Knowledge management in small and medium enterprises: a structured literature review

Maurizio Massaro, Karen Handley, Carlo Bagnoli and John Dumay

Maurizio Massaro is Lecturer at the Department of Economic Sciences and Statistics, University of Udine, Udine, Italy. Karen Handley is Postdoctoral Research Fellow at the Department of Accounting and Corporate Governance, Macquarie University, Sydney, Australia. Carlo Bagnoli is Associate Professor at the Department of Management, Ca' Foscari University of Venice, Venice, Italy. John Dumay is Associate Professor of Accounting at the Department of Accounting and Corporate Governance, Macquarie University, Sydney, Australia.

Received 24 August 2015
Revised 7 December 2015
20 December 2015
Accepted 22 December 2015

Abstract

Purpose – *This paper aims to review and critique the knowledge management (KM) literature within small and medium enterprises (SMEs), offers an overview of the state of research and outline a future research agenda.*

Design/methodology/approach – *Papers published in KM journals are analysed using a structured literature review methodology. The paper analyses 89 papers published in ten journals specialising in the field of KM.*

Findings – *KM within SMEs is a research area of growing importance. Findings show that literature on KM in SMEs is fragmented and dominated by unrelated research, with few comparative studies between countries and several countries receiving little attention. Additionally, different definitions of SMEs are used and different kinds of SMEs (e.g. micro, small and medium) are often treated as equivalent, making comparison almost impossible. The results show a failure to address the implications of findings for practitioners and policymakers, which risks relegating the KM research on SMEs to irrelevance.*

Originality/value – *The paper presents a comprehensive structured literature review of the articles published in KM journals. The paper's findings can offer insights into future research avenues.*

Keywords *Small and medium enterprises, Knowledge management, Structured literature review, Research relevance*

Paper type *Literature review*

1. Introduction

Several studies argue that small and medium enterprises (SMEs) are the engine of economic growth in the industrialised world. Indeed, less than 1 per cent of the companies within the European Union (EU) are classified as large enterprises in comparison to the remaining 99 per cent categorised as SMEs, with the latter accounting for the employment of 66 per cent of the workforce and for 58 per cent of the value added in the EU (Patrice *et al.*, 2014, p. 6). Similarly, according to Clark *et al.* (2011, p. 3), in Australia, SMEs contribute over a third of industry value added. Additionally, in the Asia–Pacific Economic Area, SMEs employ over half of the workforce (Asia-Pacific Economic Cooperation, 2014, p. 1). According to Patrice *et al.* (2014, p. 6), "SMEs were a bulwark against the devastating effects of the global financial crisis", even though the recovery after the global crisis for SMEs is slower compared to larger organisations and "its pace has slowed in the last three years".

Interestingly, SMEs can be distinguished from large firms by their constrained resources and different managerial capabilities and practices (Cohen and Kaimenakis, 2007, p. 241). According to Cantú *et al.* (2009, p. 243), "the literature describing how large firms have developed successful knowledge management (KM) projects is extensive, in contrast with the scarce attention that has been paid to small and medium enterprises (SMEs) regarding this issue". Serenko (2013, p. 792) concurs that "KM in small and medium enterprises" is one of a list of "several important topics that have not received sufficient attention in

previous KM research". Furthermore, a report released by MATRIX (2014, p. 7), the Northern Ireland Science Industry Panel, comments that the "key to SME 'exploitation and commercialization of science, technology and R&D' is the effective management of intellectual effort created in the R&D, design and in wider business activities". In the increasingly global and deregulated industrial environment, there is more interest in KM practices that drive innovation, overcome limitations arising from the fragmentation of value chains and increased industrial sophistication and provide more knowledge-intensive product solutions (Northern Ireland Science Industry Panel, 2014). This fosters a need to understand how KM is evolving within the context of SMEs. Accordingly, this paper reviews and critiques the KM literature, offers an overview of the state of KM research and outlines a future research agenda.

In conducting this research, the authors build upon a recent review of KM in SMEs (Durst and Edvardsson, 2012). These authors use Jesson *et al.*'s (2011) method for developing a "systematic review of 36-refereed empirical articles on KM and small and medium-sized enterprises" (Durst and Edvardsson, 2012, p. 879). Their study focuses on research topics, findings of the articles surveyed and methods used by the authors, and sought insight into the challenges specific to SMEs because of their size and resources. Importantly, Durst and Edvardsson's (2012) paper only examined empirical research articles accessed via ProQuest and published in the period 2001-2011. As Durst and Edvardsson (2012, p. 879) state, "by only using the ProQuest database this study may not have allowed a complete coverage of all empirical articles in the field of KM in small and medium-sized enterprises". By extending Durst and Edvardsson's (2012) study to provide a wider analysis, interesting insights can be drawn by increasing the number of articles analysed and providing a deeper understanding of some aspects that are not analysed by Durst and Edvardsson (2012). Finally, considering both theoretical and empirical articles, a wider understanding of the development of KM research may be reached. Therefore, this study provides a further development of Durst and Edvardsson's (2012) study.

To develop Durst and Edvardsson's (2012) study further, this paper uses a structured literature review (SLR) methodology, as proposed by Massaro *et al.* (2016). It also extends the SLR approach through the use of keyword analysis (McCulloh *et al.*, 2013; Ribiere and Walter, 2013) and the inclusion of more detailed content-driven analysis to further develop findings. The results and implications of this study inform practitioners and academics about the main evolution of KM within SMEs, providing some insights about future research needs.

The findings of the present study reveal promising areas to be developed. Comparative studies such as those focused on emerging and under investigated areas are encouraged. New research topics are proposed, discussing the implications both for practitioners and policymakers. Additionally, the study makes a call to develop studies to better understand the meaning of SMEs and differentiate among different kinds of SMEs. Interestingly, the findings show a need to focus primarily on medium-sized firms because of their central role in supporting recovery after the global financial crisis. Finally, there is a specific focus on how to develop research avoiding *pedantic* or *popularist science*. The authors argue that scholars should focus on the stakeholders of research findings, thus developing *pragmatic science*, characterised by rigour and relevance.

According to Massaro *et al.* (2016), an SLR "is not the end of the road, but the beginning of new journeys". Therefore, providing insights on literature developed in more mature research fields, this paper calls for future developments more focused on specific content. Therefore, future research could compare results of studies based on small firms aggregated by a similar and shared dimension only. Considering the high percentage of contributions focused on knowledge as a process (41 per cent of the whole sample), this paper provides an example of a comparison of the results of these studies that could be expanded in future research. Unfortunately, these analyses cannot be reported in more detail in this study due to the specific aims of this study and the word limitation normally

imposed on standard academic papers. The paper is organised into five further sections. Section 2 presents the SLR methodology. Section 3 develops insight and critiques presenting results of the SLR developed. Section 4 offers a discussion about implications for KM research, and Section 5 presents some conclusions and illustrates limitations of this study and new opportunities for future research.

2. Research method

This paper uses an SLR approach, as described by Massaro *et al.* (2016). Following this approach, Massaro *et al.* (2016) assert that such studies can "contribute to developing research paths and questions by providing a foundation" for future research. SLRs are promoted to both emerging and existing scholars, providing an alternative to more "traditional" literature reviews and offering outcomes that are "defensible". Even when other reviews exist, conducting an SLR "can help experienced scholars develop new and interesting research paths by accessing and analysing a considerable volume of scholarly work" (Massaro *et al.*, 2016). This approach has successfully been used to study interdisciplinary fields of accounting, auditing and accountability (Guthrie and Parker, 2011), KM in the public sector (Massaro *et al.*, 2015b), organisational knowledge protection (Manhart and Thalmann, 2015), human capital accounting (Guthrie and Murthy, 2009; Guthrie *et al.*, 2012), the use of content analysis (Dumay and Cai, 2014) and intellectual capital (IC) (Dumay, 2014). Descriptions of the approach have developed from five steps (Guthrie *et al.*, 2012) to the ten steps described by Massaro *et al.* (2016):

1. Write a literature review protocol.
2. Define the questions that the literature review is setting out to answer.
3. Determine the type of studies and carry out a comprehensive literature search.
4. Measure article impact.
5. Define an analytical framework.
6. Establish literature review reliability.
7. Test literature review validity.
8. Code data using the developed framework.
9. Develop insights and critique through analysing the data set.
10. Develop future research paths and questions.

The SLR approach provides input for further content analysis of the data, conducted using the NVivo output. A study of the interrelationships between keywords is also undertaken.

This section describes the execution of Steps 1 to 8 of the SLR. Steps 9 and 10 are discussed in the next section, along with the supporting content examples arising from the content analysis and the keyword analysis results.

2.1 Write a literature review protocol

The starting point for an SLR is a clear guide for the remainder of the study usually synthesised in a protocol. The role of the protocol is to direct the inquiry and provide a reliable, repeatable framework to ensure a robust outcome. Similar to Durst and Edvardsson (2012), this study seeks to focus on the most important journals for KM. However, considering the specific aim of this research, which is to enlarge previous studies and offer a better understanding of variables previously not analysed, it identifies the ten most important journals on KM on the basis of citation analysis. This provides a broader study than Durst and Edvardsson (2012) by analysing a total of 89 articles and includes more recent articles. Nodes for coding were determined initially

based on previous SLR studies (Dumay and Cai, 2014; Dumay, 2014; Massaro *et al.*, 2015a, 2015b). These examine authors; their affiliation and country of research; the focus of the paper; the methods, frameworks and models used; and the contribution of the research. Additionally, nodes specific to KM in SMEs were added for this study. More nodes were added later in Step 5. A detailed description of these nodes is provided in Table I.

2.2 Define the questions that the literature review is setting out to answer

According to Massaro *et al.* (2016), an SLR needs to critique an existing field of knowledge and to offer a path towards future research. Research questions can help to develop an imaginative approach that focuses the analysis and helps in providing new insights (Hart, 1998, p. 30). Within this study, as defined in prior SLR studies, the protocol document identifies three research questions:

RQ1. How is the KM literature developing for SMEs?

RQ2. What is the focus of the KM literature within SMEs?

RQ3. What are the implications for the KM research within SMEs?

Answers to these research questions are provided in the section *insights and critique* and in the section *discussion and implications* for KM research within SMEs.

2.3 Determine the type of studies and carry out a comprehensive literature research

The selection of articles for this research paper is similar to Dumay and Cai (2014) and Massaro *et al.* (2015a, 2015b). Using a number of different journal rank indicators[1], the authors identified the ten most important journals reporting on KM in SMEs (Serenko and Bontis, 2013)[2]. These ten journals were then searched for articles using the keywords "SME*" or "Small Firm*" or "Small Enterprise*", "Intellectual capital" and "Knowledge management" in the title, abstract or keywords. First, SCOPUS was searched and a total of 91 articles were identified. Second, a manual search was conducted for the years the journals were not available in SCOPUS. The Table of Contents was manually examined for each of the journals from the year of its inception to the year prior to its first appearance in SCOPUS. The title of each article was scanned for the same keywords used in the SCOPUS search. This manual search revealed a further 42 articles, yielding a total of 133 articles. These articles were loaded into a Mendeley directory and from there loaded into NVivo for analysis. Finally, only articles with a specific focus on KM were selected, ending up with a list of 89 papers. The results of this analysis are presented in Table II. The entire list of papers analysed is reported in Appendix.

Of particular interest is the degree of specialisation evident in the measure of average citations per document for 2012-2014 ("Avg cites per doc 2012-2014"), as this indicates that two of the journals selected by Serenko and Bontis (2013) as the top six journals do not appear to be popular avenues for articles containing SME studies. Indeed, *Knowledge and Process Management* provides only five articles in the field of SMEs, while *International Journal of Knowledge Management* provides only two. This confirms the argument by Massaro *et al.* (2015a, 2015b) that specific journals target specific areas of interest, and indicates that these measures are worthy of consideration by authors before submitting articles to journals.

2.4 Measure article impact

The impact of the articles within each journal is measured using the total number of citations and citations per year (CPY). As KM is a relatively new field, both measures are reported to overcome bias introduced by the time lag between publication and citation, where reporting only the total number of citations would favour older, well-cited articles over newer ones. The results of the citation analysis are compared with the total number of articles

Table I Nodes used for coding, Krippendorff's alpha and a summary of results

Category	*Variables*	*Results*	*Krippendorff's alpha*
Author type	Scholar/s only	79	
	Practitioner/s only	1	
	Practitioner/s and scholar/s	9	
	Total	89	1.000
Country of research	EU	23	
	Finland	4	
	France	2	
	Germany	2	
	Greece	1	
	Iceland	2	
	Ireland	1	
	Italy	2	
	Principality of Lichtenstein	1	
	Slovenia	2	
	Spain	4	
	Sweden	2	
	UK	14	
	North America	4	
	Canada	1	
	USA	3	
	Central America	0	
	South America	1	
	Brazil	1	
	Asia	18	
	China	4	
	India	3	
	Malaysia	4	
	Pakistan	1	
	Republic of Singapore	1	
	Saudi Arabia	1	
	Taiwan	1	
	Thailand	1	
	United Arab Emirates	1	
	Vietnam	1	
	Australia and New Zealand	9	
	Africa	4	
	Nigeria	2	
	South Africa	1	
	Tunisia	1	
	Comparative analysis	6	
	Not specified	6	
	Not applicable	4	
	Total	89	1.000
Focus of the paper	KM	86	
	KM and IC	3	
	Total	89	1.000
Research questions and hypothesis	Provide research question	23	
	Provide hypothesis	15	
	Provide research question and hypothesis	8	
	Do not provide research question or hypothesis	43	
	Total	89	0.823
Definition of SMEs	UK definitions	3	
	European definition	30	
	American definition	2	
	Australian definition	4	
	Malaysian SMIDEC	3	
	New Zealand definition	3	
	Singapore definition	1	
	International standard definition	1	
	Fijian definition	1	

(*continued*)

