TWO DECADES OF THE JOURNAL OF INTELLECTUAL CAPITAL: A BIBLIOMETRIC OVERVIEW AND AN AGENDA FOR FUTURE RESEARCH

Marina Dabić
University of Zagreb; Faculty of Economics and Business
J.F. Kennedy Square 6, 1000 Zagreb, Croatia
E-mail: mdabic@efzg.hr
&
Professor, Nottingham Trent University, Nottingham Business School,
Burton Street NG1 4BU Nottingham, UK
E-mail: marina.dabic@ntu.ac.uk
ORCID: 0000-0001-8374-9719

Božidar Vlačić
Assistant Professor, Católica Porto Business School and CEGE
Universidade Católica Portuguesa, Portugal
E-mail: bvlacic@ucp.pt
ORCID: 0000-0003-0152-1521

Veronica Scuotto
Leonard de Vinci, Pole Universitaire,
Research Center, 92 916 Paris La Défense, France
Department of Management, University of Turin
Corso Unione Sovietica, 218bis, 10134, Torino, Italy
E-mail: veronica.scuotto@unito.it
ORCID: 0000-0002-0202-4378

Merrill Warkentin
James J. Rouse Endowed Professor of Information Systems
William L. Giles Distinguished Professor
College of Business, Box 9581
Mississippi State University, MS 39762 US
E-mail: m.warkentin@msstate.edu
ORCID: 0000-0001-7435-7676

Accepted for publication in Journal of Intellectual Capital .This version is not the copy of record and may not exactly replicate the final version of the article.

Cite as: Dabić, M., Vlačić, B., Scuotto, V. and Warkentin, M. (2021), "Two decades of the Journal of Intellectual Capital: a bibliometric overview and an agenda for future research", Journal of Intellectual Capital, Vol. 22 No. 3, pp. 458-477. https://doi.org/10.1108/JIC-02-2020-0052

TWO DECADES OF THE JOURNAL OF INTELLECTUAL CAPITAL: A BIBLIOMETRIC OVERVIEW AND AN AGENDA FOR FUTURE RESEARCH

Purpose

The *Journal of Intellectual Capital* (*JIC*) is one of the leading academic journals in the field of Business and Management, with an impact factor of 3.744, according to Journal Citation Reports Clarivate Analytics, 2019. This study reports the results of a content analysis of the *JIC* articles that have been published since the journal was founded in 2000, in order to highlight its significant contribution and identify potential future research avenues within the Business and Management field.

Design/methodology/approach

Scopus database, complemented by the Web of Science (WOS) Core Collection, was used. Furthermore, this study graphically maps over 20 years' worth of bibliographic material, using the visualization of similarities (VOS) to present an overview of the journal and identify future research avenues.

Findings

The paper provides an overview of a total of 700 articles and editorial notes, authored by leading authors from various universities, as well as collating the research themes explored during the 20 year period between 2000 and 2019. The prestigious positioning of this journal is evidenced both through the increasing number of citations received from other highly regarded journals, and through its impact upon the establishment of new streams of research.

Originality/value

This article delivers an in-depth and rigorous analysis of the fields and research streams interrogated by the *JIC* over the last 20 years and offers potential topics for future research, which could stimulate authors and inspire advancements in research for years to come.

Keywords: Intellectual Capital, Bibliometric, Human Capital, Disclosure, Intangible Assets.

TWO DECADES OF THE JOURNAL OF INTELLECTUAL CAPITAL: A BIBLIOMETRIC OVERVIEW AND AN AGENDA FOR FUTURE RESEARCH

I. INTRODUCTION

The *Journal of Intellectual Capital* (*JIC*) is an international journal committed to the exploration of the roles and importance of intellectual capital in organizations. As stated in the journal's mission statements, its core research stream seeks to discover innovative ideas concerning the concept of Intellectual Capital (IC), applying theories in practical circumstances.

The first issue of the journal was published in 2000. The founding editor-in-chief (EIC) was Rory L. Chase and, from 2018, Merrill Warkentin has held this position. Since its foundation, the journal published issues on a quarterly basis, and has recently gone to bimonthly distribution with six issues per year. *JIC* is duly recognized and is notable, with a current (2018) impact factor of 3.744 in the Journal Citation Reports (from Clarivate Analytics), placing it in Quartile 1 of both the Business and Management categories in 2018; it is ranked with classification 2 at CABS and is valued at 5.79 for its Elsevier (Scopus) Cite Score.

In 2020, *JIC* celebrates its 20th anniversary and, in order to acknowledge this momentous achievement, the purpose of this study is to conduct a comprehensive bibliometric and content analysis of the *JIC*, from its foundation in 2000 to 2019.

This bibliometric analysis shows the development of the concept of IC and the evolution of *JIC*. In the beginning, IC was merely considered an intangible asset for a company, but it has since assumed more structured connotations, related to the sustainability phenomenon and the value (or co-value) creation theme. Studies on IC started to appear in the academic field in 1994. These articles argued for the relevance of IC as an intangible asset for a company (see, for example, Edvinsson, 2000; Petty and Guthrie, 2000). At that time, IC's research focus was closely linked to knowledge management research (Serenko and Bontis, 2009; Serenko et al., 2009; Mouritsen et al., 2002), and analysed from the perspective of innovation. For instance,

McElroy (2002) states that IC stems from a joint ability to develop new ideas. This has induced the theme of "social innovation capital", which was also analysed by Bueno and colleagues (2004). Hence, moving on from the consideration of IC as simply an intangible asset, researchers have expanded this topic, introducing studies on innovation (Cuganesan, 2005; Tovstiga and Tulugorova, 2009; Inkinen, 2015; Duodu and Rowlinson, 2019), emerging countries (Jardon and Martos, 2012; Daou et al., 2014), virtual environments (Zhou and Fink, 2003; Berraies, 2019), and higher education (Pedro et al., 2019; Tjahjadi et al., 2019). In order to provide an overview of the *JIC*'s accomplishments and summarize the recent trends of IC, we have conducted a bibliometric analysis (Di Stefano et al., 2010). This approach provides an overview of published *JIC* studies during the period between 2000 and 2019 using the Scopus database.

In following the bibliometric analytical approach, we are able to provide descriptive data and a cross co-citation analysis in order to recognize and evaluate links with other academic fields, encouraging future research (Culnan, 1986; Culnan, 1987; Tovstiga & Tulugorova, 2009; González-Loureiro et al., 2015; Dabić et al., 2019; Kiessling et al., 2019; Marzi et al., 2020). As the field has emerged, the close links between *JIC*'s sister journal - *Journal of Knowledge Management* (*JKM*) - reduced, highlighting significant new trend liaisons, such as: 1. IC and human capital; 2. IC and disclosure; and 3. IC and intangible assets. We also, however, consider IC's connection to the concept of knowledge management, thus adding a fourth trend: IC and knowledge management. This connection is also linked to the fact that *JIC* is mostly cited in *JKM* as a result of shared themes and similar research focus areas, as IC is often fostered, developed, and nurtured through knowledge management processes that enable innovative organizations to pursue new sources of firm value. With this in mind, this article is structured as follows. Our introduction evaluates the literature on IC and the following section provides justification for the bibliometric analysis. In the third section, *JIC* accomplishment

indicators are given. In the fourth section, the bibliometric methodology of IC's research, the main findings, and suggestions for *JIC*'s future avenues of research are all discussed in separate sections. The article ends by presenting its limitations, giving a discussion overview, suggesting managerial and academic implications, and providing conclusions.

II. BIBLIOMETRIC ANALYSIS

2.1. Justification of the Methodology

The aim of this research is to provide a broad overview of the *JIC* from 2000 to 2019 in order to trace the evolution of scientific activities - recognized by authors who have published in the journal - and to identify new research gaps to filled by new and emerging research. So far, to achieve this goal, relevant academic literature offers two different approaches: qualitative and quantitative. The qualitative approach concerns analysis based on academics' interpretations (Onwuegbuzie et al., 2012), which often suffers from cognitive bias and depends on researchers' interpretations and expertise, while the quantitative approach (Di Stefano et al., 2010; Serenko et al., 2009; Gaur & Kumar, 2018) provides an objective view of the phenomenon, highlighting the most influential works and "mapping the research field without subjective biases" (Zupic & Čater, 2015, p. 430).

Accordingly, we performed a quantitative approach by means of bibliometric methods, in order to address our research scope. A bibliometric analysis is a collection and evaluation of "quantitative bibliographic data, derived from scientific publications" (Verbeek et al., 2002, p. 181). Wu and Wu (2017) and Marzi and colleagues (2020) point out that a bibliometric analysis offers a descriptive measurement of the primary authors who have published in a specific journal, the number of citations from the analyzed journal and others, and the most relevant topics. Furthermore, it also presents a co-citation analysis (Fahimnia et al., 2015; Liu et al., 2015). The relevance of this analysis is explicated by the fact that, when looking into the trend

of citations, it is possible to understand the links with other research fields along with empirical investigations (Ratten et al., 2020). This facilitates the articulation of the scope of the journal, which relies on a combination of theoretical studies and real-world events. Di Stefano and colleagues (2010) enforce this statement, emphasizing the importance of capturing citation trends in order to identify new research fields. A co-citation analysis is presented as a form of a map, wherein several intellectual themes are connected in a set of nodes and links (Liu et al., 2015). For example, if documents X and Y are co-cited by a third article, this implies that there is a research connection between them. As such, the higher the number of citations for both, the stronger the connection between them, indicating a common subject area (Hjørland, 2013; Fahimnia et al., 2015), which can offer insights into scholarly clusters. Finally, the trends of IC are examined and categorized, and new research fields are suggested through the interpretation of these results.

2.2. Development of the Bibliometric Analysis

As previously mentioned, this research utilizes a bibliometric analysis which relies on specific keywords, co-citation analysis, and the accurate interpretation of these results (Martín-de-Castro et al., 2011; Dias et al., 2014; González-Loureiro et al., 2014; Di Stefano et al., 2010; Ratten et al., 2020). When developing a bibliometric analysis, five steps are conducted, beginning with a keyword search which produces results that are then refined and converted into descriptive measurements, illustrating the results. This has resulted in the thorough examination of past and present studies in the field of IC, often using VOS viewer software (van Eck and Waltman, 2010; 2019) by virtue of its ability to provide informative visual maps of the bibliographic data, indicating relative themes and approaches. Furthermore, the analysis provides an evaluation of top-tier academic journals, facilitating an understanding of how the topic of IC is theoretically evolving.

