

A bridge to success: the role of management accountants' intellectual capital in driving organizational decision-making through knowledge management

Laura Broccardo, Elisa Ballesio, Muhammad Zafar Yaqub and Amiya Kumar Mohapatra

Abstract

Purpose – This manuscript aims to focus on the evolution of management accountants' (MAs) intellectual capital (IC) through the lenses of knowledge management (KM), emphasizing their knowledge, competencies and roles in the decision-making process for organizational success.

Design/methodology/approach – The authors conducted a systematic literature review, analyzing 118 articles published between 1980 and 2023 in Scopus-indexed and ABS-ranked journals.

Findings – The analysis reveals that company size, country, uncertainty, sustainability and technology significantly influenced and will continue to impact MAs' IC evolution, and, consequently, KM and strategic decision-making. However, the type of organization – public or private – was not found to have a significant influence. In addition, this paper profiles the evolution of MAs' skills, which nowadays range from professional to methodological to soft. Finally, the authors define four MA role categories – scorekeeper, watchdog, business partner and hybrid. Both roles and skills turn out to be crucial to perform not only traditional accounting tasks, but also to provide support in the strategy formulation process.

Practical implications – By identifying the necessary roles and skills for MAs, this manuscript assists in identifying potential gaps that may threaten organizational success. Managers could use this framework to design skills or role development programs, enhancing the competence portfolio and role tasks within their management accounting teams.

Originality/value – This work bridges a critical research gap by investigating the evolving roles and skills of MAs, from 1980 to 2023, in various contexts, through the lenses of KM. It also highlights research trends and knowledge gaps in the management accounting field and provides valuable theoretical and practical implications, as well as future research directions.

Keywords Knowledge management, Management accountant, Management accounting, Controller, Skills, Role, Competencies, Business strategy

Paper type Literature review

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1. Introduction

Strategic decisions are one factor that affects an organization's long-term success, which is essential for the business's survival (Nutt, 2008). In literature, the strategic decision-making process is explored through multiple lenses. In most cases, the investigation of this subject uses two distinct research techniques: content research that addresses diversification, mergers and company goal alignment, and process research that examines how strategic decisions are formed and executed and their influencing elements (Nutt, 2008; Elbanna, 2006; Rajagopalan *et al.*, 1997). Although content research was dominant in the past, process research is gaining interest (Elbanna, 2006; Rajagopalan *et al.*, 1997) because of the focus on strategy formulation and implementation. Consequently, the present study

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considers process research methods in conducting the analysis, focusing on a particular element that impacts strategic decisions, namely, management accounting.

Simply put, “managerial accounting” provides financial information that includes budgeting, forecasting, variance analysis, profit analysis and overall performance measurement of an organization (Wickramasinghe and Alawattage, 2007). It is mostly internally focused, whereas financial accounting is based on external reporting. In other words, “Managerial accounting is the process of identifying, measuring, analyzing, interpreting and communicating information to pursue organizational goals. It provides internal management with the information necessary to plan, control operation, and make decisions effectively” (Garrison *et al.*, 2020). *Management accounting* is the system that in a company aims at supporting the strategic decision-making process (SDMP) to implement company strategy, leading managers to make correct decisions (Burns and Scapens, 2000; Carnegie *et al.*, 2021; Chang *et al.*, 2023). However, at the same time, it dramatically influences strategic decision-making for organizational success (Ameen *et al.*, 2018), thus underlying the strong connections between management accounting and SDMP (Chang *et al.*, 2023; Hutahayan, 2020).

Moreover, the context of management accounting has seen a sea change over the years, where the evolution of these traditional methods can be dated back to the Industrial Revolution. The need to expand factories and industries led to the development of various methods and techniques, such as the standard costing method, variance analysis, budgeting, etc. (Tabitha and Ogungbade, 2016). These methods proved to be instrumental in improving the effectiveness and efficiency of the businesses. Moreover, the theme of management accounting has a long history of evolution, which emerged from cost accounting methods that mainly focus on efficiency and cost control and are now trading on data-driven approaches. Historically, management accounting has been used to track production costs in terms of job-order costing, process costing, etc. However, over the years, due to the volatile, uncertain, complex and ambiguous environment, technological advancements and new-age business models, managers and accountants have looked for sophisticated tools and techniques for resource allocation and performance evaluation (Otley, 2001).

More recently, contemporary approaches have been used to capture real-time financial and non-financial data based on activity-based costing, balanced scorecard approaches, including ESG-related compliances (Bebbington, and Unerman, 2018). Management accounting significantly contributes to an organization’s success through enkindling effective resource allocation and efficiency, performance management, risk analysis and ESG reporting (Booth *et al.*, 2000). The major drivers that have put forth the need for such innovative techniques can be attributed to globalization, mass competition and the need for big real-time data to enhance the speed and accuracy of complex decisions (Odonkor *et al.*, 2024). Thus, with the growing complexity, it is imperative to look into the new horizon of management accounting in the context of knowledge management (KM).

Nowadays, management accounting is undergoing profound and continuous changes caused by increasing globalization, regulations, advancing competition and uncertainty, economic crises, novelties in digitalization and evolving management philosophies and strategic aims (Wolf *et al.*, 2020; Oesterreich *et al.*, 2019; Burns and Baldvinsdottir, 2005; Scapens and Jazayeri, 2003). This evolution impacts management accounting and its practitioner, the management accountant (MA) (Wolf *et al.*, 2020). Managerial accounting helps assess the effectiveness of internal accounting systems and practices and the impact of these systems on decision-making. This includes, besides others, balanced scorecard and activity-based costing to assess an organization’s financial performance and decision quality (Kaplan and Norton, 1996; Chenhall and Langfield-Smith, 1998a). In addition, the education, experience and skills of accounting personnel/MAs play vital roles in enhancing an organization’s intellectual capital (IC). MAs are referred to as the “company economic conscience” and are expected to be cognizant of the organization’s

long-term viability (Möller *et al.*, 2020; Hiromoto, 2019), as their competencies and skills influence strategic decisions, thus affecting a company's success (Carnegie *et al.*, 2021; Salehi, 2024; Tayles *et al.*, 2002).

Profound attention must be paid to MAs, as they make a crucial component of an organization's IC. Generally speaking, "intellectual capital (IC) refers to the intangible assets, knowledge, expertise, and intellectual property that an organization possesses and utilizes to provide economic, utilitarian, social, and environmental benefits" (Intezari *et al.*, 2017; Wu *et al.*, 2022; Kerpedzhiev *et al.*, 2021). IC is challenging to manage effectively, even though it is an essential component of business success (Bamel *et al.*, 2022; Bellucci *et al.*, 2021; Huang *et al.*, 2021; Kujansivu and Lonnqvist, 2008). One of these challenges is represented by personnel's competencies or the immaterial connections with stakeholders. More specifically, MAs are the human capital aspect of IC, and thus, they should be protected and enhanced (Bellucci *et al.*, 2021). Researchers in the field of IC must underscore significant nonfinancial factors that could help cater to diverse stakeholders expectations as well as serve internal management objectives and external accountability requirements (Dumay *et al.*, 2020). Indeed, IC accounting research has progressed beyond its initial emphasis on measuring, managing and reporting IC. It has now transitioned toward comprehending IC from various viewpoints, including internal, regional, national, environmental and societal perspectives, as well as across different stages (Dumay, 2016). Focusing on the internal perspective, one relevant matter is truly represented by the competencies of MAs, who dispel multiple roles within organizations, including the preparation of financial reports, performance evaluation and recommendations provision to managers (Goretzki *et al.*, 2018; Maas and Matejka; Järvenpää, 2007; Pierce and O'dea, 2003), impacting a company's success. In the literature, as well as in this study, the terms "skills" and "competencies" are used interchangeably, and the concept of skills is not distinguished from competencies (Marin-Zapata *et al.*, 2022; Bamiatzi *et al.*, 2015; Attewell, 1990).

Moreover, IC is a dynamic system that evolves gradually, generates knowledge and receives input from both codified and tacit knowledge (Giampaoli *et al.*, 2021; Latilla *et al.*, 2019) and it is well-acknowledged as one of the most critical intangible resources for organizations to create *knowledge* (Paoloni *et al.*, 2020). Building the IC to understand how management encourages knowledge sharing and how to guarantee that knowledge contributes to an organization's performance and success is becoming a cardinal issue for firms these days (Carayannis *et al.*, 2021; Muhammed and Zaim, 2020; Ur Rehman *et al.*, 2022). Consequently, MAs are closely related to KM, as it is central to improving their IC, supporting the efficiency and effectiveness of MA systems and aiding organizational success (Mohajan, 2017). The recognition of MAs' skills and their consequent rapidly evolving role accentuate the critical importance of KM. This makes KM critical in attending to evolving IC requirements identified in the present literature. It goes beyond simply applying new capabilities and adjusting to different job activities; it involves an organization cocreating, extracting and/or appropriating value by deploying, sharing or propagating what each person has learned with the rest of their colleagues (Santoro *et al.*, 2018). As MAs try to improve the management of IC in response to this change (Wolf *et al.*, 2020; Oesterreich *et al.*, 2019), managing and sharing their knowledge is a crucial professional capability that they need going forward (Paoloni *et al.*, 2020; Vera-Muñoz *et al.*, 2006).

Based on the above discussion, this paper tries to clarify the development of MAs as IC of a company and how they can competently handle knowledge to influence strategic decisions to enhance organization excellence in a context marked by uncertainty and complexity.

More specifically, this work seeks to address the following research gaps.

First, despite a growing focus on the MAs' IC, discerning their role in shaping strategic decision-making within organizations remains constrained (Erhart *et al.*, 2017; Ojra *et al.*, 2021). Second, even though plenteous studies have tried to position management accounting

within the IC context (Cleary, 2015; Guthrie *et al.*, 2012; Roberts, 2003; Tayles *et al.*, 2007; Toorchi *et al.*, 2015; Wingren, 2004), and some explanations regarding how management accounting supports IC management have been provided, a gap in empirical academic literature needs to be filled (Novas *et al.*, 2017). Consequently, the primary concern is that management accounting and KM are related if knowledge is a resource (Novas *et al.*, 2017). Third, despite KM increasingly being recognized as a crucial process to gain competitive advantage (Santoro *et al.*, 2018; Dias and Bresciani, 2006), surprisingly little research has been conducted on how MAs' IC supports KM. Thus, the present work further expands our understanding of the evolving landscape of MAs' IC by delving into the instrumental role of KM.

In response to these calls, this study uses a systematic literature review (SLR) method to understand better the role of MAs' IC in strategic decision-making, answering the following research questions:

RQ1. What is the research profile of MAs' IC?

RQ2. How has the instrumentality of MAs' skills and roles in supporting management decisions evolved?

RQ3. What are the emerging issues regarding MAs' IC along the strategic decision-making process (SDMP)?

To answer the formulated research questions, we conducted an SLR, using the preferred reporting items for systematic reviews and meta-analyses (PRISMA) methodology (Liberati *et al.*, 2009) and following Massaro *et al.*'s (2016) and Tranfield *et al.*'s (2003) indications to be able to portray the progression and patterns of research on MAs' IC and KM. Thus, this research has multiple contributions that also highlight its originality. First, we provide an overview of the evolution of the IC of MAs from 1980 to 2023 regarding skills and roles, thus shedding light on the "Hybrid MA" role. Second, we review the extant literature on MA's IC based on company size, organizational type (public or private), country-specific considerations, uncertainty, sustainability, technology and how it influences strategic decision-making and KM for organizational success. Moreover, an additional contribution of the article is the advancement of knowledge on MAs' IC. Therefore, the results of this review and the ensuing discussion are indistinguishably useful to researchers and practitioners interested in exploring the potential of a MA's IC in strategic decision-making for organizational success.

The remainder of the article is organized as follows. Section 2 provides a brief overview of the research setting and used method. Section 3 presents a descriptive content analysis. Section 4 highlights the thematic evolution of the topic. Section 5 discusses the main findings. Section 6 concludes our study by providing implications and future research paths.

2. Research setting and methods

This section aims to provide definitions and theoretical models regarding the research setting and to establish a clear foundation for understanding the context and approach used in the study. Furthermore, the methodology is illustrated to ascertain this research's scientific validity and replicability.

2.1 Research setting and relevant definitions

Academics are required to specify the parameters and boundaries of SLRs. The authors have created a research protocol to build an extensive database of studies concerning MAs' IC in terms of roles and skills. The present study's scope and boundaries were defined through inclusion and exclusion criteria. Peer-reviewed articles published in ABS-ranked journals between 1980 and 2023 were included. As the preliminary search yielded no exciting results before 1980, we decided not to include publications published before the

1980s. Furthermore, [Wolf et al.'s \(2020\)](#) SLR also found no significant contribution to MAs' IC published before 1980, further cementing our assertions.

It is essential to underline that, in some countries, the MA is called "controller", and these nouns are used interchangeably within the literature ([Wolf et al., 2020](#); [Oesterreich et al., 2019](#); [de Loo et al., 2011](#); [Verstegen et al., 2007](#)). [Tayles et al. \(2002\)](#) reported the pivotal role MAs play in the decision-making process within organizations. MAs are referred to as the "company economic conscience" ([Möller et al., 2020](#); [Hiromoto, 2019](#)) due to their activity of performance evaluators and recommendation providers ([Goretzki et al., 2018](#); [Maas and Matejka, 2009](#); [Järvenpää, 2007](#); [Pierce and O'dea, 2003](#)). In this study, MA, as an organization's IC, carries out tasks related to management accounting practices ([Wolf et al., 2020](#)) and is investigated in the light of its skills, competencies and roles.

Focusing on MA's skills and competencies, [Attewell \(1990\)](#) defined the first as the ability, often acquired through training, experience or education, to perform a specific task or activity effectively. On the contrary, competencies are a broader concept that encompasses a combination of skills, knowledge, abilities and behaviors necessary to drive superior job performance ([Hartle, 1995](#); [Le Deist and Winterton, 2005](#); [Shet et al., 2022](#)). It is important to note that there is empirical evidence highlighting the words "skill" and "competence" can be used as synonyms due to their overlapping nature in practical applications ([Attewell, 1990](#); [Le Deist and Winterton, 2005](#)). Consequently, "skills" and "competencies" are used interchangeably in the present manuscript. [Oesterreich et al. \(2019\)](#) model was applied to categorize the different sets of MAs' skills. According to that study, there are five main categories of modern MAs' skills and competencies: professional (controlling and accounting skills, qualification and professional experience to perform job tasks), data science (quantitative data analysis for pattern recognition), information technology (IT) (communicate with computers and use IT applications), methodological (Systematically complete tasks and solve problems) and soft (personal and social competences) skills.

MA's role is defined as support and advice to the management of an organization in realizing its economic, public and/or financial goals ([Verstegen et al., 2007](#)). We categorize it using the [Fourné et al.'s \(2018\)](#) theoretical model, as it is deemed a suitable theoretical underpinning for studies investigating MAs' roles ([Rieg et al., 2023](#); [Fourné et al., 2018](#)) distinguish between scorekeeper (SK) or bean-counter (BC), watchdog (WD) and business partner (BP) controllers. In particular, SK MAs undertake routine duties such as monthly reporting and variance assessments, as well as the upkeep of internal financial systems; WD controllers monitor managers in terms of budgets and targets, as well as their adherence to performance standards and internal regulations; and BP MCs support the management in strategic or operational decision-making. Over the past decades, MA has evolved significantly, transitioning from traditional cost accounting to modern, data-driven and strategic approaches ([Goretzki et al., 2013](#); [Lambert and Pezet, 2011](#); [Scapens and Jazayeri, 2003](#)). In the Eighties and the Nineties, traditional MA emphasized financial reporting and cost control ([Sathe, 1983](#)), often limiting MAs' roles to that of SKs. However, from 2000s onwards, various drivers of change, such as technological evolution and globalization, as well as an increasing focus on strategic decision-making, have transformed MAs into key players in organizational strategy ([Scapens and Jazayeri, 2003](#)). Today, they are seen as crucial organizations IC, as they provide insights and support for achieving economic and financial goals ([Möller et al., 2020](#)).