Table I

Category	*Variables*	*Results*	*Krippendorff's alpha*
	Thai definition	1	
	Nigerian definition	1	
	Chinese definition	1	
	Provide its own definition	6	
	Not specified	30	
	Not applicable	2	
	Total	89	0.883
Size of SMEs	Small	13	
	Medium	2	
	Both small and medium	48	
	Large and SMEs	8	
	Not specified	16	
	No applicable	2	
	Total	89	0.899
Kind of production	Clothing industries	1	
	IT	2	
	Engineering industries	3	
	Knowledge-intensive	1	
	Service sector	2	
	Electronic security industries	1	
	Printing sector	1	
	Chemical industries	1	
	Science-based	1	
	Education sector	1	
	Pharmaceutical industries	1	
	Petroleum industries	1	
	Software industries	4	
	Optometry sector	1	
	Automotive component sector	1	
	Construction industry	2	
	Steel sector	1	
	High-tech industries	2	
	Aerospace sector	1	
	Renewable energy sector	1	
	Cable and wire manufacturing sector	2	
	Several	49	
	Not specified	9	
	Total	89	1.000
Focus of KM papers	Communities of practice	2	
	Information technology	8	
	KM strategy	13	
	Knowledge innovation	10	
	Knowledge as a process	34	
	Organisational culture	12	
	Scientometrics	0	
	Other	7	
	Total	86	0.912
Focus of IC and KM papers	Knowledge resources and IC	2	
	Knowledge creation and IC	1	
	Other	0	
	Total	3	1.000
Research method	Action research	1	
	Case study	28	
	Interviews	8	
	Literature review–normative	4	
	Modelling tools	1	
	Other qualitative	3	
	Quantitative cross-sectional	35	
	Quantitative longitudinal	0	
	Mixed methods	6	

(*continued*)

Table I

Category	*Variables*	*Results*	*Krippendorff's alpha*
	Viewpoint	3	
	Other	0	
	Total	89	0.880
Focus on quantitative methods	Descriptive statistics	15	
	Analysis of variance or others	7	
	Regression	6	
	Multiple linear regressions	4	
	Structural equation model	7	
	Social network analysis	0	
	Other	2	
	Total	41	1.000
IC-KM frameworks and models	No framework-model used	2	
	Applies or considers previous frameworks	73	
	Proposes a new framework-model	14	
	Other	0	
	Total	89	0.880
Findings	Explains findings	89	
	Not explained	0	
	Total	89	1.000
Research implication	Explains research implication	76	
	Not explained	13	
	Total	89	0.910
Practical implication	Explains practical implication	47	
	Not explained	42	
	Total	89	0.955
Policy implication	Explains policy implication	14	
	Not explained	75	
	Total	89	0.848

Notes: The bold data in Results column provides number of papers for each variable and Krippendorff's alpha column reports the Krippendorff's alpha of the codification; a definition of the Krippendorff's alpha is provided in Section 2.6

published per year. As can be seen in Figure 1, the literature shows a growing number of articles published in the field with a decreasing CPY.

Table III lists the top ten articles ranked by total citations, and Table IV lists the top ten articles ranked by CPY. As can be seen in these tables, the top ten lists for the SME study contain the same articles, with one exception in each case. Changing the measure only seems to affect the order of the articles within the lists in this instance.

2.5 Define an analytical framework

The list of prospective nodes developed from previous studies was tested by three authors, who each coded the same five articles independently, and then discussed the coding and amended the nodes to arrive at the list provided in Table I. In this stage, it became apparent that there were wide-ranging definitions of the SMEs being studied, and that the size definitions were not uniform. For this reason, the authors refined the nodes for definition and size of SME[3] and also decided to include analysis of the research questions posed in the articles.

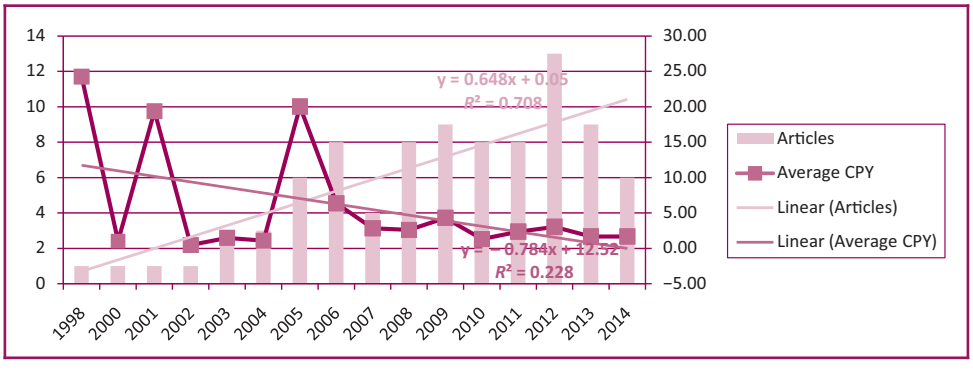
2.6 Establish literature review reliability

The practice of coding the initial five articles independently by three authors allowed the authors to use a statistical measure to test coding reliability. As illustrated by Massaro *et al.* (2015a, 2015b), this paper uses Krippendorff's alpha inter-coder reliability test (Hayes and Krippendorff, 2007, p. 82) on the coding outcome from two of the coders as provided by the software "R" (R Core Team, 2014) and the library "irr" (Gamer *et al.*, 2012). The output from the third coder is used to resolve any coding differences that arise between the first

Table II Citation indices for journals and details for articles selected

N:	Journal title	Serenko and Bontis ranking	ABDC	SJR 2014	Google H5 index	Avg cites per doc 2012-2014	Founded	On Scopus from	Numb of papers	Manual search for other years	Total	Coded as relevant for KM
1	*Journal of Knowledge Management*	A+	A	0.86	38	2.76	1997	2005	26	2	28	26
2	*Journal of Intellectual Capital*	A+	B	0.64	34	3.13	2000	2005	16	0	16	0
3	*The Learning Organization*	A	C	0.38	20	1.3	1994	2005	7	1	8	7
4	*Knowledge Management Research & Practice*	A	A	0.31	15	1.07	2003	2006	12	8	20	11
5	*Knowledge and Process Management: The Journal of Corporate Transformation*	A	B	0.34	15	1.1	1997	2009	4	1	5	5
6	*International Journal of Knowledge Management*	A	B	0.24	9	0.4	2005	2008	2	0	2	2
7	*Journal of Information and Knowledge Management*	B	C	0.14	15	0.29	2002	2002	14	0	14	12
8	*Journal of Knowledge Management Practice*	B	B	NA	NA	NA	1998	No	0	12	12	12
9	*Electronic Journal of Knowledge Management*	B	C	NA	15	NA	2003	No	0	17	17	7
10	*International Journal of Learning and Intellectual Capital*	B	C	0.22	7	0.31	2004	2006	10	1	11	7
	Total								91	42	133	89

Figure 1 Number of papers and average citation per year



two coders. According to this approach, researchers can "rely only on variables with reliability above a= 0.800; consider variables with reliabilities between 0.667 and a = 0.800 only for drawing tentative conclusions" (Krippendorff, 2013, p. 325). As reported in Table I, the results show a Krippendorff's alpha over 0.8 in all instances. Therefore, the authors argue that the results presented are reliable.

2.7 Test literature review validity

According to Silverman (2013, p. 289), researchers "must overcome temptation to jump to easy conclusions just because there is some evidence that seems to lead in an interesting direction". Therefore, within this study, external and internal validity tests are performed.

According to White and McBurney (2012, p. 145), external validity is concerned with whether the results of a study can be generalised. In this study, the authors performed

Table III Top ten articles by total citations

References	Title	Total citations	Position as CPY
Riege (2005)	Three-dozen knowledge-sharing barriers managers must consider	670	1
Deakins and Freel (1998)	Entrepreneurial learning and the growth process in SMEs	412	4
Wong and Aspinwall (2005)	An empirical study of the important factors for knowledge-management adoption in the SME sector	326	2
McAdam and Reid (2001)	SME and large organisation perceptions of knowledge management: comparisons and contrasts	271	6
Desouza and Awazu (2006)	Knowledge management at SMEs: Five peculiarities	223	3
Salojärvi *et al.* (2005)	Knowledge management and growth in Finnish SMEs	158	7
Grace (2009)	Wikis as a knowledge management tool	124	5
Chen *et al.* (2006)	Toward understanding inter-organizational knowledge transfer needs in SMEs: Insight from a UK investigation	79	9
Meroño-Cerdan *et al.* (2007)	Knowledge management strategy diagnosis from KM instruments use	63	10
Balestrin *et al.* (2008)	Knowledge creation in small-firm network	49	NA

Table IV Top ten articles ranked by citations per year (CPY)

Author	Title	CPY	Position as total citation
Riege (2005)	Three-dozen knowledge-sharing barriers managers must consider	67	1
Wong and Aspinwall (2005)	An empirical study of the important factors for knowledge-management adoption in the SME sector	32.6	3
Desouza and Awazu (2006)	Knowledge management at SMEs: Five peculiarities	24.78	5
Deakins and Freel (1998)	Entrepreneurial learning and the growth process in SMEs	24.24	2
Grace (2009)	Wikis as a knowledge management tool	20.67	7
McAdam and Reid (2001)	SME and large organisation perceptions of knowledge management: comparisons and contrasts	19.36	4
Salojärvi *et al.* (2005)	Knowledge management and growth in Finnish SMEs	15.8	6
Durst and Edvardsson (2012)	Knowledge management in SMEs: A literature review	15.33	N/A
Chen *et al.* (2006)	Toward understanding inter-organizational knowledge transfer needs in SMEs: Insight from a UK investigation	8.78	9
Meroño-Cerdan *et al.* (2007)	Knowledge management strategy diagnosis from KM instruments use	7.88	10

several queries to understand how the selected articles can be considered representative of the available literature. To this end, the abstracts of the 133 articles located in Step 3 and, in some cases, the full content of the articles, were examined by two members of the research team. Forty-four articles were identified as not relevant, leaving a remaining 89 articles to study. Rejected articles were either not scholarly articles[4] or articles in which the acronym SME either did not refer to small and medium-sized entities or the term was used in the article in a general or unrelated way[5]. A search of SCOPUS using the same keywords but not restricted to the ten selected journals yields a total of 161 articles, which satisfies the research team that the sample is representative of the available literature on these subjects.

Further analysis revealed that 86 (96.6 per cent) of the articles were only about KM and three (3.4 per cent) covered both KM and IC. As previously reported, articles focused only on IC (33 articles) were not considered. Similar results were obtained in SCOPUS using the same keywords where the search was not restricted to the ten selected journals. Therefore, the authors of this research claim that the articles analysed are representative of the available literature on the subject of KM.

Additionally, according to Massaro *et al.* (2016), the authors performed several other tests to ensure internal validity. Internal validity seeks to establish causal relationships (White and McBurney, 2012). Within this study, a pattern matching approach (Yin, 2014, l. 3,654) was used, and the results were checked first with a small group of articles and then confirmed enlarging the analysis to the whole data set. Additionally, time-series analysis

(Yin, 2014, l. 3,826), both comparing number of articles and their citation impact, was used to analyse the development of the literature. The results of these studies are provided in the following sections.

2.8 Code data using the developed framework

According to Stanley (2001, p. 135), "after reducing the sample of studies to those that contain some relevant empirical estimate, test or finding, the next step is to identify important characteristics of the studies and to code them". Articles have been coded manually by two of the authors using other members of the research team to solve discrepancies in coding. Data are coded using NVivo. Manual codes have been checked using text search queries to increase the validity of the results. Following the coding, the data are analysed to arrive at the insights and critique.

Additionally, the authors perform a keyword analysis. According to Silverman (2013, p. 275), keyword analysis "is a method that allows you to analyse very large amounts of text without losing touch with focusing on small amounts of the material in considerable depth". In this paper, keywords are classified and analysed through a social network analysis. According to Gamer (2012, p. 58), social network analysis with keywords "can help you quickly determine what topics are resonating and worthy of current conversation and content".

The results of the coding process, the keywords and social network analysis are used to address *RQ1* and *RQ2* in Section 3. The final step, developing implications for KM research paths and questions, which addresses *RQ3*, is explored in Section 4.

3. Findings: insights and critique

This section analyses the coding performed and presents the results in answer to *RQ1*: *How is the KM literature developing for SMEs?* and *RQ2*: *What is the focus of the KM literature within SMEs?* More precisely, this section explores the author demographics, regions of research, focus topics and common keywords of the articles, research questions and hypotheses, the size and definitions of SMEs studied, research methods and frameworks used and an analysis of the areas of implication of the findings.

3.1 Author demographics

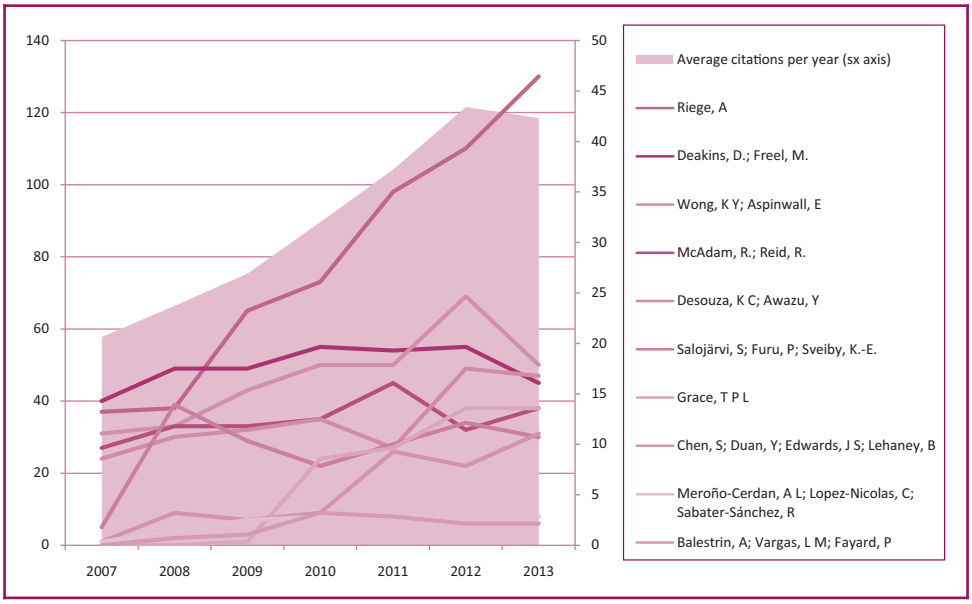
An analysis of the 207 authors who published the 89 articles analysed reveals that there are very few articles written by practitioners. Most of the articles analysed were written by academic scholars (88 per cent), with only 2 per cent and 10 per cent, respectively, written by practitioners or a collaboration between practitioners and scholars. This shows a lower participation of practitioners compared to the results of Serenko *et al.* (2010), where 17 per cent of the articles analysed are totally published by non-academics.

