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# Knowledge Management and Intellectual Capital in Knowledge-based Organisations: A Review and Theoretical Perspectives

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## Abstract

**Purpose:** This paper provides a conceptual discussion of the bidirectional relationship between Knowledge Management (KM) and Intellectual Capital (IC) in a specific subset of knowledge-based organisations, i.e., professional sport organisations. Through the review and conceptual discussion of two relevant research themes, i.e., KM strategies for IC value creation and IC codification, this paper aims to highlight research gaps useful to future research.

**Design/ methodology/ approach:** The authors apply a systematic literature review method to analyse 66 management and accounting studies on KM and IC in sport organisations. Internal and externality validity tests support the methodology adopted.

**Findings:** The authors provide a conceptual model to explain how KM strategies about IC investments can be optimal, i.e., they create value for all the stakeholders, but also suboptimal, i.e., they create value only for a group of stakeholders. Next, they provide evidence of the opportunistic use of the codification associated with IC investments that impairs financial reporting information transparency and misleads managers and investors.

**Practical implications:** The results are informative for managers, regulators and policy makers to mitigate the inefficiencies regarding KM and IC codification and decisions.

**Originality/value:** This study contributes to the understanding of the bidirectional relationship between KM and IC in knowledge-based organisations by focusing on professional sport organisations in which KM and IC have played an important role for a long time. It also includes future avenues for advances in managing, measuring and reporting IC.

**Keywords:** knowledge management, knowledge based organisations, sport organisation management, intellectual capital, codification, agency theory, institutional theory.

**Paper type:** Literature review

## 1. INTRODUCTION

### *1.1. Knowledge and Intellectual Capital in the current dynamic environment*

The relevance of knowledge has substantially expanded for today's organisations (Argote and Ingram 2000, Bounfour and Edvinsson 2012). According to the European Commission, private investments in knowledge-related resources increased by 87% in the

EU-28 and by 130% in the USA over the period 1995-2014. Business models based on generation and accumulation of knowledge-related resources are the most relevant sources of competitive advantage (Junnarkar 1997, Nonaka et al. 2000, Parent et al. 2000, Zingales 2000, Choi and Lee 2002). Firms need to strategically managing knowledge-related resources to continue creating value and maintaining competitive advantage.

In this context, Intellectual Capital (IC) and Knowledge Management (KM) represent the knowledge-related organisational activities from the stock to the management of knowledge (Rastogi 2000). As such, KM and IC are naturally connected in a bidirectional way. IC represents the stock of knowledge, in terms of human capital, structural capital, relational capital (Bontis 2001, Guthrie 2001), which derived from the organisational flow of knowledge creation over time. KM strategies consist of knowledge application, i.e., how knowledge is embedded and used to create value for organisations (Grant 1996a, Lane et al. 2001, Meier 2011).

The bidirectional connection between KM and IC can lead not only to value creation, but also to value destruction. Value destruction is one of the most undesirable KM dysfunctionality associated with IC investments and may stem from suboptimal KM strategies (Caddy 2000, Giuliani 2013). Compared with optimal KM strategies, which create value for all the stakeholders, suboptimal KM strategies generate value only for a group of stakeholders and destroy the others' value (Caddy 2000). Potential determinants of suboptimal KM strategies are the challenges related to the accounting of IC through corporate reporting, i.e., IC codification.

Past KM literature highlights that codification plays a key role to ensure organisations' efficient use of intellectual resources and capabilities (Buenechea-Elberdin et al. 2018). As a form of codification, the accounting of IC through corporate reporting could facilitate knowledge storage, supporting an organisation to communicate and independently share

information. However, despite growing investment in IC, managers are still constrained by traditional reporting systems. The lack of structured information about IC investment and its value may lead to limited financial reporting information transparency, impairing both KM strategies and investors' ability to value and compare organisations (Ragab and Arisha 2013, Gu and Lev 2017).

While past research mostly investigated KM and IC separately (Kianto et al. 2014, Hussinki et al. 2017, Buenechea-Elberdin et al. 2018), the study of the bidirectional relationship between KM and IC is underinvestigated, particularly with regard to KM dysfunctionalities associated with IC investments and codification (Caddy 2000, Pulic 2004, Cuganesan 2005, Kujansivu and Lönnqvist 2007, Giuliani 2013). We argue that it is theoretically important to widen our gaze beyond value creation to consider value destruction issues, since ignoring the latter gives an incomplete representation of the KM-IC bidirectional relationship, potentially misleading managers in their strategic management decision-making process (Caddy 2000, Giuliani 2013). From a KM perspective, managers should develop opportunities to create value and minimise the threats of value destruction, in order to gain and maintain a competitive advantage.

Accordingly, this paper addresses the need for further understanding the bidirectional relationship between KM and IC in knowledge-based organisations. We aim to understand the key debates about value creation and destruction implications of the KM strategies associated with managing IC. Next, we examine the impact of IC codification on KM strategies. To answer these research questions, we systematically analyse management and accounting research about KM and IC in professional sport organisations. Building on our finding and on the identified gaps in literatures, we discuss future avenues to advance the debate about the KM-IC bidirectional relationship.

### *1.2. Sport organisations as knowledge-based firms*

Organisational theory refers to a set of interrelated concepts and principles defined by both the internal and external environment in which organisations operate. In essence, organisational theory accounts for the efficient and effective management of organisations in relation to their institutional and competitive environment. Organisations within the sport business can be studied from different perspectives: from a formal, local group entrusted with the responsibility of acting on behalf of its members (Cuskelly and Boag 2001) to a part of a global value chain (Westerbeek 2013). In the last decade, the study of the organisations within the sport business has been increasingly driven by the knowledge-based view of the organisation as a strategic management perspective, which makes it a suitable setting for deepening the study of the bidirectional KM-IC (Byers et al. 2012, Erhardt et al. 2014).

Sport businesses are often divided into two large groups: leisure and professional organisations. Organisations within the leisure sport businesses are service providers which – through the knowledge of trainers and coaches, often have entrepreneurship ingrained in their culture and performance. Professional sport organisations, however, go beyond services to integrate and often align their performance to the strategies and operations of stakeholders from several knowledge domains and often with diverging interests (Werner et al. 2015). Of those stakeholders, athletes become key to their success as their engagement in sport activities is their occupation, and they do so with an ultimate aim of earning an income. Such profit maximisation objective is shared with ordinary profit oriented businesses (Shilbury and Ferkins 2011, Moore and Levermore 2012, Breitbarth et al. 2015) through activities rooted in the popular culture (Scully 1974, Kennedy 2013, Breitbarth et al. 2015), pursuing the objective of win maximisation, in which the success on the sports field relies.

Sport organisations depend on intangible resources for the creation of value through processes that rely on those athletes as authorised specialists. Such knowledge-related resources not only become a source of value creation but are also an indicator of

organisations' market value (Chadwick 2009). Athletes work to transform their tacit knowledge and other resources into intellectual assets in the form of customer experience and sports achievements through sporting events. Non-routine by nature, sporting events require complex management and operational networks that cover a whole range of expertise beyond technical knowledge of a particular sport, to also cover equipment, hospitality, promotions, venue and programmes, merchandising and more (Shone and Parry 2004, p. 81, Parent and Smith-Swan 2013, Kharouf et al. 2020). Environmental conditions, such as levels of uncertainty, diversity and instability, shape the planning, organisation and conduct of such events as well as the role and performance of sport organisations (Mallen and Adams 2008, p. 78).

Operating in a highly competitive environment, and with their success measured in two dimensions: sports achievements (i.e. results of competitions) and business success (i.e. financial results) (András, 2004), we conclude that each sport business is a knowledge-based firm (Shareef and Davey 2005, Andrikopoulos and Kaimenakis 2009, Byers et al. 2012, Erhardt et al. 2014). They rely on several repetitive, codified elements such as training, which are complemented by essential, innovative and personalised elements such as individual performance during matches. Although difficult to make generalisations with regard to their KM strategies, we argue that the knowledge-related resources of sport organisations are stored in their IC components, which lie at the crux of their knowledge management policies and tools.

With this in mind, we argue that there is a need for all stakeholders to further understand the determinants of the KM-IC relationship with regards to the process of value creation and destruction and their codification in professional sport organisations, as they improve their operations in an increasingly knowledge-based economy. Such an analysis could help stakeholders build and maintain a competitive advantage within the professional

sport organisations value chain.

### *1.3 Overview of the research*

To address our research questions, we apply a systematic literature review (Tranfield et al. 2003) of the management and accounting literature on KM and IC in sport organisations. We adopt a replicable process to ensure the validity and reliability of the interpretative approach. Following a content analysis of 604 papers on “Business, Management and Accounting”, “Decision Sciences”, “Economics, Econometrics and Finance” and “Social Sciences”, which are all subject areas identified via the Scopus database, this study developed and assessed the KM-IC sport dictionary. A total of 66 studies suitable for review and a conceptual discussion was selected.

The present study contributes to the understanding of the bidirectional relationship between KM and IC in knowledge-based organisations. We reviewed and discussed two relevant research themes on KM and IC literature in professional sport organisations, namely KM strategies for IC value creation and IC codification. This study contributes to connect KM and IC in a bidirectional way, and proposing advances in KM and IC research and theory. It investigates the KM strategies associated with managing IC, and then effects of accounting for IC, specifically the impact of IC codification on the KM strategies. Secondly, the present study discusses theoretical frameworks to explain the relationship between KM strategies about IC investments and value creation/destruction. This analysis enables creating a conceptual map outlining the potential multiple determinants of the relationship between IC and value creation/destruction. Thirdly, the present work provides a methodological contribution by developing and validating a KM-IC dictionary, which can be applied and adapted to future KM and IC content analysis research scopes. Finally, this study proposes future avenues to advance KM and IC research, and which have the potential to address a number of challenges associated with the overlap between the KM and the IC domains in

sports and in other domains. Empirical evidence from the sports management domain offers opportunities for further studies, particularly on the following topics: (1) the divergent effects of KM strategies associated with IC investment on value creation, i.e., IC virtuous cycle of value creation and IC cycle of value destruction; (2) IC codification practices inside knowledge-based organisations; (3) how management control systems and corporate governance mechanisms can mitigate the suboptimality of KM strategies related to IC investments inside knowledge-based organisations; (4) the determinants of the KM strategies about IC within professional sport organisations.

Our contributions have implications for scholars and practitioners with an interest in related problematic areas, such as KM and IC's impact on financial performance (Tan et al. 2007), discovering of IC investments' value destruction implications (Giuliani 2013), and accounting and measuring the KM strategies associated with managing IC (Marr et al. 2003, Garcia-Perez et al. 2019).

The remainder of the paper proceeds as follows: Section 2 presents the theoretical framework that helps us systematise the retrieved literature. Section 3 describes the research design. Sections 4 and 5 analyse the KM-IC bidirectional relationship by firstly focusing on the value creation process through KM strategies to IC investment and by then examining the effects of IC codification on KM strategies. Section 6 discusses the findings. In the concluding section, we present avenues for future research and discuss the implications of the study.

## **2. A THEORETICAL FRAMEWORK TO SYSTEMATISE THE LITERATURE**

KM and IC are two significantly intertwined research streams (Kianto et al. 2014, Poggi and Keating 2015, Rossi et al. 2016, Hussinki et al. 2017, Mehralian et al. 2018). Given the knowledge-based economy's current growth, firms are increasingly becoming knowledge-integrating organisations, since they combine their knowledge-related resources stored in the

IC components (Mårtensson 2000). This approach is consistent with the knowledge-based view of the firm as "a unique bundle of idiosyncratic resources and capabilities", of which knowledge is "the most strategically important of the firm's resources" (Barney 1986, Grant 1996b, p. 110). In particular, KM and IC are bidirectionally related, i.e., they affect one another, and their association is crucial to gain competitive advantage (Seleim and Khalil 2011). By exploiting the knowledge stored in the IC components, KM strategies activate the flow of knowledge creation which fuel the IC components in a virtuous cycle of value creation (Knight 1999, Caddy 2000).

The organisation's business model determines the KM strategies to use and develop IC (Greiner et al. 2007) in order to maximise the organisational objectives (Mehralian et al. 2018). KM strategies are considered optimal when they create value for all the stakeholders. However, past research provides preliminary evidence that managers can also implement suboptimal KM strategies if they only generate value for a group of stakeholders and destroy the others' value (Caddy 2000). Indeed, while extant literature recognises the bidirectional relationship between KM strategies and IC as the vehicle of value creation (Mouritsen et al. 2001, Kaplan and Norton 2003, Fernstrom et al. 2004, Marr et al. 2004, Mouritsen and Larsen 2005, Kianto et al. 2014), it is almost silent on the value destruction potential (Caddy 2000, Cuganesan 2005, Giuliani 2013). To increase our understanding of the value creation and destruction implications of the KM-IC bidirectional relationship, we argue that it is theoretically important to map suboptimal KM strategies' determinants.