The skills outlined above contribute to distinguishing the MA's IC. Thanks to their competencies, MAs can effectively perform their roles, supporting and advising management in achieving organizational goals. On the contrary, the distinction among the role categories is connected to the skills. It supports this study by linking how management accounting facilitates knowledge and KM in strategic planning. Therefore, this manuscript seeks to broaden the understanding of MAs from multiple perspectives rather than focusing on one, as in the studies of [Franke and Hiebl \(2023\)](#), [Wolf et al. \(2020\)](#), [Budding et al. \(2022\)](#), [Oesterreich et al. \(2019\)](#), [Ameen et al. \(2018\)](#) and [Fourné et al. \(2018\)](#).

2.2 Research method

This article uses the SLR method to assess the research streams related to MAs' skills and roles in the business, management and accounting domains. The original literature search was conducted in July 2023.

The SLR is a rigorous, transparent and replicable method for researchers to create high-quality reviews (Lelo de Larrea *et al.*, 2021; Tranfield *et al.*, 2003). It also provides a well-structured procedure that is detailed and simple, making it more convenient than the traditional narrative review method (Madanaguli *et al.*, 2023). In addition, it offers a systematic reviewing approach that is both lucid and easy to apply compared with a narrative review (Madanaguli *et al.*, 2023). Moreover, SLR also helps in a comprehensive understanding of the topic and spells out the intellectual development that has taken place in a particular domain. SLRs allow academics to find gaps and contradictions in scientific production (Paul *et al.*, 2021) and motivate them to establish a research agenda that contributes to these gaps (Massaro *et al.*, 2016). Given all the assumptions above, we consider SLR as an appropriate means to conduct this research because it is a scientifically valid and repeatable approach that leads relationships between inputs (Secinaro *et al.*, 2021) and allows the depicting of research trends in the present studies (Grisales *et al.*, 2023).

The methodologies proposed by Massaro *et al.* (2016) and Tranfield *et al.* (2003), as well as other SLRs within the management accounting and KM research field (Wolf *et al.*, 2020; Paoloni *et al.*, 2020; Senftlechner and Hiebl, 2015), were beneficial to us. The PRISM protocol (Liberati *et al.*, 2009) was adopted to conduct this SLR and identify relevant publications for this study. The four-stage PRISMA process is highlighted in Figure 1 and described below.

The search began by establishing the scope and boundaries of the study, after which a search string for database screening was formulated. The keywords used were derived from different aspects of MAs' IC. First, the authors performed a preliminary search on Google Scholar to ensure the comprehensiveness of the search terms. Second, the search string, based on these items, was run to retrieve manuscripts from reputed scientific databases. Only peer-reviewed articles published in journals with an ABS Ranking were included to keep this work scientifically rigorous. Criteria for inclusion and exclusion were, in conclusion, defined.

Post planning as execution of the first step, *identification* keywords were selected to generate a research string, based on the paper's aims and theoretical understanding of the topic. To understand the keywords used within the field, we first thoroughly analyzed conceptual manuscripts, pivotal studies and editorial pieces on Google Scholar; second, two experienced MA researchers assessed, discussed and agreed on the following research string: (TITLE-ABS-KEY ("management accountant*") OR TITLE-ABS-KEY ("managerial accountant") OR TITLE-ABS-KEY ("management controller*") OR TITLE-ABS-KEY ("cost accountant*") OR TITLE-ABS-KEY ("controller*") AND TITLE-ABS-KEY ("identity") OR TITLE-ABS-KEY ("role*") OR TITLE-ABS-KEY ("skill*") OR TITLE-ABS-KEY ("competence*")). The first part of the string features words related to MA and synonyms [Wolf *et al.* (2020) and Chenhall (2003) stated that the above terms can be used interchangeably]; the second pertains to roles (Wolf *et al.* (2020) state that it is difficult to differentiate between "identity" and role since they change interactively). In contrast, the third is skills (we benefited from the work of Marin-Zapata *et al.* (2022) and Attewell (1990). Data was retrieved from Scopus, a comprehensive database known for containing relevant and authoritative research and accurate data, metrics and analytical instruments (Secundo *et al.*, 2020; Thelwall, 2018). The original search returned 569 results.

In the next phase, namely, *screening*, the inclusion and exclusion criteria were defined to guarantee the scientific quality and relevance of the articles included. Table 1 further highlights the selected inclusion and exclusion criteria. First, as usually done for SLRs, we used language filtering to ensure that only English-published manuscripts were included (Lelo de Larrea *et al.*, 2021). Second, highly specialized manuscripts pertaining to fields such as engineering, computer science, mathematics and physics were excluded. Third, we chose to include only

Figure 1 PRISMA workflow

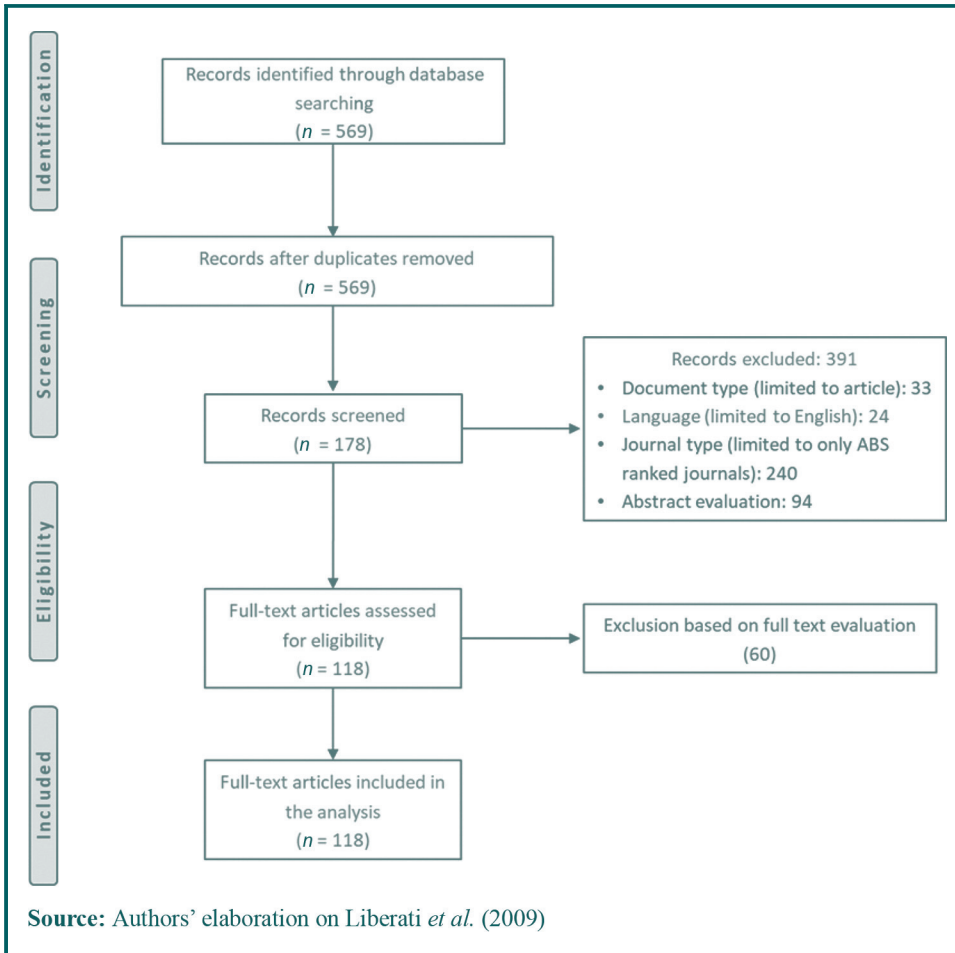


Table 1 Full inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Manuscripts focusing on MAs' roles and skills (competences) Manuscripts published from January 1, 1980, up to July 31, 2023* Peer-reviewed articles published in ABS-ranked journals Articles written in English Full-text-available articles	Manuscripts not focusing on MAs' roles and skills (competences) Gray literature, books, book chapters and conference proceedings Non-peer-reviewed articles. Non ABS-ranked journal articles Non-English-written articles Articles not available in full text
Note: *The rationale behind the inclusion of articles published from 1980 onwards is discussed in Section 2.1 of this manuscript Source: Authors' elaboration	

articles from peer-reviewed and ABS-ranked journals due to their scientific relevance (Massaro *et al.*, 2016) and because they are more likely to have undergone a rigorous peer-review process (Kaliannan *et al.*, 2023). This meant that we eliminated gray literature, books, book chapters and conference proceedings (Giacosa *et al.*, 2023).

The screening step resulted in 178 manuscripts for further review.

In the third step, *eligibility*, two academic MA experts thoroughly analyzed each paper's title, abstract, keywords, research aims and findings to exclude those whose research aim did not fall within this study's scope. We obtained a final database of 118 publications.

As [Massaro et al. \(2016\)](#) and [Tranfield et al. \(2003\)](#) advised, we started analyzing the papers after identifying our article data set. This included creating an.xlsx file. R-Studio's Bibliometrix package ([Aria and Cuccurullo, 2017](#)), as well as Microsoft Excel, were used to perform data analysis, to assess the evolution of the research stream, articles' geographic distribution, most influential sources and papers, most used methodologies and theories, countries and samples of analysis. The rationale for choosing the R-Studio package is based on the fact that it does not require any prerequisite knowledge of coding, which is often needed in other coding software such as Python and helps in the comprehensive presentation of the data with the help of visualization tools ([Sardana and Singhania, 2022](#)). To better examine the outputs, the knowledge structure was visually represented using data reduction techniques ([Aria and Cuccurullo, 2017](#)).

3. Descriptive content analysis

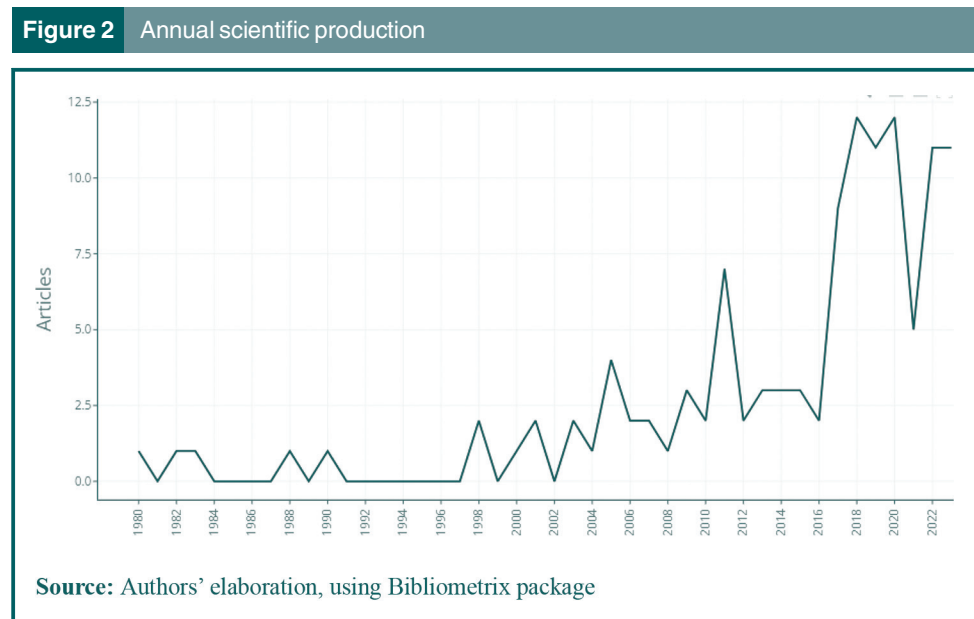
A descriptive analysis of 118 publications was conducted to detect current patterns and evolution within the literature, thus addressing *RQ1 – What is the research profile of MAs' IC?* This section will examine the primary bibliometric and methodological data in terms of annual scientific production, journal influence, citation analysis, research methodology, sample characteristics and country of analysis and theoretical lenses. R-Studio's Bibliometrix package ([Aria and Cuccurullo, 2017](#)) and Microsoft Excel were used to perform these analyses.

3.1 Annual scientific production

As [Figure 2](#) shows, the number of articles regarding MAs' skills and roles published yearly in Scopus-indexed and ABS-ranked journals has significantly fluctuated over the past 43 years.

At first glance, it is evident that the interest in this topic began to grow in 2017 (nine articles published). Despite a trough in 2021, probably due to the COVID-19 pandemic, there has been a sharp increase in annual scientific production since then.

The annual growth rate, calculated through R-Studio's Bibliometrix package ([Aria and Cuccurullo, 2017](#)), is 5.73%. 2023 was removed from the graph to prevent the results from



being distorted. However, as of July 2023, 11 articles, the same number as in 2022, have already been published, demonstrating the increasing relevance of this topic.

3.2 Journal influence analysis

Our literature data set includes 118 papers published in 50 different journals.

Concerning the journal influence, as proposed by Khatib *et al.* (2023), the authors decided to distinguish between productivity and impact. Specifically, we analyzed source productivity by examining the number of published documents, and we found that, as reported in Table 2, the *Journal of Management Control* (nine), *Management Accounting Research* (nine) and *Qualitative Research in Accounting and Management* (eight) are the three most productive journals.

Nine sources have at least five releases each, accounting for 50% of our article data set. Table 2 also demonstrates no significant concentration in the article distribution.

On the contrary, considering the source impact, as proposed by Kumar *et al.* (2020), we calculated the number of citations per journal based on the articles. Table 2 also highlights that the *European Accounting Review* tops the list, with 882 citations. However, it is only the fourth most productive source. In contrast, the *Journal of Management Control*, the most prolific source, has approximately 1/8th of the citations of *European Accounting Review*.

3.3 Citation analysis

According to our analysis, the most influential article (289 citations) was issued in 2003 and investigated how the implementation of an enterprise resource planning (ERP) system facilitated changes in the role of MAs, eliminating routine jobs, enabling line managers with accounting knowledge, providing more forward-looking information and expanding the accountants' responsibilities (Scapens and Jazayeri, 2003). It is followed by Burns and Baldvinsdottir's (2005) study (216 citations), which discusses the emergence of new team/process-oriented roles for "hybrid" accountants, and by Byrne and Pierce's (2007) paper (155 citations) that identifies a set of factors influencing the roles of MAs. It explores the consequences of how these roles are performed. All four top-cited papers (Byrne and Pierce, 2007; Järvenpää, 2007; Burns and Baldvinsdottir, 2005; Scapens and Jazayeri, 2003) were published by the *European Accounting Review*.

