

8^{èmes}
États
Généraux
DE LA RECHERCHE
COMPTABLE

10 décembre 2018

www.anc.gouv.fr



AVEC LE SOUTIEN DE :



Research paper

A fresh look at intellectual capital in the post-industrial era

Elisabeth Albertini (IAE Paris1 Panthéon Sorbonne – Gregor)

Fabienne Berger-Remy (IAE Paris1 Panthéon Sorbonne – Gregor)

Stéphane Lefrancq (CNAM – LIRSA)

Laurence Morgana (CNAM – LIRSA)

Milos Petkovic (Université Côte d'Azur – GRM)

Elisabeth Walliser (Université Côte d'Azur – GRM)

This study received the ANC financial support as a part of the research project: “intangible assets: the borderline between accounting and extra-financial information”

The views expressed are those of the authors alone.

Abstract:

Objective: Intangible capital is currently at the heart of firms' business models and plays a significant role in value creation. It is a complex whole that encompasses a wide variety of assets, as can be seen in the classifications currently used in the literature. As part of a discussion about accounting standards, these classifications, which were mostly developed in the 1990s, seem due for an update to account for the disruption of business models over the last two decades. Furthermore, most of the research aimed at achieving a better understanding of intangible capital is conceptual in nature and lacks an empirical basis. This research aims to fill in these gaps by proposing an updated classification that is based on an analysis of actual disclosure practices. The objective is to contribute to the discussion about intangibles disclosure and the usefulness of financial statements.

Methodology: We conducted a computerized content analysis of 241 letters to shareholders from the CEOs of S&P Euro 350 companies to address the research question.

Findings: Firms' intangible capital disclosures, beyond the required disclosures about balance sheet intangibles, are organised around four types of capital: human, digital, customer and environmental. Therefore, these are the components that should be used to develop an intellectual capital disclosure standard.

Implications and limitations: The main contribution of our research is a new intellectual capital classification based on an empirical approach. Our research points to an updated classification with four components instead of the three presented in the previous literature. Human capital was already familiar under previous classifications, but digital capital and environmental capital are coming to the fore and show that disclosure practices address contemporary issues.

The limitations of this study are inherent to the media studied, i.e. the CEOs' letters to shareholders, which were written as part of the firms' communication.

Original feature: This study presents the first intangible capital classification based on an empirical approach using text analysis of firms' communication practices.

Keywords: Intangible capital, intellectual capital, classification, text analysis, financial disclosure, standardisation, environmental capital, digital capital

Foreword: a question of terminology	5
1 Introduction.....	6
2 Literature review.....	8
2.1 Intellectual Capital Research (ICR): three distinct stages.....	8
2.2 The different classifications of intellectual capital	10
2.3 The value of updating intellectual capital classifications	13
2.4 Accounting issues arising from updated classifications of intangible capital	15
3 Méthodology.....	17
3.1 Sample	17
3.2 Text analysis of CEOs' letters.....	18
3.2.1 Methodological choices: computer-assisted text analysis	19
3.2.2 IRaMuTeQ software	19
3.2.3 Compiling the corpus	20
4 Findings.....	21
4.1 Text analysis of CEOs' discourse	21
4.2 Text analysis of the "intangible capital" sub-corpus	24
5 Discussion: contribution and limitations.....	32
5.1 Human capital and customer capital are two enduring categories.....	33
5.2 Environmental capital and digital capital: two emerging categories.....	34
5.3 Reallocating structural capital.....	35
5.4 Limitations and outlook	36
6 Conclusion.....	37
References	38
Appendix 1: The Index as of 31 December 2016.....	45
Appendix 2: Companies excluded from the sample and the reasons for their exclusion	52
Appendix 3: Groups in the sample.....	58
Appendix 4: List of variables.....	63

Foreword¹: a question of terminology

The term capital, as used in this article, refers to a factor of production. This term is commonly used by economists to refer to a firm's physical or financial capital. National and international accounting standards define an asset as a resource that is likely to produce future economic benefits. Given that an asset should be recognised on a balance sheet, we prefer the term "capital", which also encompasses intangible items that cannot be recognised in the firm's financial statements, since the purpose of our research is to use CEOs' discourse to reveal certain intangible components that are not reported in financial statements.

The use of the term "intangible" is meant to be neutral. It is merely the opposite of "tangible", with no reference to recognition or non-recognition in financial statements. Therefore, intangible capital includes both intangible assets recognised in the financial statements (the visible part of intangible capital) and some more "intellectual" components under the OECD classification (the invisible part of intangible capital). Therefore, we will use the term intangible capital, which covers all intangible assets (recognised or likely to be recognised on the balance sheet) along intellectual capital, which is not likely to be recognised.

Our research is part of the recent trend of intellectual capital research that started in the year 2000. The discussion is not the same as the prevailing discussion of "intangible assets" in the 1990s. This article reveals the intellectual capital components that, by nature, are not recognised in the accounts and consequently omitted from the firm's financial statements.

The English terminology uses only two terms: intangibles and intellectual capital. Intangibles could be taken to mean intangible capital, as distinct from intangible assets. Intellectual capital is a more recent term.

¹ This discussion was inspired by Bessieux-Ollier and Walliser (2010).