The broader institutional context in which firms operate affects the sub-optimality of KM strategies (Oliver 1997). Multiple, and sometimes competing, norms generate pressure and shape firms' KM strategies. Knowledge-based organisations, such as sport organisations, therefore, face institutional complexity. Multiple institutional logics reflect heterogeneous and decoupled stakeholders' interests, therefore placing pressure on the organisation to engage in

specific objectives (Ezzamel et al. 2012, Durand et al. 2013, Lander et al. 2013, Carlsson-Wall et al. 2016, Zhao et al. 2017). The divergence between institutional logics leads to suboptimal KM strategies, which may affect the value creation process negatively. Moreover, competing stakeholders' interests may also generate agency costs, potentially triggering opportunistic and suboptimal KM strategies.

IC codification substantially affects KM strategies. By promoting knowledge transferability and aggregation, codification plays a key role in ensuring organisations' optimal employment of IC (Buenechea-Elberdin et al. 2018). Knowledge transferability allows the transfer of IC resources between and within firms, thus contributing to the organisational flow of knowledge creation over time, and fostering the bidirectional KM-IC relationship. In this regard, codification strategies influence the efficiency of knowledge transferability used to combine new knowledge with the existing knowledge stored in the IC components (Grant 1996b). As a form of codification strategy, the accounting of IC through corporate reporting may facilitate the aggregation of knowledge and its transferability, therefore, helping an organisation to communicate and to independently share information. However, the partial representation of knowledge resources in a traditional reporting system is a major limitation for valuation and stewardship purposes. Human capital is mostly reported as salary expenses rather than as investment, making firms less inclined to invest in training (Roslender 1997). Other forms of IC, e.g., customer relations, staff competencies, knowledge transfer, are rarely presented due to complexity in estimating IC based on the requirements of a market price benchmark. Consequently, we question whether a lack of structured IC codification in financial reporting may lead to limited financial reporting information transparency. In turn, difficulties with the IC codification may mislead managers when they evaluate the KM strategies, raising agency costs (Ragab and Arisha 2013, Gu and Lev 2017).

To summarise, a thorough understanding of the bidirectional KM-IC relationship in knowledge-based organisations, such as sport organisations, firstly requires the theoretical investigation of the value creation and destruction implications of KM strategies associated with managing IC, and then the effects of IC codification on KM strategies (see Figure 1).

[FIGURE 1]

### 3. RESEARCH DESIGN

We apply a systematic literature review method to analyse the literature and identify potential avenues for future studies (Tranfield et al. 2003, Meier 2011, Natalicchio et al. 2017, Cillo et al. 2019). The systematic literature review method is based on a “replicable, scientific and transparent process” which minimises researcher bias (Tranfield et al. 2003, p. 209).

Figure 2 presents a review protocol summarising the steps of the review process.

[FIGURE 2]

*First Stage.* After having run a pilot study, we defined the search strings to use in our search on Scopus, one of the most accurate bibliographic database containing abstracts and citations for academic journal articles (Falagas et al. 2008, Inkinen 2015). We built the search strings by combining management and accounting keywords related to KM and IC with sport keywords<sup>1</sup>. Examples include: ("knowledge management" AND sport), ("intellectual capital" AND sport\*), (accounting AND sport\*), (“performance measurement” AND “sport management”). The search strings were applied to search for titles, abstracts and author-provided keywords. We limited the search to relevant journals classified in the Scopus subject areas of “Business, Management and Accounting”, “Decision Sciences”, “Economics, Econometrics and Finance” and “Social Sciences”. The pilot study supported the journal selection. Overall, we retrieved 604 papers. Appendix A describes the selection of the relevant papers<sup>2</sup>.

*Second Stage.* We analysed the papers gathered in the first stage to identify the sample

of papers suitable for review. Given the high level of heterogeneity and fragmentation in KM and IC literature about sport organisations, we adopt a thematically driven approach to include the papers in our literature review (Crane and Glozer 2016). First, we used WordStat software<sup>3</sup> to conduct an automated content analysis of the words occurring in the 604 full papers. Ten papers contain the expression *intellectual capital*, and we named this group of papers “the IC sport papers”. Secondly, we categorised the 604 papers by creating a sport KM-IC dictionary (Humphreys and Jen-Hui Wang 2017). We used an inductive approach to develop the dictionary. We grouped the words, which are listed according to frequency, into homogeneous categories. The papers categorised as “IC sport papers” and Petty and Guthrie's (2000) study provided theoretical support for the choice of the dictionary categories, i.e., *Intellectual Capital* and *KM codification strategies*, and for the selection of 163 words. Human coders were used to assess the dictionary. The dictionary was sent to three researchers, who were asked to check the categorisation of the 163 words. Each word is maintained in the dictionary, if at least two of the three coders vote to include it (Humphreys and Jen-Hui Wang 2017). The dictionary was validated by the three coders, who accepted the categorisation and inclusion of all the 163 words (Appendix A).

Thirdly, on the basis of the developed sport KM-IC dictionary, we used WordStat software to conduct the automated content analysis of the 604 papers. We selected 345 papers whose IC category's frequency was greater than 70 and whose KM codification strategies' category had a frequency greater than 20<sup>4</sup>. We manually analysed the full text of each paper, reading, summarising and creating synopses (Beck and Rygl 2015, Natalicchio et al. 2017, Cillo et al. 2019). Using the following inclusion/exclusion criteria, we identified 46 papers suitable for our research:

- Studies providing a further understanding of IC management and accounting in a sport setting.

- Studies whose reported findings contribute to understand sport organisations' features.
- Economics studies are only included if their findings have managerial implications.

We analysed the abstract of each of the 259 remaining articles and selected four papers on the basis of the above-mentioned criteria. By analysing the selected 50 papers, we identified 16 additional papers, which we added to our sample (Inkinen 2015). The final selection comprises 66 relevant studies for review.

Fourthly, we applied the VOSviewer text mining functionality to build a co-occurrence network of terms extracted from the 66 studies' titles and abstracts (Markoulli et al. 2017)<sup>5</sup>. The software develops a graphic visualisation of the network of terms, thus highlighting the 66 selected studies' core research themes. In Figure 3, each circle represents a term, and the size of the circle indicates the number of studies in which the term occurs. The software locates terms close to one another if they co-occur several times, grouping the terms into five clusters which can be systematised into two core research themes, i.e., KM strategies for IC value creation (yellow, violet, cyan and blue) and IC codification (red and green cluster).

[FIGURE 3]

Fifthly, we systematised and compared the 66 selected studies' empirical evidences with the two research themes, i.e., KM strategies for IC value creation and IC codification, thus enacting our theoretical framework (see Section 2). Table 1 presents a list of the studies reviewed, the key findings and the associated KM implications.

[TABLE 1]

Internal and external validity tests check the accuracy of our conceptualising, and thus of our findings (White and McBurney 2012, p. 142). Internal validity tests aim to establish a

causal relationship between the theoretical framework of a few selected articles of our sample, and our findings. “The IC sport papers” provide us the IC framework we applied to analyse all the selected studies. The external validity tests establishes a causal relationship between the burgeoning IC literature (Caddy 2000, Petty and Guthrie 2000, Pulic 2004, Kujansivu and Lönnqvist 2007, Giuliani 2013) and our findings. The KM and IC literature supports us in explaining the sport management empirical evidences.

Table 2 provides a classification of the 66 selected studies on the basis of the research method, setting and type of sport. Overall, the majority of the selected studies of our sample applies case studies related to the European football organisations.

[TABLE 2]

#### **4. KM STRATEGIES TO IC INVESTMENTS: VALUE CREATION AND VALUE DESTRUCTION IMPLICATIONS INSIDE PROFESSIONAL SPORT ORGANISATIONS**

In this section, we investigate the value creation and destruction implications of the bidirectional KM-IC relationship within professional sport organisations. We therefore first discuss the IC virtuous cycle of value creation activated by KM strategies. We thereafter analyse sport organisations’ business models, as they influence the KM strategies regarding IC investments. Finally, we examine KM dysfunctionalities in terms of IC investments by means of multiple theoretical frameworks, i.e., institutional and agency theory, to provide insights into suboptimal KM strategies and the related value destruction implications.

##### *4.1 Element 1: IC virtuous cycle value creation*

The IC components represent the information and knowledge created and shared by sport organisations over time. They are strategic intangible assets in professional sport organisations (Mnzava 2013, Dimitropoulos and Koumanakos 2015). The human capital represents the total sum of employees’ integrated knowledge and competences. It includes all

the skills and performances of players, managers, coaches, player directors and administrative staff. The structural capital refers to the knowledge embedded in the sport organisation. For example, the offensive strategy of Barcelona FC is a feature of the football club's identity, and thus it is expression of the structural capital (Andrikopoulos and Kaimenakis 2009). Finally, the relational capital comprises the knowledge embedded in the relationship between a sport organisation and its stakeholders (e.g. competitors, organisers of sporting events, media, fans, investors, regulators, the government and others), and therefore includes the resources these stakeholders share in different ways (Ducrey et al. 2003, Guzmán and Morrow 2007). These relationships are a source of knowledge that can be used and developed to create value in the organisation (Andrikopoulos and Kaimenakis 2009, Geeraert et al. 2013, 2014, Shilbury et al. 2016).

Sport organisations apply KM strategies to use and develop IC components to generate more intangible assets (Petty and Guthrie 2000), triggering the virtuous cycle of value creation (Gurel et al. 2013, Mnzava 2013). In particular, KM strategies in sport organisations, such as the player development and management, contribute to transform the knowledge stored in the human capital into sport performance (Andrikopoulos and Kaimenakis 2009). Player development strategies can activate the flow of explicit or tacit knowledge from coaches to players. Explicit knowledge consists of detailed and precise technical instructions, which players are supposed to apply in the sports field. Implicit knowledge consists of general principles about the game dynamics. Specifically, coaches allow players freedom to decide how to play (Erhardt et al. 2014). The player management includes a whole range of activities from contract negotiations, i.e. player acquisition/selling, to salary management (Hoye et al. 2015, p. 66), facilitating player development strategies to contribute to athletic performance. Furthermore, another example of KM strategies is the implementation of gaming strategies, which exploit the knowledge stored in the structural capital to contribute to the athletic

performance.

The athletic performance influences the success on the sports field, and creates value for the relational capital in a twofold way. First, professional sport organisations are part of the popular culture and of the entertainment sector (Scully 1974, Kennedy 2013, Breitbarth et al. 2015). Therefore, the athletic performance creates value for fans, investors and media by creating entertainment and by satisfying their passions (Noll 1974, Ducrey et al. 2003, Edmans et al. 2007, Andrikopoulos and Kaimenakis 2009). Secondly, professional sport organisations are generally profit-oriented companies (Shilbury and Ferkins 2011, Moore and Levermore 2012, Breitbarth et al. 2015). The athletic performance creates value for investors by generating direct and indirect revenues (Rohde and Breuer 2017). The direct revenues are monetary prizes for participating in or winning international games, and the indirect revenues are the tickets paid by fans and the commercial rights coming from the media. Revenues impact positively on the income reported and contribute to the dividend distribution in favour of investors. Revenues also permit sport organisations to meet regulatory budget requirements. The latter would, therefore, guarantee the national collective interest of financial stability among sport organisations (Biancone and Solazzi 2012, Muller et al. 2012).

While the athletic performance creates value for the relational capital, the latter supports the athletic performance from an emotional and financial point of view, leading to a potential virtuous cycle of value creation (Andrikopoulos and Kaimenakis 2009). Fans and media provide the emotional support of sport organisations. The fans are motivated by the glory interest for sport success and cheer their sport team (Slack 1998). The media influence the match attendance and promote the emotional attachment of fans to the sport organisation. In addition, the relational capital provides financial support to investments in sport human capital, i.e., investments in players, coaches, technical and medical staff, and thus contributes to improving the athletic performance. Investors can provide financial support to enhance the

athletic performance, and the athletic performance's direct and indirect revenues, i.e., the competition prizes, fans' tickets and the media's commercial rights, can be reinvested according to a self-financing process (Ducrey et al. 2003, Barros and Leach 2007, Andrikopoulos and Kaimenakis 2009, Kennedy 2013). The relational capital also influences the athletic performance by imposing rules on professional sport organisations for the participation in competitions. Regulators have the power of allowing sport organisations to participate in the sport competitions and thus they potentially impact on the athletic performance's direct and indirect revenues (Carlsson-Wall et al. 2016, Nicolliello and Zampatti 2016).