In the first step of this research, we relied on the Scopus database by Elsevier, as *JIC* had been indexed in this database since its first issue in 2000 and, furthermore, it represents one of the leading databases in academic research (Valenzuela et al., 2017). The search process considered all of the documents published in *JIC* from 2000 until the last issue of 2019. Consistent with similar research carried out in literature reviews and overviews of journals' accomplishments (see, for example, Kiessling et al., 2019 and Dabić et al., 2020), publications were identified throughout a Boolean search by running a query (Search Query) for the keyword "Journal of Intellectual Capital" in the Source Title. This search yielded a total of 700 articles and editorial notes published during the 20-year period. For an overview of *JIC*'s annual number of publications and its growing trend accomplishment indicators, see Figure 1 (available in Appendix A and Table 1).

III. *JIC* ACCOMPLISHMENT INDICATORS

By examining the trend of the *JIC* since its foundation and employing the three international indicators: impact factor (IF)[1]; SJR= SCImago Journal Rank[2]; and AJG (Academic Journal Guide) by CABS (Chartered Academic Business School Ranking)[3], it emerged that an IF score appears in 2017 (with a value of 3.634), after the AJG validation as a second star peer-to-peer international review in 2015, which was confirmed in 2018 (Table 1). The IF score also increased in 2018, showing a value of 3.744.

Table 1: *JIC* evolution between 2000-2019.

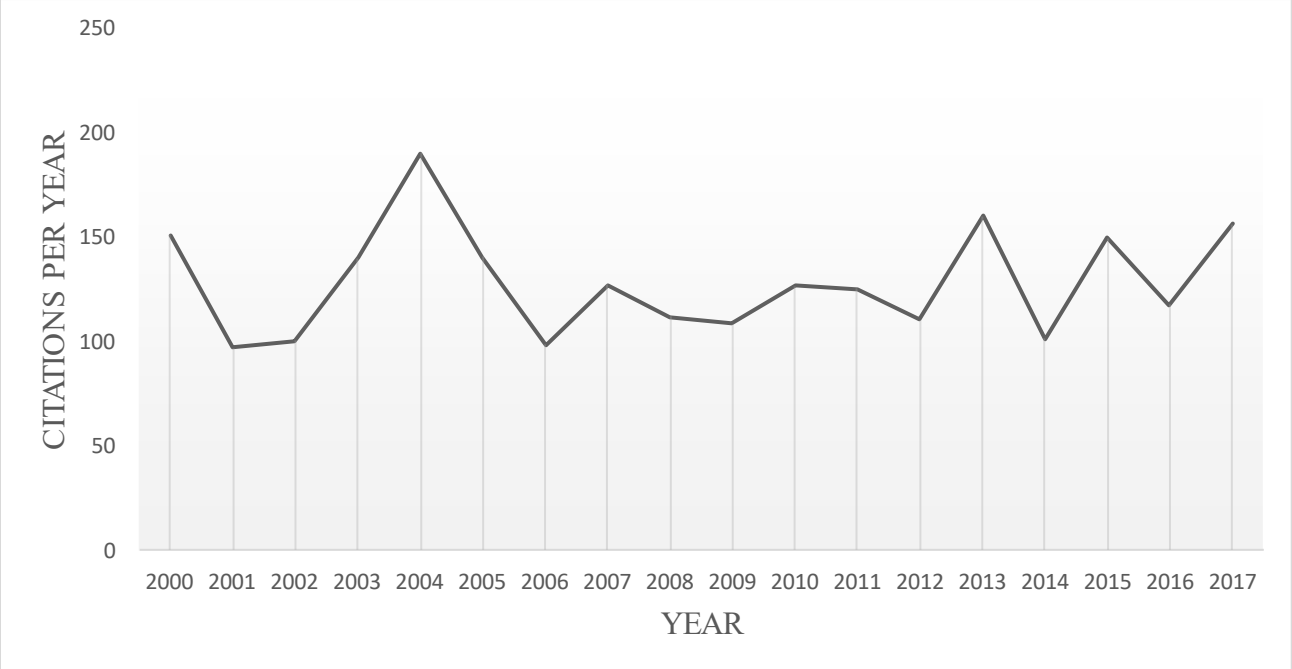
Year	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
IF	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SJR	0.686	0.339	0.511	0.517	0.590	0.469	0.925	0.684	0.500
AJG									
Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
IF	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3.634	3.744
SJR	0.504	0.519	0.610	0.855	0.715	0.885	0.741	0.701	1.294
AJG						2*			2*

[1] Journal Citation Reports – Clarivate available at www.jcr.clarivate.com
[2] SCImago Journal Rank available at https://www.scimagojr.com.
[3] AJG (Academic Journal Guide) by CABS (Chartered Academic Business School Ranking) available at https://charteredabs.org/academic-journal-guide-2018/

Abbreviations: IF = Impact factor of the Journal Citation Reports 2018; SJR = SCImago Journal Rank; AJG = Academic Journal Guide by CABS (Chartered Academic Business School Ranking); n.a. = not assigned; tbd = to be defined

Following up on the accomplishment indicators, in Figure 1 (see Appendix A), we present an overview of the total number of *JIC* publications per year and, in Figure 2, we evidence the growing interest in *JIC* publications through the number of citations received from the academic community. Our choice of 2017 as the last year of the period is a valid representation, given the evident delay period for an article to be cited (López-Duarte et al., 2016).

Figure 2: Overview of total number of *JIC* citations per year.

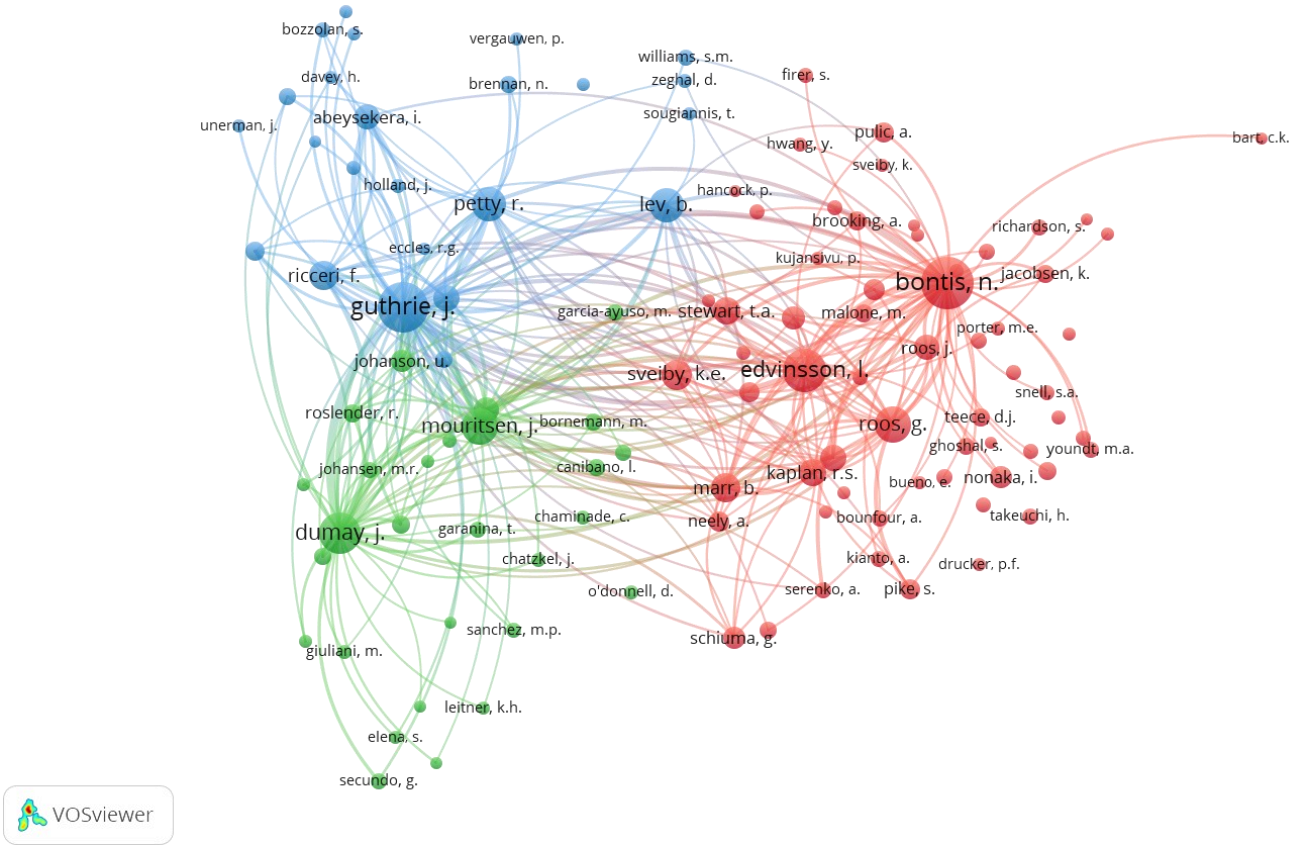


IV. BIBLIOMETRIC METHODOLOGY IN IC RESEARCH – MAIN FINDINGS

A further screening was carried out on the most productive authors. This process offers an overview of the work of academic scholars and practitioners from a wide range of countries worldwide, indicating the global scope of the journal (see Table 2, available in Appendix A). The co-citation analysis of the most prolific authors (who had respectively had 50 citations or more) is graphically displayed in Figure 3. Furthermore, Table 3 (see Appendix A) shows the most productive universities and their countries in terms of the authorship of the articles published in the journal. The most cited authors, according to their affiliation/universities, tend

to be from Anglo-Saxon countries. The first is Canada, followed by two universities in Australia. In fourth place is a UK university, and fifth place belongs to the University of Ferrara in Italy. However, other countries represented in the list include universities from the United States of America, Sweden, and Denmark. This shows an increase in international impact and in the diversity of affiliated authors published in the journal.

Figure 3: Co-citation of authors in *JIC*.