3.4 Methodology

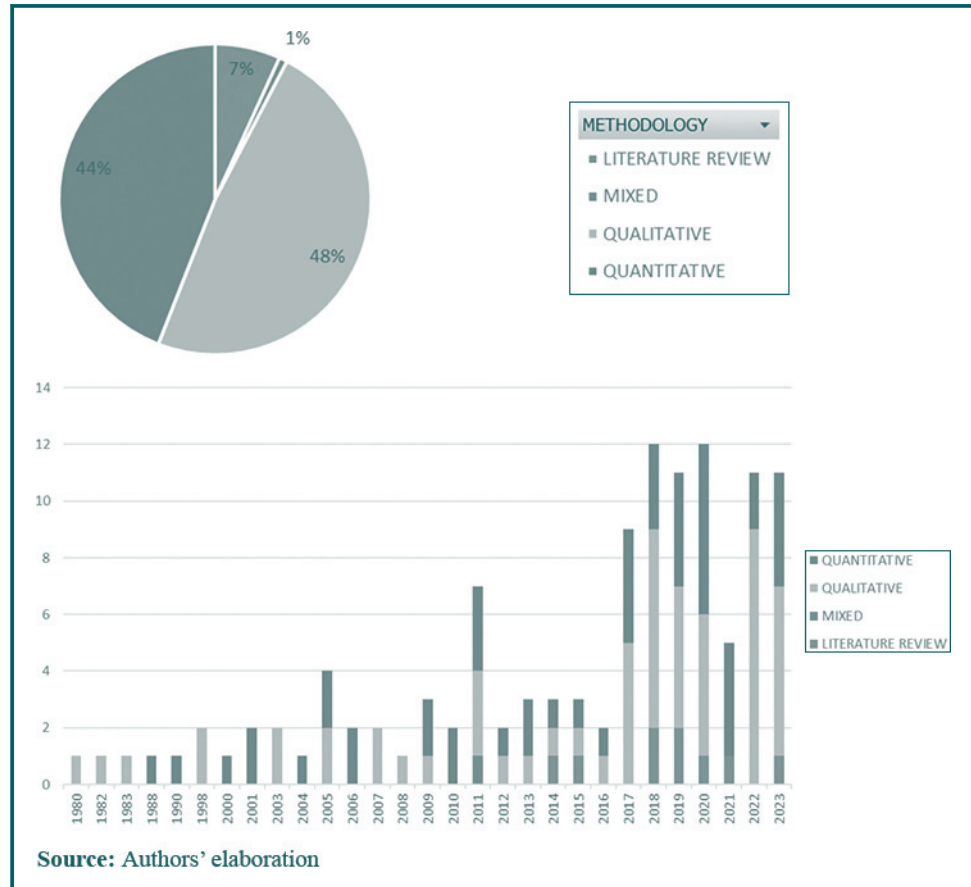
The reviewed studies, as shown in Figure 3, are mainly based on qualitative (48%) and quantitative methods (44%), except for eight literature reviews and one study that uses a mixed-method approach (Azan and Bollecker, 2011).

Table 2 Journal publications and citations

Journal publications		Journal citations	
Sources	Articles	Sources	Citations
<i>Journal of Management Control</i>	9	<i>European Accounting Review</i>	882
<i>Management Accounting Research</i>	9	<i>Management Accounting Research</i>	330
<i>Qualitative Research in Accounting and Management</i>	8	<i>Accounting, Organizations and Society</i>	245
<i>European Accounting Review</i>	6	<i>Accounting Education</i>	218
<i>Journal of Applied Accounting Research</i>	6	<i>Issues in Accounting Education</i>	171
<i>Journal of Accounting and Organizational Change</i>	6	<i>Accounting and Business Research</i>	148
<i>Accounting, Organizations and Society</i>	5	<i>Accounting Forum</i>	147
<i>Accounting Education</i>	5	<i>Journal of Management Control</i>	111

Source: Authors' elaboration

Figure 3 Methodological approaches and methodology evolution



Furthermore, as illustrated in Figure 3, unlike qualitative and quantitative studies, literature reviews and mixed-method articles began to be published only from 2010 onwards.

The quantitative papers apply many regression techniques, including ordinary least squares (e.g. Howcroft, 2017), logit (e.g. Lavigne, 2020), partial least squares (e.g. Hadidi and Al-Sayed, 2021) and probit (e.g. Ghosh and Bhuyan, 2023), and other methods, such as analysis of variance (e.g. Ghosh and Bhuyan, 2023), descriptive statistics (e.g. Adhariani, 2020) and factor analysis (e.g. Looknauth and Bélanger, 2018). This review highlights, therefore, a lack of mixed-method studies and literature reviews on the role and skills of MAs.

3.5 Sample characteristics and country of analysis

Our analysis reveals that with one notable exception that investigated only small and medium enterprises (SMEs) (Cheffi *et al.*, 2021) and five papers on both SMEs and large firms (i.e. Wenzig *et al.*, 2022; Rieg *et al.*, 2023), the majority of the empirical papers (59%) examined large publicly listed firms (i.e. Adhariani, 2020; Spraakman *et al.*, 2015). In total, 61% of the articles focus on private companies (i.e. Henttu-Aho *et al.*, 2023; Goretzki and Messner, 2019), 17% on public firms (i.e. Carlsson-Wall *et al.*, 2021; Paulsson, 2012), whereas eight studies investigate both public and private organizations (i.e. Lepistö and Ihantola, 2018; Ten Rouwelaar *et al.*, 2018).

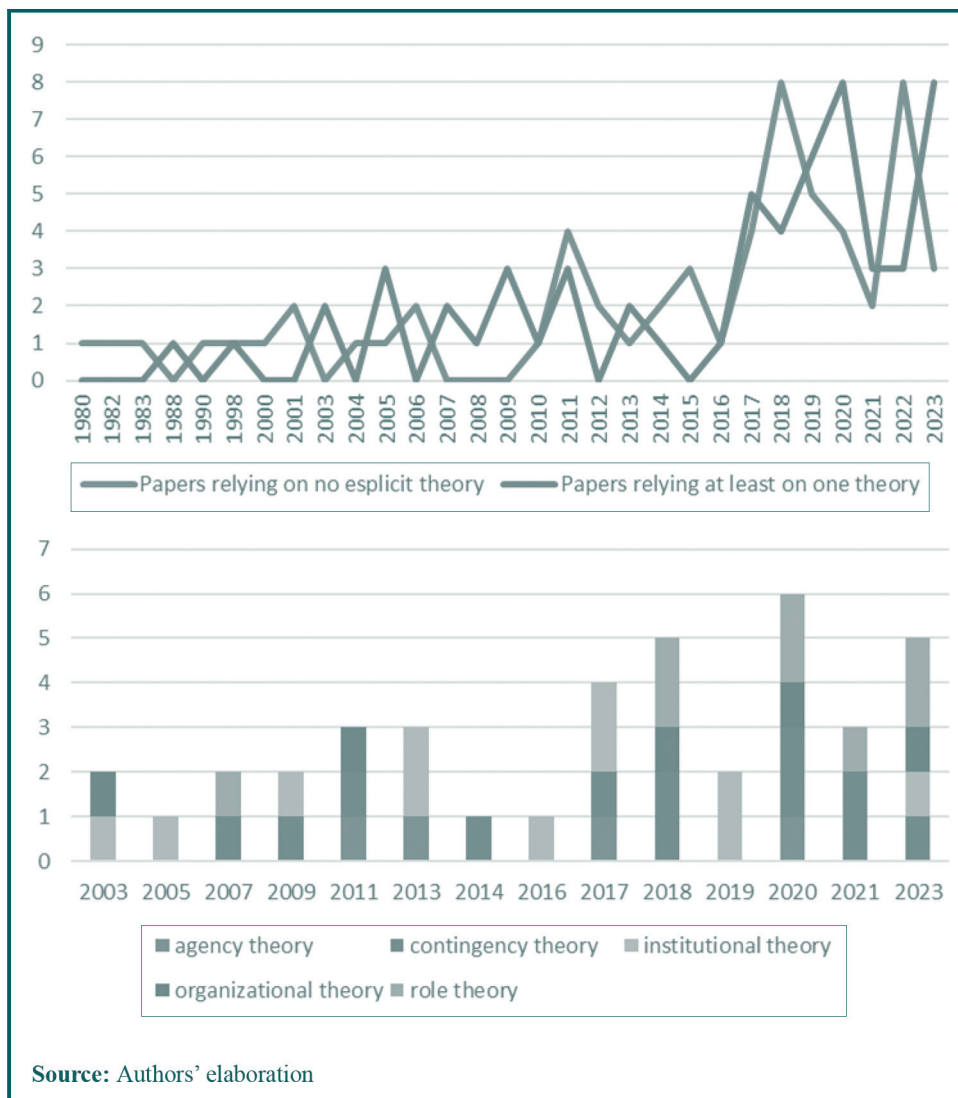
In total, 78 empirical papers (72%) focus on only one country's data, whereas 12 studies (11%) use multicountry data. Seven articles analyze two-country data (i.e. Enderich, 2014; Hassall

et al., 2005), four papers analyze three-country data (Fourné et al., 2023; Heinzelmann, 2018) and only one study analyzes five-country data (Lambert and Sponem, 2011). In total, 67% of the analyzed studies focus on European countries. UK (14 papers), Germany (13 papers), the Netherlands (9 papers), France (8 papers), USA (7 papers), Austria (6 papers) and Sweden (5 papers) are the most frequently studied nations. Even though the articles within our sample analyze at least one country per continent, research on MAs' competencies and roles in Africa, Latin America, Oceania and Eastern Asia is underrepresented in the literature.

3.6 Theoretical lenses

Analyzing the theoretical lens applied to this research field, it emerged that 60 studies (51%) do not explicitly depend on any theory. This could indicate that this research field is lacking theoretical underpinning. However, as shown in Figure 4, starting from 2016, at least one paper per year refers to a theory. Among the 58 manuscripts using theoretical lenses,

Figure 4 Theoretical lenses evolution



Source: Authors' elaboration

44 rely on one theory, 8 on two theories and 5 on three theories. A wide range of theories are used; for example, contingency theory (12), institutional theory (11), role theory (8), organizational theory (5) and agency theory (4) are the most used ones, as shown in Figure 4. Before 2003, papers used basic accounting theory (Kaye, 1988) and labor process theory (Bowerman and Hutchinson, 1998).

4. Management accountants' intellectual capital thematic evolution

To organize the findings, all 118 studies were analyzed to pinpoint their common themes. To realize our objectives, we used content analysis, a widely used research method for systematically classifying, identifying and coding themes in textual data (Hsieh and Shannon, 2005). Our approach consisted of three steps to ensure an unbiased and transparent report. First, one author gave each study on the shortlist an open code. Second, the authors combined the previously allocated open codes into axial codes using both deductive and inductive methods. Finally, we assessed the axial codes to reach a consensus regarding the classification of the various theme dimensions featured in this study.

The following sections highlight the thematic evolution from 1980 to 2023 related to MAs' IC, coding the roles and the related competencies and skills valuable in the KM and decision-making process, addressing RQ2 – *What are MAs' skills and roles evolution in supporting management decisions?* The themes' evolution and subthemes over time are presented in Figure 5, created through R-Studio's Bibliometrix package (Aria and Cuccurullo, 2017). Based on previous and reputed literature (Burns and Baldvinsdottir, 2005; Wolf et al., 2020), the period from 1980 to 2023 is segmented into five intervals, thanks to four cutting points: the first in 1991, the second in 2001, the third in 2011 and the fourth in 2017.

Each subsection, from 4.1 to 4.5 will illustrate the required MAs' roles and skills for each period. Tables from 3 to 10 provide a summary of what is stated in the paragraphs, by highlighting the most important papers published in each subperiod.

4.1 From 1980 to 1990 – “Information Provider”

Research on MAs' competencies and roles was still in its early phases between 1980 and 1990; fewer clusters were developed, and more general words were used. Indeed, Figure 5 highlights two theme clusters (“ACCOUNTING” and “MANAGEMENT”) for the first period.

Table 3 provides an overview of MAs' roles between 1980 and 1990.

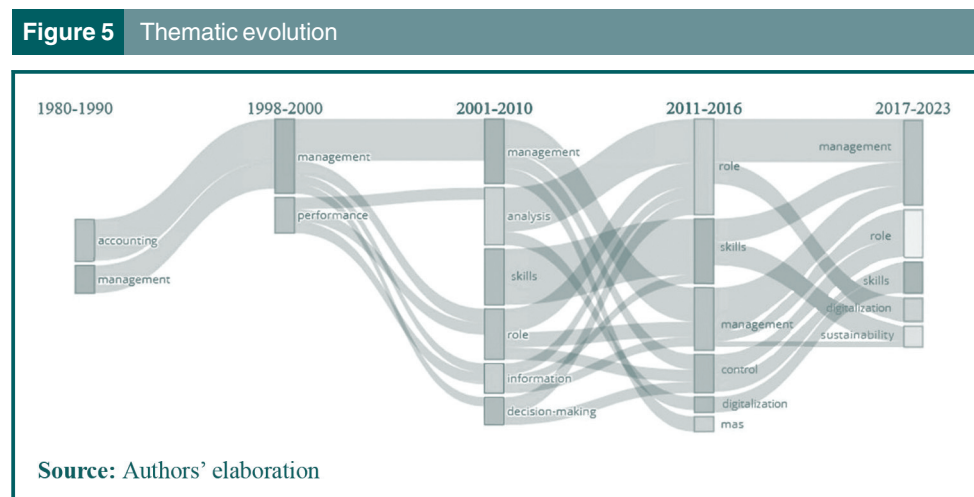


Table 3 MAs' role(s) between 1980 and 1990 – private and public companies

Category	Description	References
Business partner	Support to the management in the decision-making process	Sathe (1983) Rickwood <i>et al.</i> (1990)
Watchdog	Internal control practices compliance with corporate policy and procedures	Sathe (1983)
Scorekeeper	Providing accurate financial information on the company's situation	Sathe (1983)

Source: Authors' elaboration

Scholars argue that MCs' role, in both public and private organizations, consisted of assisting the management team in the KM and decision-making process (Rickwood *et al.*, 1990; Sathe, 1983) and ensuring that reported financial information is accurate and that internal control practices comply with corporate policy and procedures (Sathe, 1983). According to Sathe (1983), there is a conflict between these duties, as the first one necessitates active management participation, whereas the second requires a sense of independence from related management. To overcome such paradoxes, controllers must have, in addition to technical competencies in the accounting and analytical fields, strong communication and interpersonal skills (Sathe, 1983), as highlighted in Table 4.

Furthermore, Table 5 shows the abilities required by public sector MAs. According to Rosenberg *et al.* (1982), public sector MAs' skills differed slightly from those of private controllers, as they had to add to their "financial competencies" political and managerial skills to adapt to their sphere of activity efficiently.