Additionally, only ten authors have published more than one paper, and only 19.1 per cent of articles are the result of an international collaboration between co-authors. The most prominent author in the SME arena is Edvardsson (Durst and Edvardsson, 2012; Edvardsson, 2006, 2009), who has co-authored three articles. Additionally, citation analysis reveals that of the ten most prolific authors, 60 per cent are within the most cited papers. Interestingly, most cited articles show an increasing trend, collecting more and more citations. These results confirm what Serenko and Dumay (2016) called a Google Scholar effect:

> [. . .] defined as a situation when older academic publications continue to be cited because of their appearance in the top rankings of Google Scholar, which makes some authors believe that journal reviewers and editors expect to see these citations, regardless of their actual fit and contribution to the citing work.

The results of the analysis are depicted in Figure 2 for the period 2007-2013.

Figure 2 Most cited papers and their citation trend



These demographics suggest that, despite the high number of authors who have at some stage published KM articles relating to SMEs, there are very few authors who remain focused on examining further aspects particular to SMEs after their initial study. A search of publications on Google Scholar for the ten authors with more than one publication reveals that all of them, with the exception of one early career researcher, have additional publications relating to SMEs in other subject areas and other journals outside this study. This explains why this subset of authors has multiple publications in this study. It is possible that the remainder of the authors only use the SME arena as an alternative forum for concepts already explored in other areas.

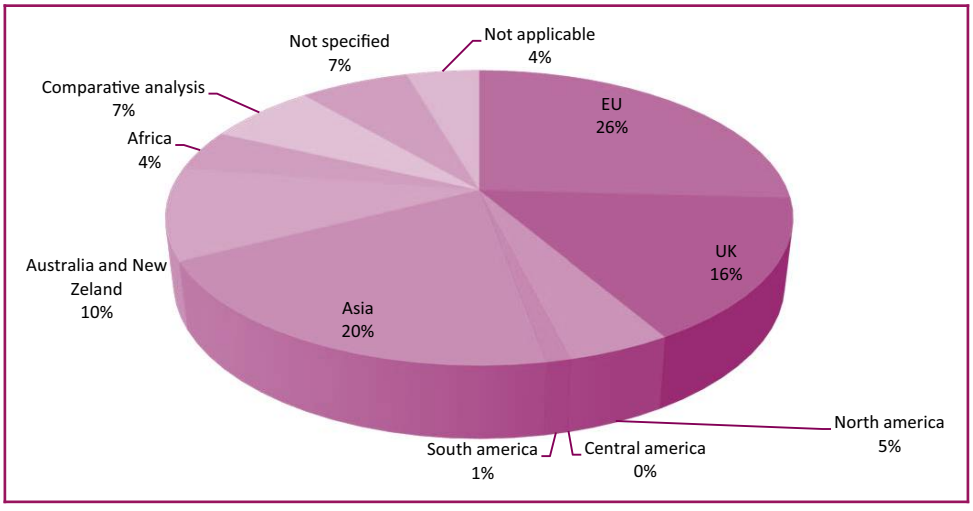
3.2 Regions of research

This section describes geographical regions analysed by the articles selected. More precisely, this study uses classifications of countries provided in previous studies (Guthrie *et al.*, 2012; Massaro *et al.*, 2015a, 2015b). Therefore, articles are first grouped by continent and then analysed by country. Additionally, as proposed by Guthrie *et al.* (2012), the UK is separated from Continental Europe, while the American continent is divided into "North", "Central" and "South". The results of the analysis are shown in Figure 3.

The regions with the highest representation are the EU with 23 articles (26 per cent), followed by Asia with 18 articles (20 per cent) and the UK with 14 articles (16 per cent). Within the 14 countries represented in the EU, Finnish and Spanish SMEs (four articles each) appear to have been studied most. In Asia, a similar pattern of dense concentration is found, with China and Malaysia (four articles each) being the location of the most studies in this region. Of the 89 articles studied, ten Asian countries are represented, and there appears to be a rising trend for publications originating in this region. Australia and New Zealand are the location for nine studies, which is a large number when the relative population of these countries is considered. In contrast, relative to the size of its economy, the North American region is under-represented with only four articles. Additionally, several emerging countries are totally ignored or poorly analysed (e.g. countries in South America and Africa). The results of the analysis are reported in Table I.

Additionally, further analysis reveals that there are only six studies comparing different locations. However, these comparative studies are cited more frequently on average (CPY) than articles located in only one country or region.

Figure 3 Most studied regions



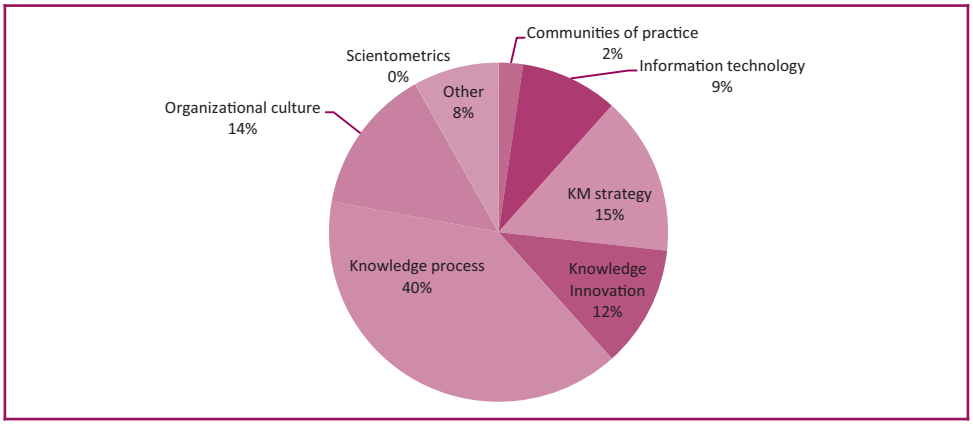
As will be discussed in Section 3.5, this analysis of SME publications by region should be reviewed with an understanding that SMEs are defined differently in different countries and, indeed, within different articles from the same country.

3.3 Topics and common keywords

This section describes topics covered by the 89 articles analysed. The most frequently used journal for KM publications in SMEs is the *Journal of Knowledge Management*, home to 24 articles on KM and two on KM and IC. The peak year for relevant publications in this journal was 2012. Other journals where concentrations of KM articles on SMEs are found are *Journal of Information and Knowledge Management* (12 articles), *Journal of Knowledge Management Practice* (12 articles) and *Knowledge Management Research and Practice* (11 articles). The topics covered in the KM articles are represented in Figure 4.

This analysis reveals that KM articles focus on knowledge as a process and, to a lesser extent, KM strategy, organisational culture and knowledge innovation. Interestingly, analysing their evolution over time, the results show that articles focusing on knowledge as a process continue grow, with the highest number of publications in the period 2010-2013. These results build on Serenko and Dumay (2015, p. 410), who found when analysing citation classics that "Knowledge as a process and managing/competitive advantage

Figure 4 KM key topics



dominate earlier rather than later articles". Therefore, papers with the highest citations are in the earlier years of development of the KM literature, whereas most of the articles focused on KM process are recent. These results suggest that prospective authors who want to publish on these topics should "think carefully about how their research is transformational [. . .] rather than blindly developing research utilising popular research methods [or topics] just because others have done so before them" (Dumay, 2014, p. 20).

This research develops a specific insight into the main findings relating to knowledge as a process, which represents 40 per cent of the whole data set. The purpose of this insight is to increase understanding of the transformational nature of prior studies. Results show that previous studies highlight both the importance of interaction between the members of the organisation and among networks of SMEs. Tools and risks to support social interaction are widely analysed in the literature. For example, Balestrin *et al.* (2008, p. 103) state "The existence of formal and informal situations so that the businessmen can share abilities, experiences, emotions and know-how, by means of face-to-face communication, promoted an environment of intense sharing of tacit knowledge". Similarly Duh and Belak (2008, p.196) states "to improve the functioning of family enterprises, it is crucial that the knowledge acquired by family business research is effectively disseminated into the communities of practice (to users) (e.g. by establishing and developing a family business network and/or family business associations, by publishing professional family business publications) and incorporated into training and educational programs".

Additionally, human factors (like personal motivation and ambition), as well as organisational factors (like communication and management support) and external factors (like customers and suppliers), are considered as key elements that affect the knowledge processes. Furthermore, specific elements of SMEs are analysed in the literature, for example the relationship between the owner/manager and employees. Desouza and Awazu (2006, p.36) state that in SMEs, "knowledge becomes part of the organization's fabric when it is socialized from the manager to the employees, seldom does knowledge move the other way, i.e. from employee to manager". Table V enlarges this analysis by providing examples from the literature studied of interactions that support knowledge as a process; human, organisational and external factors that affect knowledge as a process; and the impact of knowledge as a process on performance.

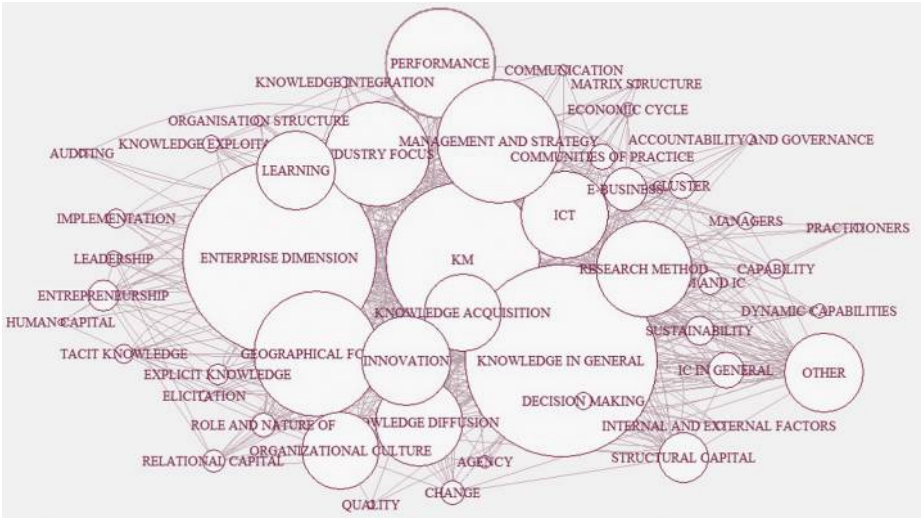
A keyword analysis is developed to enlarge the analysis depicted in Table V. Keywords are used by authors, editors and publishers to signal important themes in articles. According to Booker *et al.* (2008, p.240.), "practitioners search for articles based on topics or keywords as they are needed". To utilise this strength, a keyword analysis was performed for the articles in the sample. Similar to the study performed by Ribiere and Walter (2013), keywords were extracted from the articles and a dictionary of terms was created by aggregating similar keywords (e.g. "SME", "SMEs", "small enterprises", are all connected with the "enterprise" dimension). Arising from this aggregation, this study finds some anomalies – for example, it is questioned whether a global definition is available for knowledge value added, and manufacturing is identified as a diverse concept, even within the boundaries of a single country (e.g. China). Nevertheless, there is sufficient congruence of terms to provide a dictionary that was analysed using a social network analysis approach to identify relationships within the keywords. For example, if an article uses "performance" and "KM" as keywords and another paper uses "KM" and "strategy", the assumption is that KM is connected with strategy and performance. Figure 5 is a pictorial representation of keyword interrelationships of the articles in the sample.

The size of the spheres in Figure 5 represents their relative importance (bigger spheres have connections to more articles) calculated using the degree centrality measure. McCulloh *et al.* (2013) state that degree centrality indicates the agents with the largest number of direct links to and from other agents. The spheres identified as most important in Figure 5 by virtue of their size (i.e. enterprise dimension, knowledge in general, management and strategy, performance, KM and geographical focus) map well to the

Table V KM process: focus topics and main variables analysed

Focus	*Details*	*Quotations*
Interaction to support knowledge process	Social interaction to support/ influence the knowledge process	Social interaction provided by the network configuration had a positive influence on the dynamic of knowledge creation within the SFN (Balestrin *et al.* 2008, p. 103)
	Governance to support/influence the knowledge process	There are two radically different modes of cluster governance, of integrating external knowledge, and of managing the knowledge management phases–and their preconditions, that is, member firms' common knowledge base and shared representations (Bocquet and Mothe 2010, p. 237)
	Social networks, COPs, methods and strategies of interaction	Links to informal external SNs (in the form of social acquaintances) were useful to source external knowledge to create new ideas (Evans *et al.* 2013, p. 10)
	Interaction barriers	Organization members are aware of the danger of knowledge attrition (Durst and Wilhelm, 2012, p. 637)
Human factors that affect the knowledge process	Personal motivation, ambition, skills and absorptive capacity	Personal motivation, the opportunity to learn, source reliability and resistance, and the absorptive capacity and receptiveness of the receiver are significant variables in this investigation (Cantú et al. 2009, p. 253)
	Personal knowledge, decision-making capabilities	Personal self-responsibility/KM success, decision-making/KM success, cooperation at workplace/KM success, use of knowledge to solve unforeseen problems/KM success (Hussain *et al.*, 2010, p. 324)
	Individual barriers	Barriers originating from individual behaviour or people's perceptions and actions can relate to either individuals or groups within or between business functions (Riege, 2005, p. 23)
Organisational factors that affect the knowledge process	Management Support	Support from top management is enormously important for the implementation of KM, hence making it as one of the most important CSF (Rehman *et al.*, 2010, p. 3)
	Organisational culture	Certain cultural attributes could impede UK organisations carrying out business in international markets. This could be due to a lack of knowledge sharing between the home and the host country partners, or a lack of preparation and expertise on the part of the UK (Soley and Pandya, 2003, p. 205)
	Internal resources: financial, technological, rewards	Financial resources is another important CSF as nothing can be implemented without financial resources (Rehman *et al.*, 2010, p. 6) To encourage knowledge creation and sharing behavior, rewards are important (both intrinsic and extrinsic) (Rehman *et al.*, 2010, p. 4)
	Organisational barriers	One of the key issues of sharing knowledge in an organisational context is related to the right corporate environment and conditions (Riege, 2005, p. 25)
External factors that affect the knowledge process	Customers	Similarly, customers can potentially contribute much needed knowledge to the enterprises in terms of their requirements (Wei *et al.*, 2011, p. 193)
	Suppliers	Knowledge about suppliers is also thought to be very important because the knowledge may help them to establish good relationship with the suppliers, which in turn helps them to provide better service to their customers (Chen *et al.* 2006, p. 17)
	Competitors	In some cases, it may also be in the organization's best interest to collaborate with its competitors (Desouza and Awazu 2006, p. 40)
	Educational programmes	Training and education are very often seen by family business owners-managers as a cost burden rather than an investment in the future development of their enterprises (Duh and Belak 2008, p. 196)
	Consultants	The professionals engaged to conduct in- house training, external training, or appointed as consultants can also facilitate the knowledge sharing and acquisition processes by providing more effective knowledge-sharing vehicles and sources (Wei *et al.*, 2011, p. 193)
	Banks	The authors also propose that collaboration between banks and firms has a positive effect not only on the access to credit but also on the innovation activities and on the intervention of foreign capital in the ownership of Italian businesses (Peruta *et al.*, 2014, p. 1036)
Impact of knowledge process on performance	Individual, organisational, product, process and customer satisfaction	Knowledge organization, retention, and knowledge utilization have a significant impact (at $p = 0.05$). Both positively improve individual performance (Supyuenyong and Swierczek, 2011, p. 6) Knowledge organization and retention and knowledge utilization significantly increase organizational performance (Supyuenyong and Swierczek, 2011, p. 6)

Figure 5 Keywords analysis



three most important concepts identified by Ribiere and Walter (2013). These authors identified the most prominent themes in their analysis of the KM articles in the journal *Knowledge Management Research and Practice*, as organisational knowledge, strategic KM and operational KM.