Sport organisations may employ KM strategies by relying on the knowledge stored in the relation capital to increase a game's attractiveness, therefore reinforcing the emotional and financial support of the athletic performance (Ducrey et al. 2003, Guzmán and Morrow 2007). Examples of such KM strategies are those related to the management of sporting events. These events involve stakeholders from several knowledge domains and require a complex management networks, which cover expertise beyond the technical knowledge of a particular sport to also cover equipment, hospitality, promotions, venue and programmes and brand merchandising (Shone and Parry 2004, p. 81, Parent et al. 2014, 2017, Schenk et al. 2015, Kharouf et al. 2020).

Figure 4 outlines the virtuous cycle, which sport managers can activate through KM strategies by combining the knowledge stored in the IC components. The red colour represents the IC's components, and the black colour describes the value the athletic performance creates for the relational capital. The blue colour describes the support offered by the relational capital to the athletic performance.

[FIGURE 4]

*4.2 Element 2: The relevance of business models in KM strategies about IC investments*

Sport organisations are characterised by the trade-off between business and sport goals, and thus they tend to adopt alternatively a win maximisation or a profit maximisation business model (Jones 1969, Barros and Leach 2007, Yeh and Taylor 2008, Smith and Stewart 2010, Sloane 2015, Rohde and Breuer 2017, Terrien et al. 2017). KM strategies use and develop IC to potentially maximise the objective of the business model adopted.

Win maximisers' main objective is sport success, and their KM strategies mostly employ IC to maximise success on the sports field. For example, player management is the main strategy for attaining their objective. Managers are willing to pay high salaries for the best and most popular players at the expense of profit generation and of long-term viability and sustainability (Solberg and Haugen 2010, Cooper and Johnston 2012, Moore and Levermore 2012, Muller et al. 2012). As a result, sport managers satisfy investors' interests for sport success, and they meet fans' passions. They also create entertainment for the media.

While win maximisers perceive the sport success as their main goal, the objective of profit maximisers is related to the financial performance. In the latter, KM strategies may thus use IC to maximise profits. Sport organisations would implement KM strategies related to player management, avoiding unrecoverable high costs for popular players (Solberg and Haugen 2010, Rohde and Breuer 2017). As a result, KM strategies ultimately foster dividend distribution in favour of investors and strengthen the financial position of the organisation.

In this setting, KM strategies can lead to either optimal or suboptimal IC investments (Mnzava 2013, Rossi et al. 2013, Dimitropoulos and Koumanakos 2015). Optimal decisions create value not only for the stakeholders whose interests are coupled with the business model's objectives, but also for all the organisation's stakeholders. By simultaneously satisfying win maximisation and profit maximisation objectives, optimal KM strategies can therefore potentially trigger an IC virtuous cycle, thus creating value for all the stakeholders. By contrast, suboptimal KM strategies satisfy either the win maximisation business model's

objective or profit maximisation business model's objective. They potentially create value only for the stakeholders whose interests are coupled with the business model's objectives, and destroy value for the others (Muller et al. 2012, Kennedy 2013, Sloane 2015, Rohde and Breuer 2017). In the following sections, we investigate the determinants of the optimal/suboptimal KM strategies related to IC investments further.

#### *4.3. Element 3: Theoretical Explanations of KM strategies' value destruction implications*

Sport management empirical evidence supports the conjecture that the majority of KM strategies about IC are suboptimal and can activate mechanisms of value destruction (Cooper and Johnston 2012, Dimitropoulos et al. 2016). The institutional and the agency theories explain the determinants of suboptimal KM strategies, unveiling the KM dysfunctionalities about IC investments (Schubert 2014, Carlsson-Wall et al. 2016).

##### *4.3.1 The Institutional Theory*

The institutional theory explains the value destruction implications of suboptimal KM strategies by highlighting the institutional complexity of sport organisations (Carlsson-Wall et al. 2016). Both win maximiser and profit maximiser sport clubs face institutional complexity. Two main institutional logics, namely the sport and the business logics, coexist in sport organisations and reflect the interests of their stakeholders, such as the investors, fans, media, professional players, salaried managers, and regulators (Gammelsæter 2010, Washington and Patterson 2011).

The sport logic is associated with “institutional demands for success in sports” requiring the implementation of KM strategies that improve sport performance, for instance KM strategies related to the acquisition of players who perform best and are the most popular. The business logic is associated with institutional demands for financial performance, i.e., “a low level of debt, a particular return to shareholders or a successful initial public offering” (Carlsson-Wall et al., 2016, p. 46). This logic requires the implementation of KM strategies

that allow a satisfactory financial performance by, for instance, avoiding unrecoverable high costs due to the purchase of popular players and by generating revenues through the selling of players to other sport organisations.

The relationships between logics are ambiguous. In some cases, the sport and business logics are coupled, i.e., the logics' institutional demands are in harmony and the KM strategies could adhere to both logics simultaneously. In other cases, the logics are decoupled, i.e., they make competing institutional demands from the organisation and the KM strategies could adhere to either of the two logics (Chadwick 2009, Carlsson-Wall et al. 2016, Kringstad and Olsen 2016). The coupling/decoupling of logics may affect the optimality and suboptimality of KM strategies regarding IC investments. Building upon Rossi et al. (2013) and Carlsson-Wall et al. (2016), we systematise and discuss the effects of the coupling/decoupling of logics on IC value creation in respect of win maximisation and profit maximisation business models (see Table 3).

[TABLE 3]

When sport and business logics are coupled, sport managers have the potential to make optimal decisions related to value creation for stakeholders. By adopting alternative win maximisation and profit maximisation business models, sport organisations could create value for all stakeholders and therefore experience an IC virtuous cycle. Conversely, when the logics are decoupled, sport managers make potentially suboptimal decisions related to value creation for the stakeholders. The win and profit maximisation business models lead to the prioritisation of either the sport or business logic, creating value for only a group of stakeholders and generating dysfunctionalities for the IC virtuous cycle (Chadwick 2009, Kringstad and Olsen 2016, Nicolliello and Zampatti 2016).

Carlsson-Wall et al. (2016) argue that sport organisations' position in the league table is a crucial determinant of the coupling/decoupling of logics. Specifically, sport and business

logics seemed to be coupled in sport organisations positioned among the top three and those in the league's lowest position. In terms of the top three league positions, both logics require sport organisations to maintain their sport performance and to continue to win in order to obtaining satisfactory financial rewards. KM strategies to improve sporting performance will therefore be less relevant because the club is performing well in terms of its ranking position. Sport organisations in the lowest league positions risk relegation, which can generate financial losses in terms of reduced ticket sales and lost commercial rights deals. In the latter situation, both logics require sport organisations to implement KM strategies to improve their sport performance, even if these have negative financial effects in the short term. These sport organisations may eventually gain financially by avoiding relegation to a lower-tier league. In both scenarios, regardless of the business model adopted, the coupling between the sport and the business logic leads to the implementation of optimal KM strategies to create value for all the stakeholders.

By contrast, sport organisations with a medium sporting performance exhibit decoupled sport and business logics. Win maximisers implement KM strategies that prioritise the sport logic at the business logic's expense. The fans' external pressure on sport organisations to win contributes to making decisions regarding the acquisition of players, even if such decisions lead to financial losses. Value is subsequently mostly created for investors, fans and the media. Conversely, profit maximisers perceive KM strategies that attempt to improve the organisation's sporting performance as unjustified, and they therefore prioritise the business logic. Managers could implement KM strategies that safeguard the financial performance, such as revenue generation through the sale of players, which would mostly create value for investors and regulators (Rossi et al. 2013, Carlsson-Wall et al. 2016). Overall, the decoupling of institutional logics seems to be a key determinant of potential suboptimal KM strategies regarding IC investments, thus leading to value destruction.

#### *4.3.2 The agency theory*

The agency theory posits that managers have an information advantage over stakeholders and they can use it for opportunistic KM strategies (Mason et al. 2006). The divergence between regulators' long-term national collective interests and fans' and media's sport success interest, may lead sport managers to adopt opportunistic KM strategies about IC investments in order to apparently satisfy multiple stakeholders' interests (Mason 1997, Mason and Slack 2001a, 2001b, 2003, 2005, Mason et al. 2006, Guzmán and Morrow 2007, Geeraert et al. 2013, Schubert 2014). However, opportunistic KM strategies about IC investments are suboptimal decisions, since they create value for certain stakeholders and only apparently create value for the others.

The regulator (principal) establishes financial rules necessary to attain its national collective objective of financial stability among clubs (agents) and forces sport managers to follow them in order to join the competition. The regulator can assess the compliance of the organisation to financial targets, but not the operations and the managerial decisions at the basis of the financial results reported. Therefore, sport managers can exploit information asymmetry to maximise the value creation for fans and media, and to apparently create value for regulators (Schubert 2014). The utmost goal of fans is winning and they expect managers to acquire expensive players and to retain them by paying high salaries (Cooper and Johnston 2012). The neglect of fan demands can reduce in the short-term attendance and revenues from sponsors and media. Therefore, managers may over-invest in players satisfying fans and media and simultaneously appear to attain the financial goals by manipulating their balances with earnings management practices<sup>6</sup> (Slack and Shrivs 2008, Preuss et al. 2014, Dimitropoulos 2016, Dimitropoulos et al. 2016).

An example of a regulator's financial rules is UEFA's Financial Fair Play (FFP) rules. The FFP rule is a budget constraint in the soccer field imposed by UEFA (the regulator) in

2010 on the clubs taking part in the Champions League and Europa League competitions (Muller et al. 2012, Schubert 2014, Nicolliello and Zampatti 2016, Ghio et al. 2019). Dimitropoulos et al. (2016) show that in the aftermath of UEFA's FFP regulatory intervention, football club managers have engaged in more aggressive earnings management practices in order to simultaneously attain the sport success and compliance with financial rules.

Overall, financial regulatory interventions are a potential determinant for suboptimal KM strategies about IC investments. We find that suboptimal KM strategies can lead to earnings management practices, which allow managers to elude regulators and apparently attain to the financial rules.

## **5. THE EFFECTS OF IC CODIFICATION ON KM STRATEGIES**

In this section, we analyse the IC codification inside professional sport organisations. Although IC codification through accounting and reporting practices could facilitate the knowledge storage, significant limitations emerge in the representation of IC in traditional reporting systems. The lack of structured IC codification in financial reporting may lead to limited financial reporting information transparency, which may mislead managers and prevent them from taking optimal KM strategies (Morrow 2013, Rossi et al. 2013). As a result, managers can take suboptimal KM strategies, which may activate mechanisms of value destruction.

### *5.1. IC accounting and reporting practices*

Prior KM and IC literature about sport organisations mostly explores the codification of the knowledge stored in human capital. Specifically, it focuses on the accounting and reporting practices related to the management of players, which represents a form of human capital. Player costs have an increasing relevance in the financial statements due to the sharp increase in player salaries and recruiting costs (Deloitte 2019). Scholars investigate the appropriateness

of recognising the acquisition of players as intangible assets<sup>7</sup>, and the related challenges of evaluation<sup>8</sup> (Rowbottom 2002, Amir and Livne 2005, Forker 2005, Shareef and Davey 2005, Risaliti and Verona 2012). The recognition of players as intangible assets and their evaluation depend on the manager decisions about the type of players' acquisition. Past literature discussed the three most common types of player acquisition, i.e., the contracts with free players, the development of young players and the trade of players through a transfer market (Scully 1974, Morrow 1992, 1995, 1996).

First, clubs can stipulate a contract directly with a free player. The lack of an active market for comparable parameters causes difficulty in complying with cost reliable measurement requirements for capitalisation as an asset<sup>9</sup> (Lozano and Gallego 2011, Biancone and Solazzi 2012). Thus, player costs are expensed in the income statement, and their contracts are not recognised as intangible assets.

Second, clubs can invest in the development and education of young players, and the related costs are expensed in the income statement. Home-grown youth player costs are internally developed intangibles and thus not recognised as assets<sup>10</sup> (Shareef and Davey 2005, Oprean and Oprisor 2014). However, Kulikova & Goshunova (2014) consider the non-recognition of home-grown player costs as assets fundamentally incorrect. Home-grown young players ensure the future good sport performance results. The costs associated with their professional development are often correlated to the future sport clubs revenues, such as season-tickets, sponsorships, merchandising, broadcasting revenues, competition prizes, stadium management (Kulikova and Goshunova 2014). Therefore, the value of home-grown players would be informative to investors when recognised as intangible assets (Benkraiem et al. 2011, Rohde and Breuer 2017).