4.2 From 1991–2000 - "Non-Strategic" role

The second period (1991–2000) features two theme clusters as well ("PERFORMANCE" and "MANAGEMENT"), highlighting that research on MAs' competencies and roles was still in its

Table 4 MAs' skills profile between 1980 and 1990 – private companies

Category	Skills	Description	References
Professional skills	Accounting knowledge	Specific abilities from the controlling, finance, tax and accounting disciplines	Sate (1983)
	Market and business understanding	Understanding of the company's needs and business; strategic planning	Kaye (1988)
Methodological skills	Analytical skills	Ability to analyze data and information, discover the reasons for events and draw appropriate conclusions	Sathe (1983)
Soft skills	Communication skills	Capability to assess what is relevant to management and give recommendations	Sathe (1983)
	Interpersonal skills	Ability to build relationships and gain influence, and to constructively challenge management	
	Entrepreneurial thinking	Entrepreneurial spirit to provide value to the organization	

Source: Authors' elaboration

Table 5 MAs' skills profile between 1980 and 1990 – public companies

Category	Skills	Description	References
Professional skills	Accounting knowledge	Specific abilities from the controlling, finance and accounting disciplines	Rosenberg <i>et al.</i> (1982)
Soft skills	Political and negotiating skills	Ability to navigate and understand the workplace organization, build relationships and effectively communicate with colleagues and stakeholders	Rosenberg <i>et al.</i> (1982)
	Managerial skills	Leadership, communication, decision-making and team management	
	Ability to work in teams	Capability to work in cross-functional and interdisciplinary teams	

Source: Authors' elaboration

Table 6 MAs' skills and role(s) profile between 1991 and 2000 – public companies

Category	Skills	Description	References
<i>Roles</i>			
Business partner		Support to the management in the decision-making process	Bowerman and Hutchinson (1998)
Watchdog		Support in the environmental decision-making	
Scorekeeper		Design and implementation of control systems Providing accurate financial information on the company's situation	
<i>Skills</i>			
Professional skills	Accounting knowledge	Specific abilities from the controlling, finance and accounting disciplines required for traditional controlling tasks	
	Environmental accounting skills	Ability to understand and integrate environmental factors into the decision-making processes	
	General business skills	Competencies, knowledge and expertise to effectively manage, operate and thrive in the business environment	
Soft skills	Social skills	Capability to liaise with teams and senior management	
	Interpersonal skills	Ability to build relationships and gain influence, and to constructively challenge management	

Source: Authors' elaboration

Table 7 MAs' skills and role(s) profile between 1991 and 2000 – private companies

Category	Skills	Description	References
<i>Roles</i>			
Business partner		Support to the management in the decision-making process Support in the SHRM process Support during organizational change	Kouhy and Vedd (2000) Chenhall and Langfield-Smith (1998a)
Watchdog		Targets setting Performance measurement PMS development Planning and control	
Scorekeeper		Providing accurate financial information on the company's situation	Chenhall and Langfield-Smith (1998b)
<i>Skills</i>			
Professional skills	Accounting knowledge	Specific abilities from the controlling, finance, tax and accounting disciplines required for traditional controlling tasks	Chenhall and Langfield-Smith (1998a)
	Market and business understanding	Understanding of the company's needs and business Strategic planning	
Methodological skills	Analytical skills	Ability to analyze data and information, discover the reasons for events, draw appropriate conclusions and deal with nonfinancial performance indicators	Chenhall and Langfield-Smith (1998b)
Soft skills	Social skills	Capability to liaise with teams and senior management	Chenhall and Langfield-Smith (1998a)
	Interpersonal skills Openness to change	Ability to build relationships and gain influence, and to constructively challenge management Ability and willingness to adapt to changes, new processes, new tasks and new technology	

Source: Authors' elaboration

early phases. However, we have noticed an evolution in the role of MAs, particularly in the context of environmental considerations, HR management and organizational change, as reported in [Tables 6 and 7](#).

According to [Bowerman and Hutchinson \(1998\)](#), MAs in public organizations play a crucial role in environmental decision-making by providing information on environmental impacts and costs and preventing excessive use of environmental resources. Nevertheless, the same study highlights how MAs are not strategically involved in supporting environmental policy decisions, as they are still relegated to a bookkeeper role and need general business and environmental skills.

On the contrary, as reported in [Table 7](#), in private firms, MAs play a crucial role in providing information for KM and decision-making, setting targets and performance measurement in the Strategic Human Resource Management (SHRM) process ([Kouhy and Vedd, 2000](#)), and in developing performance measurement systems (PMS) within organizations undergoing change ([Chenhall and Langfield-Smith, 1998](#)). Scholars also stress the importance of training in enhancing the social and technical skills of an MA ([Chenhall and Langfield-Smith, 1998b](#)).

4.3 From 2001 to 2010 - “Business Controller”

In the third period, the authors noticed a sharp increase in the theme clusters (“MANAGEMENT”, “ANALYSIS”, “SKILLS”, “ROLE”, “INFORMATION”, and “DECISION-MAKING”) due to an enormous number of publications. In the second transition (from 1991 to 2000 to 2001 to 2010), some links are worth highlighting: the links between “MANAGEMENT” and “PERFORMANCE”, and “INFORMATION”; “PERFORMANCE” and “ANALYSIS”; “MANAGEMENT” and “DECISION-MAKING.” They are reflected in the findings of [Joshi and Bremser \(2004\)](#), who stated that there is a gradual shift in MAs’ roles, as they are becoming more entwined with those of other functional areas and involve increased participation in information systems, related technology, long-term strategic planning and decision-making among the new tasks. Their findings align with [Ma and Tayles’s \(2009\)](#) and [Aaver and Cadez’s \(2009\)](#) studies, highlighting a shift from purely financial concerns to a more strategic role within organizations. However, [Aaver and Cadez \(2009\)](#) also found that participation varies significantly among industries, as it is pretty high in manufacturing industries, trade and tourist and hospitality services, whereas it is relatively low in public services and utilities, construction and logistics. [Scapens and Jazayeri’s \(2003\)](#) study shows that the automatization of routine accounting tasks due to the implementation of ERP systems is responsible for the evolving role of MAs, emphasizing their transition from being primarily simple information providers and controllers of the business to becoming more actively involved in cross-functional management teams and day-to-day business operations, offering direct support to business managers in the KM and decision-making process.

On the contrary, [Burns and Baldvinsdottir \(2005\)](#) stated that globalization and internationalization, changing management philosophies and strategic aims, organizational restructuring and the pro-action of prominent groups and individuals are all factors to consider regarding MAs’ role evolution. Furthermore, [Table 8](#) provides an overview of MAs’ role and skills requirements between 2001 and 2010. We found no significant differences between public and private companies from 2001 onward.

To cope effectively with this role evolution and accomplish their duties, controllers must develop vocational ([Hassall et al., 2005](#); [Hassall et al., 2001](#); [Montano et al., 2001](#)), professional, analytical, IT ([Scapens and Jazayeri, 2003](#); [Joshi and Bremser, 2004](#); [Järvenpää, 2007](#)) and managerial skills ([Joshi and Bremser, 2004](#)) and need a broad understanding of the business rather than just technical accounting knowledge. [Bots et al. \(2009\)](#) also argued that the skills depend on a person’s age and experience, as newly graduated controllers have mostly cognitive and technical abilities, such as accounting and computer literacy. In contrast, experienced controllers have more analytical and design skills, like analysis/problem structuring or organization management.

4.4 From 2011 to 2016 – The Seismic Shift

The fourth period features six theme clusters “ROLE”, “SKILLS”, “MANAGEMENT”, “CONTROL”, “DIGITALIZATION”, “MAS” (management accounting systems)].

The years between 2011 and 2016 witnessed an evolution in the skills and role shifts of MAs, whose origins can be attributed to the adoption of new technologies implementation ([Azan and Bollecker, 2011](#); [Spraaakman et al., 2015](#)), globalization

Table 8 MAs' skills and role(s) profile between 2001 and 2010 – private and public companies

Category	Skills	Description	References
<i>Roles</i>			
Business partner		Support to the management in the decision-making process Support in the SHRM process Long-term strategic planning	Scapens and Jazayeri (2003) Järvenpää (2007) Byrne and Pierce (2007)
Watchdog		Interpret the financial and nonfinancial information Designing and changing control systems Risk monitoring	Vedd and Kouhy (2005)
Scorekeeper		Internal and external reporting Supervising and maintaining accounting information systems Managing the accounting and financial functions Providing accurate financial information on the company's situation Compliance with regulatory bodies	
<i>Skills</i>			
Professional skills	Accounting knowledge Market and business understanding Intellectual skills	Specific abilities from the controlling, finance and accounting disciplines required for traditional controlling tasks Understanding of the company's needs and business; Strategic planning Capacity of inquiry, research and logical thinking; Powers of reasoning and critical analysis	Scapens and Jazayeri (2003) Joshi and Bremser (2004) Järvenpää (2007) Montano <i>et al.</i> (2001) Burns and Baldvinsdottir (2005)
IT skills	Technical skills	Ability to communicate with computers and machines Detailed IT know-how and the ability to use IT applications (i.e. ERP systems, Microsoft Office)	Scapens and Jazayeri (2003) Joshi and Bremser (2004) Järvenpää (2007)
Methodological skills	Analytical skills Problem-solving skills Pressure and time management	Ability to analyze data and information and draw the right conclusions Quickly recognizing problems and developing effective solutions Organizing workloads effectively to meet deadlines and skillfully selecting and assigning priorities	Joshi and Bremser (2004) Montano <i>et al.</i> (2001) Järvenpää (2007)
Soft skills	Communication skills Interpersonal skills Openness to change Managerial skills Ability to work in teams Ethical attitude	Strong written and verbal communication abilities Being flexible, proactive and able to relate to colleagues from diverse backgrounds and professions Ability and willingness to adapt to changes, new processes, new tasks and new technology Management, marketing and operational expertise Collaborate effectively, assume leadership positions and skillfully organize and delegate tasks in cross-functional and interdisciplinary teams Awareness of social and ethical responsibilities	Montano <i>et al.</i> (2001) Järvenpää (2007) Scapens and Jazayeri (2003) Hassall <i>et al.</i> (2001) van den Brink <i>et al.</i> (2003) Kennedy and Sorensen (2006)

Source: Authors' elaboration

(Halbouni and Nour, 2013), uncertainty (Hartmann and Maas, 2011) and the 2007–2008 economic crisis (Endenich, 2014). Table 9 overviews MCs' role and skills requirements between 2011 and 2016.

As in the previous period, thanks to the automation of ordinary accounting tasks due to technological advancements (Azan and Bollecker, 2011), MAs are required not only to provide and control but also to interpret data and proactively advise managers (Goretzki *et al.*, 2013; Lambert and Pezet, 2011). This task expansion makes them “value-adding firm members” (Goretzki *et al.*, 2013), as they are recognized as knowing subjects and organizational truth-tellers (Lambert and Pezet, 2011). IT and data science skills are, thus, essential (Azan and Bollecker, 2011; Culasso *et al.*, 2016; Weber, 2011) for MAs to understand how the ERP systems work and interact with each other and where the relevant data reside (Spraaakman *et al.*, 2015). Furthermore, Spraaakman *et al.* (2015) also highlight that the required IT and data science skills vary over time due to the continued evolution of technology. Azan and Bollecker (2011) discussed how interpersonal

Table 9 MAs' skills and role(s) profile between 2010 and 2016 – private and public companies

Category	Skills	Description	References
<i>Roles</i>			
Business partner Watchdog Scorekeeper		Support to the management in the decision-making process	Weber (2011) Lambert and Sponem (2011) De Loo <i>et al.</i> (2011) Azan and Bollecker (2011) Culasso <i>et al.</i> (2016) Lawson <i>et al.</i> (2015) Hartmann and Maas (2011)
		Support to the management in the identification of performance and risk indicators and critical success factors	
		(Long-term) strategic planning	
		Interpret the financial and nonfinancial information	
		Socializing operational managers	
		Enabling budget use	
		Designing and changing management control and PM systems	
		Maintaining management control systems	
		Risk and financial monitoring	
		Communicating figures and what they mean	
		Controlling managerial behavior	
		Internal audit	
	Coercive budget use		
	Internal and external reporting		
	Supervising and maintaining accounting information systems		
	Managing the accounting and financial functions		
	Providing accurate financial information on the company's situation		
	Compliance with regulatory bodies		
<i>Skills</i>			
Professional skills	Accounting knowledge	Specific abilities from the controlling, finance and accounting disciplines required for traditional controlling tasks	Weber (2011) Webb and Chaffer (2016) Goretzki <i>et al.</i> (2013) Azan and Bollecker (2011) Lawson <i>et al.</i> (2015) Azan and Bollecker (2011)
	Market and business understanding	Understanding of the company's needs and business	
	Intellectual skills	Strategic planning Capacity of inquiry, research and logical thinking; Powers of reasoning and critical analysis	
Data science skills	Programming skills Algorithmic skills	Coding and scripting ability to provide added value from data analysis Capability to design, analyze and implement algorithms to solve computational problems efficiently and effectively	Azan and Bollecker (2011)
IT skills	Technical skills	Ability to communicate with computers and machines Detailed IT know-how and the ability to use IT applications (i.e. ERP systems, Microsoft Office)	Weber (2011) Spraaikman <i>et al.</i> (2015) Culasso <i>et al.</i> (2016)
Methodological skills	Analytical skills Problem-solving skills Pressure and time management	Ability to analyze data and information and draw the right conclusions, deal with nonfinancial performance indicators Quickly recognizing problems and developing effective solutions Organizing workloads effectively to meet deadlines and skillfully selecting and assigning priorities	Azan and Bollecker (2011) Webb and Chaffer (2016) Paulsson (2012) Culasso <i>et al.</i> (2016) Lawson <i>et al.</i> (2015)
Soft skills	Communication skills Interpersonal skills Openness to change Managerial skills Ability to work in teams Ethical attitude Entrepreneurial thinking Self-motivation Resilience	Strong written and verbal communication abilities (also in foreign languages) Presentation and negotiating skills Being flexible, proactive and able to relate to colleagues from diverse backgrounds and professions Ability and willingness to adapt to changes, new processes, new tasks and new technology Management, marketing and operational expertise Collaborate effectively, assume leadership positions and skillfully organize and delegate tasks in cross-functional and interdisciplinary teams. Awareness of social and ethical responsibilities Entrepreneurial way of thinking to provide added value to the firm Ability and willingness to take the initiative to learn, adapt and develop one's knowledge and skills continuously Ability to bounce back from setbacks, adapt to challenging situations and maintain a positive attitude and performance under pressure or adversity	Azan and Bollecker (2011) Webb and Chaffer (2016) Siriwardane <i>et al.</i> (2015) Lawson <i>et al.</i> (2015)

Source: Authors' elaboration

relationships have changed significantly as communication occurs through integrated tools rather than face-to-face. However, Paulsson (2012) and Lawson *et al.* (2015) emphasized the importance of communication and interpersonal skills. MAs' roles will inevitably be marginalized if they cannot successfully relate to and communicate with

others in effective KM and supporting the decision-making process. Furthermore, according to [Lawson et al. \(2015\)](#), MAs' foundational skills are communication, analytical, problem-solving, interpersonal and IT competencies.

According to [Endenich \(2014\)](#) and [Hartmann and Maas \(2011\)](#), the economic crisis and the resulting situation of uncertainty were characterized as drivers of the evolution of MAs' role, as they have become responsible for carrying out the fundamental phases of risk and new business opportunities identification, description, estimation and evaluation ([Culasso et al., 2016](#)), to make the right decisions. Uncertainty has led to the need for more soft skills, such as resilience ([Webb and Chaffer, 2016](#)).

It should be highlighted, however, that such shifts affect large organizations more than SMEs, which are more involved in local, diversified and often accounting-oriented rationalities ([Azan and Bollecker, 2011](#)). In addition, MAs' tasks also differ according to the country: for example, in the USA, they are primarily responsible for financial monitoring, whereas, in France, they are more involved in budgetary activities, managerial accounting, economic and statistical analysis and strategic planning ([Azan and Bollecker, 2011](#)).

Furthermore, in large enterprises, different MAs have varied functions, making it difficult to establish a single designation such as BC/SK, WD, or BP that suits their positions ([Paulsson, 2012](#)).

4.5 From 2017 to 2023 – “Evolved professional”

In the fifth period, the authors found five clusters (“MANAGEMENT”, “ROLE”, “SKILLS”, “DIGITALIZATION” and “SUSTAINABILITY”).

According to [Oesterreich et al. \(2019\)](#), the evolution of MAs' role and skills in the fifth period is attributed to three forces: external forces, such as globalization, regulations, increased competition, technological forces, namely, advancements in new technologies adoption and implementation, and internal forces within the organization, i.e. changes in the organizational structure, value chain and supply chain. [Table 10](#) overviews MCs' role and skills requirements between 2017 and 2023.