Narrowing down our bibliometric analysis, we scrutinized the most cited works from the *JIC*, selecting the first 50. The top 50 articles represent the core of the journal and can be considered foundational, charting the future of both the *JIC* and its research field (Rialp et al., 2019). As shown in Table 4, IC has mainly been studied in financial firms, which highlights the link between IC and reporting practices and disclosure, along with the concept of knowledge. For instance, one of the most cited articles refers to knowledge-based theory. However, newer themes have also recently been associated with IC, such as innovation, human behaviour, and others (Table 4).

Table 4: The 50 most cited documents published in *JIC*.

R	TC	Title	Author(s)/Year	C/Y	TC/∑C
1	666	Intellectual capital and business performance in Malaysian industries	Bontis et al., 2000	33.3	2.50%
2	591	Intellectual capital literature review: measurement, reporting and management	Petty & Guthrie, 2000	29.6	2.21%
3	446	Using content analysis as a research method to inquire into intellectual capital reporting	Guthrie et al., 2004	27.9	1.67%
4	435	An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance	Chen et al., 2005	29.0	1.63%
5	396	A knowledge-based theory of the firm to guide in strategy formulation	Sveiby, 2001	20.8	1.48%
6	361	Intellectual capital: Australian annual reporting practices	Guthrie & Petty, 2000	18.1	1.35%
7	337	Examining the link between knowledge management practices and types of innovation	Darroch & McNaughton, 2002	18.7	1.26%
8	335	Intellectual capital ROI: a causal map of human capital antecedents and consequents	Bontis & Fitz-enz, 2002	18.6	1.26%
9	322	Intellectual capital and traditional measures of corporate performance	Firer & Williams, 2003	18.9	1.21%
10	283	National intellectual capital index: a united nations initiative for the Arab region	Bontis, 2004	17.7	1.06%
11	282	Measuring intellectual capital: a new model and empirical study	Chen & Yuan, 2004	17.6	1.06%
12	269	Italian annual intellectual capital disclosure: an empirical analysis	Bozzolan et al., 2003	15.8	1.01%
13	247	Difficulties in diffusion of tacit knowledge in organizations	Haldin-Herrgard, 2000	12.4	0.93%
14	216	Value network analysis and value conversion of tangible and intangible assets	Allee, 2008	18.0	0.81%
15	209	Intellectual capital and firm performance of US multinational firms: a study of the resource-based and stakeholder views	Riahi-Belkaoui, 2003	12.3	0.78%
16	203	Intellectual capital and financial returns of companies	Tan et al., 2007	15.6	0.76%
17	200	The voluntary reporting of intellectual capital: comparing evidence from Hong Kong and Australia	Guthrie et al., 2006	14.3	0.75%
18	195	Intellectual capital and performance in causal models: Evidence from the information technology industry in Taiwan	Wang & Chang, 2005	13.0	0.73%
19	195	Why do firms measure their intellectual capital?	Marr et al., 2003	11.5	0.73%
20	194	The dynamics of value creation: mapping your intellectual performance drivers	Marr et al., 2004	12.1	0.73%
21	193	The management, measurement and the reporting of intellectual capital	Guthrie, 2001	10.2	0.72%
22	183	Analysing value added as an indicator of intellectual capital and its consequences on company performance	Zéghal & Maaloul, 2010	18.3	0.69%
23	181	Is intellectual capital performance and disclosure practices related?	Williams, 2001	9.5	0.68%
24	179	IC valuation and measurement: classifying the state of the art	Andriessen, 2004	11.2	0.67%
25	165	Intellectual capital research: a critical examination of the third stage	Dumay & Garanina, 2013	23.6	0.62%
26	151	Intellectual capital: current issues and policy implications	Brennan & Connell, 2000	7.6	0.57%
27	148	Intellectual capital performance of commercial banks in Malaysia	Gho, 2005	9.9	0.55%
28	147	The impact of intellectual capital on firms' market value and financial performance	Maditinos et al., 2011	16.3	0.55%

R	TC	Title	Author(s)/Year	C/Y	TC/∑C
29	147	Evidence of intellectual capital measurement from Asia, Europe and the Middle East	Ordónez de Pablos, 2002	8.2	0.55%
30	142	Intellectual capital measurement: a critical approach	Dumay, 2009	12.9	0.53%
31	136	Measuring knowledge worker productivity: a taxonomy	Ramírez & Nembhard, 2004	8.5	0.51%
32	134	Encouraging innovation in the public sector	Borins, 2001	7.1	0.50%
33	134	Toward a multi-dimensional measure of individual innovative behavior	Kleysen & Street, 2001	7.1	0.50%
34	131	Intangibles: a synthesis of current research	Kaufmann & Schneider, 2004	8.2	0.49%
35	130	Intellectual capital and business start-up success	Peña, 2002	7.2	0.49%
36	129	Intellectual capital disclosure and market capitalization	Abdolmohammadi, 2005	8.6	0.48%
37	126	Developing knowledge management metrics for measuring intellectual capital	Liebowitz & Suen, 2000	6.3	0.47%
38	124	Intellectual capital reporting in Spain: a comparative view	Ordóñez de Pablos, 2003	7.3	0.46%
39	120	Intellectual capital and firm performance in Australia	Clarke et al., 2011	13.3	0.45%
40	120	Intellectual capital performance of financial institutions in Malaysia	Ting & Lean, 2009	10.9	0.45%
41	119	Disclosing intellectual capital in company annual reports: evidence from Malaysia	Goh & Lim, 2004	7.4	0.45%
42	119	IC measurement and reporting: establishing a practice in SA mining	April et al., 2003	7.0	0.45%
43	119	Developing and managing knowledge through intellectual capital statements	Mouritsen et al., 2002	6.6	0.45%
44	115	Management of intangibles – an attempt to build a theory	Sánchez et al., 2000	5.8	0.43%
45	114	A critical reflection on the future of intellectual capital: from reporting to disclosure	Dumay, 2016	28.5	0.43%
46	113	Measuring intangible corporate assets: linking business strategy with intellectual capital	Joia, 2000	5.7	0.42%
47	111	Intellectual capital and corporate performance in Indian pharmaceutical industry	Bharathi Kamath, 2008	9.3	0.42%
48	109	Social innovation capital	McElroy, 2002	6.1	0.41%
49	107	Exploration for the relationship between innovation, IT and performance	Huang & Lui, 2005	7.1	0.40%
50	107	Intellectual capital at the crossroads: managing, measuring, and reporting of IC	Marr & Chatzkel, 2004	6.7	0.40%

Ranking according to TC. Abbreviations: R = Rank; TC = Total citations; C/P = citations per paper; TC/Y = citations per year; other abbreviations are shown in Table 2.
Note: References to top 50 most cited documents are available in Appendix B.

Furthermore, the foundations of the most cited articles provide further insights into a journal's groundwork and assist in facilitating an understanding of the foundations of the journal. The overview and co-citation analysis of references cited in the most cited *JIC* publications are presented in Table 5 and Figure 4 respectively (see Appendix A). In another analysis, evaluating the number of papers which have cited *JIC* the most yields that the *JKM* (the sister journal of *JIC*) reports a high number of citations of *JIC* articles. This shows a close connection between the theme of knowledge and the IC. This close relationship can be

explained through one of the aims of *JKM*, which is to retain knowledge and to retain human and intellectual capital. It is also clear in the journals' similar research themes and the notion that IC is forwarded and supported through knowledge management processes. Indeed, scrolling down the list (Table 6), other journals with the word 'knowledge' present in their titles can be seen. Each journal is categorized according to SJR= SCImago Journal Rank; and AJG (Academic Journal Guide) by CABS (Chartered Academic Business School Ranking). In line with this ranking rate, *JIC* articles are mostly cited from 2* journals along with a 3* journal – the *Journal of Business Research*.

Table 6: Citing articles of *JIC*: Journals ranked by total number of papers cited.

R	Journal	TPC	JCR	SJR	AJG
1	*Journal of Knowledge Management*	164	4.604	1.28	2*
2	*International Journal of Learning and Intellectual Capital*	149	n.a.	0.33	n.a.
3	*Knowledge Management Research and Practice*	89	1.485	0.4	1*
4	*Sustainability (Switzerland)*	87	2.592	0.55	n.a.
5	*Management Decision*	75	1.963	0.73	2*
6	*Journal of Information and Knowledge Management*	60	n.a.	0.19	n.a.
7	*Measuring Business Excellence*	54	n.a	0.38	1
8	*Knowledge and Process Management*	49	n.a.	0.4	1
9	*Journal of Business Research*	41	4.028	1.68	3
10	*Corporate Ownership and Control*	40	n.a.	0.16	n.a.
*Ranking according to TPC-Times Papers (published in *JIC*) Cited. Other abbreviations are shown in Table 1.					

Furthermore, in our analysis, we have also included the most cited journals in *JIC* (Table 7), such as the *Strategic Management Journal*; the *Harvard Business Review*; and the *Academy of Management Review*. This indicates that there are strong links between knowledge management research and business management work. This serves to maintain the high standard of research published in the journal.

Table 7: Most cited journals in *JIC*.

R	Journal	TC	CLS
1	*Strategic Management Journal*	677	17150
2	*Accounting, Auditing & Accountability Journal*	529	16163
3	*Harvard Business Review*	424	9065
4	*Academy of Management Review*	389	11033
5	*Management Decision*	386	11676
6	*Journal of Knowledge Management*	320	8886

R	Journal	TC	CLS
7	*Academy of Management Journal*	277	7859
8	*International Journal of Technology Management*	264	7463
9	*Accounting, Organization and Society*	257	8084
10	*Long Range Planning*	257	6673
11	*Journal of Accounting Research*	253	7147
12	*European Management Journal*	253	5805
13	*Journal of Human Resource Costing & Accounting*	229	8466
14	*Research Policy*	218	4441
15	*Journal of Management*	188	5579
16	*Organization Science*	186	5224
17	*European Accounting Review*	184	6739
18	*The British Accounting Review*	182	7088
19	*Critical Perspectives on Accounting*	179	6148
20	*Journal of Management Studies*	177	5367
*Ranking according to TC. Abbreviation: TC = Times Cited, CLS = Co-citation link strength			

Unsurprisingly, as indicated by the overview of the most frequently used author keywords for the periods 2000-2009 and 2010-2019, IC has been closely connected with knowledge management. The most common keywords over the respectively examined periods allow us to identify research trends and their dynamics. The top keyword used in each of these periods is 'intellectual capital', then 'intangible assets', followed by 'human capital' and 'knowledge management'. Globally, these are shadowed by the keywords 'disclosure', 'innovation', and 'intellectual property' (Table 8). These keywords have introduced new research fields, which will be discussed in the following paragraph.