Third, players can be traded through a transfer market with the payment of a transfer fee. Players can be recorded as intangible assets, i.e., *players-as-assets*, because the transfer

fee guarantees the reliable measurement of asset costs (Morrow 1995).

However, past literature outlines significant challenges in relation to the valuation of players-as-assets (Hirotsu and Wright 2003, Tunaru et al. 2005, Benkraiem et al. 2011, Kulikova and Goshunova 2014). Differently from other assets, which decrease their value over the time, players often increase in value over the time. Yet, their revalued amounts are not recorded in the balance sheet, since accounting standards' revaluation models<sup>11</sup> require a reliable measure of the fair value<sup>12</sup> in relation to an active market. This requirement presents application difficulties in sport organisations. The player transfer market cannot be comparable to an active market due to lack of frequent homogeneous goods' transactions.

The aforementioned valuation problems also disincentive the devaluation of player-as-assets (Risaliti & Verona, 2012). For instance, IAS 36 (Impairments of Assets) requires the impairment test to assess the recoverable amount of intangible assets. The lack of reliable measures of player fair value makes difficult the impairment test of player-as-assets. Gazzola & Amelio (2016) find a limited application of the impairment test in the Italian football organisations, and thus confirm that the fair value identification difficulties discourage the devaluation of assets. Among the Italian listed football clubs, only the Juventus club has always executed the player impairment test and has always registered a devaluation of players-as-assets in the profit/loss account.

## *5.2 The effects of IC codification on financial reporting transparency*

Financial reporting information transparency guarantees relevant and reliable information about the knowledge stored in the IC components, thus supporting optimal KM strategies and capital market efficiency (Biddle et al. 2009). However, past research shows that IC codification often undermines sport organisations' financial reporting information

transparency, affecting negatively the optimality of the KM strategies (Benkraiem et al. 2011, Morrow 2013, Rossi et al. 2013).

IC codification impairs the financial reporting information transparency of sport organisations, providing incentives for earnings management practices (Dimitropoulos 2011). Earnings management can take place through two channels, i.e., accrual-based earning management and real earning management. Accruals-based earning management consists of managers' interventions "in the financial reporting process by exercising discretion and judgment regarding accounting choices" (Kothari et al. 2016). Accrual management misrepresents the underlying operations of the sport organisations in the financial statement. The difficulties related to the players-as-assets impairment is a primary source for accrual management for professional sport organisations. Prior literature shows that sport managers can misrepresent accruals by not recording all impairment losses (Dimitropoulos 2011, Risaliti and Verona 2012).

Real earning management entails "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations" (Roychowdhury, 2006, p. 337). The recognition of transferred players as intangible assets is a primary source of real earnings management practices in sport organisations. The operations of trading of players and the lack of a player active market, allow sport managers to exercise discretion about the price of players' negotiations. Sport managers can manage earnings by overvaluing player exchanges in order to hide losses and negative shareholder equity. More specifically, managers cover losses with the capital gains obtained from the player exchanges among clubs (Risaliti and Verona 2012).

The principal-agent relationship between regulator and managers explains managers' intention to exploit the flexibility in financial reporting and undertake accrual and real

earnings management practices to potentially mislead regulators (See Section 3.3). Empirical evidences about European Football organisations confirm that managers use both accrual and real earnings management practices (Dimitropoulos et al. 2016).

Another potential way IC codification may impair financial reporting information transparency is by fostering deviations of the market value from the book value. IC is a source of value creation for sport organisations and it is expression of the organisations' market value. However, the financial reporting of sport organisations is lagging behind a complete representation of IC assets and of their fair value (Shareef and Davey 2005, Morrow 2013). On the one hand, free-player and home-grown player costs are not recognised as intangibles assets, and thus these costs are expensed to the income statement. On the other hand, the player-as-assets are potentially undervalued compared to their fair value. These differences lead book values to exhibit amounts considerably below the market value.

Earnings management practices and differences between market value and the book value negatively impact the financial reporting information transparency and usefulness. Reported earnings and market multiples (e.g., price/earnings, book-to-market ratio) present limited relevance and comparability. Therefore, KM strategies and investors' decisions often depend on information with limited relevance and reliability. Hence, we observe that the uncertainties surrounding the IC investments in professional sport organisations raise adverse selection problems (Edmans et al. 2007, Benkraiem et al. 2011, Cooper and Johnston 2012, Morrow 2013). Despite KM strategies about IC investments may aim to satisfy the business model objectives, i.e., win maximisation or profit maximisation, the limited financial reporting information transparency can mislead managers about the recoverability of IC investments (Morrow 2013, Rossi et al. 2013). Consequently, managers may adopt suboptimal KM strategies affecting negatively the value creation process.

## 6. DISCUSSION

This paper develops a systematic literature review on KM and IC in professional sport organisations. Even though the extant literature has traditionally investigated KM and IC separately, this study showed the conceptual and empirical importance of their bidirectional relationship in the value creation process. Two relevant research themes, i.e., KM strategies for IC value creation and IC codification, contribute to explain this complex bidirectional relationship.

We agree with Kianto et al. (2014) that both IC (the stock of knowledge) and the KM (the management of knowledge) determine organisational value creation. The IC components, i.e., human, structural and relational capital, are strategic intangible assets, and sport organisations apply KM strategies to exploit IC components to create additional intangible assets (Petty and Guthrie 2000), triggering the virtuous cycle of value creation (Gurel et al. 2013, Mnzava 2013).

However, the analysis of the elements shaping the relationship between KM strategies and value creation shows that KM strategies about IC lead not only to value creation, but also to value destruction. Sport organisations' business models influence KM strategies, which can be optimal strategies, i.e., create value for all the stakeholders, or suboptimal strategies, i.e., they create value only for a group of stakeholders. Figure 5 provides a visual representation of the relationship between KM strategies and value creation/destruction in professional sport organisations and their potential explanations. Institutional and agency theories support the identification of the multiple determinants of the sub-optimality in KM strategies about IC investments. The decoupling between institutional logics can be a determinant of potential suboptimal KM strategies about IC investments (Carlsson-Wall et al. 2016). Furthermore, the agency relationship between regulator and sport managers potentially leads sport managers to adopt opportunistic and suboptimal KM strategies (Schubert 2014).

[FIGURE 5]

IC codification is substantially connected to KM strategies. The limited recognition of players as assets and their evaluation determine a limited structured IC codification with the potential to impair the quality of IC financial reporting. This finding reveals that IC codification through corporate reporting generates a significant deviation between the book value and the market value, with the potential to mislead investors in their decision-making process (Amir and Livne 2005, Shareef and Davey 2005). It also creates incentives to earnings management (Dimitropoulos et al. 2016), exacerbating the incomplete representation of IC assets and of their fair value.

The limited structured codification of IC through corporate reporting often undermines the relevance and reliability of financial reporting information transparency of sport organisations, with the potential to lead to suboptimal KM strategies (Benkraiem et al. 2011, Morrow 2013, Rossi et al. 2013). Differences between market and book value, and earnings management practices impact the financial reporting information transparency and usefulness. The limited financial reporting information transparency in professional sport organisations associated with IC has the potential to generate suboptimal KM strategies about IC investments and to cause investors' inefficient decisions. Figure 6 provides a visual representation of how IC codification affects KM strategies.

[FIGURE 6]

## **7. CONCLUSION AND DIRECTIONS FOR FUTURE RESEARCH**

The study of the relationship between KM and IC is underinvestigated, particularly with regard to the value destruction process and its codification. To address these gaps, the present study provides conceptual and empirical evidence of the bidirectional KM-IC relationship and its impact on value creation/destruction, in knowledge-based organisations such as professional sport organisations. It investigates the KM strategies associated with

managing IC, and then the effects of IC codification on KM strategies.

### *7.1 Future Avenues*

The investigation of the research theme “KM strategies for IC value creation” has identified institutional complexity and agency relationships as determinants of suboptimal KM strategies, which subsequently lead to value destruction. Future research could investigate whether, and to what extent, management controls, such as policies and procedures, performance management systems, and strategic planning, can effectively mitigate suboptimal KM strategies with regard to IC investments in institutional complex organisations. In addition, our findings on the agency relationship between regulators and sport managers provide broad research directions that can drive the investigation of the relationship between financial regulatory interventions and KM strategies within professional sport organisations.

The discussion of the research area “IC codification” provides a deep understanding of the limitations of IC codification through corporate reporting and their effect on KM strategies. These limitations often determine the limited financial reporting information transparency inside sport organisations, which has negative consequences for KM strategies. While the papers reviewed mostly explore the codification of the knowledge stored in human capital and its negative effects on IC financial reporting’s quality, future avenues could examine the codification of other IC components, i.e., structural and relational capital. Sport organisations’ gaming strategy and popularity are examples of strategic intangible resources related to structural and relational capital and which are not fully presented in the traditional financial reporting system; these resources therefore contribute to the weakening of IC financial reporting’s quality.

As a form of codification strategy, IC voluntary disclosure may provide information about the IC assets costs, which are often underreported in mandatory financial reporting.

However, the reliability and relevance of IC codification by means of voluntary disclosure are still a 'black box'. Little is known of this type of codification's effects on KM strategies regarding IC investments. IC voluntary disclosure could allow professional sport organisations to provide a more complete IC codification, thus affecting an organisation's value positively (Cooper and Johnston 2012, Castilla-Polo and Gallardo-Vázquez 2016).

To conclude, we propose additional overarching research questions, which can guide future research directions in the management research about KM and IC and can allow researchers a deeper understanding of KM strategies about IC.

*Future Research Question 1. How does the interplay between decision makers affect KM strategies about IC investments in knowledge-based organisations?*

Understanding the decision-making process related to KM strategies about IC investments is under searched in knowledge based organisations (Abubakar et al. 2017). In the case of professional sport organisations, the main actors of the decision-making are investors, managers, coaches and players' agents. The interplay between the main actors leads to decisions about IC investments and valuations. However, the decision-making is a black box, in which the interplay between actors is unknown. For instance, changes in ownership may affect a manager's choice to acquire a popular player or to develop internally young players. Coaches' gaming strategies potentially lead to an increase or a decrease in the valuation of players, influencing related managerial and investors' decisions. Additionally, players' agents can substantially influence players' negotiations (Fornalik 2013), affecting managerial decisions about IC (Mason and Slack 2001a, 2001b). Future research could look inside to the black box of the knowledge-based organisations' decision-making. Surveys and interviews would be relevant to understand what are the incentives and the dynamics which lead managers to adopt certain KM strategies about IC investments and valuation.

*Future Research Question 2. How do managers' characteristics affect the way managers*

*form their beliefs, which determine their KM strategies about IC investments?*

The heterogeneity of managerial characteristics, i.e., personality traits, career experiences, education, gender, may influence corporate decision-making (Kaplan et al. 2012, Graham et al. 2013). For professional sport organisations, the trade-off between sport and business goals makes sport managers' characteristics determinant in KM strategies about IC investments (Chadwick 2009, Smith and Stewart 2010, Carlsson-Wall et al. 2016). The combination of manager characteristics affects the way sport managers cope with multiple stakeholder interests and thus with agency problems. Future research could apply a survey-based approach to measure the managers' attitude behind KM strategies about IC investments decisions. Through field studies, interviews and psychometric personality tests researchers could also develop a management behaviour dictionary regarding KM strategies.

From a methodology perspective, the majority of the papers included in our review explain phenomena using case studies or archival data analysis and focus mainly on the European football sport organisations. Future studies could develop ethnographic and interpretative research methods, such as interviews and surveys, to understand deeply why sport organisations take particular managerial decisions. Additionally, future research could extend the study of KM-IC bidirectional relationship across other countries and types of sport. The determinants of KM process may vary in relation to the type of sport played by the organisations and to the cultural context in which sport organisations operate (Parent et al. 2017).

### *7.2 Theoretical and Practical contributions*

From an academic point of view, this paper contributes to the KM and IC literature. We complement past studies which investigate KM and IC separately by examining the bidirectional relationship between IC and KM. Moreover, while extant literature focuses on the value creation process associated with the KM - IC relationship (Kianto et al. 2014, Poggi and

Keating 2015, Rossi et al. 2016, Hussinki et al. 2017, Mehralian et al. 2018), we shed light on the under investigated topic of value destruction process (Caddy 2000, Giuliani 2013). This study also contributes to the KM literature by connecting KM strategies and IC codification as well as to the understanding of how IC reporting affects KM strategies. In particular, we develop a conceptual map of the determinants of optimal/suboptimal KM strategies and the associated value creation/destruction process.