Increased innovation and transparency necessitate a higher involvement of MAs in managerial decision-making, requiring them to focus more on business-related problems rather than manual BC tasks ([Carlsson-Wall et al., 2021](#); [Pasch, 2019](#)). This is in line with the findings of [Erhart et al. \(2017\)](#), [Goretzki et al. \(2018\)](#) and [Janin \(2017\)](#), who stated that controllers can take an active part in the development of an organization's strategy and interactions with the external environment. However, despite some studies (i.e. [Jakobsen et al., 2019](#); [Janin, 2017](#)) highlighting the transition from a SK (BC) to a BP role, the majority of the papers state that clear-cut roles and transition to one role are too simplistic ([Rieg, 2018](#)), preferring a “hybrid role”, characterized by a combination of SK, WD and BP ([Karlsson et al., 2019](#); [Rieg et al., 2023](#)). To accomplish their tasks, MAs are thus required to have, alongside technical accounting skills and knowledge, KM ([Lepistö and Ihtantola, 2018](#)), data science skills ([Franke and Hiebl, 2023](#)) and a wide range of soft skills ([Adhariani, 2020](#); [Endenich et al., 2017](#)), to support the decision-making process. The need for soft skills is higher in the public sector ([Budding et al., 2022](#)). Furthermore, interpersonal and social skills, specialized knowledge/expertise, professional strength and boss mentoring are crucial for women to reach leadership positions as MAs ([Cimirotić et al., 2017](#)). Gender balance and environmental concerns have gained significant importance in the past years due to the spread of the concept of “corporate sustainability” (CS). Scholars have demonstrated a positive effect on firm performance when MAs are involved in sustainability management processes ([Cheffi et al., 2021](#)), thanks to their accounting capabilities to measure, record, monitor and verify data ([Wenzig et al., 2022](#)). However, [Wenzig et al. \(2022\)](#) also found that controllers are not involved in CS, as they lack sustainability skills and do not see sustainability accounting as important to the core business or the MA function.

Table 10 MAs' skills and role(s) profile between 2017 and 2023

Category	Skills	Description	References	
<i>Roles</i>				
Business partner		Support to the management in the decision-making process concerning sustainability	Wilbanks <i>et al.</i> (2017)	
		Support to the management in the identification of performance and risk indicators and critical success factors	Erhart <i>et al.</i> (2017)	
		(Long-term) strategic (green) planning	Janin (2017)	
		Interpret the financial and nonfinancial information	Enderich <i>et al.</i> (2017)	
		Socializing operational managers	Robalo and Gago (2017)	
		Enabling budget use	Ten Rouwelaar <i>et al.</i> (2018)	
		Facilitate the organization's interactions with the external environment	Pasch (2019)	
		Trust-builder	Karlsson <i>et al.</i> (2019)	
		Support in strategic capital investment process	Cavélius <i>et al.</i> (2020)	
		Support in the company's digital transformation process	Lavigne (2019)	
		Corporate social responsibility (CSR) management	La Paz <i>et al.</i> (2020)	
		Support in project management	Cheffi <i>et al.</i> (2021)	
		Managing uncertainty	Malagueño <i>et al.</i> (2021)	
		Act as facilitators of corporate sustainability for top management	Wenzig <i>et al.</i> (2022)	
		Support in the product innovation process	Munir <i>et al.</i> (2023)	
		Translating big data into high-quality decisions	Franke and Hiebl (2023)	
		Moderating/filtering accounting information	Rieg <i>et al.</i> (2023)	
		Information sense-giving	Järvenpää <i>et al.</i> (2023)	
	Watchdog		Supporting teams and operational units in helping themselves and learning how to perform the job themselves (educator/coach)	Holmgren Caicedo <i>et al.</i> (2018)
			Designing and changing management control and PM systems	Mack and Goretzki (2017)
		Maintaining management control systems	Wilbanks <i>et al.</i> (2017)	
		Risk and financial monitoring	Goretzki <i>et al.</i> (2018)	
		Communicating figures and what they mean	Holmgren Caicedo <i>et al.</i> (2018)	
		Controlling managerial behavior	Ahmed (2018)	
		Internal audit	Oppi and Vagnoni (2020)	
		Coercive budget use	Weber and Wiegmann (2021)	
		Make sure managers are aligned with top management's interests	Lavigne (2019)	
		Information gatekeeping	La Paz <i>et al.</i> (2020)	
		Targets setting	Bruesch and Quinn (2022)	
Scorekeeper			Internal and external reporting	Wenzig <i>et al.</i> (2022)
		Supervising and maintaining accounting information systems	Rieg <i>et al.</i> (2023)	
		Managing the accounting and financial functions	Janin (2017)	
		Providing accurate financial information on the company's situation	Enderich <i>et al.</i> (2017)	
		Compliance with regulatory bodies	Byrne and Pierce (2018)	
		Operations management	Goretzki <i>et al.</i> (2018)	
		Use sustainability data for integrated reporting to external stakeholders	Holmgren Caicedo <i>et al.</i> (2018)	
		Include environmental and social costs in systems and structures	Ahmed (2018)	
			Szukits (2019)	
			Lavigne (2019)	
<i>Skills</i>				
Professional skills	Accounting knowledge Market and business understanding Intellectual skills Sustainability skills	Specific abilities from the controlling, finance and accounting disciplines required for traditional controlling tasks	Oesterreich <i>et al.</i> (2019)	
		Understanding of the company's needs and business	Janin (2017)	
		Strategic planning	Howcroft (2017)	
		Capacity of inquiry, research and logical thinking	Byrne and Pierce (2018)	
		Powers of reasoning and critical analysis	Goretzki <i>et al.</i> (2018)	
		Technical knowledge in corporate sustainability (CS); integrating sustainable practices into decision-making	Lepistö and Ihantola (2018)	
			Adhariani (2020)	
			La Paz <i>et al.</i> (2020)	
			Wenzig <i>et al.</i> (2022)	
			Rieg <i>et al.</i> (2023)	
Data science skills	Programming skills Algorithmic skills Data analytics skills Statistical skills	Coding and scripting ability to provide added value from data analysis	Ala-Heikkilä and Järvenpää (2023)	
		Capability to design, analyze and implement algorithms to solve computational problems efficiently and effectively	Wenzig <i>et al.</i> (2022)	
		Proficiency in quantitative and statistical methods for data mining; data acquisition, preparation, integration, analysis and visualization; identifying patterns and interrelations within large datasets; system and data architecture	Oesterreich <i>et al.</i> (2019)	
			Enderich <i>et al.</i> (2017)	
			Franke and Hiebl (2023)	

(continued)

Table 10

Category	Skills	Description	References
IT skills	Data modeling skills	Advanced statistical and mathematical skills to develop exploratory hypotheses based on available data Ability to create structured representations of data systems, processes or concepts using modeling techniques and tools	Oesterreich <i>et al.</i> (2019) Howcroft (2017) Byrne and Pierce (2018) Nielsen (2018) Oesterreich and Teuteberg (2019) Budding <i>et al.</i> (2022)
	Technical skills Digital competence and digital business understanding	Ability to communicate with computers and machines Detailed IT know-how and the ability to use IT applications (i.e. ERP systems, Microsoft Office) Effectively using digital technologies and media and understanding their implications in the context of business operations	
Methodological skills	Analytical skills Problem-solving skills	Ability to analyze data and information and draw the right conclusions, deal with nonfinancial performance indicators Quickly recognizing problems and developing effective solutions	Oesterreich <i>et al.</i> (2019) Howcroft (2017) Byrne and Pierce (2018) Nielsen (2018) Budding <i>et al.</i> (2022) Ott (2023)
	Pressure and time management Dealing with complexity Econometrics skills	Organizing workloads effectively to meet deadlines and skillfully selecting and assigning priorities Ability to understand, navigate and manage complex situations effectively Ability to apply statistical techniques and mathematical models to economic data for empirical analysis, hypothesis testing and developing predictive economic models	
Soft skills	Communication skills	Strong written and verbal communication abilities (also in foreign languages) Presentation and negotiating skills	Oesterreich <i>et al.</i> (2019) Howcroft (2017) Wilbanks <i>et al.</i> (2017) Janin (2017) Cimirotić <i>et al.</i> (2017) Endenich <i>et al.</i> (2017) Tillema <i>et al.</i> (2022) Byrne and Pierce (2018) Goretzki <i>et al.</i> (2018) Nielsen (2018) Lepistö and Ihanola (2018) Hirth-Goebel and Weißenberger (2019) Adhariani (2020) La Paz <i>et al.</i> (2020) Budding and Wassenaar (2021) Budding <i>et al.</i> (2022) Rieg <i>et al.</i> (2023) Ala-Heikkilä and Järvenpää (2023) Ghosh and Bhuyan (2023) Ott (2023)
	Interpersonal skills	Listen effectively to gather information and comprehend conflicting viewpoints Being flexible, proactive and able to relate to colleagues from diverse backgrounds and professions	
	Openness to change Mentoring	Ability and willingness to adapt to changes, new processes, new tasks and new technology	
	Managerial skills Ability to work in teams	Management, marketing and operational expertise	
	Ethical attitude Entrepreneurial thinking	Collaborate effectively, assume leadership positions and skillfully organize and delegate tasks in cross-functional and interdisciplinary teams. Awareness of social and ethical responsibilities	
	Self-motivation Resilience	Entrepreneurial way of thinking to provide added value to the firm Ability and willingness to take the initiative to learn, adapt and develop one's knowledge and skills continuously	
	Creativity Intuition	Ability to bounce back from setbacks, adapt to challenging situations and maintain a positive attitude and performance under pressure or adversity	
	Dynamism Independence	Capability to generate unique ideas, think outside the box and develop innovative solutions to problems Ability to make quick and effective decisions based on instinct, gut feelings and subconscious knowledge Capacity to adapt quickly and respond proactively to evolving situations Ability to make independent decisions rather than being influenced by others	

Source: Authors' elaboration

In line with the fourth and fifth periods, scholars highlight how MAs' tasks differ according to the country and the firm they work in (large or SME). For example, MAs' roles vary from country to country. For instance, in Germany, MAs have a proactive advisory function and influence decision-making (BP), whereas Spanish controllers provide information on the company situation (SK) (Endenich *et al.*, 2017). On the contrary, Rieg *et al.* (2023) highlighted how MAs in SMEs are more involved in operational tasks (scorekeeping role), whereas, in large organizations, controllers monitor and support managers (WDs and BPs) in the KM and decision-making process. Concerning the skills required of MAs, they are influenced by both the size and technological level of the organization. For example, organizations that have yet to adopt data analytics techniques do not require an MC with data science skills (Oesterreich *et al.*, 2019).

4.6 Concluding remarks: management accountants' intellectual capital evolution over time

MAs' skills and roles have significantly evolved from 1980 to 2023, shedding light on the dynamic nature of the IC of this profession. From 2001 onward, MAs began to assume a

more strategic role alongside their traditional duties of information providers and supervisors of the firm financial situation (Rickwood *et al.*, 1990; Chenhall and Langfield-Smith, 1998a; Sathe, 1983; Bowerman and Hutchinson, 1998). They started proactively advising managers (Goretzki *et al.*, 2013; Lambert and Pezet, 2011) with analysis and interpretation of the figures they gathered (Scapens and Jazayeri, 2003; Järvenpää, 2007; Byrne and Pierce, 2007) to formulate long-term strategies (Aaver and Cadez, 2009; Ma and Tayles, 2009) and monitor potential risks and critical success factors of the business (Hartmaan and Maas, 2011; Eendenich, 2014; Culasso *et al.*, 2016), thus highlighting a change in competencies to support the SDMP and effective KM. Further periods of analysis confirmed this evolution trend in IC, with controllers becoming increasingly involved at a corporate level (Erhart *et al.*, 2017; Goretzki *et al.*, 2018; Janin, 2017), not only in strategy implementation and development but also as socializers, auditors, information gatekeepers and sense-givers, among other roles (Ahmed, 2018; Karlsson *et al.*, 2019; Järvenpää *et al.*, 2023; Rieg *et al.*, 2023).

The evolution of MAs' roles and skills is further corroborated by contingency, institutional and role theories. First, according to contingency theory (Luthans, 1973), MAs' roles would adapt to environmental (i.e. the degree of instability of the market) and organizational contingencies (i.e. the size of the organization), shaping their skill requirements accordingly. Second, MAs, being subjected to pressures by the organizations they work in and by conforming to policies and interests that are held in high regard by the firm, are motivated to change their roles and skill sets accordingly, thus supporting the institutional theory (DiMaggio and Powell, 1983). Finally, the evolution of MAs' roles and skills could be explained by the fact that controllers would act and behave based on the expectations of those they interact with, supporting the role theory (Newman and Newman, 1995).

Observing MAs' IC evolution described in the paragraph mentioned above, we were able to spot many issues.

First, an emerging issue concerns MAs' roles: while some manuscripts assert an evolution from a BC to a BP (i.e. Jakobsen *et al.*, 2019; Janin, 2017), others argue that they would assume a hybrid role (i.e. Rieg, 2018; Rieg *et al.*, 2023).

Second, we also noticed that MAs' evolution has been pushed by some factors, such as company size (large firms or SMEs) (Rieg *et al.*, 2023; Oesterreich *et al.*, 2019) and type (public or private) (Aaver and Cadez, 2009), country (Eendenich *et al.*, 2017; Guenther, 2013; Azaan and Bollecker, 2011), uncertainty (Eendenich, 2014; Hartmaan and Maas, 2011), sustainability (Bowerman and Hutchinson, 1998) and technology (Franke and Hiebl, 2023; Oesterreich *et al.*, 2019; Spraakman *et al.*, 2015; Scapens and Jazayeri, 2003) influence. All the emerging issues will be addressed and discussed in Section 5.

5. Discussion

This section aims to discuss the main findings of the reviewed papers to address *RQ3 – What are the new emerging issues regarding MAs' IC along the SDMP?* Throughout the thematic analysis conducted in Section 4, the authors found several emerging issues regarding MAs' IC along the SDMP: Hybrid MAs, differences between SMEs and large companies, public and private organizations, country, uncertainty, sustainability and technology influence. Each issue has been accounted for its evolution over time, its impact on KM and strategic decision processes and shedding light on future research lines.

5.1 Hybrid management accountants

Despite many studies highlighting the transition from an SK (BC) to a BP (i.e. Byrne and Pierce, 2007; Järvenpää, 2007; Sorensen, 2009; Jakobsen *et al.*, 2019; Janin, 2017), our findings suggest an extension of roles, the so-called "Hybrid MA" This is in harmony with the

studies of [de Loo et al. \(2011\)](#), [Graham et al. \(2012\)](#), [Cooper and Dart \(2013\)](#), [Rieg \(2018\)](#) and [Rieg et al. \(2023\)](#). For instance, in their Dutch empirical study, [de Loo et al. \(2011\)](#) demonstrated that in the context they analyzed, there was no distinction between SK, WD and BP, as all controllers were required to do tasks pertaining to all these three categories. Their findings are corroborated by [Rieg et al.'s \(2023\)](#) study on job advertisements. In fact, [Rieg et al. \(2023\)](#) found that almost all job advertisements align with a hybrid role, indicating a prevalent demand for hybrid MAs in the current job market. More specifically, we noticed that MAs have always been hybrid, as they have been requested to fulfill SK, WD and BP roles since 1980. During the 43 years we analyzed, MAs' roles have been evolving intrinsically, incorporating new tasks and competencies, along with the evolution of the external and internal environments. It is essential to acknowledge that the BP tasks are the ones which have increased the most, going from mere "Support to the management in the decision-making process" in the 1980s to incorporating 18 different duties such as "(Long-term) strategic (green) planning", "Interpret the financial and non-financial information", "Socializing operational managers", "Support in the company digital transformation process", "CSR management" and "Moderating/filtering accounting information" in 2023.