1 Introduction

In the post-industrial economy, intangible capital has overtaken tangible as the capital that creates value for the firm (Dean & Kretschmer, 2007). In this context, intangible capital, such as brands, customer relationships, technology, and working procedures and methods, along with human capital, drive value creation for organisations (Inkinen, Kianto, Vanhala, & Ritala, 2017; Murthy & Mouritsen, 2011). Today, high-tech groups have replaced manufacturing groups in the top ranks of market capitalisations². In 2015, intangible capital accounted for 84% of the market value of S&P 500 companies, compared to 68% in 1995 and only 15% in 1975, according to an Ocean Tomo³ study (2015). Intangible capital gives rise to a host of accounting problems, as shown by the large share that cannot be recognised on the firm's balance sheet. Indeed, intangible capital encompasses all of the intangible resources and capabilities that the firm owns or controls and that it uses to do business, create value and distinguish itself from its competitors (Brooking, 1996; Edvinsson & Malone, 1997; Sveiby, 1997). In other words, intangible capital includes all of the firm's resources without physical substance that have an economic value and are likely to produce future cash flows and profits (Bessieux-Ollier, Schatt, Walliser, & Zeghal, 2014). In simple terms, intellectual capital is intangible capital that is not recognised in the financial statements (Castilla-Polo & Gallardo-Vazquez, 2016). This distinguishes it from intangible assets, which are disclosed in the financial statements. Recognition of intangible assets is subject to conditions and limited by tight standards (Zeghal & Maaloul, 2011). This is the intellectual capital that contributes to the formation of the firm's share price.

Intellectual capital encompasses a wide variety of assets, which makes measurement a complex task, as can be seen in the different classifications currently used in the literature (Martin de Castro, Delgado-Verde, Lopez-Saez, & Navas-Lopez, 2011). Generally speaking, research work has identified three intellectual capital components: human capital (employees' knowledge, know-how and behaviour), relational capital (the firm's external relationships with customers and suppliers) and structural capital (databases, organisational routines, corporate culture, values). Structural capital is sometimes broken down further into organisational capital and technological capital. These intellectual capital components are classified on one level (Brooking, 1996; Sveiby, 1997) or two levels (Edvinsson & Malone, 1997; Roos & Roos, 1997). These classifications come from consulting firms or academia. In the first case, an instrumental vision is preferred, as the objective is to defend the choice of management tools deployed to identify and measure the various intellectual capital components (Edvinsson & Malone, 1997; Kaplan & Norton, 1992; Stewart, 1997; Sveiby, 1997). In the second case, the classifications widely used by institutions such as the OECD

² A PwC survey (2017) shows that the technology sector has the highest aggregate market capitalisation, both in absolute value and average value per company. The financial sector ranks second in absolute value, but the value per company is much lower.

³ An investment bank specialising in intellectual property

(2008, 2013) or the European Commission as part of the MERITUM⁴ project (2002) are more theoretical in their approach.

The growing contribution that intellectual capital components make to value creation calls for a re-examination of the classifications currently used in the literature (Murthy & Mouritsen, 2011). Many of them were designed from *a priori* knowledge and are often fairly old. This means they do not give enough consideration to firms' actual practices and may be overly simplistic or obsolete (Castilla-Polo & Gallardo-Vazquez, 2016). They may not identify a major component or, conversely, they may reveal a component that does not correspond to economic players' perceptions. Furthermore, investors coping with incomplete recognition of intangibles stemming from the restrictions imposed by accounting standards, give greater weight to firms' discursive practices. Yet, there are no standards for these practices, which undermines the usefulness of financial statements. The purpose of our research is to ascertain firms' current intellectual capital disclosure by analysing their non-financial communication. This should enable us to identify the capital components addressed by current discursive practices. Discussion of these components as part of the standard-setting process could then contribute to improving the comparability and understandability of financial disclosure, helping to make it more useful. Our research builds on that of Gröjer (2001), which calls for an update of the available classifications in view of the growing importance of this type of capital in firms' value creation and the shortcomings of IAS 38 and the current academic classifications.

With this in mind, we conducted a computerized content analysis of 241 letters to shareholders from the CEOs of S&P Euro 350 companies that accompanied the 2016 financial statements published in early 2017. These letters are the introductions to annual reports. They present the highlights of the past year and outline the firm's future strategies (Bournois & Point, 2006). They are one of CEOs' favourite means of communicating with investors or with any other stakeholders interested in the enterprises' financial performance (Plattet-Pierrot, 2009; Yuthas, Rogers, & Dillard, 2002). The intellectual capital classification derived from this source can be used to update the description of the components of such capital, using an empirical approach based on narrative elements provided by the firms themselves that illustrate their strategic concerns. Our study reveals four intellectual capital components: human capital, digital capital, customer capital and environmental capital. Human capital was already familiar under previous classifications, but digital capital and environmental capital are coming to the fore and show that communication practices address contemporary issues. Our findings highlight the key importance of technological and environmental issues for enterprises.

⁴ MERITUM: **ME**asu**R**ing Intangibles **T**o **U**nderstand and improve innovation **M**anagement. This European Commission report by a group of experts aimed to define best practices for measuring and disclosing intellectual capital. The report led to the development of guidelines for identifying and presenting intellectual capital components based on 60 case studies of large corporations and SMEs in six different countries.

This study is a response to a call for research into improving the nomenclature of intangibles through greater emphasis on firms' practices (Castilla-Polo & Gallardo-Vazquez, 2016; Kaufmann & Schneider, 2004). Our work is part of the current discussion led by the International Accounting Standards Board (IASB) on disclosures accompanying financial statements (Disclosure Initiative). More specifically, it attempts to address two of the three aspects raised by the IASB as part of this initiative: the lack of relevant information (intangibles disclosure needs to be strengthened) and the ineffectiveness of the information disclosed (which brings us back to the need for standardisation based on more codified practices) (IASB, 2017). The objective is to make discursive disclosure more useful in order to supplement quantitative data for an understanding of the firm's business models and to inform investors' decision-making (Holland, 2003; Mouritsen, 2003).

This paper has four sections. We start with a perspective on the various classifications used in the literature. Then, in the second section, we explain the methodology used to address our research question. The third section presents our main findings and the last section is a discussion of those findings.