Additionally, eigenvector centrality analysis was developed to identify central topics. According to McCulloh *et al.* (2013, p. 46), "a node is high in eigenvector centrality if it is connected to many other nodes which are themselves well connected [. . .] Nodes in social networks with high eigenvectors are considered to be influential nodes in the network". Figure 5 shows that the enterprise dimension is often used as a keyword with the highest eigenvector centrality of 1. This is important, given the inconsistent definition of the term "SME" observed (see Section 3.5). Second, articles are often focused on industry (eigenvector centrality = 0.7) and geography (eigenvector centrality = 0.8). This is supported by the low number of comparative studies in either dimension, as well as the low incidence of articles authored by practitioners or arising from international collaboration between authors. Similarly, the research method used (eigenvector centrality = 0.6) appears frequently in the keywords. Unfortunately, as discussed in Section 3.6, many quantitative articles use only a very basic approach, and this limits the comparability of articles using similar research methods.

Some other matters arising from the analysis include the low importance of "entrepreneurship" (eigenvalue centrality = 0.2) as a keyword, which is particularly interesting, given this is a study of SME articles, and a high incidence of entrepreneurs could be expected in such businesses. The keyword "entrepreneurship" first appears in paper titles in 1999 (Deakins and Freel, 1998) and only appears again in 2008 (Ngui *et al.*, 2008).

Interestingly, the topic of gender is absent from the keywords, appearing only in the complete text of nine papers, mainly as a control variable (Cantú *et al.*, 2009, p. 248; Graham and Nafukho, 2007, p. 287). This appears particularly relevant within SMEs, as "research suggests that businesses operated by women are characterised by different organisational and managerial approaches" (Paoloni and Dumay, 2015, p. 174). Thus, women are an important part of SME businesses and their management.

Similarly, business models are another under-investigated topic absent from the keywords. According to Zott *et al.* (2011, p. 1,019), from 1995 to 2011, 1, 177 articles have been

published in peer-reviewed journals, and therefore, "the business model has been the focus of substantial attention from both academics and practitioners". The results of this analysis show that the topic of business model should be further developed within the KM literature, especially considering that "the business model concept concern[s] the transformation of resources into value" (Beattie and Smith, 2013, p. 244).

3.4 Research questions and hypotheses

This section aims to analyse if research questions and/or hypotheses are commonly defined within the literature of KM in SMEs. According to Miles *et al.* (2013, p. 1,151), "research questions represents the facets of inquiry that the researcher most wants to the enquiry. The formulation of research question may be general or particular descriptive or explanatory". Research questions are important to evaluate the quality of the research. Therefore, understanding if and how the articles analysed provide specific research questions could help in understanding the evolution of the research topic to a stage of scientific maturity.

For the articles analysed in this study, 9 per cent provide research questions and hypotheses and/or propositions, 26 per cent provide research questions only and 17 per cent develop hypotheses or provide propositions only. This leaves 48 per cent (43 articles) with no research question, hypotheses or propositions. As can be seen in Figure 6, the practice of conducting research using hypotheses and research questions is improving over time. It is possible that this is an indication of the maturation of this field of research into a more scientific phase (Serenko and Dumay, 2015, p. 415).

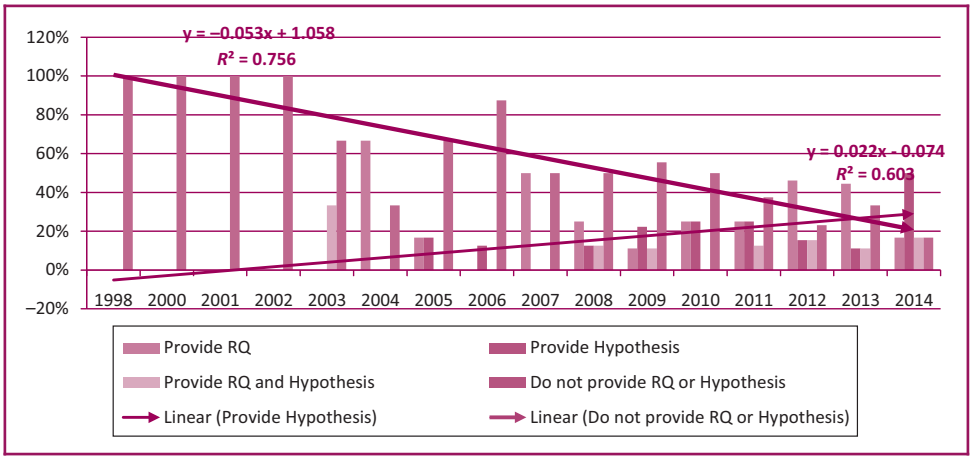
3.5 Size and definitions of SMEs

The definition of SMEs provides researchers and policymakers with a country-specific dilemma. "Small", "medium" and "large" are relative measures that vary depending on the robustness of the host economy. As identified by Steenkamp and Kashyap (2010, p. 372), definitions commonly refer to thresholds relating to revenue, assets and number of employees:

> There is no universally-used definition of what constitutes a small business and by what criteria it should be measured [. . .] Internationally, SMEs constitute a diverse and dynamic group of enterprises and the firm size is measured in a variety of ways. Although numbers of employees, sales figures, assets and industrial classification are typically used to determine the firm size, the diverse structures of economies make a single statistical definition impractical.

Some researchers rely on all of the components of the definition, while others rely on selected components, or none. This dilemma is evident in this analysis, with

Figure 6 Incidence of research questions and hypotheses over time



researchers relying on country-specific (19 per cent) or region-specific (40 per cent) definitions, creating their own definitions (7 per cent) or not clearly specifying what is meant by the term "SME" (34 per cent). Articles with no SME definition appear to be declining in frequency, and in 2014, only one paper out of six papers published had no definition. However, the varying size of formal definitions for SMEs in different jurisdictions, as illustrated in Table VI, continues to be challenging for researchers seeking to do international comparisons.

Table VI shows that there is a restriction placed on generalising findings arising from the inconsistent definitions of SMEs, which vary in the relative quantum of the elements, the number of elements cited and the authority for the definition cited (the UK Act (2006) and EC (2003/5) Article 2 of the Annex of Recommendation 2003/361/ECA). An extreme example of quantum variation can be seen if findings in China (Wang and Han, 2011) are compared with findings in Spain (Cegarra-Navarro and Dewhurst, 2006)[6]. According to the Chinese authors, an SME is an entity with fewer than 1,000 employees, whereas in the Spanish study, the entities studied had more than three employees. Conceptually, there may also be a variation in the practices between small and medium entities. However, these are most commonly studied as if they are homogeneous (48 articles) rather than disparate. Additionally, only two studies specifically declare a focus on medium-sized enterprises.

As with SME definitions, there appears to be a wide spread of sectors studied, with no real density in any particular sector. Interestingly, 49 articles (55 per cent) do not differentiate by sector, or compare multiple sectors, and 10 per cent of the articles do not provide any

Table VI Size and definitions of SMEs

Size	*Country or region*	*Revenue*	*Assets/Bal sheet*	*Employees*	*Reference*
Micro	International			<10	Lockett and Brown (2000, p. 199)
	European Union	<€2 million		<10	Duh and Belak (2008), Durst and Edvardsson (2012, p. 880), Meroño-Cerdan *et al.* (2007)
Small	Own definition			<50	Migdadi *et al.* (2012, p. 8)
	Own definition			10-250	Migdadi *et al.* (2012, p. 8)
	Fijian	$30,000 and $100,000	$30,000-$100,000	6-20	Devi *et al.* (2013, p. 2)
	International			<100	Lockett and Brown (2000, p. 199)
	American				Marcketti and Kozar (2007)
	American			150	Graham and Nafukho (2007)
	European Union	<€10 million		10-49	Duh and Belak (2008), Durst and Edvardsson (2012, p. 880), Meroño-Cerdan *et al.* (2007)
Medium	European Union	<€50 million		50-250	Duh and Belak (2008), Durst and Edvardsson (2012, p. 880), Meroño-Cerdan *et al.* (2007)
	International			<250	Lockett and Brown (2000, p. 199)
	Fijian	$100,000-$500,000	$100,000-$500,000	21-50	Devi *et al.* (2013, p. 2)
SMEs	European Union	€ 30 million		124	Peruta *et al.* (2014, p. 1041)
	European Union			>3	Cegarra-Navarro and Dewhurst (2006, p. 54)
	European Union			>14	Soto-Acosta *et al.* (2014, p. 106)
	Australian			48	Coyte *et al.* (2012, p. 793)
	Australian			<200	Parker *et al.* (2014)
	Australian	< $5million			Evans *et al.* (2013, p. 5)
	Malaysian	RM250,000-RM25million		<150	Chong *et al.* (2014, p. 126)
	Malaysian	RM200,000-RM5milions		<50	Chong *et al.* (2014, p. 126)
	Thai		<$5.71 million	<200	Supyuenyong and Swierczek (2011)
	Nigerian		<500 million naira	<100	Egbetokun *et al.* (2012, p. 101)
	Chinese			<1,000	Wang and Han (2011, p. 807)
	Vietnamese			<300	Pham (2011, p. 18)
	Own definition			<100	Desouza and Awazu (2006, p. 34)

information about the sector studied. Details about the sectors studied are depicted in Table I.

3.6 Research methods and frameworks used

The articles were coded with respect to the research methods and frameworks used. The framework analysis reveals that authors rely quite heavily on existing frameworks (83 per cent), with only 16 per cent of the authors proposing new frameworks. This supports the argument in Section 3.3 that authors may be applying concepts to SMEs that have already been explored for larger entities. Figure 7 reveals that quantitative methods are most prominent (39 per cent), followed by case studies (31 per cent).

Further analysis of the quantitative methods used reveals the most common to be basic statistics (22 articles or 54 per cent use descriptive statistics or basic statistical tests like analysis of variance tests). The second most used approach is structural equation modelling (SEM) (7 articles or 17 per cent), followed by regression analysis. There are very few or even no studies using social network analysis (0 per cent) and multiple linear regressions (10 per cent). Further details are provided in Table I.

These results must be interpreted considering that "there is a need for more empirical work based on critical and performative KM, as opposed to more normative articles by practitioners advocating KM benefits and suggesting what to do" (Serenko and Dumay, 2015, p. 417). Interestingly, as Mouritsen (2006, p. 835) asks and answers: "Will such a research agenda make statistical testing impossible? No". These considerations are supported by the findings of this study. Indeed, the wide use of SEM suggests that researchers agree with Massaro *et al.* (2015a, p. 498, 2015b) who state that "SEM does not provide a unique predefined model because any initially proposed model can be modified by deleting insignificant paths, finding new paths and testing them again". Therefore, there is growing attention to more complex research methods "that questions established conclusions" (Mouritsen, 2006, p. 835) but that is not completely answered within SMEs studies.

3.7 Areas of implication of the findings

While findings are clearly identified in all 89 articles, and the majority elaborate on the implications of the findings for research (85 per cent), and the practical implications of the research (53 per cent), there is a very low incidence of explanation of policy implications (16 per cent). A synthesis of main implications for practitioners and policymakers is depicted in Table VII.