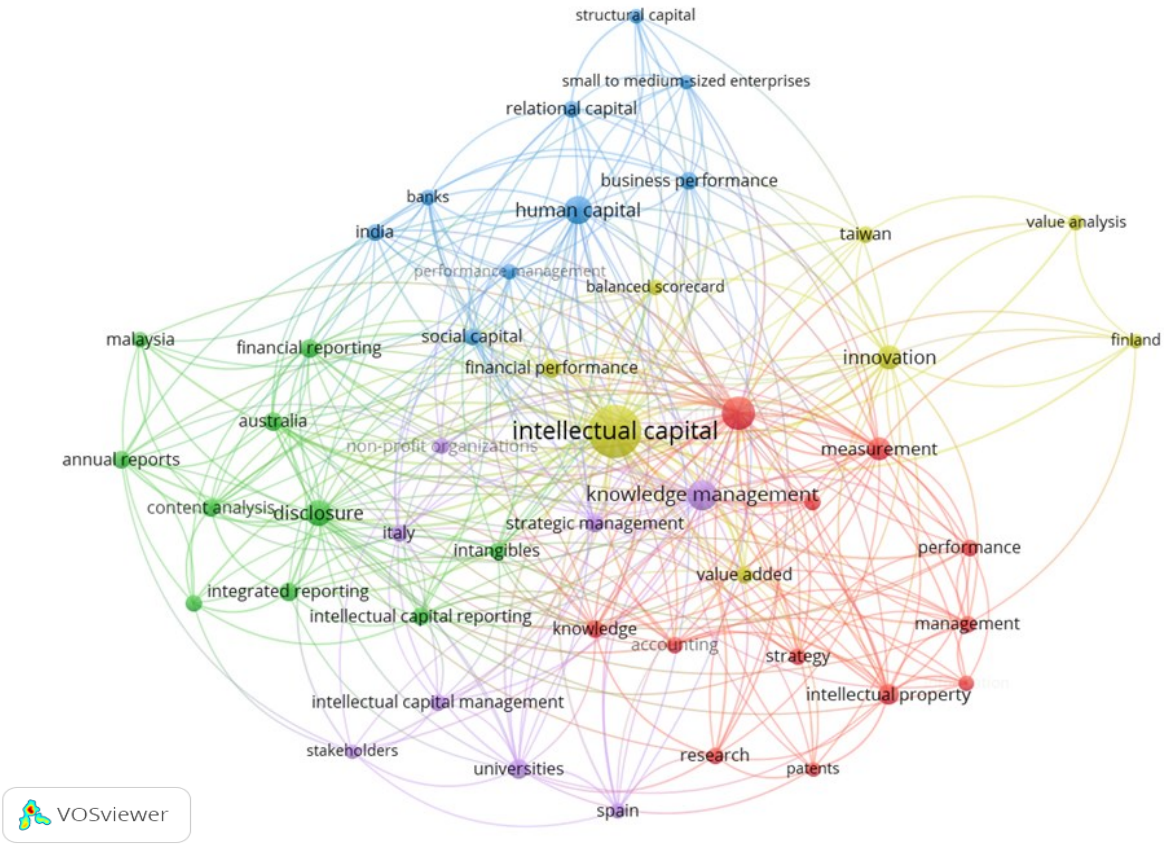
Table 8: Overview of the most frequently used author keywords for the periods 2000-2009 and 2010-2019.

	Global			2000-2009			2010-2019		
R	Keyword	OC	TLS	Keyword	OC	TLS	Keyword	OC	TLS
1	Intellectual Capital	482	517	Intellectual Capital	238	390	Intellectual Capital	244	380
2	Intangible Assets	119	166	Intangible Assets	92	176	Human Capital	35	83
3	Knowledge Management	85	120	Knowledge Management	60	106	Intangible Assets	27	40
4	Human Capital	67	99	Human Capital	32	55	Disclosure	25	58
5	Disclosure	52	94	Disclosure	27	59	Knowledge Management	25	51
6	Innovation	43	58	Australia	22	36	Innovation	22	40
7	Measurement	36	64	Innovation	21	44	Integrated Reporting	20	34

	Global			2000-2009			2010-2019		
R	Keyword	OC	TLS	Keyword	OC	TLS	Keyword	OC	TLS
8	Intellectual Property	27	28	Intellectual Property	21	38	Content Analysis	17	42
9	University	22	35	Financial Reporting	15	31	Intellectual Capital Reporting	16	30
10	Australia	21	40	Research	15	29	Financial Performance	15	29
11	Financial Performance	20	30	Business Performance	12	18	Intellectual Capital Disclosure	15	28
12	Financial Reporting	20	35	Strategy	12	20	Measurement	15	35
13	Integrated Reporting	20	29	Management	11	24	University	15	32
14	Content Analysis	17	33	Information	10	26	Intangibles	14	30
15	Knowledge	17	27	Spain	10	23	Relational Capital	14	42
16	Annual Reports	16	31	Knowledge	9	20	Social Capital	14	24
17	Management	15	27	Taiwan	9	19	Intellectual Capital Management	11	22
18	Accounting	14	31	Annual Reports	8	21	Italy	10	29
19	Italy	14	32	Balance Scorecard	8	22	Accounting	9	23
20	Relational Capital	14	28	Resources	6	18	Structural Capital	9	31
Ranking According to OC. OC = Author Keyword Occurrences; TLS = Total Link Strength.									

Figure 5 graphically depicts the co-occurrence of author keywords published in *JIC.* As expected, ‘intellectual capital’ is dominant, however the remaining terms yield interesting scholarly connections between IC and related terms and concepts. Notably, in addition to ‘intellectual capital’, keywords such ‘intangible assets’, ‘knowledge management’, and ‘human capital’ have the highest number of keyword links in terms of strength, indicating a higher number of links with other keywords (van Eck and Waltman, 2019). The combination of the most frequently used author keywords’ longitudinal analysis (Table 7) and the co-occurrence of authors’ keywords (Figure 5) unveils conceptual building blocks and tracks the evolution of the concept of IC (Zupcic & Čarter, 2015).

Figure 5: Co-occurrence of author keywords published in *JIC*.



For example, the most common topics connected to IC are linked around five clusters - areas colored in blue, red, green, purple, and yellow. The blue cluster's co-occurrence of human capital and innovation shows that research has mainly been conducted in India. Knowledge management's (purple cluster) co-occurrence - strategic management and stakeholders – has been mostly covered in Italy. The red cluster is linked to stakeholders, strategic management universities, and IC management, and it forms a bridge to performance, patents, and measurements. This was investigated globally. The green cluster links IC, disclosure, and reporting, and most of the research in this cluster has been applied in Australia. The yellow cluster focused on the connection between IC, innovation, and value analysis, but this was applied in Taiwan and Finland. The green group which focuses on innovation has mainly been investigated in Taiwan and Australia.

V. DISCUSSION AND FUTURE RESEARCH AVENUES

The results show that the topic of knowledge management is still correlated with IC, although less so than in the past. In addition to this, new research trends can be proposed, divided into the following three categories: 1) IC and human capital; 2) IC and disclosure; and 3) IC and intangible assets, plus emerging research areas such as IC and cybersecurity and business research methods.

5.1. IC and Human Capital

As the keyword search analysis highlights, these three topics are the main research fields that populated *JIC* from 2010 to 2019. IC relies on knowledge, personal skills, technology, and clients' interactions, with the aim being to bring value to a company (Edvinsson and Malone, 1997). This consideration was also enforced by Nahapiet and Ghoshal (1998) and Roos and Roos (1997). Furthermore, Subramaniam and Youndt (2005) stated that IC formed by human capital and social capital influences the development of radical innovations. Hence, IC has yielded several new perspectives reliant on intangible assets.

The concept of human capital has always been connected with IC as a relative element of IC. Since Smith (1776), the significance of human capital within companies' performance has been recognized. Marshall (1890) advocates the importance of investing in human beings. Nerdrum &Erikson (2001) state that "intellectual capital is seen as complementary capacities of competence and commitment" (p. 127). Harrison & Sullivan (2000) offer a different perspective on human capital, analysing the leadership role. Edivdsson (2000) introduces a study on human capital, which is converted into structural capital. Kianto et al. (2017) empirically explore the relationship between IC and human resource management (HRM). As shown, IC plays a mediating role between HRM and innovation. This study takes influence from other studies which have also investigated this relationship (Cabello-Medina et al., 2011;

Wang & Chen, 2013). Human capital resides within employees and it is highly relevant when it comes to a company's performance (Bontis, 1998).

It is worth noting that human capital is a scarce resource, which is an inner quality of a human being, and so it is considered an intangible asset. The scarcity of human capital evokes the need for new studies on this factor and IC, in order to provide an understanding of how they can bring more value to a company. An important research question for consideration would be: how can human capital be stimulated in order to generate more value? What will its effect on IC be?

5.2. IC and Disclosure

With the Securities and Exchange Commission's (SEC's) (2000) Regulation FD, disclosure information has encouraged new research to understand its effect on IC (Abdolmohammadi, 2005). This analysis was primarily considered for public companies, because their annual reports (and other documents required by regulatory agencies) are open and available to everyone. Indeed, multinationals in Australia have been investigated on this matter (Guthrie & Petty, 2000). Consequently, this study was extended in Europe, mainly looking into Irish (Brennan, 2001), Swedish (Olsson, 2001), and Italian companies (Bozzolan et al., 2003). Furthermore, the question of IC disclosure is also important for emerging countries, such as Malaysia (Goh & Lim, 2004). IC disclosure is still a relevant phenomenon to be investigated, especially as there is a common doubt on what exactly should be disclosed.

Some studies show a positive effect of IC disclosure on companies' market capitalization (Lang & Lundholm, 2000), suggesting that greater disclosure contributes to higher stock price offerings during initial public offers of stock sales. This has induced research interests in companies' stock from the perspective of investors (Healy & Wahlen, 1999). Abdolmohammadi (2005) empirically supports the hypothesis that IC disclosure is positively correlated with market capitalization.