2 Literature review

Over the last two decades, firms have undergone radical changes that have substantially altered the nature of value creation. Physical frontiers have been erased, at least for the purposes of trade in goods, and regulatory frameworks have become looser. Products have become services, use has taken the place of ownership, value lies in collecting and exploiting massive amounts of data, and computerisation has fluidified, and even pulverised in some cases, processes and organisations that are the legacy of the industrial age; all of which is set in the context of depleted natural resources. Some authors talk about a third industrial revolution (Rifkin, 2011) or a post-industrial economy (Cohen, 2006), while others speak of the knowledge-based economy (David & Foray, 2003; von Krogh, Ichijo, & Nonaka, 2000). All agree that a convergence of seemingly irreversible forces means that intangibles are accounting for a growing share of the value created.

2.1 Intellectual Capital Research (ICR): three distinct stages

Changing business models have enabled the invisible to overtake the visible. The literature on intangible capital naturally reflects this change for intangible capital in the broadest sense, as defined by Lev (2001, p. 5), where the same term covers intangible and knowledge assets, intellectual capital as defined in the terminology used here. The authors who attempted to track changes in intangible capital found three clearly distinct stages (Dumay & Garanina, 2013; Guthrie, Ricceri, & Dumay, 2012; Petty & Guthrie, 2000).

In the first stage, which they say started in the early 1980s and continued into the early 1990s, researchers looked into the advent of intangible capital and its value for the firm ("why, what and where") (Petty & Guthrie, 2000, p. 162). There is no real distinction

made between intangible assets and intellectual capital, which is often confused with goodwill. This first wave of research resulted in a growing awareness of the importance of intangible capital. Its value creation capability means that it should be possible to measure it and report it in the financial statements (“intellectual capital is something significant and should be measured and reported”) (Petty & Guthrie, 2000, p. 162).

In the second stage, which lasted until 2005, the debate focused on the problem of measuring and managing intangible capital (“How”) (Petty & Guthrie, 2000, p. 162). Once the economic importance of intangible capital was recognised, it was then a matter of achieving accounting and managerial recognition. This stage coincided with the standard-setting bodies’ project to establish relevant accounting standards. The IASB started discussing IAS 38 “Intangible assets” in 1993, in conjunction with the recasting of IAS 9 “Research and development costs” and IAS 22 “Business combinations”. The final version of the IAS 38 standard was published in 1998, after five years of lively debates about recognition (as expenses or assets) and valuation (amortisation or depreciation) (Camfferman & Zeff, 2007). The literature took a more organisational approach during this second stage, driven by the “resource-based” view of the firm (Barney, 1991; Wernerfelt, 1984), and was then influenced by the work of Nonaka and Takeuchi (1995) on knowledge. It was symptomatic that this stage also saw the advent of the first tools for monitoring intellectual capital using Kaplan and Norton’s (1992) Balanced Scorecard, the Skandia Monitor (Edvinsson, 1997) or Sveiby’s Intangible Assets Monitor (1997a). Towards 2005, there were more than fifty models for capturing a firm’s intellectual capital (Dumay & Garanina, 2013).

At the end of the second stage, a common terminology emerged to qualify intellectual capital. The OECD (OCDE, 2008) adopted this terminology, with breaks intellectual capital down into human capital, structural capital and relational capital. As a result, intellectual capital is distinguished from other intangible assets (Dumay & Garanina, 2013). There is no longer much public debate about intangible assets, which are recognised under accounting standards. This leaves us with the issue of capturing intellectual capital.

Nearly twenty years after the development of these innovative tools, it seems only logical that we should see the advent of a third stage of research. According to Guthrie et al. (2012), this coincides with a more critical approach to the intellectual capital valuation models established in the second stage. Intellectual capital research (ICR) is at the crossroads (Chatzkel, 2004; Marr & Chatzkel, 2004). This research runs the risk of losing credibility because of the multitude of models proposed, often with no empirical verification (Marr, Gray, & Neely, 2003, p. 456). This makes it important to adopt a more rigorous methodology (Mouritsen, 2006; Mouritsen & Roslender, 2009). The discussions show that it is impossible to come up with any particular model for all firms since their operating circumstances are too specific. Rather than taking a top-down approach that applies a given model to all firms, the authors recommend a bottom-up methodology that reveals what works (or does not work) for a given firm (Dumay & Garanina, 2013, p. 21). Even though our approach is different from that of

researchers aiming to propose and test a valuation model from the managerial viewpoint, our research is still part of this third stage of Intellectual Capital Research (see Figure 1).