Figure 7 Research methods used

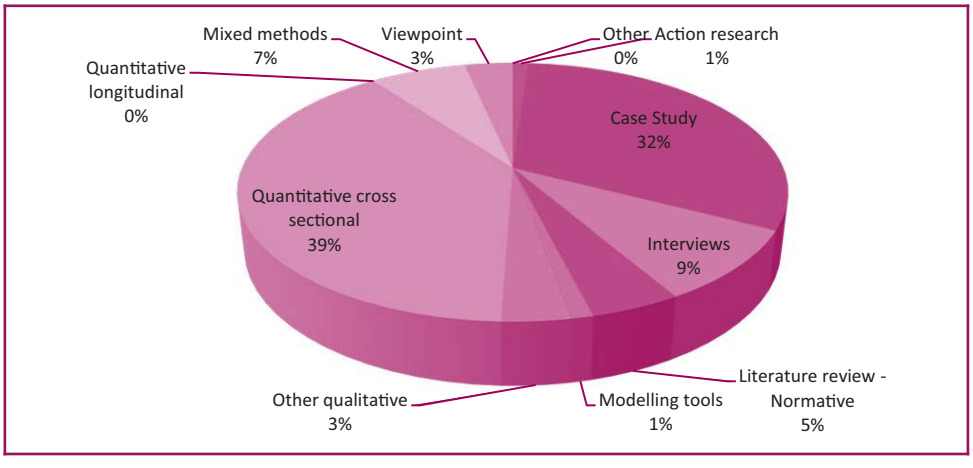


Table VII Main implications for practitioners and policymakers

Implication	*Description*	*Reference*
Managerial implications	The role of network structures, cluster structures or communities of practice in the process of knowledge creation	Balestrin *et al.* (2008), Meroño-Cerdan *et al.* (2007), Pattinson and Preece (2014)
	The relevance of generation and transfer (two phases of knowledge management), inter-organisational knowledge transfer, information exchange and absorptive capacity	Cantú *et al.* (2009), Chen *et al.* (2006)), Peruta *et al.* (2014), Wang and Han (2011);
	The danger of knowledge loss in SMEs, specifically relating to succession planning and the importance of knowledge of older experts in the professional services, and IC elements	Durst and Wilhelm (2012), Joe *et al.* (2013)
	The importance of external knowledge (for example, customer information and competitive advantage), informal learning, succession planning, methods for the development of communities of practice and networks or clusters	Chen *et al.* (2006), Chong *et al.* (2014), Hui (2012), Panagiotakopoulos (2011), Durst and Wilhelm (2012), Pattinson and Preece (2014), Bocquet and Mothe (2010), Haapalainen and Mäkiranta (2013), Nordman (2012)
Policy implications	The lack of access SMEs have to networks aimed at improving strategic opportunities	Tomlinson (2011)
	The ability to innovate and change and lack of resources, in particular the time-poor nature of owner-managers, also need to be considered when suggesting policy changes	Devi *et al.* (2013), Duh and Belak (2008), Kamoun-Chouk (2007), Roxas *et al.* (2013)

The limited focus on the practical implications of research findings is less surprising, considering that the majority of researchers were scholars rather than practitioners (see Section 3.1). However, it highlights the inability of some academic researchers to address the relevance of their work to an audience beyond academia. While practitioners are known to occasionally refer to academic papers for useful "golden nuggets" of knowledge to improve their decision-making processes (Booker *et al.*, 2008, p. 241), the academic paper is limited in its ability to convey consumable knowledge to practitioners because of the use of academic language, statistics, measurements, validity and jargon, rather than reporting findings in a method understandable to practitioners with different educational backgrounds from academics. According to Booker *et al.* (2008, p. 243), this "communication gap" could be overcome by academics disseminating their findings in a suitable format in both academic and practitioner outlets.

Serenko *et al.* (2011, p. 5) argue that there is a complementary role for books in bridging the academic–practitioner gap. They find that academic papers are incorporated effectively via indirect or "translated" methods, through books written by academics tailored to practitioners' needs. Book authors augment academic material with "personal research, formal and informal discussions with practitioners, personal industry experience and professional publications". Serenko *et al.* (2011, p. 8) add the caveat that "there is an assumption that business students and practitioners actually read the book, understand the material, and will eventually implement the practices which reflect the message of the book". Nevertheless, academic papers would be rendered more useful to an outside audience if they presented a formulation of policy and practical implications of studies. Academic editors might assist, suggest Serenko *et al.* (2012, p. 505), with the adoption of a "supplemental practitioner-friendly abstract" written in "generic terms".

Additionally, understanding implications from a policy perspective is relevant due to the importance of SMEs to the society and the global economy, particularly after the global financial crisis. According to Cohen *et al.* (2014, p. 295), during recession periods, "firms might divert resource allocations from higher risk intangible investments that are expected to improve future performance, to tangible investments with lower returns and lower risk in order to reverse their declining economic performance due to the financial crisis". Several

countries have adopted investment support policies to reduce this effect. For example, according to the Edinburgh Group (2012, p. 17), Canada "provided financial assistance for innovative SMEs by allocating $200 million over two years to its Industrial Research Assistance Programme". Similarly, "Germany increased the funding available to support SMEs' research and development projects" (Edinburgh Group, 2012, p. 17). According to the Organisation for Economic Co-operation and Development (OECD) (2009, p. 12), after the global financial crisis, "emerging firms and those redesigning their processes should be encouraged to focus on sustainability and knowledge-based outcomes". The limited attention paid by scholars providing implications of their study could delay or even harm the development of effective policies that support economy recovery after the global financial crisis.

4. Discussion and implications

This section aims to discuss the main findings to answer *RQ3*: *What are the implications for the KM research within SMEs?* and, therefore, develops and addresses several implications in the following sub-sections.

4.1 Implication 1: focusing on SMEs unique characteristics

Findings of this study confirm that there are few authors who specialise in the area of KM in SMEs, with only ten authors publishing more than one paper in this area. The low author specialisation could lead to the risk that scholars are applying concepts derived in different contexts to SMEs, rather than developing studies tailored to the specifics of SMEs. According to Durst and Edvardsson (2012, pp. 897-898), "in order to understand KM practice in SMEs researchers need a different approach". They suggest "more research is needed towards putting a stronger emphasis on what is given in SMEs rather than what should be given". This lack of emphasis poses a risk for academia to stay isolated in an ivory tower, as practitioners complain of difficulties in accessing and utilising academic knowledge for managerial decision-making (Booker *et al.*, 2008). Practitioners need to overcome barriers identified by Moshonsky *et al.* (2014), including the lack of understanding of academic language and jargon used by academics and the cost of subscribing to academic journals. Considering the higher resource constraints that SMEs have compared to larger corporations, researchers could face an increased risk for academia not being understood by practitioners, managers and policymakers in this sector. Therefore, there is a call for scholars to increase efforts to find new, relevant, research avenues by focusing on what makes SMEs a specific and unique research context rather than replicating concepts derived from larger organisations.

4.2 Implication 2: globalisation, entrepreneurship and business modelling in SMEs

This study found few articles that provide an international comparison. Additionally, only 19.1 per cent of the articles in this study result from international collaboration, and the inconsistent definition of SMEs across international boundaries inhibits the ability of readers to compare entities. Comparative studies that could help policymakers in developing knowledge-intensive economies are therefore limited. This shortage is further exacerbated by the low number of articles published in several emerging countries and the absence of SME-specific topics, for example the absence of studies on the role of entrepreneurs and some emerging topics like business models (Beattie and Smith, 2013).

According to Serenko *et al.* (2010, p. 18), KM "may potentially offer a competitive advantage and help develop knowledge-intensive economies". The Commission of the European Communities (2008, p. 1) also indicates that "dynamic entrepreneurs are particularly well placed to reap opportunities from globalisation and from the acceleration of technological change". However, the shortage of articles in this area suggests that scientific dialogue to support the development of knowledge-intensive economies is limited and unsupported by research on KM within SMEs. Therefore, studies on globalisation,

entrepreneurship and business modelling should be welcomed by editors and journals and carefully considered by policymakers.

4.3 Implication 3: what is an SME? Not all equivalent sets are equal

According to Durst and Edvardsson (2012, p. 897), "it would appear that many researchers in this field, consciously or unconsciously, compare KM activities in large firms with those found in smaller firms, on the assumption that these firms are comparable". Even though "it is well-known that SMEs are not smaller versions of large firms" (Olejnik, 2014, p. 1), findings of this study highlight the need to reach a shared definition of SMEs, as identified by previous researchers. The results show that within the literature, different measures are used to define SMEs (e.g. annual revenue, balance sheet value) and even when the measure used is the same, statistics are very different (e.g. from less than 250 employees to less than 1,000 employees).

Additionally, findings of this study are that medium-sized firms are under-investigated. This deepens the results of Durst and Edvardsson's (2012, p. 894) study, who indicate that "what seems missing is a distinction between the different types of SMEs, namely micro, small and medium-sized enterprises". This specific result should be analysed considering the growing attention that medium-sized firms are receiving because of their importance to support national growth in many countries (Barbaresco, 2013, p. 21). Therefore, even though there is a general call to distinguish firms consistently within the concept of SMEs, medium-sized firms seem to be the least investigated, creating a call for further developments in this context.

These findings must inform researchers and policymakers on the need to take care when comparing results among studies. As Petticrew and Roberts (2008, p. 3) say, "the more skeptical research-informed policymaker may simply wait patiently, on the grounds that another researcher will soon publish a paper saying the opposite". In this case, as suggested by Partee *et al.* (1993, p. 55), who study mathematical methods in linguistics, the problem arises because researchers confuse the concepts of equal and equivalent. "Equal sets have the same numbers, while equivalent sets have the same number of members". The results of this research call for a better understanding of the research context of SMEs to avoid confusion among equal and equivalent sets. Researchers and policymakers must note that equivalent sets are not equal sets, and be aware that a different definition or focus of studies may impede their comparative use when drafting international industrial policies.

4.4 Implication 4: KM is maturing but more interesting research that questions established conclusions is required

The results of this study confirm the evolution of KM as a scientific discipline (Serenko *et al.*, 2010). On the one hand, there is a growing trend towards using research questions and hypotheses. Additionally, studies that use a purely theoretical approach are declining. However, as Serenko and Dumay (2015, p. 417) state, the implications for future studies is that researchers "need to think seriously about how their future research will be interesting enough and make a significant contribution". Several suggestions can be developed. As Massaro *et al.* (2015a, p. 544, 2015b) state, research on knowledge resources and their management "is facing an important epistemological debate". On the one hand, statistical studies that embrace a positivistic ontology must be developed questioning established conclusions rather than applying a pre-set idea (Mouritsen, 2006, p. 835; Serenko and Dumay, 2015, p. 419). On the other hand, different approaches like interventionist research (Dumay, 2010) or action research (Martincic and Dovey, 2011) can be used to force researchers to "abandon research methodologies that take a helicopter view" (Dumay, 2012, p. 12).

4.5 Implication 5: sometimes literature produces conflicting results, while other results reveal untapped knowledge that helps us to see further

According to Massaro *et al.* (2016), "to see further researchers need to understand previous research studies". The findings show a high concentration of articles covering a limited group of topics. KM with a focus on knowledge as a process seems to be the most investigated research topic in the field of KM (almost 40 per cent of the articles). The authors believe that the results of this study highlight both the need to develop more research for under-investigated topics as well as the need to realise research synthesis for more mature research fields.

Some of the issues analysed in this research confirm Durst and Edvardsson's (2012) findings (e.g. the need to focus on SMEs rather than larger organisations). Other elements of this study contribute to enlarging Durst and Edvardsson's (2012) findings (e.g. providing insights about the elements that influence the KM process). Additionally, this study offers new perspectives, such as the need for a better definition of SMEs. It provides analysis of topics not previously considered by Durst and Edvardsson (2012), such as citation analysis and areas of implication of the findings. Additionally, this study extends validity of the findings, focusing on a higher number of papers.

According to Glass (1976, p. 4), scholars "need more scholarly effort concentrated on the problem of finding the knowledge that lies untapped in completed research studies". Indeed, according to Petticrew and Roberts (2008, p. 3), too many times, research "produce[s] such conflict findings for reasons other than methodological shortcomings, or authorial bias". Following these suggestions, this research builds on the basis of Durst and Edvardsson's (2012) findings, focuses on the variables that influence KM process and provides new insights for future research. These insights call for further research synthesis to better summarise results comparing and explaining contradictory findings.

Research synthesis encourages researchers to "search through mountains of potentially contradictory research to uncover the nuggets of knowledge that lie buried underneath" (Stanley, 2001, p. 131). Further, according to Tranfield *et al.* (2003, p. 214), research synthesis is "concerned with putting together findings from a number of empirical studies in some coherent way". According to Massaro *et al.* (2015, p. 544), "several approaches can be used according to the epistemological approach adopted (e.g. meta-analysis, meta-ethnography, meta-synthesis)". Therefore, building on previous literature reviews, this study contributes to existing literature finding both new research topics that deserve to be investigated and mature research that requires the development of research synthesis.

4.6 Implication 6: bridging the relevance gap and aligning stakeholders in the future KM research

According to this study's results, scholars must be more engaged, especially with policymakers (84 per cent do not have a specific section) and practitioners (47 per cent of the papers do not have a specific section), showing practical implications of their studies. Considering the important role of SMEs in the recovery after the global financial crisis, there is a call to fill the gap. Scholars in KM must build future research agendas aligning stakeholders' needs. Scholars, but also business schools, practitioners, managers and policymakers, are some of the recognised consumers of academic research (Starkey and Madan, 2001, p. 5). However, the relevance of "academic excellence"-focused business school curricula to the needs of employers of graduates, the lack of multidisciplinary emphasis and shortage of practical and ethical application in MBA programmes is questionable (Bennis and O'Toole, 2005, p. 98). According to Hodgkinson *et al.* (2001, p. 41), the "research-base of the business and management studies field is failing to meet the needs of various parties who are (or ought to be) valid stakeholders in the knowledge production process".

Interestingly, the role of research and its connection with research consumers has been largely analysed in several research fields (Tucker and Lowe, 2014, p. 395). According to Wofford and Troilo (2013, p. 41), "one of the significant impacts of this divide between academicians and professionals is that the best available evidence often is not be used to solve problems and make decisions". Additionally, James G. March (speech at the AOM conference reported by Huff, 2000, p. 55) states "fundamental knowledge becomes more useful to managers [. . .] in changing worlds, in new ventures, and when faced with the unexpected". Therefore, research must "help managers become better reflective practitioners" since "the heart of education lies in changing behaviour to make it more effective" (Starkey and Madan, 2001, pp. 4–5). Therefore, when research fails to meet stakeholders' needs, it harms the effectiveness and efficiency of decision-makers, especially in new and unknown contexts, and limits the use of already available evidence to solve practical problems. Considering the role of SMEs in most industrialised economies and the "new global context" (World Economic Forum, 2015), the divide between academia on the one side and policymakers and practitioners on the other side can affect the wealth-creation process, especially after the global financial crisis.

Interestingly, according to Tucker and Lowe (2014, p. 399), "a divide between academic research and practice may not be inevitable or insurmountable". As Anderson *et al.* (2001, p. 392) state:

> [. . .] practitioners and researchers have often held stereotypical views of each other, with practitioners viewing researchers as interested only in methodological rigour while failing to concern themselves with anything in the real world, and researchers damning practitioners for embracing the latest fads, regardless of theory of evidence.