This paper also contributes to the sport management literature. Despite the role of KM and IC in professional sport organisations, which are knowledge-based organisations, past sport research is highly fragmented and analyses only single aspects of KM and IC (Andrikopoulos and Kaimenakis 2009, Mnzava 2013, Dimitropoulos and Koumanakos 2015). This study fills this literature gap by applying a systematic literature review method (Tranfield et al. 2003) and by developing a KM-IC dictionary to support the conceptual discussion of the relationship between KM and IC inside professional sport organisations.

Furthermore, this paper describes the practical implications for managers involved in knowledge-based organisations. The findings show how managers can improve organisational performance by combining the knowledge-related resources stored in organisations' IC components. Specifically, managers can use our results to shape their decisions and thus mitigate their KM strategies' inefficiencies about IC investments and reporting. By providing evidence of the effects of IC investment and codification decisions on value creation for stakeholders, our research allows managers to reflect about the consequences of their decision-making on the optimality or suboptimality of KM strategies. Building on our results, managers can implement performance measurement systems based on metrics, which are capable of measuring the value creation for stakeholders and thus potentially limit inefficient KM strategies about IC investments.

Our discussion is also informative for regulators and policy makers by highlighting

how they can support value creation within professional sport organisations. Specifically, our findings provide these actors with useful insights into their regulatory intervention's effects on KM strategies' suboptimality regarding IC investments, thus promoting the implementation of solutions that mitigate suboptimality. For example, regulators and policy makers could design policies to support corporate governance mechanisms that favour KM strategies' efficiency regarding IC investments or to implement codification practices that meet knowledge-based organisations' needs.

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## Appendix A. Research Design

### A1. Keyword search strings.

SCOPUS SEARCH	
Database	Scopus
Keywords	("knowledge management" AND sport*) OR ("intellectual capital" AND sport*) OR ("structural capital" AND sport*) OR ("human capital" AND sport*) OR ("human capital" AND player*) OR ("relational capital" AND sport*) OR (accounting AND sport*) OR ("intangible* asset* accounting*" AND sport) OR (profitability* AND "professional sport club*") OR (economic AND "professional sport") OR (econom* AND "professional sport industry") OR ("financial statement*" AND "professional sport club*") OR ("business practice*" AND "professional sport") OR (evaluation AND "sport competition*") OR (earning* AND sport*) OR (disclosure AND sport*) OR (financial* AND "sport performance") OR ("agency theory" AND sport) OR ("agency theory" AND player* AND professional*) OR ("institutional theory" AND sport) OR ("principal-agent theory" AND professional* AND sport*) OR ("institutional logic*" AND sport) OR ("stakeholder theory" AND sport) OR (financ* AND sport) OR (theory* AND "sport governance*") OR ("performance measurement" AND "sport management") OR (accountability* AND "sport governance") OR (transparency AND "sport organisation*") OR (financ* AND sport) OR (sport AND corporate* AND governance*) OR (profit* AND "professional sport") OR ("knowledge management" AND football) OR ("intellectual capital" AND football) OR ("structural capital" AND football) OR ("human capital" AND football) OR ("relational capital" AND football) OR (accounting AND football) OR (accounting AND club*) OR (intellectual AND capital AND football) OR ("intangible* asset* accounting*" AND football) OR (disclosure* AND football) OR (earning* AND football) OR (earning* AND club*) OR (disclosure* AND club*) OR (financial* AND player* AND registration* AND right*) OR (profitability* AND "football club*") OR ("agency theory" AND football) OR ("principal-agent theory" AND professional* AND football*) OR ("institutional theory" AND football) OR ("institutional logic*" AND football) OR ("stakeholder theory" AND football) OR (economic AND "professional football") OR (accountability AND football) OR (econom* AND "football industry") OR ("financial statement*" AND "professional football club*") OR (financ* AND "football club*") OR ("business practice*" AND "professional football") OR (evaluation AND "football match*") OR (financ* AND "professional football") OR ("knowledge management" AND soccer*) OR ("intellectual capital" AND soccer*) OR ("structural capital" AND soccer*) OR ("human capital" AND soccer*) OR ("relational capital" AND soccer*) OR (accounting AND soccer*) OR (intellectual AND capital AND soccer*) OR ("intangible* asset* accounting*" AND soccer*) OR (earning* AND soccer*) OR (disclosure AND soccer*) OR (profitability* AND "soccer club*") OR ("agency theory" AND soccer*) OR ("principal-agent theory" AND professional* AND soccer*) OR ("institutional theory" AND soccer) OR ("institutional logic*" AND soccer) OR ("stakeholder theory" AND soccer) OR (economic AND "professional soccer") OR (accountability AND soccer*) OR (econom* AND "soccer industry") OR ("financial statement*" AND "professional soccer club*") OR (financ* AND "soccer club*") OR ("business practice*" AND "professional soccer*") OR (evaluation AND "soccer match*") OR (financ* AND "professional soccer*")

Notes: wildcards (\*) work for Scopus search about approximate phrases.

A2. The sport KM-IC dictionary

<b>DICTIONARY</b>				
CATEGORY	SUBCATEGORY	ITEMS	No	of
				<b>WORDS</b>
Intellectual Capital	Human Capital	Board, Competence, Employer, Sport_Managers	52	
	Relational Capital	brand, broadcast, business_ethics, community	33	
	Structural Capital	offensive_strategy, organisational_performance, strategic_capability, technical_efficiency	6	
	Others	performance_sport, sporting_performance, sporting_success value_creation	6	
KM codification strategies		accountability, accounting, accrual, management_accountants	66	

Figure 1: Theoretical framework for literature systematization.

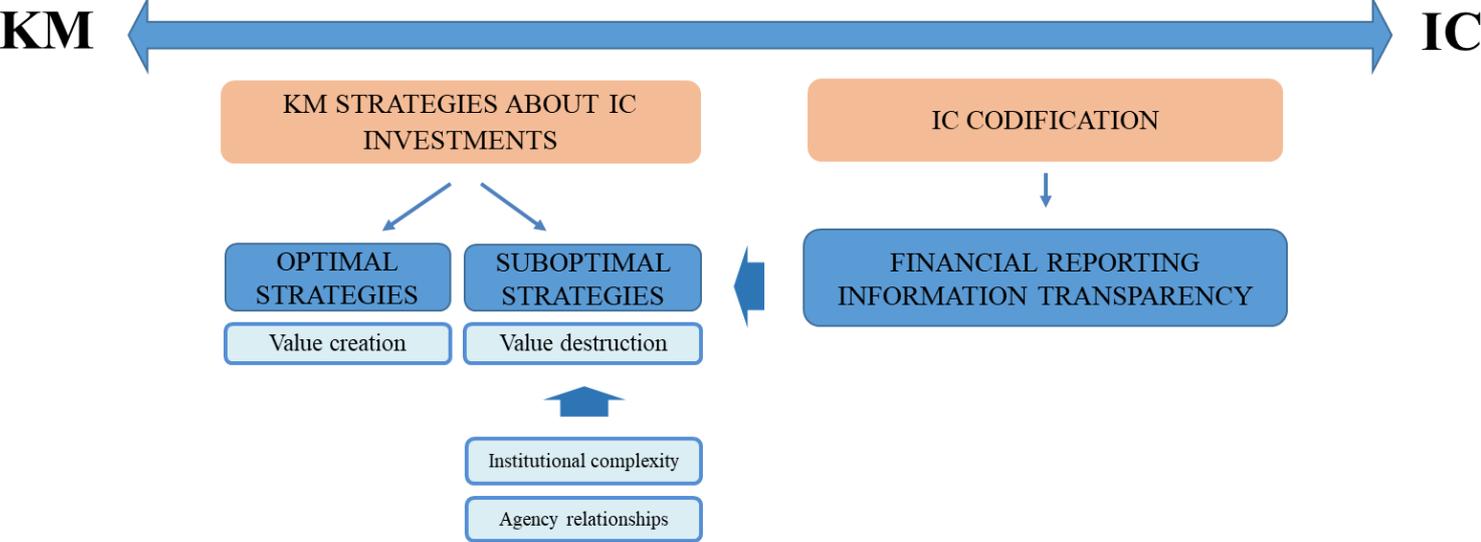


Figure 2: Literature Review Protocol.

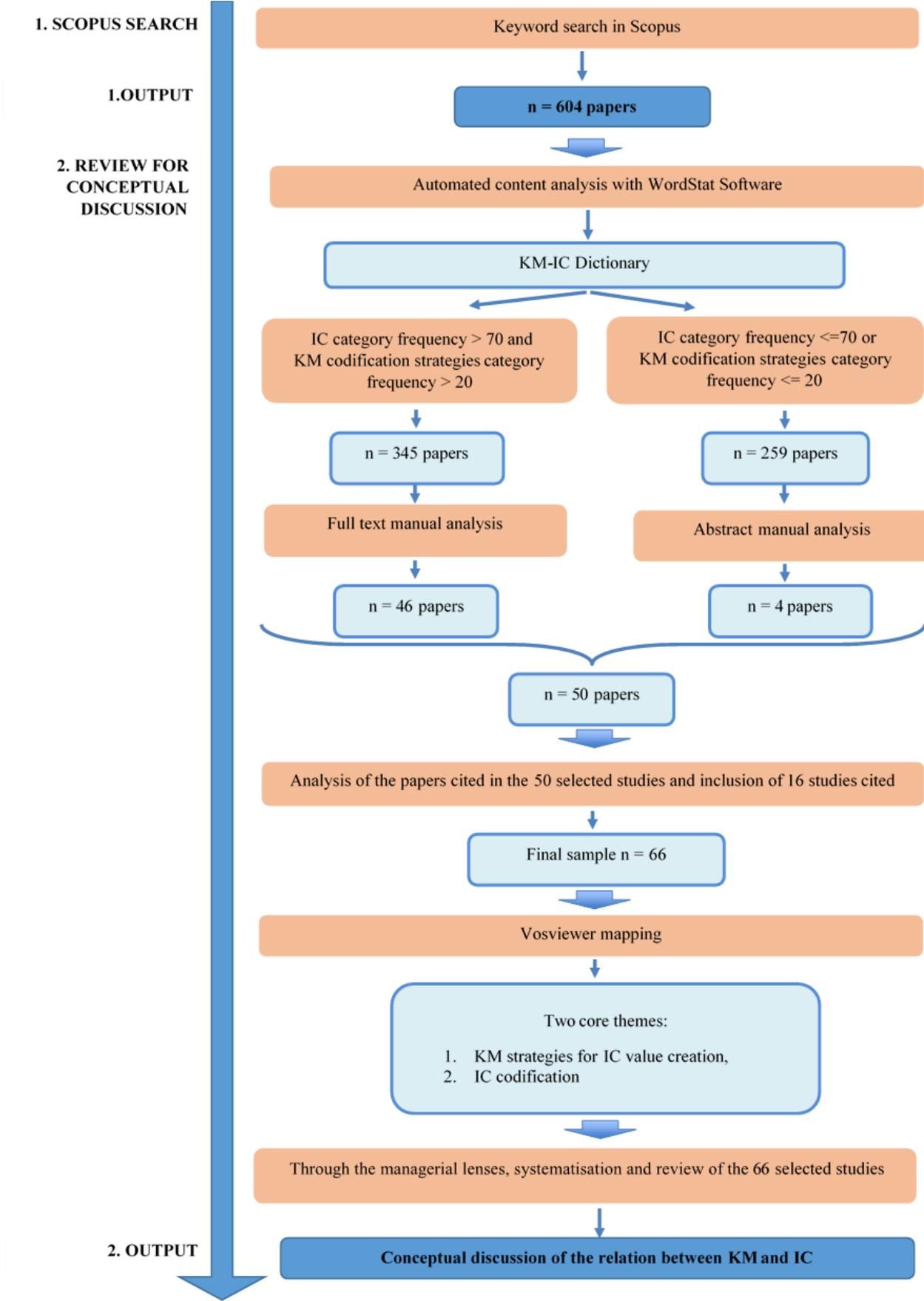
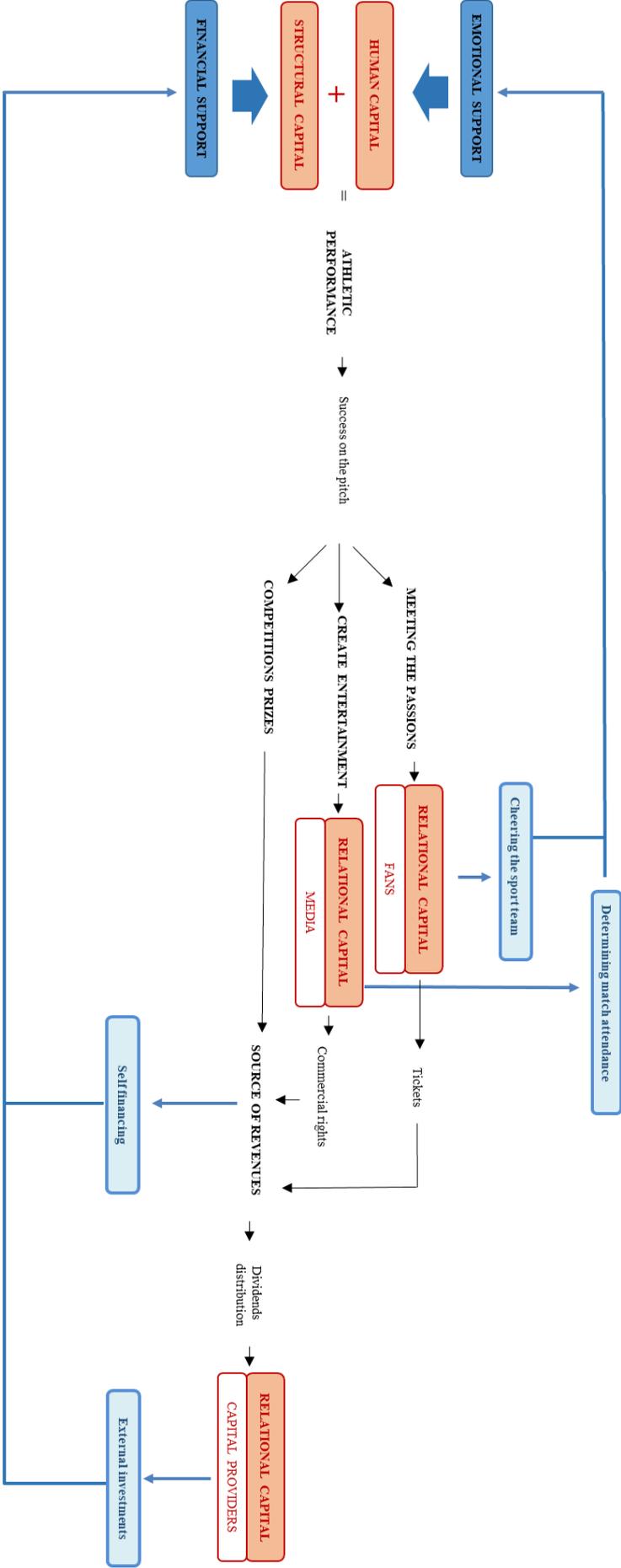