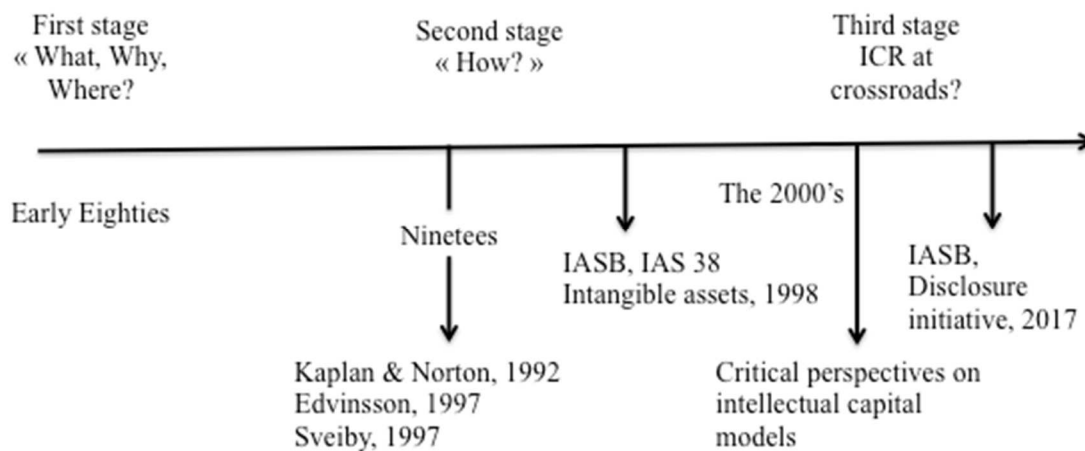


Figure 1: Timeline of intangible capital research

Given the disruption of economic models over the last two decades, it seems to be time for an update of these classifications, most of which were developed in the 1990s (Inkinen et al., 2017, p. 1163). Therefore, we propose to establish a classification based on firms' disclosure practices, drawing from an international sample. In this case, we are dealing with an accounting issue, rather than a managerial one. The point is to improve financial communication ("*...* to help make financial information more useful and improve the way financial information is communicated to users of the financial statements." as the IASB states in its introduction to the presentation of the *Better Communication in Financial Reporting*⁵ project).

2.2 The different classifications of intellectual capital

The most frequently used classifications in academic literature distinguish between three main components of intellectual capital: human capital, structural capital and relational capital (Bontis, 1998; Martinez-Torres, 2006; Murthy & Mouritsen, 2011; Reed, Lubatkin, & Srinivasan, 2006; Sveiby, 1997a; Tayles, Pike, & Sofian, 2007). Human capital covers employees' tacit or implicit knowledge, their talent, experience, know-how, behaviour and skills. In simple terms, human capital refers to everything that employees take away from the firm when they leave at the end of the day. It is often deemed to be the primary factor of competitiveness and a source of lasting competitive advantage, even though it does not belong to the firm (do Rosario-Cabrera & Bontis, 2008; Hsu & Wang, 2012; Martinez-Torres, 2006; Nonaka & Takeuchi, 1995). Human capital is central to these classifications since it is institutionalised in the organisational capital and comes through in the firm's relationships with its customers and society at large (Bontis, 1998; Subramaniam & Youndt, 2005).

⁵ Accessible on the Foundation website: <https://www.ifrs.org/projects/better-communication/> (consultation on 29 October 2018).

Structural capital includes organisational routines, procedures, methods, databases, information systems, technology, research and development. In simple terms, structural capital is what is left at the office after the employees have gone home. It can be seen as the firm's skeleton because it provides the architecture for the working methods and the knowledge required by the firm's business model (do Rosario-Cabrita & Bontis, 2008; Martin de Castro et al., 2011; Reed et al., 2006). The fact that it remains with the firm, even if employees move on, makes it a key element for value creation (Lev, Radhakrishnan, & Zhang, 2009).

Relational capital includes the firm's relationships with its customers, suppliers, partners and, more generally, all of the stakeholders. A specific, customer-centric, conception of this capital lies at the heart of the Kaplan and Norton's (1992) Balanced Scorecard and the Skandia Monitor (Edvinsson, 1997). It is not the only conception, since we can also cite a firm-centric conception that also encompasses the firm's reputation, customer loyalty, brand and brand image (Brooking, 1996). Relational capital can also be broken down into a "firm" sub-component that covers the firm's relationships with its customers, suppliers and partners in the broadest sense, and a "social" sub-component that refers mainly to the value of these relationships to society at large (Martin de Castro et al., 2011).

Other classifications present four main components of intellectual capital. In the wake of Mouritsen's work (1995), the Danish government encouraged firms to prepare "intellectual capital statements" covering four aspects: employees, customers, processes and technologies. Brooking's classification (Brooking, 1996a) breaks intellectual capital down into market assets, human-centric assets, intellectual property assets and infrastructure assets. This classification was widely adopted for financial research, where the notion of an asset refers to items identified in the accounts that produce economic benefits for the firm (intangible assets). Finally, some classifications, like that of *Observatoire de l'Immatériel*, consider ten components of intellectual capital: technological, social, natural, information-system related, brand, supplier-partner, shareholder, organisational, human and customer. Figure 2 presents a summary of the different components of intangible capital.