Moving from this premise, Anderson *et al.* (2001, p. 392) define a 2 × 2 matrix to classify research based on methodological rigour and practical relevance. The original model was further developed by Hodgkinson *et al.* (2001) in the management research context. According to Anderson *et al.* (2001, p. 392) and Hodgkinson *et al.* (2001), four classifications are proposed.

Pragmatic Science "simultaneously addresses questions of applied [. . .] relevance and does so in a methodologically robust manner" (Anderson *et al.*, 2001, p. 394). Clearly, this is the most important research, as it conjugates both methodological rigour and practical relevance. *Popularist science*, also called junk science, addresses "a theme widely recognized as relevant, but fail to do so with sufficient rigour to permit an reliance upon [its] findings" (Anderson *et al.*, 2001, p. 393). *Pedantic science* is generated by studies that are fastidious in their design and analytical sophistication, yet fail to address an issue of current organisational or psychological relevance (Anderson *et al.*, 2001, p. 395). *Puerile science* can emerge when authors have pursued "issues of unacceptably low practical relevance and have done so using research design and methods lacking in rigour" (Anderson *et al.*, 2001, p. 395).

According to Serenko and Dumay (2015, p. 415), "the KM discipline is at the pre-science stage, but it has been progressing towards normal science and academic maturity". The results of this study build on this statement showing that the low engagement with policymakers and practitioners risks relegating KM research to a pedantic science level, with low engagement with practice.

Bridging the gap between research and stakeholders of research findings requires actions from editors, practitioners and policymakers. Indeed, research findings first need to address practical needs, but the findings need to be shared. One way to help the diffusion process is through publishing in reputable peer-reviewed open-access journals or established journals allowing gold open-access to articles. Indeed, according to Massaro *et al.* (2015a, p. 546, 2015b), "open-source publishing is becoming more prominent and offers a greater opportunity for researchers to disseminate their research to practice". Additionally, editors and business schools

should provide opportunities for discussion of research findings between scholars and stakeholders. Collaboration among practitioners and scholars can be useful, and conferences can also help with this collaboration. According to Lee (1997, p. 13), "knowledge production is associated with a structured social space in which individuals and institutions are hierarchically positioned so as to form [. . .] a dominant élite". To overcome this problem, editors and business schools should provide room for discussions of research findings between scholars and stakeholders. Similarly, "reward systems need to recognize the value of the evidence-based practice" (Wofford and Troilo, 2013, p. 49). To this end, practitioners and policymakers need to be trained to understand research findings and identify best evidence (Wofford and Troilo, 2013, p. 49). It is interesting that the process of production and diffusion of research results is clearly a KM problem that could be more studied within the KM literature.

5. Conclusion

To conclude this paper, the authors reflect on the initial motivation to perform this study. Several studies focus on the role of SMEs both in emerging economies where their contribution drives the development of a knowledge-based economy, and in developed countries, where SMEs support the recovery after the global financial crisis. Additionally, SMEs show specific characteristics that distinguish them from large organisations. Because of the central role played by SMEs in supporting economic development and their specificities compared to larger organisations, the authors expected to find a wide variety of research projects spanning many different nations, organisational contexts and, especially, research trying to understand KM practices to support managers and policymakers. Interestingly, the results revealed a different situation.

Findings show that literature on KM in SMEs is fragmented, with few specialised authors, and dominated by unrelated research mainly originating in other contexts (e.g. larger organisations), with few comparative studies between countries, and with limited studies in important developed countries (e.g. USA and Canada) and some continents almost ignored (e.g. Africa). Additionally, KM articles focus mainly on knowledge as a process. Interestingly, different definitions of SMEs are used and different kinds of organisations (e.g. micro, small and medium) are sometimes treated as equivalent, making comparisons between studies hard.

In analysing results, readers should consider that this paper has some limitations. First, only journal articles published in leading KM journals are used. Defining the boundaries of the research is a central step of SLR methodology, as "not all research evidence (qualitative or quantitative) is of equal validity or relevance" (Dixon-Woods, 2011, p. 340). Even though the peer-review process is accepted as a synonym for quality in published work (Easterby-Smith *et al.*, 2012, p. 39), by including only journal articles, important contributions in other works may be excluded from this study. Second, the validity of results can only be considered at the time of the analysis. This research builds on previous literature reviews (Durst and Edvardsson, 2012). Therefore, future contributions to the field could modify considerations developed in this study and change the validity of some results. Third, readers should consider that SLRs are not a panacea or the end of the road, but must rather be considered as the beginning of new journeys (Massaro *et al.*, 2016). Therefore, the aim of this study is not to provide a synthesis of existing knowledge, but rather to identify where research is currently lacking and thereby offer pathways for future research.

Despite the above described limitations, findings show several implications both for practitioners and policymakers. Several variables are described as having impacts on knowledge as a process and should be considered by managers. Tools and risks to support social interaction as well as human, organisational and external factors are main topics analysed and considered as key elements that affect knowledge as a process. Additionally, results show that policymakers should focus on some specific

characteristics of SMEs (e.g. developing policy to support the creation of SMEs network).

Additionally, the results do signal that the literature on KM is progressing towards a normal science, with an increasing number of papers presenting research questions or hypotheses. However, the prevalence of contributions supported by superficial research methodologies, including the limited number of papers that present implications of the findings for practitioners and policymakers, risks relegating the literature to a *pedantic science* stage. To avoid this risk, Daly *et al.* (2014, p. 581) state that "innovative practice constitutes new knowledge [. . .] [therefore] scholars need access to practitioners to guide research agendas so their ideas should captivate both practitioners and consumers". Similarly, scholars need to concern themselves with the dissemination of relevant findings to practitioners using a method and language that practitioners can understand (Booker *et al.*, 2008). For their part, policymakers should be more involved with research agendas. As suggested by the UNCTAD (2006, p. 3), "communication flows should go both ways". Policymakers should think about channels to inform academia of major policy questions and scholars should involve policymakers in their research studies. Therefore, there is a call for practitioners and policymakers to contribute to the scientific dialogue, stimulating and being directly involved in research agendas.

In terms of new research opportunities, the paper draws some implications. First, scholars should be focused in developing pragmatic research. According to Kepes *et al.* (2014, p. 447), to fulfill the promise of relevance for KM literature, "all the evidence must be trustworthy". As suggested by Hodgkinson *et al.* (2001, p. 46), "only work that is rigorous both theoretically and methodologically and centered on issues of focal concern to a wide community of stakeholders (e.g. managers, government policymakers, trades unionists, and consumer groups) will truly bridge the relevance gap". Performative research (Mouritsen, 2006), such as interventionist research (Dumay, 2010) and action research (Martincic and Dovey, 2011), demonstrates how KM can live up to the challenges presented by SMEs and can help academics to get their "hands dirty" (Serenko and Dumay, 2015, p. 22). However, methodologies cannot be taken for granted and different research questions can require different approaches. Second, new and under-investigated topics should be deepened. The role of entrepreneurs, gender analysis and some emergent themes (e.g. the business model) are indeed mostly ignored, leaving space for further research agendas. Finally, researchers could develop research synthesis to compare results of more mature topics like knowledge as a process.

Notes

1. The measures used were the Serenko and Bontis ranking, Australian Business Deans Council (ABDC) ranking, SCImango Journal Rank indicator (SJR) for 2014, Google Scholar's "H5-index" and an average of the citations per document over the years 2012-2014.
2. Included in the ten journals studied is the *Journal of Intellectual Capital*, in which the authors did not find knowledge management articles suitable for these selection criteria. However, this journal is included in the data reported in this paper because it is one of the top ten journals in the Serenko and Bontis (2013) ranking. Additionally, there are a number of articles within this journal that discuss the relationship between KM and IC (Kianto *et al.*, 2014; Seleim and Khalil, 2011), and it was therefore possible that some articles might be found relating to SMEs. This was not the case.
3. The authors' classifications of size were used to code this category.
4. For example, Kidd (2003), which was a book review
5. For example, Oliver and Kandadi (2006), who state in the abstract: "Therefore, the findings may not be applicable for small and medium-sized enterprises (SMEs)".
6. The subject matter of these two studies is not comparable – these two studies have been selected purely based on their definitions of SMEs.

References

Anderson, N., Herriot, P. and Hodgkinson, G.P. (2001), "The practitioner-researcher divide in Industrial, work and organizational (IWO) psychology: where are we now, and where do we go from here?", *Journal of Occupational and Organizational Psychology*, Vol. 74 No. 4, pp. 391-411.

Asia-Pacific Economic Cooperation (2014), Small and medium enterprises", p. 2.

Balestrin, A., Vargas, L.M. and Fayard, P. (2008), "Knowledge creation in small-firm network", *Journal of Knowledge Management*, Vol. 12 No. 2, pp. 94-106.

Barbaresco, G. (2013), *Medium-Sized Enterprises In Europe*, Milan.

Beattie, V. and Smith, S.J. (2013), "Value creation and business models: refocusing the intellectual capital debate", *British Accounting Review*, Vol. 45 No. 4, pp. 243-254.

Bennis, W.G. and O'Toole, J. (2005), "How business schools lost their way", *Harvard Business Review*, Vol. 83 No. 5, pp. 96-104.

Bocquet, R. and Mothe, C. (2010), "Knowledge governance within clusters: the case of small firms", *Knowledge Management Research and Practice*, Vol. 8 No. 3, pp. 229-239.

Booker, L.D., Bontis, N., Serenko, A. and Edvinsson, L. (2008), "The relevance of knowledge management and intellectual capital research", *Knowledge and Process Management*, Vol. 15, pp. 235-246.

Cantú, L.Z., Criado, J.R. and Criado, A.R. (2009), "Generation and transfer of knowledge in IT-related SMEs", *Journal of Knowledge Management*, Vol. 13 No. 5, pp. 243-256.

Cegarra-Navarro, J.G. and Dewhurst, F.W. (2006), "Linking shared organisational context and relational capital through unlearning: an initial empirical investigation in SMEs", *Learning Organization*, Vol. 13 No. 1, pp. 49-62.

Chen, S., Duan, Y., Edwards, J.S. and Lehaney, B. (2006), "Toward understanding inter-organizational knowledge transfer needs in SMEs: insight from a UK investigation", *Journal of Knowledge Management*, Vol. 10 No. 3, pp. 6-23.

Chong, A.Y.L., Ooi, K.B., Bao, H. and Lin, B. (2014), "Can e-business adoption be influenced by knowledge management? An empirical analysis of Malaysian SMEs", *Journal of Knowledge Management*, Vol. 18 No. 1, pp. 121-136.

Clark, M., Eaton, M., Lind, S., Pye, E. and Baterman, L. (2011), *Key Statistics. Australian Small Business, Australian Government*, Department of Innovation Industry, Science and Research, Canberra, available at: www.innovation.gov.au

Cohen, S. and Kaimenakis, N. (2007), "Intellectual capital and corporate performance in knowledge-intensive SMEs", *The Learning Organization*, Vol. 14 No. 3, pp. 241-262.

Cohen, S., Naoum, V.C. and Vlismas, O. (2014), "Intellectual capital, strategy and financial crisis from a SMEs perspective", *Journal of Intellectual Capital*, Vol. 15 No. 2, pp. 294-315.

Commission of the European Communities (2008), *Think Small First*, Brussels.

Coyte, R., Ricceri, F. and Guthrie, J. (2012), "The management of knowledge resources in SMEs: an Australian case study", *Journal of Knowledge Management*, Vol. 16 No. 5, pp. 789-807.

Daly, A., Baron, S., J. Dorsch, M., P. Fisk, R., J. Grove, S., Harris, K. and Harris, R. (2014), "Bridging the academia-practitioner divide: the case of 'service theater'", *Journal of Services Marketing*, Vol. 28 No. 7, pp. 580-594.

Deakins, D. and Freel, M. (1998), "Entrepreneurial learning and the growth process in SMEs", *Learning Organization*, Vol. 5 No. 3, pp. 144-155.

Desouza, K.C. and Awazu, Y. (2006), "Knowledge management at SMEs: five peculiarities", *Journal of Knowledge Management*, Vol. 10 No. 1, pp. 32-43.

Devi, K., Singh, G. and Naz, R. (2013), "Marketing information system (MkIS): benefits for small and medium enterprises in Fiji", *Journal of Information and Knowledge Management*, Vol. 12 No. 1, pp. 1-15.

Dixon-Woods, M. (2011), "Systematic reviews and qualitative methods", in Silverman, D. (Ed.), *Qualitative Research, Issues of Theory, Method and Practice*, 3rd ed., Sage, London, pp. 331-346.

Duh, M. and Belak, J. (2008), "Special knowledge needs of family enterprises in transition economies: experiences from Slovenia", *Knowledge Management Research and Practice*, Vol. 6 No. 3, pp. 187-198.

Dumay, J. (2010), "A critical reflective discourse of an interventionist research project", *Qualitative Research in Accounting and Management*, Vol. 7 No. 1, pp. 46-70.

Dumay, J. (2012), "Grand theories as barriers to using IC concepts", *Journal of Intellectual Capital*, Vol. 13 No. 1, pp. 4-15.

Dumay, J. (2014), "15 years of the journal of intellectual capital and counting: a manifesto for transformational IC research", *Journal of Intellectual Capital*, Vol. 15 No. 1, pp. 2-37.

Dumay, J. and Cai, L. (2014), "A review and critique of content analysis as a methodology for inquiring into IC disclosure", *Journal of Intellectual Capital*, Vol. 15 No. 2, pp. 264-290.

Durst, S. and Edvardsson, I.R. (2012), "Knowledge management in SMEs: a literature review", *Journal of Knowledge Management*, Vol. 16 No. 6, pp. 879-903.

Durst, S. and Wilhelm, S. (2012), "Knowledge management and succession planning in SMEs", *Journal of Knowledge Management*, Vol. 16 No. 4, pp. 637-649.

Easterby-Smith, M., Thorpe, R. and Jackson, P. (2012), *Management Research*, 4th ed., Sage Publications, Thousand Oaks, CA.

Edinburgh Group (2012), *Growing the Global Economy Through SMEs*, available at: www.edinburgh-group.org/activities/papers.aspx

Edvardsson, I.R. (2006), "Knowledge management in SMEs: the case of Icelandic firms", *Knowledge Management Research and Practice*, Vol. 4 No. 4, pp. 275-282.

