which we have named the ‘lone ranger’, that consists of a full professor who works exclusively with outsiders (PhDs and foreign scholars, most likely).

These ego-networks are quite traditional and highlight how the community once was, whereas Figures 6.4 and 6.5 highlight ego-networks that emerged in the last two time windows. Figure 6.4 highlights the role of a research directorship held by an associate professor in collaborations with assistant professors and externals. Figure 6.5 shows a further change in perspective, in which the research director with many collaborations and publications is a fixed-term assistant professor (RTD), a young scholar. This phenomenon most likely emerged in response to the need to publish at all costs by those in the most precarious positions.

Fig. 6: Some ego-networks of publishing behaviours



Legend: Red: full professor; Blue: associate professor; Dark green: permanent assistant professor. Light green: fixed-term assistant professor.

Source: our elaboration

5. Conclusions

The aim of this paper was to present the evolution of the publications of the Italian management community in international journals and to investigate the role of co-authorships against the backdrop of the growing use of collaborations in scientific research.

The first result of the research highlighted the growth in publications, both in quantity and quality, from Italian management scholars. The community has made important strides in terms of the number of articles published in international journals and the number of articles published in international journals with high impact. The study period lasted about twenty years and showed a clear evolution of the community.

The second result is related to the analysis of co-authorships, through social network analysis. We analysed the co-authorships network of the

community in four time windows, highlighting the differences between each period. This analysis was also based on the study of some ego-networks' characteristic of the various periods.

Using ego-network analysis we identified some different ideal types that highlight a relevant generation shift. In the first period, we had a few collaborative activities that essentially related to the academic pyramidal structure with the figure of the full professor at the centre. In the second period, very dense networks of relationships emerge characterized by horizontal relationships among young researchers, often random. This generational divide is also present in the co-authorships and is the analysis's most relevant result.

The last result concerns the analysis of co-authorships. In general, co-authorship dynamics changed considerably in the period, underlining new publishing behaviours within the management community. These different behaviours were observed across different positions, highlighting the increasing use of co-authorships by those in the most precarious positions within the University.

In particular, in the last of the four time window, fixed-term assistant professors (RTD) exceeded full professors in terms of research co-authorships. This phenomenon can be related to the 'publish or perish' discourse, where those in the most precarious jobs need to publish at all costs or leave the academia.

As for future trends, those in precarious university positions will be placed under even more stress, encouraging opportunistic behaviour and short-term goals to the detriment and impoverishment of the researcher role and profound consequence for the future of recruited scholars.

Finally, the study had some limitations as the analyses were limited to papers appearing in the Scopus database containing articles in indexed international journals. We did not consider books and articles in Italian journals, also important to Italian management scholars, such as *Sinergie - Italian Journal of Management*, which only recently finalised the process for inclusion in Scopus (Pastore, 2021). Moreover, an analysis based on the quality of publications, for instance with the number of citations was not conducted. Such analysis could reveal interesting patterns. In addition, a benchmarking analysis comparing the Italian scholars with another community or the same community in another country could enhance the research and allow a comparison of publishing and co-authorship behaviours.

Notwithstanding the limits of this work and possible improvements, this article presents a first interesting investigation of the publishing behaviours and dynamics of the Italian management community. It sheds light on some critical and important issues related to the community's evaluation and recruiting policies.

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