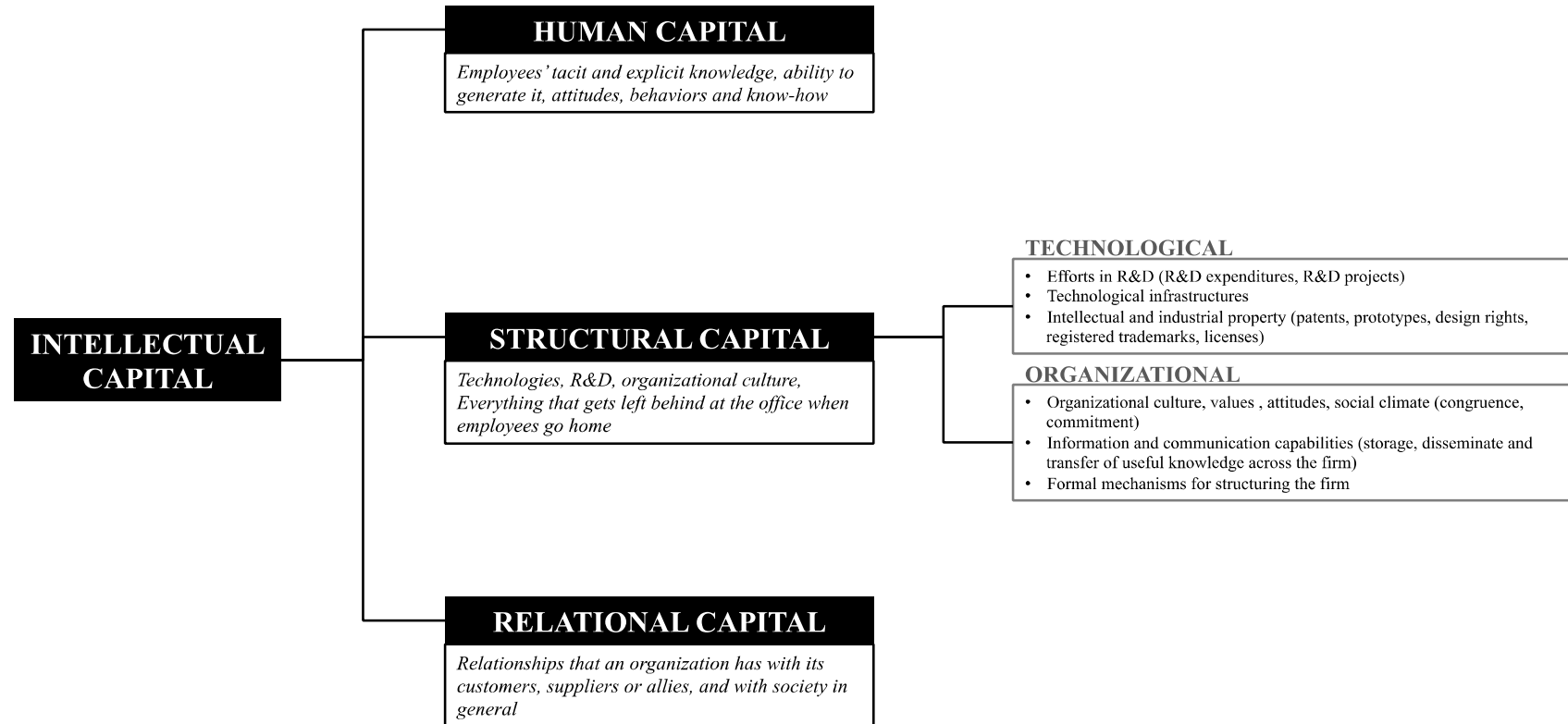


Figure 2: Summary of intellectual capital classifications

Some classifications rank intellectual capital components in relation to each other. For example, intellectual capital may be distinguished into thinking (human capital) or non-thinking (structural capital). The latter includes organisational capital, customer capital and relational capital (Roos & Roos, 1997). This classification can also be found in the research work of Edvinsson and Malone (1997), which makes a distinction between human capital and structural capital. Human capital refers to knowledge that is created and mastered by employees, whereas structural capital refers to the entire infrastructure that supports human capital. Structural capital is broken down further into two components: organisational capital, which concerns all of the knowledge created and mastered by the firm, and relational capital, which concerns all of the relationships that the firm has with its customers.

Most of these classifications date back to the end of the 1990s and are already out of date, since the number and content of intellectual capital components have changed as their importance for firm's value creation increases. Some more recent classifications have replaced the traditional intellectual capital components and highlight automated information systems (software and databases); innovation property (patents, copyrights, designs, models and brands); and business skills (brand capital, firm-specific human capital, networks of people and institutions, organisational know-how that enhances the firm's efficiency) (Corrado, Hulten, & Sichel, 2005). More recently, other intellectual capital components have been added to those already identified. In addition to human, structural and relational capital, renewable capital, trust capital and entrepreneurial capital have appeared (Inkinen et al., 2017). Renewable capital refers to the firm's learning capability, which enables it to renew its knowledge, practices and review its organisational capital (Kianto, Hurmelinna-Laukkanen, & Ritala, 2010). Trust capital is critical for the firm's relationships with its partners. It makes the firm's business transactions, and even its technological transactions, more secure (Nahapiet & Ghoshal, 1998). Entrepreneurial capital refers to the firm's proactive responses to market signals and its ability to launch new products and services, as well as its risk-taking capability (Erikson, 2002).

2.3 The value of updating intellectual capital classifications

Identification of intellectual capital components is now an urgent matter because of their growing contribution to firms' value creation. In 1975, tangible and financial assets accounted for 83% of firms' financial value. In 2009, they contributed only 19% to firms' financial value (IIRC, 2011; KPMG, 2012). At the end of 2017, the value of intellectual capital accounted for 37% of aggregate market capitalisation, marking a 33% increase over the previous year (Ricol Lasteyrie - EY, 2018). At the same time, investment in intangible assets in the OECD countries grew steadily and is now on the same scale as investment in plant and machinery. In 2002, investment in knowledge (R&D, education and software) in Europe accounted for 7% of GDP, after posting annual growth of 1.5% since 1994 (OCDE, 2008).

This means that updating the existing classifications is critical. The old classifications give little consideration to firms' practices, either because they are conceptual (Brooking, 1996; Edvinsson & Malone, 1997; Mouritsen, 1995; Roos & Roos, 1997; Sveiby, 1997a), or because they are instrumental (Fustec, 2011; Kaplan & Norton, 1992; Kaplan & Norton, 2001; Lev, 2001; Meritum, 2002; OCDE, 2008, 2013). The MERITUM classification (2002) may be based on case studies conducted in firms, but the composition of the sample means that it cannot be deemed suitable for broader standard-setting purposes. The firms in the sample were selected according to the importance of intangible capital for their business, based on the share of intangibles on their balance sheets in the case of French firms and membership of Club Intellect in the case of Spanish firms. The Norwegian, Swedish and Danish firms in the sample already have some experience with intellectual capital measurement, management and/or disclosure. Generally speaking, the firms examined under the project are all knowledge-intensive, which limits the suitability of the resulting classification for general use.