To cope effectively with this role evolution, MAs had to develop a more extensive and broader set of skills, facilitating knowledge sharing among team members and fostering a culture of continuous learning and improvement ([Kouhy and Vedd, 2000](#)). Indeed, we noticed an extension of competencies rather than a transition. In 1980–1990, MAs' skill set included six abilities (four in public companies) belonging to the macrocategories of professional, methodological and soft skills. After 43 years, due to the changes in the external and internal environment and consequently, the evolving business demands and requirements, the literature highlights 29 essential skills for controllers: professional, data science, IT, methodological and soft skills. All the macrocategories have evolved intrinsically, incorporating new abilities, such as sustainability and statistical skills, creativity, intuition, ethical attitude and problem-solving. Soft ([Adhariani, 2020](#); [Enderich et al., 2017](#)) and IT skills ([Howcroft, 2017](#); [Byrne and Pierce, 2018](#)) have acquired greater importance over time, but despite some studies highlighting decreasing importance of accounting skills (i.e. [Lepistö and Ihanntola, 2018](#)), the latter is still considered crucial, as MAs are still required to perform "traditional accounting tasks", especially in SMEs ([Rieg, 2018](#); [Oesterreich et al., 2019](#)).

5.2 Differences between SMEs and large companies

Despite very few papers taking into account SMEs (6), the authors were able to spot some differences in MAs' skills and roles between large and small companies. According to [Rieg et al. \(2023\)](#) and [Oesterreich et al. \(2019\)](#), the company size influences MCs' IC. In SMEs, indeed, MAs are more required to perform operational and traditional tasks (SK role), compared to large firms, where they also monitor and support managers (WD and BP roles) ([Joshi and Bremser, 2004](#); [de Loo et al., 2011](#); [Mistry et al., 2014](#); [Oesterreich et al., 2019](#); [Wolf et al., 2020](#)). These differences are based on some SMEs' characteristics: on the one hand, a low level of ICT adoption due to limited time, knowledge and financial resources ([Arendt, 2008](#); [Hong, 2001](#)) does not allow the automatization of routine accounting tasks; on the other hand, SMEs short-term orientation ([Ates et al., 2013](#)) explains why MAs are less or not involved in providing support in strategic planning and decision-making. Scarce digitalization and role requirements suggest that business analytics, data science, econometrics and IT skills are likely to be less required of SMEs' MAs than those working in large firms ([Oesterreich and Teuteberg, 2019](#)).

However, as SMEs are often still run by the founder, who may have received scarce business education ([Hiebl and Mayrleitner, 2019](#); [Rieg et al., 2023](#)), these companies need the IC of hybrid MAs that can perform traditional and controlling tasks and, at the same time, provide support in business matters to the entrepreneurs, to help them in KM and decision-making processes and in facing uncertainty ([Garengo et al., 2005](#)). Furthermore, due to the

lack of financial resources, small businesses cannot afford to hire multiple and differentiated controllers; on the other hand, large companies have higher financial resources and different MA requirements because of their business size (Neubauer *et al.*, 2012; Rieg *et al.*, 2023), might look for differentiated MCs, with specific skills. This also aligns with the fact that in SMEs, MAs tend to have a more transversal role and competencies, giving them greater exposure across the whole business. In contrast, large organizations have more specific tasks related to particular business areas, leading to the presence of, for example, Aria and Cuccurullo and/or brand MAs (Sageder and Feldbauer-Durstmüller, 2019).

Nevertheless, research on this topic still needs to be explored and, thus, it would be beneficial to explore MAs' skills and roles in SMEs to see whether there has been an evolution over time. Furthermore, we have yet to find papers focusing on microenterprises or start-ups. Future research should focus on the figure of MA in microenterprises or start-ups to investigate his role (Järvenpää *et al.*, 2023) and skills and to understand whether management control is conducted internally within the company or outsourced to external professionals (Agburu *et al.*, 2017).

5.3 Differences between public and private organizations

Our findings reveal that, between 1980 and 2000, slight differences did exist between controllers' skills and roles in public and private organizations. Private firms emphasize accounting, managerial and business skills, which are essential for navigating the competitive business landscape (Sathe, 1983; Kaye, 1988). On the contrary, public organizations prioritized soft skills, such as teamwork, negotiation and interpersonal abilities (Rosenberg *et al.*, 1982; Bowerman and Hutchinson, 1998). This could be because, despite roles being relatively similar across both kinds of organizations, focusing on providing accurate financial information, supporting management decisions and measuring performance (Sathe, 1983; Bowerman and Hutchinson, 1998; Kouhy and Vedd, 2000), MAs were less involved in strategic decision-making in public firms (Aaver and Cadez, 2009), thus needing less managerial and business competencies and entrepreneurial thinking. The skills and roles of MAs began to converge in the 2000s (Vedd and Kouhy, 2005; Ott, 2023).

Consequently, controllers' IC has become more versatile and adaptable, regardless of whether they have worked in public or private organizations. Thus, the distinction between MAs in the public and private sectors has diminished over time. Due to the convergence of skills and roles in both public and private organizations, KM is becoming more critical. As MAs' roles expand to encompass strategic decision-making and performance measurement, KM becomes crucial for ensuring that knowledge is effectively shared, analyzed and applied across the firm to drive organizational success.

5.4 Country influence

The analyzed papers display country-specific differences concerning MAs' roles. For instance, German MCs tend to assume a proactive advisory role, significantly impacting decision-making processes (BP). At the same time, their Spanish counterparts primarily provide information on the company situation (SK) (Endenich *et al.*, 2017). In the USA, controllers' primary responsibility lies in financial monitoring (WD), whereas in France, their duties encompass budgeting, managerial accounting, statistical and economic analyses and long-term planning (hybrid) (Azan and Bollecker, 2011; Guenther, 2013). Our findings are supported by Wolf *et al.*'s (2020) study, which highlights that, in contrast to European countries, in Anglo-Saxon countries, there is no explicit distinction between financial accountants and MAs, thus explaining why US controllers are responsible for financial monitoring.

Based on the above discussion, we can assert that, as there are country-specific differences concerning MAs' roles, there are differences in KM roles and impact across different countries. However, KM remains crucial for organizational success. It would be

thus attractive for further research to conduct comparative studies focusing on the role of KM in management accounting across different countries.

Future studies could also explore emerging issues and the new requirements for MAs' IC in the countries mentioned earlier and in other regions.

5.5 Uncertainty influence

Economic crises and the resulting situations of uncertainty or stressing events have been critical drivers of the evolution of MAs' roles (Endenich, 2014; Hartmaan and Maas, 2011), as after the 2008 crisis, they have been required new competencies related to the identification, description, estimation and evaluation of risks and new business opportunities (Culasso *et al.*, 2016), to drive the decision-making process better. This dynamic environment has generated the need for more soft skills, including resilience (Webb and Chaffer, 2016), thus influencing MAs' IC. As a consequence, KM is crucial in developing soft skills, such as resilience, by providing, for instance, access to training materials, expert knowledge and collaborative platforms for sharing experiences and strategies for coping with challenging and uncertain situations.

5.6 Sustainability influence

The interest in the role of MAs in sustainability matters dates back to 1998. After having been neglected for almost two decades, it resurged in the last period of our analysis (2017–2023). Scholars agree that MAs would play a crucial role in sustainability-related activities, such as environmental decision-making (Bowerman and Hutchinson, 1998), sustainability accounting and reporting (Wenzig *et al.*, 2022) and corporate social responsibility (CSR) management (Cheffi *et al.*, 2021); thanks to their accounting training and education (Wenzig *et al.*, 2022), which gives them technical abilities in collecting, preparing, analyzing and interpreting information (Schaltegger and Zvezdov, 2015); selecting relevant data (Scapens and Jazayeri, 2003); and adapting control systems to laws and regulations (Özsözgün Çalışkan, 2014), thus nurturing knowledge creation. However, MAs' involvement is shallow, as they lack sustainability skills (Bowerman and Hutchinson, 1998; Wenzig *et al.*, 2022) do not see sustainability accounting as being essential to the core business or the MA function (Wenzig *et al.*, 2022) and because CS initiatives are shared among different professionals with different backgrounds and roles within the organization (particularly technical managers) (Albelda, 2011; Mistry *et al.*, 2014). MAs must expand their competencies, engage in interdisciplinary perspectives and multidisciplinary approaches and start recording, reporting and controlling increasingly nonfinancial measures, such as new sustainability-related metrics (Bebbington and Unerman, 2018). By sharing knowledge and expertise across different departments, organizations can develop holistic approaches to sustainability management. To perform these new sustainability-related tasks, controllers need to develop specific IC, which plays a crucial role in ensuring that the link between actions and sustainability achievement is representative and formative, based on objective and properly measured data (Galli *et al.*, 2023). Further research is, thus, needed to investigate the specific skills MAs need to play a crucial role in sustainability-related activities. It would also be beneficial to explore the enabling factors fostering MAs' participation in CS activities and decision-making, as well as the characteristics of experts who can implement fruitful collaboration patterns in MA for sustainability.

5.7 Technology influence

From what emerges in the literature, controllers are increasingly exposed to technology and consistently work with it. Scapens and Jazayeri (2003) observed how technology helps simplify and truncate routine accounting tasks, making it a key driver in the evolution of

MAs' skills and roles. From 2001 onward, thanks to the automation of some processes, we noticed a shift in controllers' roles as they started to become more actively involved in offering support to managers in the KM and decision-making process (Scapens and Jazayeri, 2003; Spraakman *et al.*, 2015; Franke and Hiebl, 2023). The need to deal with technology requires MAs to have specific skills, such as IT and data science abilities. However, the need for such competencies depends on the technological level of the organization: while IT skills are essential for current MAs, as all organizations use computers, many companies have not adopted data analytics techniques, thus not requiring data science or econometric skills (Oesterreich *et al.*, 2019). The same study also highlights that despite data science skills being considered crucial for MAs in literature, they still need to be entirely disregarded by organizations and control professionals.

Further reflections concern the impact of new technologies, such as AI and machine learning, on controllers' skills and roles. From what emerges in the literature, technology appears to be staying within their competencies (Munir *et al.*, 2023). However, due to the recent development of AI and machine learning, further research is needed to explore a potential erosion of MCs' skills and roles along the decision-making process and KM.

6. Conclusions

The primary purpose of this study has been to investigate MAs as organizations' IC, scrutinizing both their competencies and roles in nurturing knowledge for SDMP, using the SLR method. The research profile of MAs' IC was created, shedding light on emerging needs to increase literature review methodology on this topic and deepen countries' influence. The MAs' IC thematic evolution was outlined from 1980 to 2023, supported by R-studio's Bibliometrix package, thus shedding light on relevant emerging issues: Hybrid MAs, differences between SMEs and large companies, public and private organizations and countries, uncertainty, sustainability and technology influence.

Consequently, the study's findings fill the research gaps highlighted in the introduction. In particular, the research helps explain how MAs influence strategic decision-making in large, public and private companies (Erhart *et al.*, 2017). Moreover, we positioned management accounting in an IC context throughout the human capital of MAs (Cleary, 2015; Novas *et al.*, 2017), highlighting KM impact (Santoro *et al.*, 2018). Furthermore, the present manuscript enriches the research on how MAs use their IC to share knowledge, as Paoloni *et al.* (2020) suggested. Given that many organizations are creating KM systems meant to make knowledge creation, sharing and storage easier (Santoro *et al.*, 2018), this study makes significant contributions to expand both the theory and the practice. Finally, the research has profound theoretical, practical and policy implications, elaborated in the following sections.

6.1 Theoretical implications

From a theoretical perspective, this paper sheds light on the dynamic nature of the management accounting and IC fields, showing how MAs' skills and roles have been evolving and will continue to evolve in response to both external and internal factors within an organization (Scapens and Jazayeri, 2003; Burns and Baldvinsdottir, 2005; Azan and Bollecker, 2011; Spraakman *et al.*, 2015; Halbouni and Nour, 2013; Hartmann and Maas, 2011; Eendenich, 2014; Oesterreich *et al.*, 2019), differently supporting the SDMP and KM. This evidence can contribute to refining existing management accounting theories and frameworks and developing new ones to align better and understand MCs' contemporary and future skills and roles (Halbouni and Nour, 2013). More specifically, our research contributes to understanding MAs' IC by highlighting various competencies needed in different organizational settings, thus impacting KM practices. This constitutes a valuable implication for educational institutions, informing them about the evolving tasks and skill

requirements for future professionals and, therefore, allowing them to adapt their curricula accordingly (Lawson *et al.*, 2014; Lawson *et al.*, 2015; Siriwardane *et al.*, 2015; Howcroft, 2017; Ott, 2023).

We found manuscripts disagreeing on whether MAs would transition from a BC to BP role (i.e. Jakobsen *et al.*, 2019; Janin, 2017) or assume a hybrid one (i.e. Rieg, 2018; Aria and Cuccurullo). Our results provide evidence that MAs have always been hybrid, as they have always been asked to be SK, WD and BP. This imbalance is a significant theoretical challenge to extant MA literature, as theoretical frameworks may need to be redeveloped to include the complexity and variability of MAs' roles to fully discern controllers' contributions to organizational decision-making and performance.

In addition, it is observed that the dynamics of MAs' IC evolution differ according to different organizational contexts. For example, our findings indicate differences in MAs' roles and skills that could be due to the country they are working in and their culture. We also contribute to the theoretical frameworks related to MA and business organization by emphasizing how contextual variations must be considered to recognize changes in MAs' roles and skills.

Our findings also point out that crises and uncertainty drive the creation of new competencies because quick decision-making is needed. Furthermore, our research highlights the strategic relevance of handling controllers' IC in conveying sustainability (Wenzig *et al.*, 2022) and technology (Franke and Hiebl, 2023) competencies and knowledge for aligning corporate decision-making with sustainable development and concrete technological usage to business strategy. The present study unravels the importance of including sustainability-related aspects in the theoretical frameworks in the MA literature. In this context, MA theories should consider how organizations deliberately handle their IC when facing environmental challenges, technological innovations and uncertain situations.

Similarly, our study offers an extensive description of the research field due to the few SLRs on this topic previously published; hence, it contributes to overcoming a methodological void (Kraus *et al.*, 2022; Ojra *et al.*, 2021). Due to the increasing number of MAs' papers, we found an increased interest in this research field. Thanks to identifying knowledge gaps, this SLR proposes a further research agenda that can be useful to future investigations and studies (Massaro *et al.*, 2016). Finally, this body of work extends the existing understanding of contingency, institutional and role theories to explain how MAs' roles and competencies change over time.

6.2 Practical implications

Our study provides several practical implications. First, it helps identify the roles and skills required for MAs in today's business environment. Managers can use our framework to target their MA teams and detect competence or role gaps that would threaten the reaching of organizational success. Managers could incorporate insights from the proposed framework into bespoke skill or role development programs to address the shortcomings in their current MA teams (Siriwardane *et al.*, 2015). Second, our manuscript can give managerial and practical advice to create a well-rounded MA competence portfolio and role tasks for MAs. For example, companies need to create an effective performance measurement system to assess their IC with the company's performance. This procedure provides an in-depth understanding of intellectual asset creation and management, with a consideration of governance mechanisms.

In addition, this study offers evidence of the role of performance measurement systems in enabling firms to manage their strategic resources effectively and thus involve KM. This allows organizations to amend their strategic planning and KM approach as MAs' roles evolve. Third, our study exposes MAs' skills gaps in the current business context. Based on our findings, organizations, for instance, can invest in training programs related to sustainability or

technology integration. This should help firms ensure that their MCs possess the required competencies for their changing roles, which can further improve their involvement in strategic decision-making and operational efficiency (Halbouni and Nour, 2014). Fourth, the present manuscript would help organizations understand the type of MAs and related competencies needed based on their operating context, thus becoming useful for strategic decision-making and economic planning. For instance, SMEs should hire hybrid MAs who can perform traditional and controlling tasks and support the entrepreneurs' decisions in business matters.