Despite this, further research is required to explore the differences and similarities between a diverse range of industries and companies' sizes. In addition to this, an investigation of the contrasts between companies belonging to the new economy and the old economy is also needed. Surely, the latter stimulates the analysis of the use of technology within companies, particularly when it comes to the common characteristics of IC disclosure in companies belonging to different industries and those of different sizes; their differences; and how this would be affected by companies working in either the old or the new economy?

5.3. IC and Intangible Assets

IC has been considered an intangible asset from the outset, and the general concept of IC as an intangible asset has been discussed repeatedly since the first publication of the *JIC* in 2000. Usually, these two concepts tend to be intertwined and overlapped (Caddy, 2000). Caddy (2000) points out that IC is more appropriately derived as a net figure (subtracting intellectual liabilities from intellectual assets) rather than a mere summation of the organization's identified intellectual assets (p.1). Essentially, IC does not include only intangible assets, but it also tangible ones. Indeed, the key elements of IC are summarised in three factors: human capital, structural capital, and relational capital (Bontis et al., 2005). These terms are commonly confused as companies frequently rely on their intangible assets to create value, and the aim of IC is to generate value for a company (Sullivan & Sullivan, 2000).

Finally, the relationship between IC and intangible assets is such a broad concept that further clarification and investigation is needed. Hence, is it possible to state that IC involves intangible assets and the latter is a factor of IC? Both aim to bring about value within a company; so would value differ between them?

5.4. Emerging Areas of Research

Research in the IC field continues to evolve. As described earlier, the field has transitioned from a focus on valuation of IC and other accounting perspectives toward a management focus

on creation and maintenance of IC, including leveraging (1) knowledge management, (2) information and communication technologies (ICT), and (3) emerging ICT-enabled business structures and capabilities. Firms that create and maintain significant levels of IC often do so by leveraging creative human capital and organizational relationships to develop new technologies that enable new avenues for profitability. These proprietary technologies are often the target of cyber security attacks, such as the theft of intellectual property. Accordingly, an emerging focus area within IC research includes the exploration of improved methods to protect the firm's valuable assets from threats, especially cyber security threats, both internal and external. Renaud, et al. (2019) and Sallos, et al. (2019), in separate articles in *JIC* describe guidance for organizations and their Boards of Directors to protect the IC assets. In a forthcoming special issue, Renaud (2020) summarizes several *JIC* papers that present research related to cyber security and IC, as part of the "fourth wave" of IC research described by Dal Mas (2018).

Finally, the journal has recently added a new submission category that invites manuscripts that will focus on business research methods in an effort to improve both the rigor of scientific discovery methods, whether they are qualitative or quantitative, positivist or interpretivist, organizational-level or individual-level, or other approaches to investigating IC and other business topics. Improved measurement scales, improved analytic techniques, and creative data gathering opportunities are some of the methods that are envisioned as topics of papers JIC will publish going forward.

VI. CONCLUSION

6.1. Contribution

This article contributes towards IC literature in several ways. Firstly, this article focuses on the progression of the *JIC*, investigating the transformation and development of a field that

has increased in status. The tangible increase in IC business research over the last twenty years serves as grounds to justify the explanation and understanding of the trajectories of research on IC issues. Secondly, we examine the changes in the subject matter referred to as 'intellectual capital' as fundamental to the demonstration of the diversity of approaches. As such, this research helps to identify potentially under-researched topics that require further attention. Thirdly, we extend the current scope of research on IC by exhibiting its relevance in other journals through bibliometric techniques. This assists in the promotion of IC research and demonstrates the ways in which it could be intensified through inter-disciplinary studies. Finally, we suggest new research areas that are yet to be explored, which consequently enables a richer research agenda which links IC with other notable research areas. This article could thus be viewed as a steppingstone for the advancement of the *JIC* and this research field, inspiring the exploration of new and unchartered territories for decades to come.

6.2 Managerial Implications and Conclusion

As anticipated, this study provides new insights but also presents some research limitations. The focus of this study is exclusively on *JIC* publications and so, to broaden the outlook on studies on IC, further research would be necessary in order to include articles from other peer-to-peer international journals. Comprehensive content analysis may also be needed to thoroughly explore the current trends of IC.

In applying a bibliometric analysis, this paper offers an overview of past and present themes related to IC. For instance, human capital is one of the current hot topics. This factor is a topical matter in the era of digital transformation, as it incorporates the implementation of widespread robotics and artificial intelligence, which alters the process of managing human resources. As discussed, IC is a topic closely related to HRM, as human capital is considered a significant element of IC when creating value for a company.

On the managerial side, during the last decade, *JIC* has attracted the attention of a lot of practitioners who have been more immersed in the 'use' of IC in the real word. Big companies have been analyzed extensively; whereas small to medium enterprises (SMEs) have comparatively not been investigated as much in this context. This presents a significant research opportunity. For instance, does IC usage vary between large corporations and SMEs in the process of value creation? IC disclosure remains a phenomenon of large publicly-traded companies, which are increasingly interested in disclosing their information for future investors.

IC disclosure is another topic which has populated *JIC* articles. Even though this topic has been investigated in different countries, there is a common sense that disclosing this information can increase the value of a company. Managers have focused their attention and practical activities on the value generated by IC. Scholars have widely affirmed that IC is formed of human capital, structural capital, and relational capital, which are currently considered the three main pillars of a successful company. This suggests that research can open up debates regarding IC disclosure and whether it should include all three pillars or instead focus on just one. In addition to this, future research could examine the differences between IC disclosure within large corporations and SMEs.

IC disclosure occurs and evokes a combination of tangible and intangible assets in a business and managerial environment. In the past, IC was considered a mere intangible asset but, with the evolution of the economic system, these two terms are no longer considered interchangeable. Presently, intangible assets are crucial for a business – the economy is shifting from a knowledge-based economy to an era of digital transformation. Knowledge was considered the main leverage for the success of company, but this is now increasingly accompanied by the use of technologies. At the same time, the meaning of IC is more complex. It can be recognized as the intertwined combination of tangible and intangible assets. Managers

are still focusing on human beings - employees and customers - but are also encouraging the use of new technologies to facilitate their tasks.

The border between human and artificial intelligence is too unpredictable to allow us to question the role of IC in this realm. However, by connecting computer scientists with business management scholars, new research could be conducted on this topic. This is the new research basis of the future, which involves more interdisciplinary projects and further collaboration between industries and academia. We implore researchers to be critical, reflective, and realistic, while simultaneously making an impact in the real world.

VII. REFERENCES

Abdolmohammadi, M. J. (2005). Intellectual Capital Disclosure and Market Capitalization. *Journal of Intellectual Capital*, *6*(3), 397-416.

Berraies, S. (2019). The effect of enterprise social networks use on exploitative and exploratory innovations: Mediating effect of sub-dimensions of intellectual capital. *Journal of Intellectual Capital*, *20*(3), 426-452.

Bontis, N. (1998). Intellectual capital: an exploratory study that develops measures and models. *Management Decision, 36*(2), 63-76.

Bontis, N., Wu, S., Chen, M., Cheng, S. & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance, *Journal of Intellectual Capital*, *6*(2), 159-176.

Bozzolan, S., Favotto, F., & Ricceri, F. (2003). Italian Annual Intellectual Capital Disclosure: An Empirical Analysis. *Journal of Intellectual Capital*, 4(4), 543-558.

Brennan, N. (2001). Reporting intellectual capital in annual reports: evidence from Ireland. *Accounting, Auditing & Accountability Journal*, *14*(4), 423-436

Bueno, E., Paz Salmador, M., & Rodríguez, Ó. (2004). The role of social capital in today's economy: Empirical evidence and proposal of a new model of intellectual capital. *Journal of Intellectual Capital*, *5*(4), 556-574.

Cabello-Medina, C., López-Cabrales, Á., & Valle-Cabrera, R. (2011). Leveraging the innovative performance of human capital through HRM and social capital in Spanish firms. *The International Journal of Human Resource Management*, *22*(04), 807-828.

Caddy, I. (2000). Intellectual capital: recognizing both assets and liabilities, *Journal of Intellectual Capital*, *1*(2), 129-146.

Cuganesan, S. (2005). Intellectual capital-in-action and value creation: A case study of knowledge transformations in an innovation project. *Journal of Intellectual Capital*, *6*(3), 357-373.

Culnan, M. J. (1986). The intellectual development of management information systems, 1972–1982: A co-citation analysis. *Management Science*, *32*(2), 156-172.

Culnan, M. J. (1987). Mapping the intellectual structure of MIS, 1980-1985: A co-citation analysis. *MIS Quarterly*, *11*(3), 341-353.

Dabić, M., Maley, J., Dana, L. P., Novak, I., Pellegrini, M. M., & Caputo, A. (2019). Pathways of SME internationalization: a bibliometric and systematic review. *Small Business Economics*, available online ahead of print: https://doi.org/10.1007/s11187-019-00181-6.

Dabic, M., Vlacic, B., Paul, J., Sahasranamam, S., Dana, L-P & Glinka, B. (2020), Immigrant entrepreneurship: a review & agenda for future research", *Journal of Business Research*,113, 25-38

Daou, A., Karuranga, E., & Su, Z. (2014). Towards a better understanding of intellectual capital in Mexican SMEs. *Journal of Intellectual Capital*, *15*(2), 316-332.

Di Stefano, G., Peteraf, M., and Verona, G. (2010), Dynamic capabilities deconstructed: a bibliographic investigation into the origins, development, and future directions of the research domain, *Industrial and Corporate Change, 19*(4), 1187-204.

Dias, M. A. H., Zarelli, P. R., & Selig, P. M. (2014). Intellectual capital and public management: a bibliometric analysis. *Journal of US-China Public Administration*, *11*(2), 108-120.

Duodu, B. & Rowlinson, S. (2019). Intellectual capital for exploratory and exploitative innovation: Exploring linear and quadratic effects in construction contractor firms. *Journal of Intellectual Capital*, *20*(3), 382-405.

Edvinsson, L. & Malone, M.S. (1997). *Intellectual Capital – The Proven Way to Establish Your Company's Real Value by Measuring its Hidden Brainpower*, Judy Piatkus Ltd, London.