The obsolescence of the available classifications is another issue, not only because of the *a priori* construction of most of them, which means their relation to firms' actual practices is limited, but because many of them are more than twenty years old. Consequently, one or more intellectual capital components may not be identified. This risk comes on top of the risk incurred in the *a priori* construction of the classifications or the use of overly specific samples, which may have identified or combined intellectual capital categories in ways that do not reflect the practices of firms as a whole.

However, these problems do not call the importance of information about intellectual capital into question. The very existence of the MERITUM project (2002) testifies to this fact. This information is critical for investors' understanding of how intangible capital components interact with each other and with tangible assets (Mouritsen, 2003). Discursive disclosures supplement the financial statements to help understand the firm's business model. This informs investors' decision-making (Holland, 2003). Investors coping with incomplete recognition of intangibles in the financial statements stress the importance of this discursive information for a better understanding of how intangible capital components interact with each other and with tangible assets in the value creation process (Castilla-Polo & Gallardo-Vazquez, 2016; Mouritsen, 2003b). The lack of standardisation of such information, other than information about intangible assets, seems to undermine the usefulness of financial statements. As the contribution of intangible capital to firms' value creation grows, it seems to critical to update these classifications around the intellectual capital components that firms deem to be strategic (Castilla-Polo & Gallardo-Vazquez, 2016; Murthy & Mouritsen, 2011). This update would enhance the usefulness of financial statements by standardising disclosure of information that is not covered by the standards currently in force for intangible assets.

2.4 Accounting issues arising from updated classifications of intangible capital

Despite its financial importance, the standards for recognition of intangible capital in financial statements are tight and restrict it to those elements that meet the accounting definition of assets (i.e. intangible assets). These restrictions have been invoked to explain the gap between book value and market value (Cazavan-Jeny, 2004; Mouritsen, 2003b; Murthy & Mouritsen, 2011). And, even when recognition does take place, the information provided is often very limited (Disle & Janin, 2015) and may even depress the entity's share price (Cazavan-Jeny & Jeanjean, 2005). The IASB has properly identified these problems, even though it was relatively slow to address the issue, compared to other issues.

Intangible assets were not covered by a specific accounting standard until IAS 38 was first published in 1998⁶. This standard was revised in 2004⁷, and again in 2008, at the same time IFRS 3 was introduced to replace IAS 22 (2004) and the revised version of the latter (2008) was published. The new version of IFRS 3 introduced a major change concerning intangible assets by eliminating the reliable fair value measurement requirement. This change made it easier to report identifiable intangible assets on the balance sheet in a business combination, thereby reducing the share subsumed into goodwill.

Recognition of intangibles under IFRS 3

Under the 2004 version of IFRS 3, recognition of intangible assets required such assets to meet the definition given in IAS 38 and reliable measurement of their fair value (IFRS 3.45).

Under the 2008 version of IFRS 3, the only requirement is that the asset meets the definition in the conceptual framework at the time of the acquisition (IFRS 3.11). In the case of intangibles, the standard requires that the asset be a contractual or legal right or a separable right (IFRS 3.B31).

There have been no major amendments to IAS 38 since 2008. This fact, combined with the lack of any mention of amendments to the standard in the IASB's plans, seems to indicate that it will stay the same in the medium term, given the complexity of the issues that still need to be addressed. The restrictions on recognising intangibles on the balance sheet seem therefore bound to last. IAS 38 states that an asset can only be identifiable if it is separable and the entity controls the future economic benefits (IAS 38.10) Not all of the assets listed by the standard: “scientific or technical knowledge, design and implementation of new processes or systems, licences, intellectual property, market knowledge and trademarks (including brand names and

⁶ In contrast, the first publication of IAS 16 – Tangible assets dates back to 1982.

⁷ The 2004 revision included the elimination of asset reporting criteria, guidance for the notion of identifiable assets and the elimination of the (rebuttable) presumption of a maximum life of twenty years.

publishing titles” (IASB, 2008, para. 9) are actually intangible assets. This is where the dividing line is found between assets that can or must be reported on the balance sheet and intellectual capital. Information about intellectual capital can be given only in disclosures and not on the balance sheet. This topic has obviously been discussed and the IASB attempted to contribute to the discussion about non-financial disclosures, acknowledging thusly their importance. For example, it published a practice statement on management commentary in 2010. This commentary was defined as “a narrative report that provides a context within which to interpret the financial position, financial performance and cash flows of an entity.” (IASB, 2010, para. IN3). The purpose of the practice statement was to help readers understand, “how resources that are not presented in the financial statements could affect the entity’s operations” (IASB, 2010, para. 14(b)). These issues were also brought up in the work on project “Principles of disclosure”, which propose substantial changes to disclosure requirements concerning assets that are not reported in the financial statements (IASB, 2017). In this document, the IASB highlights the current limitations of financial disclosure that explain the problems inherent in relying on judgment to determine which information entities should disclose. The discussion under way aims to enhance the usefulness of financial statements (IASB, 2018b). Their usefulness obviously depends on their relevance and accuracy (IASB, 2018a). An examination of the project documents shows that the usefulness of financial statements and, more specifically for our research, the lack of some key elements, go to the heart of the problem (IASB, 2017, 2018b).

The usefulness of accounting information provided about intangible capital has already been addressed, but with regard to intangible assets only (Beldi, Chastenet, Dupuis, & Talfi, 2010; Cazavan-Jeny & Jeanjean, 2005; Lenormand & Touchais, 2008). Some authors argue that the category of intangible assets should be expanded⁸, but their main concern is assessing the usefulness of current accounting practices and potential changes to them (Cazavan-Jeny & Jeanjean, 2005). Our research does not share this concern. Instead, it builds on the research proposed by Gröjer (2001), which uses the classification as a heuristic device for the construction of an interpretation. A classification does indeed serve this purpose, which is critical for financial statements, since the ability to interpret the statements depends on the usefulness of the information they contain. Gröjer’s article calls for the construction of such a classification of intangibles, which would require simplification. The “archetypal” approach is one of the approaches considered for such simplification and it is particularly well suited when there are a large number of items and relationships between them, as is the case for intangibles. The entanglement of intangibles is one of the arguments for not reporting them on the balance sheet. The test used to ensure the validity of a classification is not an empirical test when putting it into practice, but its actual use. In this respect, the approach used to develop the proposed classification would contain the source of its justification within itself.