Figure 4: Sport IC Virtuous Cycle.



\*

**Figure 5: The theorisation of the relationship between KM strategies and value creation.**

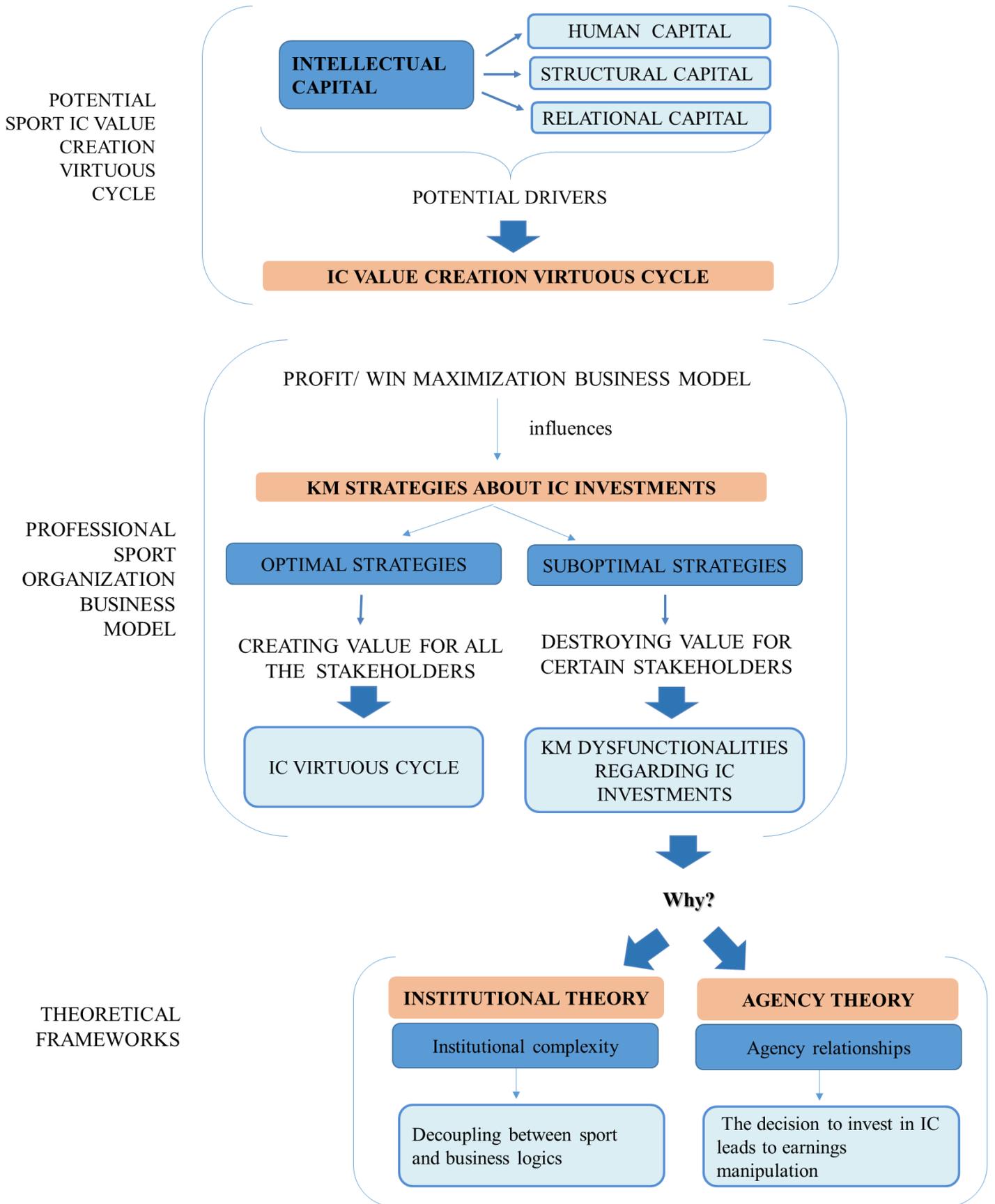
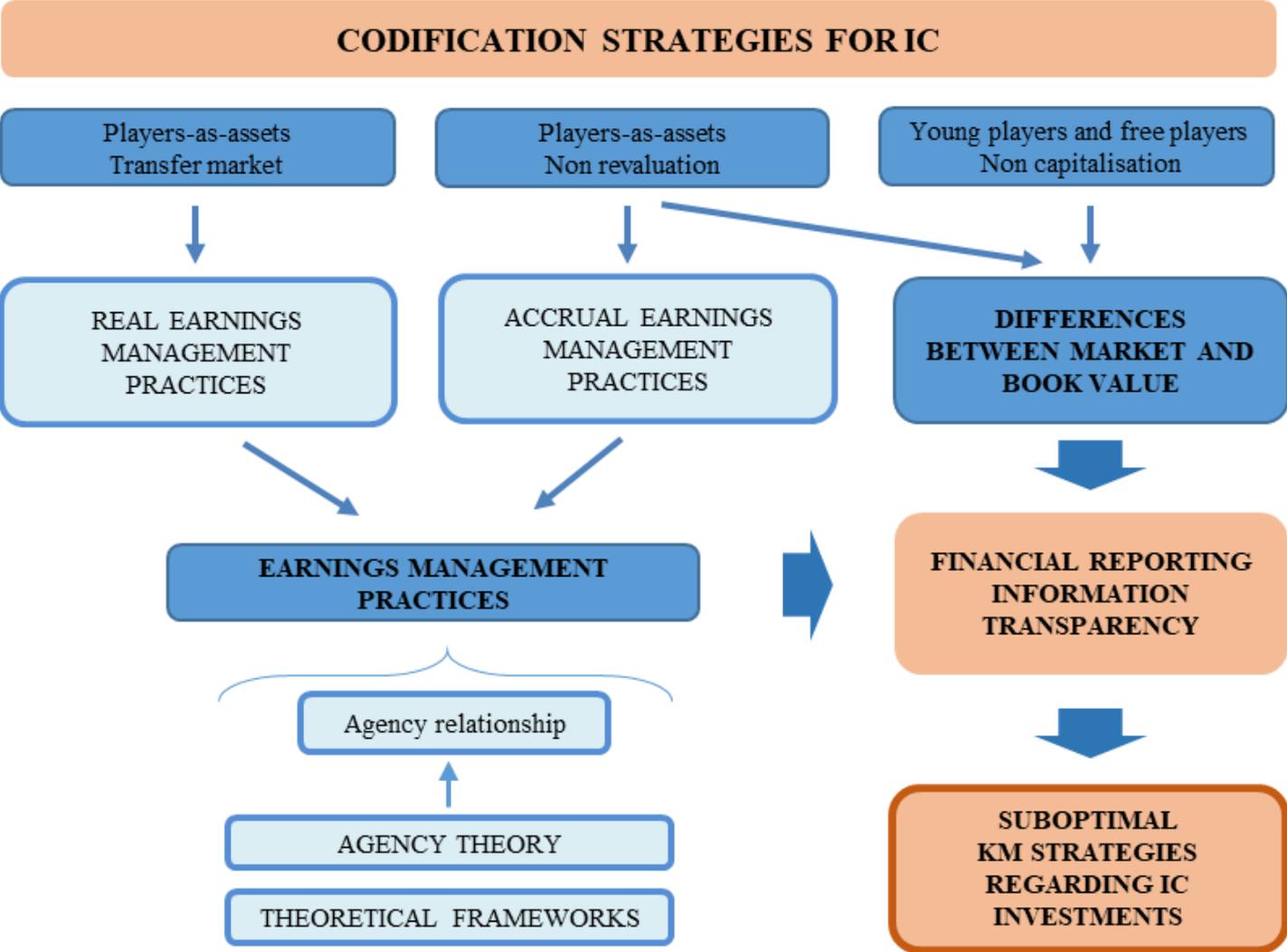


Figure 6: The impact of IC codification strategies on KM strategies regarding IC investments.



**Table 1: The systematisation of the 66 selected studies.**

<b>Authors</b>	<b>Key findings</b>	<b>Contributions to KM</b>
<b>Core research area: KM strategies for IC Value Creation</b>		
Andrikopoulos & Kaimenakis (2009)	<ul style="list-style-type: none"> <li>• Definition of an IC map for value-creating intangibles.</li> </ul>	<ul style="list-style-type: none"> <li>• An integrated decision making tool to support managerial decisions.</li> </ul>
Barros & Leach (2007)	<ul style="list-style-type: none"> <li>• The increase of match attendance and turnover leads to costs' increases.</li> <li>• Sport success represents the main driver in cost management.</li> </ul>	<ul style="list-style-type: none"> <li>• Managerial skills are central to determine a competitive sporting strategy.</li> </ul>
Benkraiem et al. (2011) *	<ul style="list-style-type: none"> <li>• The uncertainty of evaluating sport organisations' intangible assets may lead to commercial and financial risks.</li> <li>• Sporting performance affects stock market valuation of football organisations.</li> </ul>	<ul style="list-style-type: none"> <li>• The uncertainties surrounding IC investments raise adverse selection problems, leading to suboptimal KM decisions.</li> </ul>
Breitbarth et al. (2015)	<ul style="list-style-type: none"> <li>• Review of governance and corporate social responsibility in sports. Regional and cultural contexts impact management and governance of sport organisations.</li> </ul>	<ul style="list-style-type: none"> <li>• The cultural context influences the decision-making of sport organisations.</li> </ul>
Carlsson-Wall et al. (2016)	<ul style="list-style-type: none"> <li>• Sport organisations are complex institutional organisations, in which multiple logics coexists.</li> <li>• Sport and business logics are in some cases coupled and in other cases decoupled.</li> </ul>	<ul style="list-style-type: none"> <li>• The coupling/decoupling between logics affects the (sub)optimality of managerial decisions.</li> </ul>
Chadwick (2009)	<ul style="list-style-type: none"> <li>• Review of governance models, ethics, human resource management, public relations and media in sport organisations.</li> </ul>	<ul style="list-style-type: none"> <li>• Relevance of sport managers' characteristics in IC investment decisions.</li> </ul>
Dimitropoulos & Koumanakos (2015)	<ul style="list-style-type: none"> <li>• Investments in IC positively affect sport organisations' financial performance.</li> </ul>	<ul style="list-style-type: none"> <li>• KM strategies can lead to (optimal/suboptimal) IC investments.</li> </ul>
Dimitropoulos (2011)	<ul style="list-style-type: none"> <li>• Football managers misrepresent accruals by not recording all impairment losses.</li> <li>• Corporate governance can mitigate football managers' earnings management practices.</li> </ul>	<ul style="list-style-type: none"> <li>• Corporate governance mechanisms influence the impact of financial regulation on managers' decision-making.</li> </ul>
Dimitropoulos (2016)	<ul style="list-style-type: none"> <li>• Analysis of FFP Regulation: -highly leveraged sport organisations hire low quality auditors to conceal their financial situation from investors and regulators; -less profitable sport organisations hire high quality auditors to achieve the FFP requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• The implementation of financial regulatory intervention fosters opportunistic managers' decisions.</li> </ul>
Ducrey et al. (2003)	<ul style="list-style-type: none"> <li>• Sport organisations are part of the popular culture.</li> <li>• The relationship between sport organisations and fans is source of value creation.</li> </ul>	<ul style="list-style-type: none"> <li>• Investments in IC components generate intangible assets and activate the virtuous cycle of value creation.</li> </ul>