Edvinsson, L. (2000). Some perspectives on intangibles and intellectual capital 2000. *Journal of Intellectual Capital*, *1*(1), 12-16.

Fahimnia, B., Sarkis, J., and Davarzani, H. (2015). Green supply chain management: A review and bibliometric analysis, *International Journal of Production Economics,* 162, 101-14.

Gaur, A. Kumar, M. (2018). A systematic approach to conducting review studies: An assessment of content analysis in 25years of IB research, *Journal of World Business*, *53*(2), 280-289.

Goh, P.C. & Lim, K.P. (2004). Disclosing intellectual capital in company annual reports: Evidence from Malaysia, *Journal of Intellectual Capital*, 5(3), 500-510.

González-Loureiro, M., Dabić, M., & Kiessling, T. (2015). Supply chain management as the key to a firm's strategy in the global marketplace. *International Journal of Physical Distribution & Logistics Management, 45*(1/2), 159-181.

González-Loureiro, M., Dabić, M., & Puig, F. (2014). Global organizations and supply chain: new research avenues in the international human resource management. *International Journal of Physical Distribution & Logistics Management, 44*(8/9), 689-712.

Guthrie, J. and Petty, R. (2000). Intellectual Capital: Australian Annual Reporting Practices, *Journal of Intellectual Capital*, *1*(3), 241-251.

Harrison, S., & Sullivan, P. H. (2000). Profiting from intellectual capital. *Journal of Intellectual Capital*, *1*(1), 33-46.

Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, *13*(4), 365-383.

Hjørland, B. (2013). Citation analysis: A social and dynamic approach to knowledge organization, *Information Processing & Management, 49*(6), 1313-25.

Inkinen, H. (2015). Review of empirical research on intellectual capital and firm performance. *Journal of Intellectual Capital*, *16*(3), 518-565.

Jardon, C. M. & Martos, M. S. (2012). Intellectual capital as competitive advantage in emerging clusters in Latin America. *Journal of Intellectual Capital*, *13*(4), 462-481.

Kianto, A., Sáenz, J., & Aramburu, N. (2017). Knowledge-based human resource management practices, intellectual capital and innovation. *Journal of Business Research*, *81*, 11-20.

Kiessling, T., Vlačić, B., & Dabić, M. (2019). Mapping the future of cross-border mergers and acquisitions: A review and research agenda. *IEEE Transactions on Engineering Management*. published online ahead of print. DOI: 10.1109/TEM.2019.2954799.

Lang, M. H., & Lundholm, R. J. (2000). Voluntary disclosure and equity offerings: reducing information asymmetry or hyping the stock?. *Contemporary accounting research*, *17*(4), 623-662.

Liu, Z., Yin, Y., Liu, W., & Dunford, M. (2015). Visualizing the intellectual structure and evolution of innovation systems research: a bibliometric analysis, *Scientometrics, 103*(1), 135-58.

López-Duarte, C., González-Loureiro, M., Vidal-Suárez, M. M., & González-Díaz, B. (2016). International strategic alliances and national culture: Mapping the field and developing a research agenda. *Journal of World Business*, *51*(4), 511-524.

Marshall, A. 1890. *Principles of Economics*. London: Macmillan

Martín-de-Castro, G., Delgado-Verde, M., López-Sáez, P., & Navas-López, J. E. (2011). Towards 'an intellectual capital-based view of the firm': Origins and nature. *Journal of Business Ethics*, *98*(4), 649-662.

Marzi, G., Caputo, A., Garces, E., & Dabić, M. (2020). A three-decade mixed-method bibliometric investigation of the IEEE Transactions on Engineering Management. *IEEE Transactions on Engineering Management*, *67*(1), 4-17.

McElroy, M. W. (2002). Social innovation capital. *Journal of Intellectual Capital*, *3*(1), 30-39.

Mouritsen, J., Bukh, P. N., Larsen, H. T., & Johansen, M. R. (2002). Developing and managing knowledge through intellectual capital statements. *Journal of Intellectual Capital*, *3*(1), 10-29.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, *23*(2), 242-266.

Nerdrum, L., & Erikson, T. (2001). Intellectual capital: a human capital perspective. *Journal of Intellectual Capital*, *2*(2), 127-135.

Olsson, B. (2001). Annual reporting practices: information about human resource in corporate annual reports in major Swedish companies. *Journal of Human Resource Costing & Accounting*, *6*(1), 39-52.

Onwuegbuzie, A. J., Leech, N. L., & Collins, K. M. (2012). Qualitative analysis techniques for the review of the literature. *Qualitative Report*, *17*(56), 1-28.

Pedro, E., Leitão, J., & Alves, H. (2019). The intellectual capital of higher education institutions: Operationalizing measurement through a strategic prospective lens. *Journal of Intellectual Capital*, *20*(3), 355-381.

Petty, R. & Guthrie, J. (2000). Intellectual capital literature review: Measurement, reporting and management. *Journal of Intellectual Capital*, *1*(2), 155-176.

Ratten, V., Pellegrini, M. M., Fakhar Manesh, M., & Dabić, M. (2020) Trends and changes in Thunderbird International Business Review Journal: A bibliometric review. *Thunderbird International Business Review*, available online ahead of print: https://doi.org/10.1002/tie.22124.

Renaud, K., Von Solms, B., & Von Solms, R. (2019). How does intellectual capital align with cyber security?. *Journal of Intellectual Capital, 20*(5), 621-641.

Renaud, K. (2020). Exploring Research at the Intersection of Intellectual Capital and Cyber Security. *Journal of Intellectual Capital, 21*, forthcoming.

Rialp, A., Merigó, J. M., Cancino, C. A., & Urbano, D. (2019). Twenty-five years (1992–2016) of the International Business Review: A bibliometric overview. *International Business Review,* available online ahead of print: https://doi.org/10.1016/j.ibusrev.2019.101587.

Roos, G., & Roos, J. (1997). Measuring your company's intellectual performance. *Long Range Planning*, *30*(3), 413-426.

Sallos, M. P., Garcia-Perez, A., Bedford, D., & Orlando, B. (2019). Strategy and organisational cybersecurity: a knowledge-problem perspective. *Journal of Intellectual Capital, 20*(4), 581-597.

Serenko, A. & Bontis, N. (2009). Global ranking of knowledge management and intellectual capital academic journals. *Journal of Knowledge Management, 13*(1), 4-15.

Serenko, A., Bontis, N., & Grant, J. (2009). A scientometric analysis of the Proceedings of the McMaster World Congress on the Management of Intellectual Capital and Innovation for the 1996-2008 period. *Journal of Intellectual Capital*, *10*(1), 8-21.

Smith, A. (1776). *The wealth of nations*. New York: The Modern Library.

Subramaniam, M., & Youndt, M. A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management journal*, *48*(3), 450-463.

Sullivan, P.H. & Sullivan, P.H. (2000). Valuing intangibles companies – An intellectual capital approach, *Journal of Intellectual Capital*, *1*(4), 328-340.

Tjahjadi, B., Soewarno, N., Astri, E., & Hariyati, H. (2019). Does intellectual capital matter in performance management system-organizational performance relationship? Experience of higher education institutions in Indonesia. *Journal of Intellectual Capital*, *20*(4), 533-554.

Tovstiga, G. & Tulugurova, E. (2009). Intellectual capital practices: a four-region comparative study. *Journal of Intellectual Capital*, *10*(1), 70-80.

Valenzuela, L. M., Merigó, J. M., Johnston, W. J., Nicolas, C., & Jaramillo, J. F. (2017). Thirty years of the Journal of Business & Industrial Marketing: A bibliometric analysis. *Journal of Business & Industrial Marketing*, *32*, 1-18.

van Eck, N. J., & Waltman, L. (2019). VOSviewer manual version 1.6.8. Leiden, The Netherlands: Universiteit Leiden

van Eck, N.J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics, 84*(2), 523–538.

Verbeek, A., Debackere, K., Luwel, M., & Zimmermann, E. (2002). Measuring progress and evolution in science and technology – I: The multiple uses of bibliometric indicators. *International Journal of Management Reviews, 4*(2), 179-211.

Wang, D., & Chen, S. (2013). Does intellectual capital matter? High-performance work systems and bilateral innovative capabilities. *International Journal of Manpower*, *34*(8), 861-879.

Wu, Y.-C.J. & Wu, T. (2017). A decade of entrepreneurship education in the Asia Pacific for future directions in theory and practice. *Management Decision, 55*(7), 1333-50.

Zhou, A. Z. & Fink, D. (2003). The intellectual capital web: a systematic linking of intellectual capital and knowledge management. *Journal of Intellectual Capital*, *4*(1), 34-48.

Zupic, I. & Čater, T. (2015). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, *18*(3), 429–472.

Appendix A

Note: Tables and Figures are ordered according to their appearance in the manuscript.

Figure 1: Annual number of publications in *JIC*.

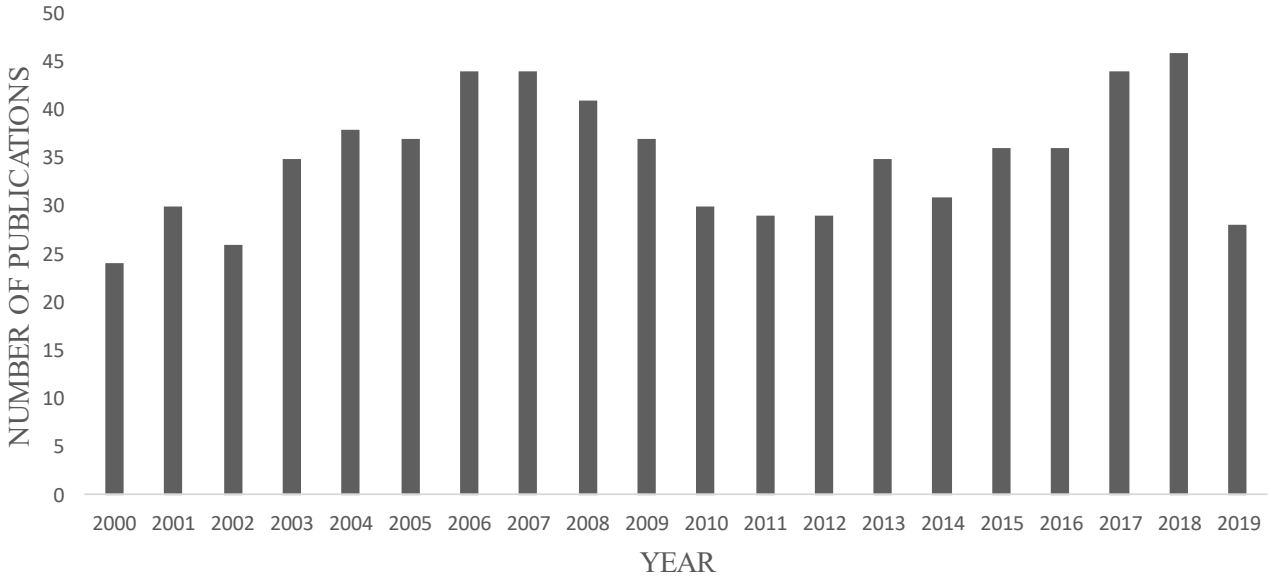


Table 2: Most productive authors published in *JIC*.