Edvardsson, I.R. (2009), "Is knowledge management losing ground Developments among Icelandic SMEs", *Knowledge Management Research and Practice*, Vol. 7 No. 1, pp. 91-99.

Egbetokun, A.A., Adeniyi, A.A., Siyanbola, W.O. and Olamade, O.O. (2012), "The types and intensity of innovation in developing country SMEs: evidences from a Nigerian subsectoral study", *International Journal of Learning and Intellectual Capital*, Vol. 9 Nos 1/2, pp. 98-112.

Evans, N., Bosua, R. and Sawyer, J. (2013), "Using social networks for knowledge acquisition in regional Australian SMEs: management considerations", *Journal of Knowledge Management Practice*, Vol. 14 No. 2, pp. 1-14.

Gamer, M., Lemon, J., Fellows, I. and Singh, P. (2012), "Coefficients of interrater reliability and agreement for quantitative, ordinal and nominal data", available at: http://cran.r-project.org/web/packages/irr/index.html

Gamer, R. (2012), *Search and Social: The Definitive Guide to Real-Time Content Marketing*, Simbex – John Wiley & Son, IN.

Glass, G.V. (1976), "Primary, secondary, and meta-analysis of research", *Educational Researcher*, Vol. 5 No. 10, pp. 3-8.

Grace, T.P.L. (2009), "Wikis as a knowledge management tool", *Journal of Knowledge Management*, Vol. 13 No. 4, pp. 64-74.

Graham, C.M. and Nafukho, F.M. (2007), "Employees' perception toward the dimension of culture in enhancing organizational learning", *Learning Organization*, Vol. 14 No. 3, pp. 281-292.

Guthrie, J. and Murthy, V. (2009), "Past, present and possible future developments in human capital accounting", *Journal of Human Resource Costing & Accounting*, Vol. 13 No. 2, pp. 125-142.

Guthrie, J. and Parker, L.D. (2011), "Reflections and projections 25 years of interdisciplinary perspectives on accounting, auditing and accountability research", *Accounting, Auditing & Accountability Journal*, Vol. 25 No. 1, pp. 6-26.

Guthrie, J., Ricceri, F. and Dumay, J. (2012), "Reflections and projections: a decade of Intellectual Capital Accounting Research", *British Accounting Review*, Vol. 44, pp. 68-82.

Haapalainen, P. and Mäkiranta, A. (2013), "Acquiring and sharing knowledge in SMEs: a case in the manufacturing industry", *Journal of Knowledge Management Practice*, Vol. 14 No. 1, pp. 1-8.

Hart, C. (1998), *Doing Literature Review: Releasing the Social Science Research Imagination*, Sage Publications, London.

Hayes, A.F. and Krippendorff, K. (2007), "Answering the call for a standard reliability measure for coding data", *Communication Methods and Measures*, Vol. 1 No. 1, pp. 77-89.

Hodgkinson, G.P., Herriot, P. and Anderson, N. (2001), "Re-aligning the stakeholders in management research: lessons from industrial, work and organizational psychology", *British Journal of Management*, Vol. 12 No. S1, p. S41.

Huff, A.S. (2000), "Citigroup' s John Reed and Stanford's James march on management research and practice", *Academy of Management Executive*, Vol. 14 No. 1, pp. 52-64.

Hui, G.C.B. (2012), "What makes small and medium enterprises innovative? A look at knowledge management", *Journal of Knowledge Management Practice*, Vol. 13 No. 4, pp. 1-12.

Hussain, I., Ahmed, S. and Si, S. (2010), "Personal knowledge abilities and knowledge management success", *Journal of Information and Knowledge Management*, Vol. 9 No. 4, pp. 319-327.

Jesson, J., Matheson, L. and Lacey, F.M. (2011), *Doing Your Literature Review: Traditional and Systematic Techniques*, SAGE Publications Ltd, London.

Joe, C., Yoong, P. and Patel, K. (2013), "Knowledge loss when older experts leave knowledge-intensive organisations", *Journal of Knowledge Management*, Vol. 17 No. 6, pp. 913-927.

Kamoun-Chouk, S. (2007), "Environmental scanning in Tunisian manufacturing SMEs", *Journal of Information and Knowledge Management*, Vol. 6 No. 1, pp. 57-67.

Kepes, S., Bennett, A. and McDaniel, M. (2014), "Evidence-based management and the trustworthiness of our cumulative scientific knowledge: implications for teaching, research, and practice", *Academy of Management Learning & Education*, Vol. 13 No. 3, pp. 446-466.

Kianto, A., Ritala, P., Spender, J.-C. and Vanhala, M. (2014), "The interaction of intellectual capital assets and knowledge management practices in organizational value creation", *Journal of Intellectual Capital*, Vol. 15 No. 3.

Krippendorff, K. (2013), *Content Analysis. An Introduction to Its Methodology*, Sage Publications, Thousand Oaks, CA.

Lee, T. (1997), "The editorial gatekeepers of accounting academy", *Accounting, Auditing & Accountability Journal*, Vol. 10 No. 1, pp. 11-30.

Lockett, N. and Brown, D. (2000), "eClusters: the potential for the emergence of digital enterprise communities enabled by one or more intermediaries in SMEs", *Knowledge and Process Management*, Vol. 7 No. 3, pp. 196-206.

McAdam, R. and Reid, R. (2001), "SME and large organisation perceptions of knowledge management: comparisons and contrasts", *Journal of Knowledge Management*, Vol. 5 No. 3, pp. 231-241.

McCulloh, D.I., Armstrong, H. and Johnson, A. (2013), *Social Network Analysis with Applications*, Wiley, Hoboken.

Manhart, M. and Thalmann, S. (2015), "Protecting organizational knowledge: a structured literature review", *Journal of Knowledge Management*, Vol. 19 No. 2, pp. 190-211.

Marcketti, S.B. and Kozar, J.M. (2007), "Leading with relationships: a small firm example", *Learning Organization*, Vol. 14 No. 2, pp. 142-154.

Martincic, A. and Dovey, K. (2011), "Action research as a knowledge generating change methodology", *International Journal of Learning and Intellectual Capital*, Vol. 8 No. 1, pp. 108-122.

Massaro, M., Dumay, J. and Bagnoli, C. (2015a), "Where there is a will there is a way: IC, strategic intent, diversification and firm performance", *Journal of Intellectual Capital*, Vol. 16 No. 3, pp. 490-517.

Massaro, M., Dumay, J. and Garlatti, A. (2015b), "Public sector knowledge management: a structured literature review", *Journal of Knowledge Management*, Vol. 19 No. 3, pp. 530-558.

Massaro, M., Dumay, J.C. and Guthrie, J. (2016), "On the shoulders of giants: undertaking a structured literature review in accounting", *Accounting, Auditing and Accountability Journal*, forthcoming.

Meroño-Cerdan, A.L., Lopez-Nicolas, C. and Sabater-Sánchez, R. (2007), "Knowledge management strategy diagnosis from KM instruments use", *Journal of Knowledge Management*, Vol. 11 No. 2, pp. 60-72.

Migdadi, M., Zaid, M.K.A. and Hujran, O.S. (2012), "The impact of collaborative technology on organisational performance through intranet use orientations", *Journal of Information and Knowledge Management*, Vol. 11 No. 1.

Miles, M.B., Huberman, A.M. and Saldana, J. (2013), *Qualitative Data Analysis: A Methods Sourcebook*, 3rd ed., Sage Publications, Thousand Oaks, CA.

Moshonsky, M., Serenko, A. and Bontis, N. (2014), "Examining the transfer of academic knowledge to business practitioners: doctoral program graduates as intermediaries", *International Journal of Knowledge Management*, Vol. 10 No. 3, pp. 70-95.

Mouritsen, J. (2006), "Problematising intellectual capital research: ostensive versus performative IC", *Accounting, Auditing & Accountability Journal*, Vol. 19 No. 6, pp. 820-841.

Ngui, K.S., Songan, P. and Hong, K.S. (2008), "Organisational learning capability of Malaysia SMEs: examining the effects of entrepreneurial orientation and human-capital development practices", *Journal of Information and Knowledge Management*, Vol. 7 No. 4, pp. 219-230.

Nordman, E.R. (2012), "The innovative product development of internationalising SMEs", *International Journal of Learning and Intellectual Capital*, Vol. 9 No. 3, pp. 276-294.

Northern Ireland Science Industry Panel (2014), *Matrix Report into the Exploitation of Intellectual Capital by SMEs in Northern Ireland*, Belfast.

Olejnik, E. (2014), *International Small and Medium-Sized Enterprises*, Springer Gabler, Trier.

Oliver, S. and Kandadi, K.R. (2006), "How to develop knowledge culture in organizations? A multiple case study of large distributed organizations", *Journal of Knowledge Management*, Vol. 10 No. 4, pp. 6-24.

Organisation for Economic Co-operation and Development (2009), *The Impact of the Global Crisis on SME and Entrepreneurship Financing and Policy Responses*, Paris.

Panagiotakopoulos, A. (2011), "Workplace learning and its organizational benefits for small enterprises: evidence from Greek industrial firms", *Learning Organization*, Vol. 18 No. 5, pp. 364-374.

Paoloni, P. and Dumay, J. (2015), "The relational capital of micro-enterprises run by women: the startup phase", *Vine*, Vol. 45 No. 2, pp. 172-197.

Parker, C.M., Bellucci, E., Torlina, L., Zutshi, A. and Fraunholz, B. (2014), "Towards a method for measuring the quality of environmental improvement communications on SME websites", *Knowledge and Process Management*, Vol. 21 No. 3, pp. 187-197.

Partee, B., Meulen, A.G. and Wall, R. (1993), *Mathematical Methods in Linguistics*, Springer.

Patrice, M., Dimitri, G., Cecilia, C., Nuray, U.B. and Klitou, D. (2014), *Annual Report on European SMEs 2013-2014: A Partial and Fragile Recovery*, Brussels.

Pattinson, S. and Preece, D. (2014), "Communities of practice, knowledge acquisition and innovation: a case study of science-based SMEs", *Journal of Knowledge Management*, Vol. 18 No. 1, pp. 107-120.

Peruta, M.R.S., Campanella, F. and Giudice, M.D. (2014a), "Knowledge sharing and exchange of information within bank and firm networks: the role of the intangibles on the access to credit", *Journal of Knowledge Management*, Vol. 18 No. 5, pp. 1036-1051.

Petticrew, M. and Roberts, H. (2008), *Systematic Reviews in the Social Sciences: A Practical Guide*, Kindle ed., Wiley-Blackwell, Oxford.

Pham, Q.T. (2011), "Framework for implementing KMS based on SNS in Vietnamese SME", *Journal of Knowledge Management Practice*, Vol. 12 No. 2, pp. 1-17.

R Core Team (2014), *R: A Language and Environment for Statistical Computing*, R Foundation for Statistical Computing, Vienna, available at: www.R-project.org/

Rehman, M., Mahmood, A.K.B., Sugathan, S.K. and Amin, A. (2010), "Implementation of knowledge management in small and medium enterprises", *Journal of Knowledge Management Practice*, Vol. 11 No. 1, pp. 1-9.

Ribiere, V. and Walter, C. (2013), "10 Years of KM theory and practices", *Knowledge Management Research & Practice*, Vol. 11, pp. 4-9.

Riege, A. (2005), "Three-dozen knowledge-sharing barriers managers must consider", *Journal of Knowledge Management*, Vol. 9 No. 3, pp. 18-35.

Roxas, B., Battisti, M. and Deakins, D. (2013), "Learning, innovation and firm performance: knowledge management in small firms", *Knowledge Management Research and Practice*, Vol. 12 No. 4, pp. 443-453.

Salojärvi, S., Furu, P. and Sveiby, K.-E. (2005), "Knowledge management and growth in Finnish SMEs", *Journal of Knowledge Management*, Vol. 9 No. 2, pp. 103-122.

Seleim, A. and Khalil, O.E.M. (2011), "Understanding the knowledge management-intellectual capital relationship: a two-way analysis", *Journal of Intellectual Capital*, Vol. 12 No. 4, pp. 586-614.

Serenko, A. (2013), "Meta-analysis of scientometric research of knowledge management: discovering the identity of the discipline", *Journal of Knowledge Management*, Vol. 17 No. 5, pp. 773-812.

Serenko, A. Bontis, N. and Hull, E. (2011), "Practical relevance of knowledge management and intellectual capital scholarly research: books as knowledge translation agents", *Knowledge and Process Management*, Vol. 18 No. 1, pp. 1-9.

Serenko, A. and Bontis, N. (2013), "Global ranking of knowledge management and intellectual capital academic journals: 2013 update", *Journal of Knowledge Management*, Vol. 17 No. 2, pp. 307-326.

Serenko, A. and Dumay, J. (2015), "Citation classics published in knowledge management journals", *Journal of Knowledge Management*, Vol. 19 No. 2, pp. 401-431.

Serenko, A. and Dumay, J. (2016), "Citation classics published in Knowledge Management Journals. Part II: studying research trends and discovering the Google scholar effect", *Journal of Knowledge Management*, forthcoming.

Serenko, A., Bontis, N., Booker, L., Sadeddin, K. and Hardie, T. (2010), "A scientometric analysis of knowledge management and intellectual capital academic literature (1994-2008)", *Journal of Knowledge Management*, Vol. 14 No. 1, pp. 3-23.

Serenko, A., Bontis, N. and Moshonsky, M. (2012), "Books as a knowledge translation mechanism: citation analysis and author survey", *Journal of Knowledge Management*, Vol. 16 No. 3, pp. 495-511.

Silverman, D. (2013), *Doing Qualitative Research*, 4th ed., Sage Publications, London.

Soley, M. and Pandya, K.V. (2003), "Culture as an issue in knowledge sharing: a means of competitive advantage", *Electronic Journal of Knowledge Management*, Vol. 1 No. 2, pp. 205-212.

Soto-Acosta, P., Colomo-Palacios, R. and Popa, S. (2014), "Web knowledge sharing and its effect on innovation: an empirical investigation in SMEs", *Knowledge Management Research and Practice*, Vol. 12 No. 1, pp. 103-113.