⁸ To include internally generated brands, for example (Barth, Clement, Foster, & Kasznick, 1998; Beldi, Chastenet, Dupuis, & Talfi, 2010)

Placing our research in the context of the IASB project on the principles of disclosure is consistent with the maturity that seems to have been achieved for standards regarding intangible assets. However, it does raise the issue of the value of the information disclosed in the notes to the financial statements. In the specific case of intellectual capital, a recent study highlighted the usefulness of such information for users of financial statements based on an experimental approach to brands (Abeysekera, 2016). From this perspective, standardising disclosure of intangibles using a classification based on practices would enhance the usefulness of the financial statements by making them more consistent and comparable (Gröjer, 2001).

3 Methodology

After defining a sample of companies from the S&P Europe 350 index, we explain the selection of documents examined (CEOs' letters to shareholders) and the methodology used (content analysis).

3.1 Sample

This research relies on the CEOs' discourse to uncover an intellectual capital classification. However, the documents we use have an institutional aspect, which requires companies in our sample to be subject to uniform standards with regard to disclosure requirements. Consequently, we have drawn up a sample of listed European companies that comply with IFRS. The sample is drawn from companies in the S&P Europe 350 index on 31 December 2016 to ensure diversity by geography and industry. This date also coincides with the end of the accounting period for the financial data used. The index is made up of 350 companies listed on 16 European markets (S&P Dow Jones Indices, 2018). The markets in the sample are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom (Appendix 1). The companies in the sample have more than 2 billion dollars in circulating capital. The country of residence is primarily defined as the country where the company is registered. The sample excludes companies in the financial sector, such as banks, insurance companies and asset management companies, because of their special accounting standards and the size of their balance sheet assets, resulting in particular from the non-offsetting of financial derivatives and the large proportion of financial instruments. This exclusion is common practice for this type of research (Cazavan-Jeny, 2004; Disle & Janin, 2015; Dumas & Martinez, 2015). In addition to financial sector companies, the sample also excludes entities that are not IFRS compliant. This was necessary to avoid differences in accounting representations and ensure that CEOs' discourses are produced under the same conditions. As a result of

this criterion, some Swiss companies are excluded since local provisions allow them to produce consolidated financial statements that do not necessarily comply with IFRS⁹.

For the same reason, the sample excludes companies located outside of the European Economic Area. The regulatory framework for such companies' disclosures is not the same. More particularly, the European Securities and Markets Authority (ESMA) had no say in their disclosure framework¹⁰. This may have an influence on their disclosures, including non-financial disclosures. Furthermore, some companies are represented by more than one share in the index, either because they have issued different classes of shares or because they are listed in several markets. Since an annual report is published for each group and not for each share, the survey obviously counts each entity only once, even though they may have more than one share represented in the index.

Finally, the sample excludes companies that were removed from the index in 2017. The purpose of this exclusion is to avoid any bias that an expected exit from the index could bring to the way external communication is practiced, since certain investors, such as asset managers who use the index as a performance benchmark, could analyse the entity's shares differently. Even though inclusion or exclusion from the index does not constitute additional information about the group, and should not lead to a change in its share price, surveys have shown the effects that the composition of indices has on the shares included in them (e.g. Collins and Wansley 1995; Bildik and Gülay 2008; Becker-Blease and Paul 2010). Appendix 2 lists all of the groups excluded from our analysis, giving the reason or reasons for their exclusion from the sample. Appendix 3 lists all of the companies that are ultimately included in our study.

3.2 Text analysis of CEOs' letters

Listed companies voluntarily include discursive data along with accounting data in their financial reporting (Depoers, 2000). To answer our research question, we focused on content analysis of the letters that CEOs publish as an introduction to the management commentary. This discursive part of the annual report is intended to supplement accounting data or put them into perspective. Not much management research has focused on these letters (Abrahamson & Amir, 1996; Chekkar & Onnée, 2006; Platet & Giordano-Spring, 2011; Point, 2007; Point & Trébuçq, 2015). And yet, the CEO's discourse is important from an instrumental point of view: "CEOs speaking in the name of the institutions they lead do not speak impartially; they speak to win support for a strategy", (Jacquot & Point, 2000; Pupion, Leroux, Latouille, & Paumier, 2006). Piette and Rouleau (2008) even speak of the "discourse tool" used to "facilitate management

⁹ Article 963b of the "code des obligations" requires the production of consolidated financial statements that comply with a recognised accounting standard. A Federal ordinance stipulates that the following standards are recognised: Swiss GAAP, IFRS, IFRS for SMEs, US GAAP and IPSAS.

¹⁰ Strictly speaking, Norway is not a Member State of the European Union. Nevertheless, it enjoys observer status at the ESMA. Collaboration with Switzerland is also very close, as can be seen with the signature of a Memorandum of Understanding on the EMIR Directive on 30 November 2015 and recognition of certain passports (e.g. *Alternative Investment Fund Managers Directive*).

of processes and achieve results, to formulate and disseminate strategies, to mobilise employees, to communicate an image, to improve knowledge about the entity's environment, to promote effective decision-making and to make assessments. Ultimately, the CEO's discourse has the power to manage and articulate frequently contradictory pressures" (Jacquot, 1998; Pupion et al., 2006).