R	Author	University	Country	TP	TC	C/P	H
1	Dumay, J.	Macquarie University	Australia	33	1268	38.42	30
2	Bontis, N.	McMaster University	Canada	25	2018	80.72	41
3	Guthrie, J.	Macquarie University	Australia	18	2176	121.4	37
4	Chatzkel, J.	Progressive Practice	USA	11	238	23.8	8
5	Roos, G.	University of South Australia	Australia	10	360	36.0	17
6	Abeysekera, I.	Charles Darwin University	Australia	7	390	55.7	15
7	Giuliani, M.	Marche Polytechnic University	Italy	7	130	18.57	7
8	Johanson, U.	Mälardalen University	Sweden	7	224	32.0	13
9	Mouritsen, J.	Copenhagen Business School	Denmark	7	394	56.2	31
10	Secundo, G.	University of Salento	Italy	7	226	32.2	13
11	Bonfour,A.	University of Paris-Saclay	France	6	129	21.5	5
12	Bukh, P.N.	Aalborg University	Denmark	6	375	62.5	16
13	Cricelli, L.	University of Naples Federico II	Italy	6	100	16.7	15
14	Edvinsson, L.	Lund University	Sweden	6	279	46.5	14
15	Grimaldi, M.	University of Cassino and Southern Lazio	Italy	6	100	16.7	18
16	Nielsen, C.	Aalborg University	Denmark	6	115	19.2	11
17	Abhayawansa, S.	Swinburne University of Technology	Australia	5	64	12.8	10
18	Andriessen, D.	Inholland University of Applied Sciences	Netherland	5	318	63.6	9
19	Chiucchi, M.S.	Marche Polytechnic University	Italy	5	116	23.2	6
20	Davey, H.	University of Waikato	New Zealand	5	189	37.8	13
21	Kong, E.	University of Southern Queensland	Australia	5	163	32.6	11
22	Lönnqvist, A.	Tampere University	Finland	5	156	31.2	18
23	Marr, B.	Cranfield University	United Kingdom	5	544	108.8	19

R	Author	University	Country	TP	TC	C/P	H
24	O'Donnell, D.	Intellectual Capital Research Institute	Ireland	5	175	35	12
25	Petty, R.	Macquarie University	Australia	5	1638	327.6	10
26	Pike, S.	Cranfield University & Intellectual Capital Services Ltd	United Kingdom	5	292	58.4	12
27	Schiuma, G.	University of Basilicata	Italy	5	328	65.6	25
Abbreviations: R = Rank according to TP; TP = Total papers published in *JIC*; TC = Total citations; C/P = citations per paper; H = h-index according to Scopus.							

Table 3: Most productive universities in *JIC*.

R	University	Country	TP	TC	C/P
1	McMaster University	Canada	50	3832	76.6
2	Macquarie University	Australia	44	2858	64.9
3	The University of Sydney	Australia	17	1128	66.3
4	Cranfield School of Management	United Kingdom	13	863	66.4
5	University of Ferrara	Italy	13	157	12.1
Abbreviations: TP = Total papers published in *JIC*; TC = Total citations; C/P = citations per paper.					

Figure 4:Co-citation of references in the most cited *JIC* publications.

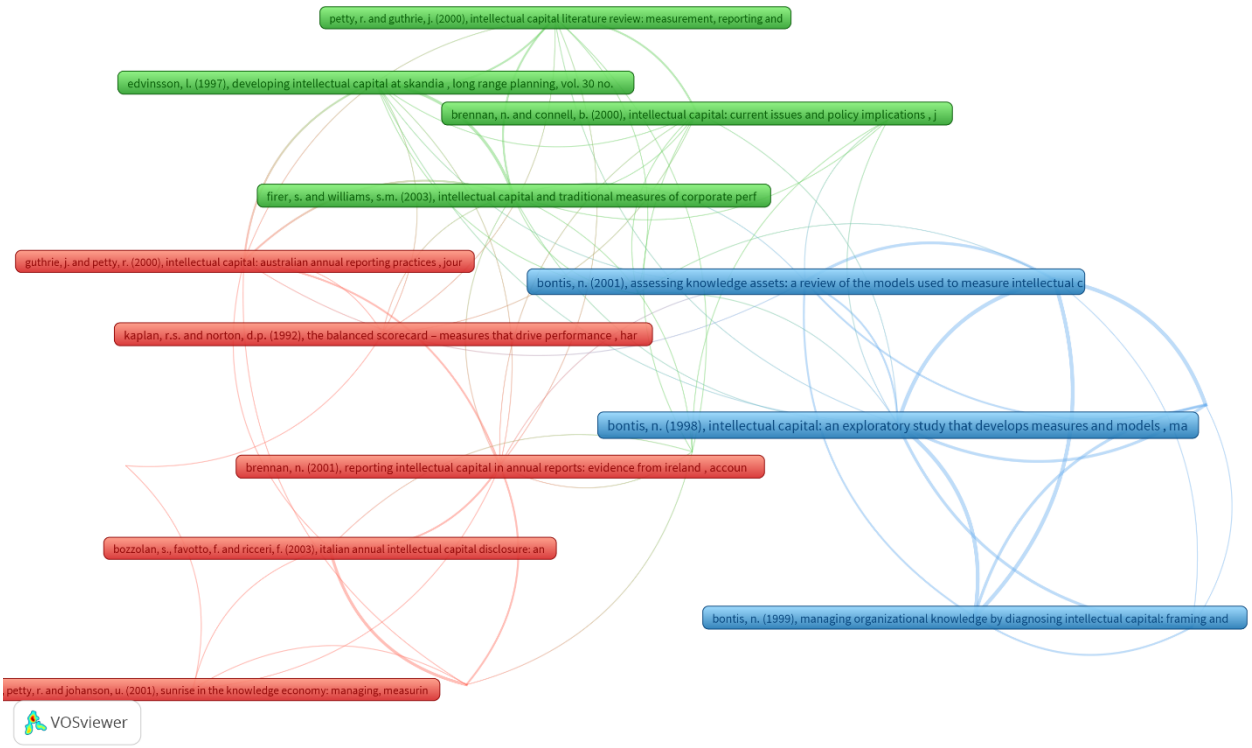


Table 5: Notable references in *JIC*'s most cited journals.

R	Reference	TR	TLS

1	Bontis, N. (1998). Intellectual Capital: An Exploratory Study That Develops Measures and Models, *Management Decision*, (36)2, 63-76.	9	27
2	Bontis, N. (2001). Assessing Knowledge Assets: A Review of The Models Used to Measure Intellectual Capital, *International Journal of Management Reviews*, (3)1, 41-60.	8	20
3	Bontis, N., Dragonetti, N., Jacobsen, K. and Roos, G. (1999). The Knowledge Toolbox: A Review of the Tools Available to Measure and Manage Intangible Resources, *European Management Journal*, (17)4, 391-402.	6	20
4	Brennan, N. (2001). Reporting Intellectual Capital in Annual Reports: Evidence from Ireland, *Accounting, Auditing & Accountability Journal*, (14)4, 423-436.	5	14
5	Brennan, N. and Connell, B. (2000). Intellectual Capital: Current Issues and Policy Implications, *Journal of Intellectual Capital,* (1)3, 206-240.	5	12
6	Edvinsson, L. (1997). Developing Intellectual Capital at Skandia, *Long Range Planning*, (30)3, 266-373.	5	13
7	Choo, C. W. and Bontis, N. (2002). *The Strategic Management of Intellectual Capital and Organizational Knowledge*, Oxford University Press, New York, NY.	4	13
8	Firer, S. and Williams, S. M. (2003). Intellectual Capital and Traditional Measures of Corporate Performance, *Journal of Intellectual Capital*, (4)3, 348-360.	4	18
9	Kaplan, R. S. and Norton, D. P. (1992). The Balanced Scorecard – Measures That Drive Performance, *Harvard Business Review*, (70)1, 71-79.	4	8
10	Bontis, N. (1999). Managing Organizational Knowledge by Diagnosing Intellectual Capital: Framing and Advancing the State of The Field, *International Journal of Technology Management*, (18)5, 433-462.	3	5
11	Bozzolan, S., Favotto, F., and Ricceri, F. (2003). Italian Annual Intellectual Capital Disclosure: An Empirical Analysis, *Journal of Intellectual Capital*, (4)4, 543-558.	3	8
12	Canibano, L., Garcia-Ayuso, M., and Sanchez, P. (2000). Accounting for Intangibles: A Literature Review, *Journal of Accounting Literature*, (19), 102-130.	3	8
13	Edvinsson, L. and Malone, M. S. (1997). *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower*, Harper Business, New York, NY.	3	8
14	Guthrie, J. and Petty, R. (2000). Intellectual Capital: Australian Annual Reporting Practices, *Journal of Intellectual Capital*, (1)3, 241-251.	3	12
15	Guthrie, J., Petty, R., and Johanson, U. (2001). Sunrise in The Knowledge Economy: Managing, Measuring and Reporting Intellectual Capital, *Accounting, Auditing & Accountability Journal*, (14)4, 365-384.	3	5
16	Guthrie, J., Petty, R., Yongvanich, K., and Ricceri, F. (2004). Using Content Analysis as A Research Method to Inquire into Intellectual Capital Reporting, *Journal of Intellectual Capital*, (5)2, 282-293.	3	8
17	Nelson, R. R. and Winter, S. G. (1982). *An Evolutionary Theory of Economic Change*, Harvard University Press, Cambridge, MA.	3	3
18	Nonaka, I. and Takeuchi, H. (1995). *The Knowledge-Creating Company*, Oxford University Press, New York, NY.	3	8
19	Olsson, B. (2001). Annual Reporting Practices: Information About Human Resources in Corporate Annual Reports in Major Swedish Companies, *Journal of Human Resource Costing and Accounting*, (6)1, 39-52.	3	8
20	Petty, R. and Guthrie, J. (2000). Intellectual Capital Literature Review: Measurement, Reporting and Management, *Journal of Intellectual Capital*, (1)2, 155-176.	3	13
Rank according to TR. Abbreviations: R = Rank; TR = Times referred (to the reference); TLS = Total link strength.			