Erhardt et al. (2014)	<ul style="list-style-type: none"> <li>• Coaches share explicit (e.g. technical and detailed game instructions) or tacit (e.g. general principles about the game dynamics) knowledge with players.</li> <li>• A tall teamwork structure with clear roles and a multi-layered chain of command favour the flow of explicit knowledge from coaches to players. Whereas a flat teamwork with fewer layers of command favours the flow of tacit knowledge from coaches to players.</li> </ul>	<ul style="list-style-type: none"> <li>• Player development strategies are KM strategies which activate the flow of knowledge from coaches to players contributing to transform the knowledge stored in human capital into value creation.</li> </ul>
Edmans et al. (2007)	<ul style="list-style-type: none"> <li>• Losses in sport competitions affect investors' mood, leading to stock market price to drop.</li> </ul>	<ul style="list-style-type: none"> <li>• Athletic performances create value for fans, investors and media.</li> <li>• Managers' and coaches' strategies are determinant for sport performance, affecting investors' decisions.</li> <li>• The interplay between coaches, managers, investors and player agents determine IC investments decisions.</li> </ul>
Gammelsæter (2010)	<ul style="list-style-type: none"> <li>• Idealism, identity, managerialism, entrepreneurialism, bureaucracy logics coexist in professional sport organisations, reflecting stakeholders' interests.</li> </ul>	<ul style="list-style-type: none"> <li>• The complex relationship among logics affect the optimality and sub optimality of managerial decisions.</li> </ul>
Geeraert et al. (2013)	<ul style="list-style-type: none"> <li>• Football organisations operate in a context of intense stakeholders' pressure, i.e., regulators, fans, investors, government, society.</li> <li>• Usefulness of governance networks in sport.</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholders' pressure can affect the (sub)optimality of managerial decisions inside professional sport organisations.</li> </ul>
Geeraert et al. (2014)	<ul style="list-style-type: none"> <li>• Sport governing bodies often exhibit low governance quality.</li> </ul>	<ul style="list-style-type: none"> <li>• Sport governing bodies' regulatory interventions may negatively affect the optimality of KM strategies in professional sport organisations.</li> </ul>
Gurel et al. (2013)	<ul style="list-style-type: none"> <li>• Higher IC investments lead to higher market shares for football organisations.</li> </ul>	<ul style="list-style-type: none"> <li>• IC is a source of value creation and is expression of organisations' market value.</li> <li>• IC assets are relevant to managerial investment and reporting decisions.</li> </ul>
Guzmán & Morrow (2007)	<ul style="list-style-type: none"> <li>• Significant relationships between sport organisations and stakeholders, such as fans and community.</li> </ul>	<ul style="list-style-type: none"> <li>• The relationship between sport organisations and stakeholders affects organisational decision-making.</li> </ul>
Jones (1969)	<ul style="list-style-type: none"> <li>• Sport organisations exhibit a trade-off between business and sport.</li> </ul>	<ul style="list-style-type: none"> <li>• Sport organisations opportunistically adopt win maximisation or profit maximisation business model.</li> </ul>
Kennedy (2013)	<ul style="list-style-type: none"> <li>• The football industry is part of the popular culture.</li> <li>• Under supporters' pressure, win maximisation is prioritised relative to profit maximisation.</li> </ul>	<ul style="list-style-type: none"> <li>• Business models may affect the optimality and sub optimality of IC investment decisions.</li> </ul>
Kringstad & Olsen (2016)	<ul style="list-style-type: none"> <li>• Budgeted revenues positively affect sporting outcome among bottom-half clubs.</li> <li>• The relationship between budgeted revenues and sporting outcome is not significant among top-half clubs.</li> </ul>	<ul style="list-style-type: none"> <li>• Sport competitions' results affect the relationship between financial and sport performance, determining sport managers' decision-making.</li> </ul>
Mason & Slack (2001a)	<ul style="list-style-type: none"> <li>• The agency relationship between the player (principal) and the player agent (agent) raises adverse selection problems. Agents can mislead the principal by overestimating their skills.</li> <li>• Monitoring solutions to agents' opportunism in hockey are rarely effective.</li> </ul>	<ul style="list-style-type: none"> <li>• The opportunistic behaviour of players' agents in the players' negotiations may lead to suboptimal managerial decisions about IC.</li> </ul>
Mason & Slack (2001b)	<ul style="list-style-type: none"> <li>• Review of the changes in the hockey industry and of their effects on the relationship between player and player agent.</li> </ul>	<ul style="list-style-type: none"> <li>• The behaviour of players' agents potentially affects the optimality of KM strategies about players' acquisition.</li> </ul>

	<ul style="list-style-type: none"> <li>• The relationship between professional hockey players and player agents is a principal-agent relationship.</li> </ul>	
Mason & Slack (2003)	<ul style="list-style-type: none"> <li>• Professional hockey industry as a testing ground to explore the principles of agency theory.</li> <li>• Changes in the hockey players' agent profession, such as a more competitive agent market, salary disclosure, concerns for agent reputation and player agent certification, reduce agent's opportunism.</li> </ul>	<ul style="list-style-type: none"> <li>• Agency theory explains the decision-making about players' negotiation in sport organisations.</li> <li>• The managerial decisions about the type of player acquisition can create incentives for agents' opportunistic behaviour.</li> </ul>
Mason & Slack (2005)	<ul style="list-style-type: none"> <li>• Review of the agency theory assumptions by investigating the sporting context.</li> <li>• Agency theory supports future empirical studies about sport organisations.</li> </ul>	<ul style="list-style-type: none"> <li>• Agency theory may permit the explanation of earnings management inside professional sport organisations.</li> <li>• Agency relationships lead managers to exploit the financial reporting flexibility and to potentially mislead regulators.</li> </ul>
Mason (1997)	<ul style="list-style-type: none"> <li>• The relationship between the league and the sport organisation management is a principal agent relationship.</li> </ul>	<ul style="list-style-type: none"> <li>• The combination of managers' characteristics affects how sport managers cope with agency problems.</li> </ul>
Mason, et al. (2006)	<ul style="list-style-type: none"> <li>• Agency problems emerge in sport organisations when the same individual operates in the management and in the decision making control function.</li> <li>• By separating the decision-making control function from management function, organisations achieve greater accountability for stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing accountability for stakeholders can reduce information asymmetry and discourage opportunistic managerial decisions.</li> </ul>
Mnzava (2013)	<ul style="list-style-type: none"> <li>• Investments in intangible assets have a positive impact on both sporting and financial performance.</li> </ul>	<ul style="list-style-type: none"> <li>• Sport managers can exploit IC components to create value.</li> </ul>
Moore & Levermore (2012)	<ul style="list-style-type: none"> <li>• Professional sport organisations operate as profit oriented companies.</li> </ul>	<ul style="list-style-type: none"> <li>• To maximise profit, sport managers may exploit IC.</li> </ul>
Muller, et al. (2012)	<ul style="list-style-type: none"> <li>• European football organisations experience pathological economic deficits.</li> <li>• FFP regulation aims to ensure sport organisations long-term sustainability.</li> </ul>	<ul style="list-style-type: none"> <li>• The divergence between the long-term national collective interests of regulators and the sport success interest of fans and media may lead to opportunistic managerial decisions about IC investments.</li> </ul>
Nicoliello & Zampatti (2016)	<ul style="list-style-type: none"> <li>• Players' wages are the most relevant expenses for sport organisations.</li> <li>• Players' trading generate core revenues.</li> <li>• After the FFP regulation, sport organisations need to achieve sport results by respecting financial stability.</li> </ul>	<ul style="list-style-type: none"> <li>• Regulatory interventions affect sport management decisions about IC investments and reporting.</li> </ul>
Noll (1974)	<ul style="list-style-type: none"> <li>• Sport organisations are part of the entertainment sectors.</li> <li>• Athletic performance affects match attendance.</li> </ul>	<ul style="list-style-type: none"> <li>• The athletic performance influences the success on the pitch, determining managers' and investors' decisions.</li> </ul>
Parent et al. (2014)	<ul style="list-style-type: none"> <li>• KM is applicable to the sporting event stakeholder network.</li> </ul>	<ul style="list-style-type: none"> <li>• Strategies related to the management of sporting events are KM strategies, which transform the knowledge stored in the relation capital into value creation.</li> </ul>
Parent et al. (2017)	<ul style="list-style-type: none"> <li>• The interrelationship between KM strategies and good governance practices in sporting events.</li> <li>• The cultural context, in which the governance structure operates, potentially affects the effective exploitation of knowledge in sporting events.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• The broader institutional context in which firms operate affects the KM strategies related to the management of sporting events.</li> </ul>

Preuss et al. (2014)	<ul style="list-style-type: none"> <li>• FFP regulation can generate negative externalities.</li> <li>• Football organisation managers tend to mismanage earnings to apparently attain the FFP objectives.</li> </ul>	<ul style="list-style-type: none"> <li>• Financial regulatory interventions are a potential determinant for suboptimal IC investment decisions.</li> </ul>
Rohde & Breuer (2017)	<ul style="list-style-type: none"> <li>• Sport organisations exhibit a trade-off between business and sport goals. They alternatively adopt win or profit maximisation business models.</li> </ul>	<ul style="list-style-type: none"> <li>• Sport organisations' business models influence managers' decision-making about IC investments.</li> </ul>
Rossi et al. (2013)	<ul style="list-style-type: none"> <li>• Discrepancies between sport and financial performance.</li> <li>• Managerial decision can lead to four business models.</li> </ul>	<ul style="list-style-type: none"> <li>• The coupling/decoupling between sport and business logics in a business model influences the (sub)optimality of IC investment decisions.</li> </ul>
Schenk et al. (2015)	<ul style="list-style-type: none"> <li>• Sporting events involve stakeholders from several knowledge domains and fuel a KM process.</li> </ul>	<ul style="list-style-type: none"> <li>• KM strategies of sporting event management activate the flow of knowledge creation which fuel the virtuous cycle of value creation.</li> </ul>
Schubert (2014)	<ul style="list-style-type: none"> <li>• The relationship between UEFA and sport organisations is a principal-agent relationship.</li> <li>• Managers opportunistically exploit their information advantage to manage earnings and meet regulators' expectations.</li> </ul>	<ul style="list-style-type: none"> <li>• Agency theory describes managers' motivations to earnings management.</li> </ul>
Scully (1974) *	<ul style="list-style-type: none"> <li>• Players salaries are related to sport performance.</li> <li>• Identification of the types of player acquisitions.</li> </ul>	<ul style="list-style-type: none"> <li>• The type of players' acquisitions affects the quality of IC financial reporting.</li> </ul>
Shilbury & Ferkins, (2011)	<ul style="list-style-type: none"> <li>• Sport transited from an amateur hobby to a business-like sector.</li> <li>• A distinctive characteristic of sport organisations is the trade-off between sport and business goals.</li> </ul>	<ul style="list-style-type: none"> <li>• The trade-off between business and sport goals affects KM strategies about IC investments.</li> </ul>
Shilbury et al. (2016)	<ul style="list-style-type: none"> <li>• Description of the relationships between sport organisations and their stakeholders, such as media, fans, investors, regulators, government, society.</li> </ul>	<ul style="list-style-type: none"> <li>• The relationships between sport organisations and their stakeholders impacts organisational decision-making.</li> </ul>
Slack R. & Shrives (2008)	<ul style="list-style-type: none"> <li>• Professional sport organisations need to meet stakeholders' expectations.</li> <li>• Clubs face the increasing adverse media reporting.</li> <li>• Expanding communities' activities and social reporting help to meet stakeholders expectations and repair legitimacy.</li> </ul>	<ul style="list-style-type: none"> <li>• The decoupling among stakeholders' expectations can lead managers to suboptimal KM strategies.</li> </ul>
Slack T. (1998)	<ul style="list-style-type: none"> <li>• The social value of sport makes sport management differ from ordinary business management.</li> </ul>	<ul style="list-style-type: none"> <li>• The social value of sport substantially impacts KM strategies about IC investments and valuation.</li> </ul>
Sloane (2015)	<ul style="list-style-type: none"> <li>• According to the cultural context, sport organisations prioritise a profit maximisation or win maximisation business model.</li> </ul>	<ul style="list-style-type: none"> <li>• The cultural context affects IC investments.</li> <li>• Managers invest in IC to potentially maximise the objectives of the business model adopted.</li> </ul>
Smith & Stewart (2010)	<ul style="list-style-type: none"> <li>• Review of the special features of sport organisations.</li> <li>• The special features of sport organisations should be addressed with customized management practices.</li> </ul>	<ul style="list-style-type: none"> <li>• The sport performance uncertainty, the tensions between sport and business goals make sport managers' characteristics determinant in IC investment decisions.</li> </ul>
Solberg & Haugen (2010)	<ul style="list-style-type: none"> <li>• European Football organisations mostly adopt a win maximisation business model.</li> <li>• Managers pay high salaries for the best and most popular players at the expense of long-term viability and sustainability.</li> </ul>	<ul style="list-style-type: none"> <li>• Optimal (suboptimal) KM strategies about IC investments simultaneously (either) satisfy win and profit maximisation objectives, creating value for all (certain) stakeholders.</li> </ul>