Stanley, T. (2001), "Wheat from chaff: meta-analysis as quantitative literature review", *Journal of Economic Perspectives*, Vol. 15 No. 3, pp. 131-150.

Starkey, K. and Madan, P. (2001), "Bridging the relevance gap: aligning stakeholders in the future of management research", *British Journal of Management*, Vol. 12 No. S1, pp. S3-S26.

Steenkamp, N. and Kashyap, V. (2010), "Importance and contribution of intangible assets: SME managers' perceptions", *Journal of Intellectual Capital*, Vol. 11 No. 3, pp. 368-390.

Supyuenyong, V. and Swierczek, F.W. (2011), "Knowledge management process and organizational performance in SMEs", *International Journal of Knowledge Management*, Vol. 7 No. 2, pp. 1-21.

Tomlinson, P.R. (2011), "Strong ties, substantive embeddedness and innovation: exploring differences in the innovative performance of small and medium-sized firms in UK manufacturing", *Knowledge and Process Management*, Vol. 18 No. 2, pp. 95-108.

Tranfield, D., Denyer, D. and Smart, P. (2003), "Towards a methodology for developing evidence-informed management knowledge by means of systematic review", *British Journal of Management*, Vol. 14 No. 3, pp. 207-222.

Tucker, B. and Lowe, A. (2014), "Practitioners are from Mars: academics are from Venus?", *Accounting, Auditing & Accountability Journal*, Vol. 27 No. 3, pp. 394-425.

UNCTAD (2006), *Research-Based Policy Making: Bridging the Gap Between Researchers and Policy Makers*, Geneva.

Wang, C. and Han, Y. (2011), "Linking properties of knowledge with innovation performance: the moderate role of absorptive capacity", *Journal of Knowledge Management*, Vol. 15 No. 5, pp. 802-819.

Wei, C.C., Choy, C.S. and Chew, G.G. (2011), "The KM processes in Malaysian SMEs: an empirical validation", *Knowledge Management Research and Practice*, Vol. 9 No. 2, pp. 185-196.

White, T. and McBurney, D. (2012), *Research Method*, 9th ed., Cengage Learning, Belmont, CA.

Wofford, L. and Troilo, M. (2013), "The academic-professional divide: generating useful research and moving it to practice", *Journal of Property Investment & Finance*, Vol. 31 No. 1, pp. 41-52.

Wong, K.Y. and Aspinwall, E. (2005), "An empirical study of the important factors for knowledge-management adoption in the SME sector", *Journal of Knowledge Management*, Vol. 9 No. 3, pp. 64-82.

World Economic Forum (2015), "4 key issues on the agenda for Davos 2015", *AGENDA*.

Yin, R.K. (2014), *Case Study Research: Design and Methods*, 5th ed., SAGE, Los Angeles, CA.

Zott, C., Amit, R. and Massa, L. (2011), "The business model: recent developments and future research", *Journal of Management*, Vol. 37 No. 4, pp. 1019-1042.

Further reading

Durst, S. (2008), "The relevance of intangible assets in German SMEs", *Journal of Intellectual Capital*, Vol. 9 No. 3, pp. 410-432.

Guthrie, J., Parker, L.D. and Dumay, J. (2015), "Academic performance, publishing and peer review: peering into the twilight zone", *Accounting, Auditing & Accountability Journal*, Vol. 28 No. 1, pp. 3-13.

Appendix. List of analysed papers

Birdthistle, N. (2008), "Family SMEs in Ireland as learning organizations", *Learning Organization*, Vol. 15 No. 5, pp. 421-436.

Chen, T.F. (2008), "A case study of e-knowledge networks in high-tech SMEs", *Journal of Knowledge Management Practice*, Vol. 9 No. 2, pp. 1-13.

Daghfous, A. and Kah, M.M.O. (2006), "Knowledge management implementation in SMEs: a framework and a case illustration", *Journal of Information and Knowledge Management*, Vol. 5 No. 2, pp. 107-115.

Dai, W. and Uden, L. (2008), "Empowering SME users through technology innovation: a services computing approach", *Journal of Information and Knowledge Management*, Vol. 7 No. 4, pp. 267-278.

Devane, S., Wilson, J. and Wilson, J. (2009), "Business benefits of non-managed knowledge", *Electronic Journal of Knowledge Management*, Vol. 7 No. 1, pp. 31-40.

Dipasquale, J. and McInerney, C.R. (2010), "Knowledge management in small- and medium-sized enterprises", *Journal of Information and Knowledge Management*, Vol. 9 No. 4, pp. 341-353.

Egbetokun, A.A., Adeniyi, A.A. and Siyanbola, W.O. (2012), "On the capability of SMEs to innovate: the cable and wire manufacturing subsector in Nigeria", *International Journal of Learning and Intellectual Capital*, Vol. 9 Nos 1/2, pp. 64-85.

Fernandez, J.T., Segura, S.L., Salmeron, J.L. and Moreno, J.R. (2006), "Operational knowledge management system design in total quality management: Small and medium size companies", *Journal of Knowledge Management Practice*, Vol. 7 No. 1, pp. 1-11.

Fink, K. and Ploder, C. (2009), "Knowledge management toolkit for SMEs", *International Journal of Knowledge Management*, Vol. 5 No. 1, pp. 46-60.

Grimaldi, M., Quinto, I. and Rippa, P. (2013), "Enabling open innovation in small and medium enterprises: a dynamic capabilities approach", *Knowledge and Process Management*, Vol. 20 No. 4, pp. 199-210.

Heavin, C. and Adam, F. (2012), "Characterising the knowledge approach of a firm: an investigation of knowledge activities in five software SMEs", *Electronic Journal of Knowledge Management*, Vol. 10 No. 1, pp. 48-63.

Jutla, D., Feindel, S. and Bodorik, P. (2003), "KM infrastructure and electronic services with innovation diffusion characteristics for community economic development", *Electronic Journal of Knowledge Management*, Vol. 1 No. 2, pp. 77-92.

Lambe, P. (2002), "Ignorance management: the lessons of small enterprises for knowledge management", *Journal of Information and Knowledge Management*, Vol. 1 No. 1, pp. 41-47.

Li, X. (2012), "R&D intensity and productivity of exporting SMEs: empirical evidence from China", *International Journal of Learning and Intellectual Capital*, Vol. 9 Nos 1/2, pp. 86-97.

Lin, I.-C., Seidel, R., Shekar, A., Shahbazpour, M. and Howell, D. (2012), "Knowledge sharing differences between engineering functional teams: an empirical investigation", *Journal of Information and Knowledge Management*, Vol. 11 No. 3.

Magnusson, J. and Nilsson, A. (2003), "To facilitate or intervene – a study of knowledge management practice in SME networks", *Journal of Knowledge Management Practice*, pp. 1-6.

Martins, B. and Solé, F. (2013), "Roles-purpose-and-culture misalignments: a setback to bottom-up SME clusters", *Journal of Knowledge Management*, Vol. 17 No. 4, pp. 598-616.

Mohannak, K. and Matthews, J. (2011), "Managing specialised knowledge in technopreneurial firms: evidence from Australian SMEs", *Journal of Knowledge Management Practice*, Vol. 12 No. 4, pp. 1-10.

Nunes, M.B., Ananasingh, F., Eaglestone, B. and Wakefield, R. (2005), "Managers' perceptions of the value of knowledge management in small and medium sized knowledge-intensive enterprises (SMEs)", *Journal of Knowledge Management Practice*, pp. 1-12.

Pillania, R.K. (2008), "Strategic issues in knowledge management in small and medium enterprises", *Knowledge Management Research and Practice*, Vol. 6 No. 4, pp. 334-338.

Reed, N., Scanlan, J., Wills, G. and Halliday, S. (2010), "The inertia problem: implementation of a holistic design support system", *Electronic Journal of Knowledge Management*, Vol. 8 No. 3, pp. 319-332.

Salojarvi, S. (2004), "The role and nature of knowledge management in Finnish SMEs", *International Journal of Learning and Intellectual Capital*, Vol. 1 No. 3, p. 334.

Sargis Roussel, C. and Deltour, F. (2012), "Beyond cross-functional teams: knowledge integration during organizational projects and the role of social capital", *Knowledge Management Research and Practice*, Vol. 10 No. 2, pp. 128-140.

Saunila, M., Ukko, J. and Rantanen, H. (2014), "Does innovation capability really matter for the profitability of SMEs?", *Knowledge and Process Management*, Vol. 21 No. 2, pp. 134-142.

Shackelford, A. and Sun, P.Y.T. (2009), "Knowledge management strategy employed in a SME: the case of a building materials supplier", *Journal of Knowledge Management Practice*, Vol. 10 No. 4, pp. 1-9.

Sharif, M.N.A., Zakaria, N.H., Ali, N.M. and Rozan, M.Z.A. (2005), "Preliminary study: knowledge management (KM) practices in the small medium software companies", *Journal of Knowledge Management Practice*, pp. 1-10.

Sharma, N.L. and Goswami, S. (2009), "The nuances of knowledge creation and development in Indian pharmaceutical industry", *Journal of Knowledge Management*, Vol. 13 No. 5, pp. 319-330.

Sparrow, J. (2005), "Classification of different knowledge management development approaches of SMEs", *Knowledge Management Research & Practice*, Vol. 3, pp. 136-145.

Steinheider, B. and Al-Hawamdeh, S. (2004), "Team coordination, communication and knowledge sharing in SMEs and large organisations", *Journal of Information and Knowledge Management*, Vol. 3 No. 3, pp. 223–232.

Tan, H.C., Carrillo, P., Chimay, A., Kamara, J.M., Bouchlaghem, D. and Udeaja, C. (2006), "Live capture and reuse of project knowledge in construction organisations", *Knowledge Management Research and Practice*, No. 4, pp. 149-161.

Thakkar, J., Kanda, A. and Deshmukh, S.G. (2011), "Mapping of supply chain learning: a framework for SMEs", *Learning Organization*, Vol. 18 No. 4, pp. 313-332.

Tiago, F., Tiago, M.T.B. and Couto, J.P. (2009), "Assessing the drivers of virtual knowledge management impact in European firms' performance: an exploratory analysis", *Electronic Journal of Knowledge Management*, Vol. 7 No. 2, pp. 277-286.

Webb, B.R. and Schlemmer, F. (2008), "Predicting web services performance from internet performance: an empirical study of resources and capabilities in e-business SMEs", *Journal of Knowledge Management*, Vol. 12 No. 6, pp. 137-155.

Wee, J.C.N. and Chua, A.Y.K. (2013), "The peculiarities of knowledge management processes in SMEs: the case of Singapore", *Journal of Knowledge Management*, Vol. 17 No. 6, pp. 958-972.

Weir, M., Huggins, R., Schiuma, G., Lerro, A. and Prokop, D. (2010), "Valuing knowledge assets in renewable energy SMEs: some early evidence", *Electronic Journal of Knowledge Management*, Vol. 8 No. 2, pp. 225-234.

Werr, A., Blomberg, J. and Löwstedt, J. (2009), "Gaining external knowledge – boundaries in managers' knowledge relations", *Journal of Knowledge Management*, Vol. 13 No. 6, pp. 448-463.

Whyte, G. and Classen, S. (2012), "Using storytelling to elicit tacit knowledge from SMEs", *Journal of Knowledge Management*, Vol. 16 No. 6, pp. 950-962.

Wilhelm, S., Gueldenberg, S. and Güttel, W. (2013), "Do you know your valuable customers?", *Journal of Knowledge Management*, Vol. 17 No. 5, pp. 661-676.

Wong, K.Y. and Aspinwall, E. (2004), "A fundamental framework for knowledge management implementation in SMEs", *Journal of Information and Knowledge Management*, Vol. 3 No. 2, pp. 155-166.

Xu, Q. and Zhu, J. (2010), "The pathway on implementation of total innovation management: with the case of SMEs", *International Journal of Learning and Intellectual Capital*, Vol. 7 Nos 3/4, pp. 252-264.

Zheng, G., Lu, J., Yu, X.Z., Li, W.F. and Ding, X. (2010), "Total innovation management paradigm for SMEs – an empirical study based on SME survey", *International Journal of Learning and Intellectual Capital*, Vol. 7 Nos 3/4, pp. 235-251.

About the authors

Maurizio Massaro, PhD, has been an Assistant Professor at Udine University since 2008. Before joining academia, he was founder and CEO of multiple consultancy firms. He has also served as a research center Vice President in the field of metal analysis. He has been a visiting Professor at Florida Gulf Coast University and Leicester University. He enjoys several contacts and research partnerships with universities in the USA, continental Europe, the UK and Australia. His research interests include knowledge management, intellectual capital, sustainability in international business and research methods. Maurizio Massaro is the corresponding author and can be contacted at: mail@mauriziomassaro.eu

Dr Karen Handley is a Postdoctoral Research Fellow in the Department of Accounting and Corporate Governance at Macquarie University in Sydney, where she has been employed since completing her PhD in Accounting in 2013. An MBA Old Mutual Gold Medallist from the University of Cape Town, Karen's roles prior to academia included owner manager of various small businesses in Canada and Australia, and Information Technology project management in the mining and retail industries. Karen's research interests are grounded in real-world financial accounting and corporate governance issues, with a particular focus on small and medium-sized entities.

Carlo Bagnoli is Associate Professor of Business Policy and Strategy at the Department of Management, Ca' Foscari University of Venice. He received a PhD in Business Economics at Ca' Foscari University of Venice. He was a visiting research fellow at the University of Florida. He is Scientific Director of the Innovarea Project funded by the Regional Italian Government. His research interests include knowledge management, competitive strategy and business model innovation. Carlo's research work has been published in various

outlets, including the *Journal of Business Economics and Management, Industrial Management & Data System, Journal of Management and Governance* and *Journal of Intellectual Capital*.

John Dumay is an Associate Professor in Accounting at Macquarie University, Sydney. He worked for over 15 years as an independent business consultant across a wide variety of industries before joining academia after completing his PhD in 2008. His PhD entitled Intellectual Capital in Action: Australian Studies won the prestigious Emerald/EFMD Outstanding Doctoral Research Award for 2008 for the Knowledge Management category. John continues to research on the topic of intellectual capital, sustainability reporting, innovation, research methods and academic writing. His research activities link closely to management accounting and scholarly practice.