On the contrary, large companies should rely on different controllers with specific competencies. This can significantly affect a company's KM and SDMP, which might determine its success or failure (Sinnaiah *et al.*, 2023). Finally, this paper can be used as a basis for recruitment strategies by highlighting today's required MAs' skills and roles. Therefore, organizations may refine job descriptions with this information to attract candidates possessing relevant skills and hire in a targeted manner (Ott, 2023), thus enabling them to find those MAs who will contribute effectively toward KM and organizational goals. According to Rieg *et al.*'s case study (2023), this further presents additional challenges for recruiters and HR managers as they seek an adequate fit while recruiting new MAs.

6.3 Implications for policymakers

This study offers important implications for policymakers in environmental policy and public organizations' strategic planning domains. Our results indicate that the organizations can be served through MAs in terms of environmental decision-making (Bowerman and Hutchinson, 1998), sustainability accounting and reporting (Wenzig *et al.*, 2022) and CSR management (Cheffi *et al.*, 2021). However, MAs are not strategically involved in CS. This could be addressed, for instance, by suggesting educational programs for MAs to become more experienced in sustainability, developing platforms that allow cross-sectoral interaction between MAs and other stakeholders and fostering organizations to involve MAs in their sustainability programs. Thanks to this, policymakers can make public organizations more competitive in meeting sustainability challenges, issues, requirements or opportunities by enhancing the dynamic capability of MAs to participate actively in sustainable development activities.

6.4 Limitations and future research agenda

Even though this study provides valuable insights, it is essential to acknowledge that every study has limitations. First, we limited our search to titles, abstracts and keywords, although some papers may cite our research string words in the text corpus. As a result, our article data set may include only some Scopus articles related to this topic. Second, although Scopus was chosen for its accuracy and extensive coverage (Vera-Baceta *et al.*, 2019), relying on more than one database could be limiting. Further studies should search other databases, such as the Web of Science, to conduct more in-depth research and compare results from various sources. Third, the authors selected only papers published in ABS-ranked journals to analyze scientifically relevant articles (Massaro *et al.*, 2016), which may have excluded exciting and relevant articles. Finally, we noticed that most of our article data set comprises studies conducted in large European firms which may limit the generalizability of our findings to different geographical regions and organizational contexts.

Our examination of the main methodological and thematic findings on MAs' IC, determined by competencies and roles, enabled us to highlight some gaps that could be investigated in further research. Concerning MAs' skills and roles, exploring how competencies differ based on the controller's role within various contexts, including countries, company sizes and stressful events, such as crises, is valuable. Further research is needed to investigate the factors contributing to the convergence of skills and roles in private and public organizations.

Furthermore, it is also necessary to investigate MAs' IC evolution in SMEs to determine whether there have been changes over time. In addition, a specific focus on microenterprises and start-ups is essential.

Based on the findings, an extended research agenda emerged. More specifically, [Table 11](#) provides an overview of future RQs and avenues.

Table 11 Suggested directions for future research

Topic	Questions	References
Role	<p>How do large firms, SMEs and family businesses differ in their requests for MA roles?</p> <p>How does each controller type (SC et al.) impact the effectiveness of the controlling function?</p> <p>How do MCs perceive their roles and responsibilities in organizations have changed over time? What are the institutional and organizational factors that are likely to affect MAs' tasks? What is the impact of coercive regulations?</p> <p>Which are MAs' characteristics, in terms of culture, background and experiences, that can positively or negatively affect their abilities to perform a BP, WD or SK role, especially when coercive regulations are implemented?</p> <p>What are the effects of cultural traits on the role played by MAs in translating sustainability initiatives into performance outcomes?</p> <p>How are MCs' roles institutionalized in the long term, especially in case of a dissonance between their understanding of their role and external expectations?</p> <p>How are regulatory and ethical considerations impacting MCs' roles and responsibilities? How can they navigate these challenges effectively?</p> <p>Which role (s) do MAs have in cross-organizational planning processes?</p> <p>How do MAs' roles vary across different industries?</p> <p>What are MAs' roles in start-up firms?</p> <p>How will MA's roles evolve over the next decade? What is (will be) the impact of ongoing mega-trends, especially digitalization, sustainability and servitization on MCs' roles?</p> <p>How do MA graduates believe their university education prepared them for their roles within organizations?</p> <p>How does organizational culture influence MAs' roles?</p> <p>What is the impact of data analytics and AI on MAs' roles and responsibilities? Will technology and AI substitute MAs?</p> <p>What are MAs' roles in organizations in emerging economies?</p> <p>What is the role MAs can play in addressing biodiversity concerns? Which theoretical lens can support this practice?</p> <p>What are MAs' roles in microenterprises?</p>	<p>Rieg <i>et al.</i> (2023)</p> <p>La Paz <i>et al.</i> (2020)</p> <p>Oppi and Vagnoni (2020)</p> <p>Oppi and Vagnoni (2020)</p> <p>Cheffi <i>et al.</i> (2021)</p> <p>Ala-Heikkilä and Järvenpää (2023)</p> <p>Ghosh and Bhuyan (2023)</p> <p>Henttu-Aho <i>et al.</i> (2023); Järvenpää <i>et al.</i> (2023)</p> <p>Järvenpää <i>et al.</i> (2023)</p> <p>Magnacca and Giannetti (2023)</p> <p>Howcroft (2017)</p> <p>Hadid and Al-Sayed (2021)</p>
Skills	<p>How do large firms, SMEs and family businesses differ in their requests for MA skills?</p> <p>Do the increased skills requirements have an impact on social and health aspects?</p> <p>Are there any differences between the skills required for MAs in job roles and those provided by higher educational institutions? Does (will) digitalization influence that?</p> <p>How can MAs enhance their resilience, particularly during digital transformation, where traditional boundaries of their expertise blur, potentially leading to competition with other specialists like data scientists?</p> <p>What is the impact of data analytics and AI on MAs' skills? How can they adapt to leverage these technologies effectively? Will technology and AI de-skill MAs?</p> <p>Which skills are required of MAs in organizations in emerging economies?</p> <p>Which key skills and competencies will MCs need in the next decade?</p> <p>How do MAs' skills vary across different industries and sectors?</p> <p>What is the difference between "skills" and "competencies" within the context of management accounting?</p> <p>What specific sustainability skills are required for MAs to be involved and effectively contribute to the successful implementation of sustainability initiatives within an organization?</p> <p>What are the skills required for MAs in micro-enterprises and start-ups?</p>	<p>Rieg <i>et al.</i> (2023)</p> <p>Oesterreich <i>et al.</i> (2019)</p> <p>Oesterreich <i>et al.</i> (2019)</p> <p>Tillema <i>et al.</i> (2022)</p>
General	<p>What are the actual control approaches in companies and the dominant abilities of individuals?</p> <p>How does the selection of over/under-qualified MAs affect an organization?</p> <p>Which actions or strategies can HR managers implement to prevent/minimize the mismatches in the selection and recruitment of MAs?</p> <p>What is the relationship between external parties, such as vendors or service providers, and management accountants during ERP/CERP system development processes?</p> <p>Is there an opportunity for a better balance between the ideal image utilized to recruit the top candidates for MA positions and MCs' actual lived experience?</p> <p>What is the impact of MAs in terms of benefits acquired before and after their inclusion in new product development (NPD) projects?</p> <p>What are the specific characteristics of professionals who can implement fruitful patterns of collaboration in controlling for sustainability? What could be the determinants of such collaboration that can enhance MCs' contribution to sustainability decision-making?</p> <p>What is the impact of the evolving roles and skills of MCs on organizational performance and decision-making?</p> <p>What are the causes driving MAs' roles and skills convergence between public and private firms?</p> <p>Has there been an evolution in the role and skills of controllers in SMEs? What are its causes?</p> <p>Are there any differences in the role of KM in management accounting across different countries?</p>	<p>La Paz <i>et al.</i> (2020)</p> <p>La Paz <i>et al.</i> (2020)</p> <p>La Paz <i>et al.</i> (2020); Carlsson-Wall <i>et al.</i> (2022)</p> <p>Ala-Heikkilä and Järvenpää (2023)</p> <p>Magnacca and Giannetti (2023)</p>

Source: Authors' elaboration

Appendix 1 and 2 display the list of article samples and the list of removed words, respectively.

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Appendix 1

Table A1 Articles sample				
Author	Title	Year	Journal	DOI
Adhariani D	The influence of the ASEAN economic community on the future of the management accounting profession	2020	<i>Meditari Accountancy Research</i>	10.1108/MEDAR-04-2019-0476
Ahmed MN	Outsourcing relationship management: accounting in the decision mix	2018	<i>Journal of Business Strategy</i>	10.1108/JBS-03-2018-0049
Ala-Heikkilä V; Järvenpää M	Management accountants' image, role and identity: employer branding and identity conflict	2023	<i>Qualitative Research in Accounting and Management</i>	10.1108/QRAM-04-2021-0064
Albu CN; Albu N; Faff R; Hodgson A	Accounting competencies and the changing role of accountants in emerging economies: the case of Romania	2011	<i>Accounting in Europe</i>	10.1080/17449480.2011.621395
Andreassen R-I	Digital technology and changing roles: a management accountant's dream or nightmare?	2020	<i>Journal of Management Control</i>	10.1007/s00187-020-00303-2
Aver B; Cadez S	Management accountants' participation in strategic management processes: a cross-industry comparison	2009	<i>Journal of East European Management Studies</i>	10.5771/0949-6181-2009-3-310
Azan W; Bollecker M	Management control competencies and ERP: an empirical analysis in France	2011	<i>Journal of Modelling In Management</i>	10.1108/17465661111149575
Bots JM; Groenland E; Swagerman DM	An empirical test of Birkett's competency model for management accountants: survey evidence from Dutch practitioners	2009	<i>Journal of Accounting Education</i>	10.1016/j.jaccedu.2009.06.001
Bowerman M; Hutchinson F	The role of local authority accountants in environmental decision-making	1998	<i>Financial Accountability and Management</i>	10.1111/1468-0408.00067
Brazel JF; Lucianetti L; Schaefer TJ	Reporting concerns about earnings quality: an examination of corporate managers	2021	<i>Journal of Business Ethics</i>	10.1007/s10551-020-04436-1
Bruesch A; Quinn M	Concept maps and visualisation as a means of triangulation in management accounting and control research	2022	<i>Qualitative Research in Accounting and Management</i>	10.1108/QRAM-10-2021-0179
Budding T; De Jong G; Smit M	New development: bridging the gap—analysis of required competencies for management accountants in the public sector	2022	<i>Public Money and Management</i>	10.1080/09540962.2022.2068862
Budding T; Wassenaar M	New development: is there a management accountants' expectation gap?	2020	<i>Public Money and Management</i>	10.1080/09540962.2020.1726612
Burns J; Baldvinsdottir G.	An institutional perspective of accountants' new roles—the interplay of contradictions and praxis	2005	<i>European Accounting Review</i>	10.1080/09638180500194171
Byrne S; Pierce B	Towards a more comprehensive understanding of the roles of management accountants	2007	<i>European Accounting Review</i>	10.1080/09638180701507114
Byrne S; Pierce B	Exploring management accountants' role conflicts and ambiguities and how they cope with them	2018	<i>Qualitative Research in Accounting and Management</i>	10.1108/QRAM-11-2016-0083
Carlsson-Wall M; Goretzki L; Hofstedt J; Kraus K; Nilsson C-J	Exploring the implications of cloud-based enterprise resource planning systems for public sector management accountants	2022	<i>Financial Accountability and Management</i>	10.1111/faam.12300
Cavélius F; Enderich C; Zicari A	Back to basics or ready for take-off? The tensions on the role of management controllers in the digital age; [retour aux fondements ou prêt au décollage? Les tensions sur le rôle du contrôleur de gestion à l'ère du digital]	2020	<i>Comptabilite Controle Audit</i>	10.3917/cca.262.0089
Cheffi W; Abdel-Maksoud A; Farooq MO	CSR initiatives, organizational performance and the mediating role of integrating CSR into management control systems: testing an inclusive model within SMEs in an emerging economy	2021	<i>Journal of Management Control</i>	10.1007/s00187-021-00323-6
Chenhall R; Langfield-Smith K	Factors influencing the role of management accounting in the development of performance measures within organizational change programs	1998	<i>Management Accounting Research</i>	10.1006/mare.1998.0080
Cimirotić R; Duller V; Feldbauer-Durstmüller B; Gärtner B; Hiebl MRW	Enabling factors that contribute to women reaching leadership positions in business organizations: the case of management accountants	2017	<i>Management Research Review</i>	10.1108/MRR-10-2014-0233

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Table A1

Author	Title	Year	Journal	DOI
Cracel Viana L; Moreira JA; Alves P	State audit of public-private partnerships: effects on transparency, auditor's roles, and impact on auditee's reactions	2022	<i>Financial Accountability and Management</i>	10.1111/faam.12342
Culasso F; Broccardo L; Manzi LM; Truant E	Management accounting and enterprise risk management. A potential integration as a new change in managerial systems	2016	<i>Global Business and Economics Review</i>	10.1504/GBER.2016.076238
De Loo I.;Verstegen B; Swagerman D	Understanding the roles of management accountants	2011	<i>European Business Review</i>	10.1108/09555341111130263
Dobroszek J	Supply chain and logistics controller – two promising professions for supporting transparency in supply chain management	2020	<i>Supply Chain Management</i>	10.1108/SCM-04-2019-0169
Dobroszek J; Mourao P; Grzesiak L	Identification of the similarities and differences of logistics controller, manager and specialist: a study based on a content analysis	2019	<i>International Journal of Logistics Management</i>	10.1108/IJLM-10-2017-0281
Emsley D; Chung LH	How management accountants' cognitive style and role involvement combine to affect the effort devoted to initiating change	2010	<i>Abacus</i>	10.1111/j.1467-6281.2010.00318.x
Endenich C	Economic crisis as a driver of management accounting change: comparative evidence from Germany and Spain	2014	<i>Journal of Applied Accounting Research</i>	10.1108/JAAR-11-2012-0075
Endenich C; Trapp R; Brandau M	Management accounting networks in corporate processes – a cross-national study	2017	<i>Journal of Accounting and Organizational Change</i>	10.1108/JAOC-08-2015-0064
Enslin Z; Hall J; Du Toit E.	The susceptibility of management accountants to framing bias	2022	<i>Meditari Accountancy Research</i>	10.1108/MEDAR-02-2021-1185
Erhart R; Mahlendorf MD; Reimer M; Schäffer U	Theorizing and testing bidirectional effects: the relationship between strategy formation and involvement of controllers	2017	<i>Accounting, Organizations and Society</i>	10.1016/j.aos.2017.07.004
Fitz Verploegh R; Budding T; Wassenaar M	Policy control as an alternative approach to performance-based budgeting (PBB) to strengthen the link between policy and financial means	2022	<i>Public Money and Management</i>	10.1080/09540962.2022.2062162
Flamand G; Jaumier S	The contribution of identity workspaces and initial accounting education to the legitimization of management accounting: the case of an arts-based seminar in a master's degree	2023	<i>Comptabilite Controle Audit</i>	10.3917/cca.292.0007
Fourné SPL; Guessow D; Margolin M; Schäffer U	Controllers and strategic decision-making: the role of cognitive flexibility in controller-manager collaboration	2023	<i>Management Accounting Research</i>	10.1016/j.mar.2023.100840
Franke F; Hiebl MRW	Big data and decision quality: the role of management accountants' data analytics skills	2023	<i>International Journal of Accounting and Information Management</i>	10.1108/IJAIM-12-2021-0246
Ghosh A; Bhuyan N	Do professional management accountants in business understand their professional code of ethics? Evidence from the Indian context	2023	<i>Journal of Accounting in Emerging Economies</i>	10.1108/JAEE-04-2022-0119
Goretzki L; Löhlein L; Schäffer U; Schmidt A; Strauss E	Exploring the role of metaphors in social-identity construction: the case of the German controller	2022	<i>European Accounting Review</i>	10.1080/09638180.2021.1882318
Goretzki L; Lukka K; Messner M	Controllers' use of informational tactics	2018	<i>Accounting and Business Research</i>	10.1080/00014788.2017.1407627
Goretzki L; Messner M	Backstage and frontstage interactions in management accountants' identity work	2019	<i>Accounting, Organizations and Society</i>	10.1016/j.aos.2018.09.001
Goretzki L; Strauss E; Weber J	An institutional perspective on the changes in management accountants' professional role	2013	<i>Management Accounting Research</i>	10.1016/j.mar.2012.11.002
Gupta A; Messerschmidt DC; Herath SK	Business process reengineering and the management accountant	2006	<i>International Journal of Management and Enterprise Development</i>	10.1504/IJMED.2006.008245
Hadid W; Al-Sayed M.	Management accountants and strategic management accounting: the role of organizational culture and information systems	2021	<i>Management Accounting Research</i>	10.1016/j.mar.2020.100725
Halbouni SS; Nour MA	An empirical study of the drivers of management accounting innovation: a UAE perspective	2014	<i>International Journal of Managerial and Financial Accounting</i>	10.1504/IJMFA.2014.060512
Halbouni SS; Nour MA	An empirical investigation of the impact of globalisation and information technology on the role of the management accountant: evidence from the united Arab emirates	2013	<i>International Journal of Accounting, Auditing and Performance Evaluation</i>	10.1504/IJAAPE.2013.055898