Washington & Patterson (2011)	<ul style="list-style-type: none"> <li>Multiple stakeholders, such as suppliers, regulators, fans, exert pressure on sport organisations, making them a testing ground to extend institutional theory.</li> <li>Institutional theory can support sport research to fill research gaps.</li> </ul>	<ul style="list-style-type: none"> <li>Institutional theory explains the determinants of suboptimal IC investment decisions.</li> </ul>
Yeh & Taylor (2008)	<ul style="list-style-type: none"> <li>Review of the governance literature in sport management.</li> <li>Sport organisations' stakeholders often have divergent interests.</li> <li>Business goals can be decoupled from sport goals.</li> </ul>	<ul style="list-style-type: none"> <li>Decoupled stakeholders' interests may lead to suboptimal managerial IC decisions.</li> <li>Management control systems and corporate governance mechanisms can mitigate the sub-optimality of IC investments.</li> </ul>
Core research area: IC codification		
Amir & Livne (2005)	<ul style="list-style-type: none"> <li>Players' contracts cannot be capitalised because their costs are weakly associated with future benefits.</li> </ul>	<ul style="list-style-type: none"> <li>The financial reporting choices of professional sport organisations may lead to an incomplete representation of the IC assets and to misleading KM strategies.</li> </ul>
Biancone & Solazzi (2012)	<ul style="list-style-type: none"> <li>Accounting standards lead to an incomplete representation of IC assets in professional sport organisations.</li> </ul>	<ul style="list-style-type: none"> <li>The incomplete representation of IC assets induces suboptimal manager and investor decisions.</li> </ul>
Forker (2005)	<ul style="list-style-type: none"> <li>Players' transfer fees are positively associated with listed sport organisations' market value.</li> <li>Investors consider investments in players as value-creating intangible assets.</li> </ul>	<ul style="list-style-type: none"> <li>Recognition of players' costs as intangible assets can reduce the information asymmetry between managers and investors.</li> </ul>
Gazzola & Amelio (2016)	<ul style="list-style-type: none"> <li>The difficulties of identifying players' fair value discourage the devaluation of players-as-assets.</li> </ul>	<ul style="list-style-type: none"> <li>Financial reporting choices often lead to limited information transparency and to suboptimal KM strategies.</li> </ul>
Hirotsu & Wright (2003)	<ul style="list-style-type: none"> <li>Football matches' statistical model for evaluating sport organisations' characteristics.</li> </ul>	<ul style="list-style-type: none"> <li>Coaches' gaming strategies influence players' valuations, affecting the related KM strategies.</li> </ul>
Kulikova & Goshunova (2014)	<ul style="list-style-type: none"> <li>Home-grown young players' costs meet the capitalisation requirements and should be recognised as assets.</li> </ul>	<ul style="list-style-type: none"> <li>IC codification affects sport organisations' decisions.</li> </ul>
Lozano & Gallego (2011)	<ul style="list-style-type: none"> <li>Football players are core assets of football organisations, but they are only partially recognised in the financial reporting.</li> <li>Young players' costs are not recognised as assets.</li> <li>Significant deviations between the market and the book value in sport organisations.</li> </ul>	<ul style="list-style-type: none"> <li>The incomplete representation of IC assets in the financial reporting influences KM strategies.</li> </ul>
Morrow (1992)	<ul style="list-style-type: none"> <li>Human capital is a source of value creation.</li> <li>Description of human resource accounting inside professional football organisations.</li> </ul>	<ul style="list-style-type: none"> <li>IC codification plays a key role in managerial decisions of sport organisations.</li> </ul>
Morrow (1995)	<ul style="list-style-type: none"> <li>The accounting treatments of players' rights exhibit limits.</li> <li>Multiple ways to purchase players, i.e., home grown players, free players and transferred players.</li> </ul>	<ul style="list-style-type: none"> <li>The limits of IC codification lead to suboptimal managers' and investors' decisions.</li> </ul>
Morrow (1996)	<ul style="list-style-type: none"> <li>Football players can be considered intangible assets.</li> </ul>	<ul style="list-style-type: none"> <li>The capitalisation of players' costs affects the financial reporting transparency.</li> </ul>
Risaliti & Verona (2012)	<ul style="list-style-type: none"> <li>Football organisations of the five major European Leagues prefer to recognise players as assets.</li> </ul>	<ul style="list-style-type: none"> <li>IC codification provides incentives for earnings management practices in sport organisations.</li> </ul>

	<ul style="list-style-type: none"> <li>• The uncertainty associated to players' valuations disincentive the devaluation of player-as-assets.</li> <li>• Football organisations' managers undertake accrual and real earnings management practices.</li> </ul>	
Rowbottom (2002)	<ul style="list-style-type: none"> <li>• Sport organisations are unique organisations because they recognise human resources on the balance sheet.</li> <li>• The institutional context affects professional sport organisations' financial reporting choices.</li> </ul>	<ul style="list-style-type: none"> <li>• Sport managers exploit the financial reporting flexibility with regards to IC and potentially mislead their stakeholders.</li> </ul>
Shareef & Davey (2005)	<ul style="list-style-type: none"> <li>• Sport organisations' financial reporting lags in terms of a complete representation of IC assets.</li> <li>• Deviations between the market and the book value.</li> </ul>	<ul style="list-style-type: none"> <li>• Differences between the market and the book value affect the financial reporting information transparency and its usefulness for both managers and investors.</li> </ul>
Tunaru et al. (2005)	<ul style="list-style-type: none"> <li>• Identification of the method of evaluating players.</li> <li>• Players' value depends on organisations' turnover and sport performance.</li> </ul>	<ul style="list-style-type: none"> <li>• Valuation uncertainties impede the devaluation of players-as-assets, leading to limited financial reporting information transparency.</li> </ul>
Cooper & Johnston (2012) *	<ul style="list-style-type: none"> <li>• Sport managers operate under fans' pressure.</li> <li>• Managers are willing to pay high salaries for the most popular players at the expense of profit generation.</li> </ul>	<ul style="list-style-type: none"> <li>• The pressure exerted by stakeholders such as fans over managers may lead to suboptimal KM strategies about IC investment decisions.</li> </ul>
Dimitropoulos et al. (2016)	<ul style="list-style-type: none"> <li>• The FFP increases managerial incentives to manage earnings to simultaneously attain sport success and comply with financial rules.</li> </ul>	<ul style="list-style-type: none"> <li>• Regulation can determine suboptimal decisions about IC, leading to earnings management practices.</li> </ul>
Morrow (2013)	<ul style="list-style-type: none"> <li>• Sport organisations are profit-oriented businesses belonging to the entertainment sector.</li> <li>• Financial reports present limited information transparency in terms of IC and are ill-suited to meet stakeholders' information needs.</li> </ul>	<ul style="list-style-type: none"> <li>• Additional IC voluntary disclosure can increase shareholders' wealth and meet stakeholders' expectations.</li> </ul>
Oprean & Oprisor (2014)	<ul style="list-style-type: none"> <li>• Limited financial reporting information transparency within sport organisations.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited financial reporting information transparency may lead to suboptimal KM strategies regarding IC investments.</li> </ul>

\*It is related to both the KM strategies for IC Value Creation and the IC codification core research area.

**Table 2: The classification of the 66 selected studies.**

<b>Research Method</b>	<b>Number of studies</b>
Archival data analysis	11
Case study	32
Content Analysis	7
Interviews	8
Literature review	19
Simulation and analytical models	7

<b>Setting</b>	<b>Number of studies</b>
South America	1
Asia	1
Australia	1
Europe	21
Italy	4
New Zealand	1
North America	8
Norway	1
South Africa	1
Spain	1
Sweden	1
Turkey	1
UK	15
*	15

<b>Sport</b>	<b>Number of studies</b>
Baseball	1
Basketball	1
Cricket	1
Football	44
Hockey	1
Ice Hockey	5
Rugby	1
*	15

Notes: the sum of articles of each classification can be more than the total number of papers of our sample (i.e., 66), because some papers use multiple research methods, or/and they concern with multiple sports and settings. Wildcards (\*) stand for studies not related to a specific setting or type of sport.

**Table 3: The institutional complexity inside professional sport organisations and the IC virtuous cycle.**

Clubs' Objectives (Barros and Leach 2007, Smith and Stewart 2010, Terrien et al. 2017)	Institutional Complexity (Washington & Patterson 2011; Rossi et al. 2013; Martin Carlsson-Wall et al. 2016)	
	Sport and business logic coupling	Sport and business logic decoupling
Win Maximization	<ul style="list-style-type: none"> <li>• <b>IC VIRTUOUS CYCLE</b></li> <li>• <b>VALUE CREATION FOR ALL THE STAKEHOLDERS</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>DYSFUNCTIONALITIES OF THE IC VIRTUOUS CYCLE</b></li> <li>• <b>VALUE CREATION MOSTLY FOR INVESTORS, FANS, MEDIA</b></li> </ul> <p>Winner professional sport organisations with poor financial performance.</p>
Profit Maximization		<ul style="list-style-type: none"> <li>• <b>DYSFUNCTIONALITIES OF THE IC VIRTUOUS CYCLE</b></li> <li>• <b>VALUE CREATION MOSTLY FOR INVESTORS, REGULATORS</b></li> </ul> <p>Professional sport organisations with financial equilibrium, but poor sport performance.</p>

<sup>1</sup> We also included keywords related to 'football' and 'soccer' because of their relevance highlighted in our pilot study (Parent and Chappelet 2015). To ensure that our findings are not driven by the inclusion of these keywords, we repeated the Scopus search with keywords related to other types of sport, such as hockey, cricket, rugby, basketball and baseball. The initial sample of papers is robust to these changes.

<sup>2</sup> We repeated the search several times to update the sample between June 2016 and January 2018. We conducted the last revision of the search on January 12, 2018.

<sup>3</sup> WordStat software has been applied in more than 300 researches in different academic areas, embracing business and management (Marina et al. 2016).

<sup>4</sup> We chose a threshold to capture the studies with a substantial IC category relevance in relation to the KM codification strategies' category. We repeated our analysis with other thresholds, i.e., an IC category frequency greater than 60 or 80, and the KM codification strategies' category frequency greater than 10 or 30, obtaining similar results.

<sup>5</sup> VOSviewer is a popular software for analysing and reviewing academic studies, and has been employed in several literatures across research areas (Markoulli et al. 2017).

<sup>6</sup> Managers are involved in earnings management practices, when they use judgement in financial reporting and to structure operations to alter earnings (Elias 2002).

<sup>7</sup> The recognition of player costs as intangible assets implies that the costs are capitalised and thus not expensed to the income statement.

<sup>8</sup> Scholars mainly focus on the IAS/IFRS accounting standards, which are a set of international accounting rules issued by the International Accounting Standards Board (IASB).

<sup>9</sup> See accounting standards IAS 38 (Intangible Assets) or the US GAAP ASC350 (Intangibles – Goodwill and Other).

<sup>10</sup> See either IAS 38 or ASC 350.

<sup>11</sup> See IAS 38.

<sup>12</sup> The asset's fair value corresponds to the asset's market value (IFRS 13).