Appendix B: References to the 50 most cited documents published in *JIC.*

**Note: References follow the order presented in Table 4.*

Bontis, N., Keow, W. C. C., & Richardson, S. (2000). Intellectual Capital and Business Performance in Malaysian Industries. *Journal of Intellectual Capital*, 1(1), 85-100.

Petty, R. & Guthrie, J. (2000). Intellectual Capital Literature Review: Measurement, Reporting and Management. *Journal of Intellectual Capital*, 1(2), 155-176.

Guthrie, J., Petty, R., Yongvanich, K., & Ricceri, F. (2004). Using Content Analysis as a Research Method to Inquire Into Intellectual Capital Reporting. *Journal of Intellectual Capital*, 5(2), 282-293.

Chen, M-C., Cheng, S-J., & Hwang Y. (2005). An Empirical Investigation of The Relationship Between Intellectual Capital and Firms' Market Value and Financial Performance. *Journal of Intellectual Capital*, 6(2), 159-176.

Sveiby, K.-E. (2001). A Knowledge-Based Theory of The Firm to Guide in Strategy Formulation. *Journal of Intellectual Capital*, 2(4), 344-358.

Guthrie, J. & Petty, R. (2000). Intellectual Capital: Australian Annual Reporting Practices. *Journal of Intellectual Capital*, 1(3), 241-251.

Darroch, J. & McNaughton, R. (2002). Examining the Link Between Knowledge Management Practices and Types of Innovation. *Journal of Intellectual Capital*, 3(3), 210-222.

Bontis, N. & Fitz-enz J. (2002). Intellectual Capital ROI: A Causal Map of Human Capital Antecedents and Consequents. *Journal of Intellectual Capital*, 3(3), 223-247.

Firer, S. & Williams, S. M. (2003). Intellectual Capital and Traditional Measures of Corporate Performance. *Journal of Intellectual Capital*, 4(3), 348-360.

Bontis, N. (2004). National Intellectual Capital Index: A United Nations Initiative for The Arab Region. *Journal of Intellectual Capital*, 5(1), 13-39.

Chen, J. & Yuan Xie, H. (2004). Measuring Intellectual Capital: A New Model and Empirical Study. *Journal of Intellectual Capital*, 5(1), 195-212.

Bozzolan, S., Favotto, F., & Ricceri, F. (2003). Italian Annual Intellectual Capital Disclosure: An Empirical Analysis. *Journal of Intellectual Capital*, 4(4), 543-558.

Haldin-Herrgard, T. (2000). Difficulties in Diffusion of Tacit Knowledge in Organizations. *Journal of Intellectual Capital*, 1(4), 357-365.

Allee, V. (2008). Value Network Analysis and Value Conversion of Tangible and Intangible Assets. *Journal of Intellectual Capital*, 9(1), 5-24.

Riahi-Belkaoui, A. (2003). Intellectual Capital and Firm Performance af US Multinational Firms: A Study of The Resource-Based and Stakeholder Views. *Journal of Intellectual Capital*, 4(2), 215-226.

Tanl, H. P., Plowmanl, D., & Hancockl, P. (2007). Intellectual Capital and Financial Returns of Companies. *Journal of Intellectual Capital*, 8(1), 76-95.

Guthrie, J., Petty, R., & Ricceri, F. (2006). The Voluntary Reporting of Intellectual Capital: Comparing Evidence From Hong Kong And Australia. *Journal of Intellectual Capital*, 7(2), 254-271.

Wang, W-Y. & Chang, C. (2005). Intellectual Capital and Performance in Causal Models. Evidence from The Information Technology Industry in Taiwan. *Journal of Intellectual Capital*, 6(2), 222-236.

Marr, B., Gray, D., & Neely A. (2003). Why Do Firms Measure Their Intellectual Capital? *Journal of Intellectual Capital*, 4(4), 441-464.

Marr, B., Neely, A., & Schiuma, G. (2004). The Dynamics of Value Creation: Mapping Your Intellectual Performance Drivers. *Journal of Intellectual Capital*, 5(2), 312-325.

Guthrie, J. (2001). The Management, Measurement and The Reporting of Intellectual Capital. *Journal of Intellectual Capital*, 2(1), 27-41.

Zéghal, D. & Maaloul A. (2010). Analysing Value Added as an Indicator of Intellectual Capital and its Consequences on Company Performance. *Journal of Intellectual Capital*, 11(1), 39-60.

Williams, S. M. (2001). Is Intellectual Capital Performance and Disclosure Practices Related? *Journal of Intellectual Capital*, 2(3), 192-203.

Andriessen, D. (2004). IC Valuation and Measurement: Classifying the State of The Art. *Journal of Intellectual Capital*, 5(2), 230-242.

Dumay, J. & Garanina, T. (2013). Intellectual Capital Research: A Critical Examination of The Third Stage. *Journal of Intellectual Capital*, 14(1), 10-25.

Brennan, N. & Connell, B. (2000). Intellectual Capital: Current Issues and Policy Implications. *Journal of Intellectual Capital*, 1(3), 206-240.

Gho, P. C. (2005). Intellectual Capital Performance of Commercial Banks in Malaysia. *Journal of Intellectual Capital*, 6(3), 385-396.

Maditinos, D., Chatzoudes, D., Tsairidis, C., & Theriou, G. (2011). The Impact of Intellectual Capital on Firms' Market Value and Financial Performance. *Journal of Intellectual Capital*, 12(1), 132-151.

Ordónez de Pablos, P. (2002). Evidence of Intellectual Capital Measurement From Asia, Europe And The Middle East. *Journal of Intellectual Capital*, 3(3), 287-302.

Dumay, J. C. (2009). Intellectual Capital Measurement: A Critical Approach. *Journal of Intellectual Capital*, 10(2), 190-210.

Ramírez, Y. W. & Nembhard, D. A. (2004). Measuring Knowledge Worker Productivity: A Taxonomy. *Journal of Intellectual Capital*, 5(4), 602-628.

Borins, S. (2001). Encouraging Innovation in the Public Sector. *Journal of Intellectual Capital*, 2(3), 310-319.

Kleysen, R. F. & Street, C. T. (2001). Toward A Multi-Dimensional Measure of Individual Innovative Behavior. *Journal of Intellectual Capital*, 2(3), 284-296.

Kaufmann, L. & Schneider, Y. (2004). Intangibles: A Synthesis of Current Research. *Journal of Intellectual Capital*, 5(3), 366-388.

Peña, I. (2002). Intellectual Capital and Business Start-Up Success. *Journal of Intellectual Capital*, 3(2), 180-198.

Abdolmohammadi, M. J. (2005). Intellectual Capital Disclosure and Market Capitalization. *Journal of Intellectual Capital*, 6(3), 397-416.

Liebowitz, J. & Suen, C. Y. (2000). Developing Knowledge Management Metrics for Measuring Intellectual Capital. *Journal of Intellectual Capital*, 1(1), 54-67.

Ordóñez de Pablos, P. (2003). Intellectual Capital Reporting in Spain: A Comparative View. *Journal of Intellectual Capital*, 4(1), 61-81.

Clarke, M., Seng D., & Whiting R. H. (2011). Intellectual Capital and Firm Performance in Australia. *Journal of Intellectual Capital*, 12(4), 505-530.

Ting, I. W. K. & Lean, H. H. (2009). Intellectual Capital Performance of Financial Institutions In Malaysia. *Journal of Intellectual Capital*, 10(4), 588-599.

Goh, P. C. & Lim, K. P. (2004). Disclosing Intellectual Capital in Company Annual Reports: Evidence From Malaysia. *Journal of Intellectual Capital*, 5(3), 500-510.

April, K. A., Bosma, P., & Deglon, D. A. (2003). IC Measurement and Reporting: Establishing A Practice in SA Mining. *Journal of Intellectual Capital*, 4(2), 165-180.

Mouritsen, J., Bukh, P. N., Larsen, H. T., & Johansen, M. R. (2002). Developing and Managing Knowledge Through Intellectual Capital Statements. *Journal of Intellectual Capital*, 3(1), 10-29.

Sánchez, P., Chaminade, C., Olea, M. (2000). Management of Intangibles – An Attempt To Build a Theory. *Journal of Intellectual Capital*, 1(4), 312-327.

Dumay, J. (2016). A Critical Reflection on the Future of Intellectual Capital: From Reporting to Disclosure. *Journal of Intellectual Capital*, 17(1), 168-184.

Joia, L. A. (2000). Measuring Intangible Corporate Assets: Linking Business Strategy with Intellectual Capital. *Journal of Intellectual Capital*, 1(1), 68-84.

Bharathi Kamath, G. (2008). Intellectual Capital and Corporate Performance in Indian Pharmaceutical Industry. *Journal of Intellectual Capital*, 9(4), 684-704.

McElroy, M. W. (2002). Social Innovation Capital. *Journal of Intellectual Capital*, 3(1), 30-39.

Huang, C. J. & Lui, C. J. (2005). Exploration for The Relationship Between Innovation, It And Performance. *Journal of Intellectual Capital*, 6(2), 237-252.

Marr, B. & Chatzkel, J. (2004). Intellectual Capital at The Crossroads: Managing, Measuring, and Reporting of IC. *Journal of Intellectual Capital*, 5(2), 224-229.