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Author	Title	Year	Journal	DOI
Hartmann FGH; Maas VS	The effects of uncertainty on the roles of controllers and budgets: an exploratory study	2011	<i>Accounting and Business Research</i>	10.1080/00014788.2011.597656
Hassall T; Joyce J; Montano JLA; Anes Jad	The employers' priorities: vocational skills and capabilities for management accountants	2001	<i>Industry and Higher Education</i>	10.5367/00000001101295920
Hassall T; Joyce J; Montaña JLA; Anes JAD	Priorities for the development of vocational skills in management accountants: a European perspective	2005	<i>Accounting Forum</i>	10.1016/j.accfor.2005.03.002
Heinzelmann R	Occupational identities of management accountants: the role of the it system	2018	<i>Journal of Applied Accounting Research</i>	10.1108/JAAR-05-2017-0059
Henttu-Aho T; Järvinen JT; Lassila EM	Constructing the accurate forecast: an actor-network theory approach	2023	<i>Meditari Accountancy Research</i>	10.1108/MEDAR-03-2022-1613
Hiebl MRW; Feldbauer-Durstmüller B; Duller C	The changing role of management accounting in the transition from a family business to a non-family business	2013	<i>Journal of Accounting and Organizational Change</i>	10.1108/18325911311325933
Hirth-Goebel TF; Weissenberger BE	Management accountants and ethical dilemmas: how to promote ethical intention?	2019	<i>Journal of Management Control</i>	10.1007/s00187-019-00288-7
Holmgren Caicedo M; Mårtensson M; Tamm Hallström K	The development of the management accountant's role revisited: an example from the Swedish social insurance agency	2018	<i>Financial Accountability and Management</i>	10.1111/faam.12156
Hopper TM	Role conflicts of management accountants and their position within organisation structures	1980	<i>Accounting, Organizations and Society</i>	10.1016/0361-3682(80)90039-2
Horton KE; Wanderley CDA	Identity conflict and the paradox of embedded agency in the management accounting profession: adding a new piece to the theoretical jigsaw	2018	<i>Management Accounting Research</i>	10.1016/j.mar.2016.06.002
Howcroft D	Graduates' vocational skills for the management accountancy profession: exploring the accounting education expectation-performance gap	2017	<i>Accounting Education</i>	10.1080/09639284.2017.1361846
Jack L; Kholeif A	Enterprise resource planning and a contest to limit the role of management accountants: a strong structuration perspective	2008	<i>Accounting Forum</i>	10.1016/j.accfor.2007.11.003
Jakobsen M; Mitchell F; Nørreklit H; Trenca M	Educating management accountants as business partners: pragmatic constructivism as an alternative pedagogical paradigm for teaching management accounting at master's level	2019	<i>Qualitative Research in Accounting and Management</i>	10.1108/QRAM-10-2017-0099
Janin F	When being a partner means more: the external role of football club management accountants	2017	<i>Management Accounting Research</i>	10.1016/j.mar.2016.05.002
Järvenpää M	Making business partners: a case study on how management accounting culture was changed	2007	<i>European Accounting Review</i>	10.1080/09638180701265903
Järvenpää M; Hoque Z; Mättö T; Rautiainen A	Controllers' role in managerial Sensemaking and information trust building in a business intelligence environment	2023	<i>International journal of Accounting Information Systems</i>	10.1016/j.accinf.2023.100627
Karlsson B; Hersinger A; Kurkkio M	Hybrid accountants in the age of the business partner: exploring institutional drivers in a mining company	2019	<i>Journal of Management Control</i>	10.1007/s00187-019-00280-1
Karlsson B; Kurkkio M; Hersinger A	The role of the controller in strategic capital investment projects: bridging the gap of multiple topoi	2019	<i>Journal of Management and Governance</i>	10.1007/s10997-018-09449-7
Kaye GR	The role of management accountants in information strategy	1988	<i>Journal of Information Technology</i>	10.1057/jit.1988.44
Kennedy FA; Sorensen JE	Enabling the management accountant to become a business partner: organizational and verbal analysis toolkit	2006	<i>Journal of Accounting Education</i>	10.1016/j.jaccedu.2006.07.007
Kouhy R; Vedd R	Performance measurement in strategic human resource management	2000	<i>International Journal of Business Performance Management</i>	10.1504/ijbpm.2000.000073
Kristensen TB; Nielsen H	Configuring a profile-deviation-analysis to statistical test complementarity effects from balanced management control systems in a configurational fit approach	2020	<i>Journal of Management Control</i>	10.1007/s00187-019-00292-x
La Paz A; Gracia D; Vásquez J	Matching the controller role: individuals vs companies	2020	<i>Journal of Business Economics and Management</i>	10.3846/jbem.2020.13187

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Author	Title	Year	Journal	DOI
Lal Joshi P; Bremser WG	Changing dimensions of accountants' role and skill requirements in organisations: findings from the corporate sector in Bahrain	2004	<i>International Journal of Accounting, Auditing And Performance Evaluation</i>	10.1504/ijaape.2004.005926
Lambert C; Pezet E	The making of the management accountant - becoming the producer of truthful knowledge	2011	<i>Accounting, Organizations and Society</i>	10.1016/j.aos.2010.07.005
Lambert C; Sponem S	Roles, authority and involvement of the management accounting function: a multiple case-study perspective	2012	<i>European Accounting Review</i>	10.1080/09638180.2011.629415
Lavigne L	Management control in local public administrations in France - typological construction and organizational determinants - the case of large intermunicipalities	2020	<i>Public Organization Review</i>	10.1007/s11115-019-00457-1
Lawson RA; Blocher EJ; Brewer PC; Cokins G; Sorensen JE; Stout DE; Sundem GL; Wolcott SK; Wouters MJF	Focusing accounting curricula on students' long-run careers: recommendations for an integrated competency-based framework for accounting education	2014	<i>Issues in Accounting Education</i>	10.2308/iace-50673
Lawson RA; Blocher EJ; Brewer PC; Morris JT; Stocks KD; Sorensen JE; Stout DE; Wouters MJF	Thoughts on competency integration in accounting education	2015	<i>Issues in Accounting Education</i>	10.2308/iace-51021
Lepistö L; Ihtantola E-M	Understanding the recruitment and selection processes of management accountants: an explorative study	2018	<i>Qualitative Research In Accounting and Management</i>	10.1108/QRAM-11-2016-0080
Looknauth T; Bélanger CH	Accountants' satisfaction following unification of Canadian accounting bodies	2018	<i>Journal of Accounting and Organizational Change</i>	10.1108/JAOC-07-2017-0066
Ma Y; Tayles M	On the emergence of strategic management accounting: an institutional perspective	2009	<i>Accounting and Business Research</i>	10.1080/00014788.2009.9663379
Mack S; Goretzki L	How management accountants exert influence on managers - a micro-level analysis of management accountants' influence tactics in budgetary control meetings	2017	<i>Qualitative Research in Accounting and Management</i>	10.1108/QRAM-07-2016-0058
Magnacca F; Giannetti R	Management accounting and new product development: a systematic literature review and future research directions	2023	<i>Journal of Management and Governance</i>	10.1007/s10997-022-09650-9
Malagueño R; Gomez-Conde J; De Harlez Y; Hoffmann O	Controller involvement in a project management setting: effects on project functions and performance	2021	<i>Journal of Applied Accounting Research</i>	10.1108/JAAR-07-2020-0129
Montano JLA; Donoso JA; Hassall T; Joyce J	Vocational skills in the accounting professional profile: the Chartered Institute of Management accountants (CIMA) employers' opinion	2001	<i>Accounting Education</i>	10.1080/09639280210122339
Morales J	Symbolic categories and the shaping of identity: the categorisation work of management accountants	2019	<i>Qualitative Research In Accounting And Management</i>	10.1108/QRAM-06-2018-0040
Munir S; Abdul Rasid SZ; Amir M; Jamil F; Ahmed I	Big data analytics capabilities and innovation effect of dynamic capabilities, organizational culture and role of management accountants	2023	<i>Foresight</i>	10.1108/FS-08-2021-0161
Nielsen S	Reflections on the applicability of business analytics for management accounting – and future perspectives for the accountant	2018	<i>Journal of Accounting and Organizational Change</i>	10.1108/JAOC-11-2014-0056
Oesterreich TD; Teuteberg F	The role of business analytics in the controllers and management accountants' competence profiles: an exploratory study on individual-level data	2019	<i>Journal of accounting and Organizational Change</i>	10.1108/JAOC-10-2018-0097
Oesterreich TD; Teuteberg F; Bensberg F; Buscher G	The controlling profession in the digital age: understanding the impact of digitisation on the controller's job roles, skills and competences	2019	<i>International Journal of Accounting Information Systems</i>	10.1016/j.accinf.2019.100432
Oppi C; Vagnoni E	Management accountants' role and coercive regulations: evidence from the Italian health-care sector	2020	<i>Qualitative Research in Accounting and Management</i>	10.1108/QRAM-02-2019-0040
Ott C	The professional identity of accountants – an empirical analysis of job advertisements	2023	<i>Accounting, Auditing and Accountability Journal</i>	10.1108/AAAJ-08-2021-5389
Oyewo B; Vo XV; Akinsanmi T	Strategy-related factors moderating the fit between management accounting practice sophistication and organisational effectiveness: the global management accounting principles (GMAP) perspective	2020	<i>Revista Espanola De Financiacion Y Contabilidad</i>	10.1080/02102412.2020.1774857

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Table A1

Author	Title	Year	Journal	DOI
Pasch T	Strategy and innovation: the mediating role of management accountants and management accounting systems' use	2019	<i>Journal of Management Control</i>	10.1007/s00187-019-00283-y
Paulsson G	The role of management accountants in new public management	2012	<i>Financial Accountability and Management</i>	10.1111/j.1468-0408.2012.00552.x
Puyou F-R	Systems of secrecy: confidences and gossip in management accountants' handling of dual role expectations and MCS limitations	2018	<i>Management Accounting Research</i>	10.1016/j.mar.2018.01.001
Ratnatunga J; Alam M	Strategic governance and management accounting: evidence from a case study	2011	<i>Abacus</i>	10.1111/j.1467-6281.2011.00344.x
Rickwood CP; Coates JB; Stacey RJ	Stapylton: strategic management accounting to gain competitive advantage	1990	<i>Management Accounting Research</i>	10.1016/S1044-5005(90)70044-3
Rieg R	Tasks, interaction and role perception of management accountants: evidence from Germany	2018	<i>Journal of Management Control</i>	10.1007/s00187-018-0266-0
Rieg R; Meier J-H; Finckh C	Beware of the watchdog! Role communication in job advertisements for management accountants	2023	<i>Journal of Applied Accounting Research</i>	10.1108/JAAR-07-2022-0188
Robalo R; Gago S	The role of trust in the primary adoption stage of management accounting innovations; [el Papel de la Confianza En La Etapa Primaria De Adopción De Innovaciones De Contabilidad De Gestión]	2017	<i>Revista Espanola De Financiacion Y Contabilidad</i>	10.1080/02102412.2016.1256721
Rosenberg D; Tomkins C; Day P	A work role perspective of accountants in local government service departments	1982	<i>Accounting, Organizations and Society</i>	10.1016/0361-3682(82)90016-2
Sathe V	The controller's role in management	1983	<i>Organizational Dynamics</i>	10.1016/0090-2616(83)90004-9
Scapens RW; Jazayeri M	Erp systems and management accounting change: opportunities or impacts? A research note	2003	<i>European Accounting Review</i>	10.1080/0963818031000087907
Schnegg M; Möller K	Strategies for data analytics projects in business performance forecasting: a field study	2022	<i>Journal of Management Control</i>	10.1007/s00187-022-00338-7
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Szukits Á	Controllers' profession in contemporary organisations -evidence from Hungary	2019	<i>Journal of East European Management Studies</i>	10.5771/0949-6181-2019-1-8
Ten Rouwelaar H; Bots J; De Loo I	The influence of management accountants on managerial decisions	2018	<i>Journal of Applied Accounting Research</i>	10.1108/JAAR-10-2016-0101
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Van Der Steen MP	Identity work of management accountants in a merger: the construction of identity in liminal space	2022	<i>Management Accounting Research</i>	10.1016/j.Mar.2022.100792
Vedd R	Management accounting and strategic human resource management: a comparison of the UK royal mail and Canada post	2005	<i>Problems and Perspectives in Management</i>	
Vedd R; Kouhy R	Interface between management accounting and strategic human resource management: four grounded theory case studies	2005	<i>Journal of Applied Accounting Research</i>	10.1108/96754260580001043

(continued)

Table A1

<i>Author</i>	<i>Title</i>	<i>Year</i>	<i>Journal</i>	<i>DOI</i>
Victoravich LM	When do opportunity costs count? The impact of vagueness, project completion stage, and management accounting experience	2010	<i>Behavioral Research in Accounting</i>	10.2308/bria.2010.22.1.85
Webb J; Chaffer C	The expectation performance gap in accounting education: a review of generic skills development in UK accounting degrees	2016	<i>Accounting Education</i>	10.1080/09639284.2016.1191274
Weber J	The development of controller tasks: explaining the nature of controllership and its changes	2011	<i>Journal of Management Control</i>	10.1007/s00187-011-0123-x
Weber J; Wiegmann L	Persistent but adaptable – the path dependent development of German cost accounting	2020	<i>Journal of Accounting and Organizational Change</i>	10.1108/JAOC-12-2019-0124
Wenzig J; Nuzum A-K; Schaltegger S	Path dependence of accountants: why are they not involved in corporate sustainability?	2022	<i>Business Strategy and the Environment</i>	10.1002/bse.3263
Wilbanks RM; Hermanson DR; Sharma VD	Audit committee oversight of fraud risk: the role of social ties, professional ties, and governance characteristics	2017	<i>Accounting Horizons</i>	10.2308/acch-51695

Source: Authors' elaboration

Appendix 2. List of removed words

- Austria
- case study
- education
- Germany
- identity
- institutional theory
- institutional work
- managers
- pragmatic constructivism
- Spain
- structural equation modeling
- survey
- UAE
- United Arab Emirates
- United States

About the authors

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