3.2.1 Methodological choices: computer-assisted text analysis

We opted for computerized content analysis, because our sample contains 241 CEOs' letters, some of which are quite long. This method provides an opportunity for partial measurement of strategic intentions through the analysis of the topics addressed in the CEOs' public statements (Osborne, Stubbart, & Ramaprasad, 2001). The literature highlights three types of computerized content analysis: representational text analysis or manual analysis, inferential text analysis, or semi-automatic text analysis, and positioning text analysis, or automatic analysis (Illia, Sonpar, & Baeur, 2014; Normand & Garon, 2013). We chose positioning text analysis, or automatic analysis, because of the large number of documents to be analysed and the length of some of them.

This method is used to assign meaning to a word according to its natural context, since meaning depends on the position of the word in the semantic space. Two fundamental rules govern such analysis. First, words are reduced to their lemma. The singular and plural forms of a word stem from the same lemma. Secondly, words are considered according to their average frequency. This makes it possible to analyse the co-occurrence of words, meaning "the statistically significant association of two items (generally two words) within a defined window of the text (generally a paragraph)" (Mayaffre, 2014). The point is to identify how words occur together in a text segment and compare them with other text segments. This approach relies on text statistics software, such as ALCESTE, IRaMuTeQ, Lexico and TLab, which require protracted preparation of the raw data.

3.2.2 IRaMuTeQ software

Our choice of software was IRaMuTeQ (R Interface for Multidimensional Analysis of Texts and Questionnaires). It is a lexicometric analysis software that has been developed by Pierre Ratinaud at the Applied Social Science Research Laboratory (LERASS) at the University of Toulouse 3 since 2009¹¹. It uses R statistical interface software¹². The system uses the statistical analysis tool for textual data called "Alceste" (Analysis of co-occurring lexemes in the simple statements of a text - *Analyse des Lexèmes Cooccurents dans les Énoncés Simples d'un Texte*). It was developed at the end of the 1970s by Max Reinert, and has a lexicometric analysis software named after it. IRaMuTeQ is an open source version of the Alceste software that is intended primarily for academic use. It can be used to describe and explore large text corpora.

¹¹ Ratinaud, Pierre, 2009. IRAMUTEQ: Interface de R pour les Analyses Multidimensionnelles de TExtes et de Questionnaires. <http://www.iramuteq.org>.

¹² For more about the R project see <http://www.r-project.org>.

The method applied by IRaMuTeQ is similar to that of Alceste. It includes four main steps (Reinert, 1983, 1986, 1987, 2001). The first step prepares and digitises the texts. Each text is broken down into “context units”, called ICUs (Initial Context Units). The second step breaks the ICUs down into text segments, called ECUs (Elementary Context Units), which are the default statistical units for the software. The breakdown follows the punctuation and is called “natural” by Reinert. It is a key step, since lemmatisation of the corpora is based on these elementary context units. The third step classifies and ranks the units. The different categories of vocabulary chosen are ranked on the basis of the distribution and co-occurrence of the words in the subdivisions of the corpus (elementary context units) (Bart, 2011). A correspondence analysis is conducted using the classification results to “account for attraction and distance relationships in the corpus between the categories, the forms and the categories and forms” (Bart, 2011). The fourth and final step carries out supplementary computations for each class. The most representative elementary context units for each class are identified and extracted.

3.2.3 Compiling the corpus

Collecting and formatting the corpus

We extracted the English-language CEOs’ letters from the public and freely available annual reports of the 241 groups in our sample. This approach means that we are working with texts that have uniform disclosure intentions and follow a specific line of reasoning.

The corpus was formatted in two stages. In the first stage, each portable document format (pdf) file was converted into plain text format. A preview of all of the texts eliminated all extraneous elements¹³, leaving only the body of the text. We took special care to conserve all of the punctuation, which is critical for breaking the text down into elementary context units. In the second stage, a set of 25 variables was matched against each letter in order to qualify it for further analysis. The list of variables can be found in Appendix 4.

Building the dictionary

IRaMuTeQ lemmatises the text using dictionaries, with no disambiguation. The lemmatisation phase of the software uses two files: lexicon and expressions. The verbs are reduced to their infinitive forms and nouns are reduced to their singular form to ensure successful execution of text analysis. We added 2,882 words that were in the texts to the lexicon file. These words were too technical or business-specific to be in the default dictionary of the software. We also added 293 expressions to the expressions file for the same reasons. The purpose of this stage was to enable the tool to recognise terms that are present in the semantic field of the research object.

¹³ Logos and text highlighted during the layout stage, for example.

Examples of terms and expressions added

The following terms and expressions were added to the corpus, for example:

- accounting standards
- balance sheet
- carbon footprint
- cash performance
- sustainable development
- customer loyalty
- EBITDA, earnings per share
- renewable energies
- financial reporting

4 Findings

4.1 Text analysis of CEOs' discourse

Two successive text analyses were carried out. The first analysed the entire corpus with the idea of revealing the main elements of CEOs' discourse. This first level of analysis shows that the corpus is made up of 379,441 occurrences, with 15,362 different forms, including 5,029 hapax¹⁴, which account for 41.23% of the forms and 0.11% of the occurrences. After this first ranking was completed, we came up with a classification (**Figure 3**) with six categories based on their semantic content (**Table 1**).

	Colour code	Name	% of forms analysed
Category 1	Red	Relational capital	23,5
Category 2	Grey	Strategy	21,3
Category 3	Green	Environmental Capital	8,7
Category 4	Turquoise	Human Capital	12,6
Category 5	Blue	Financial Results	21,8
Category 6	Pink	Governance	12,1

Table 1: Values of the six categories of CEOs' discourse

¹⁴ Forms that only occur once in a corpus.

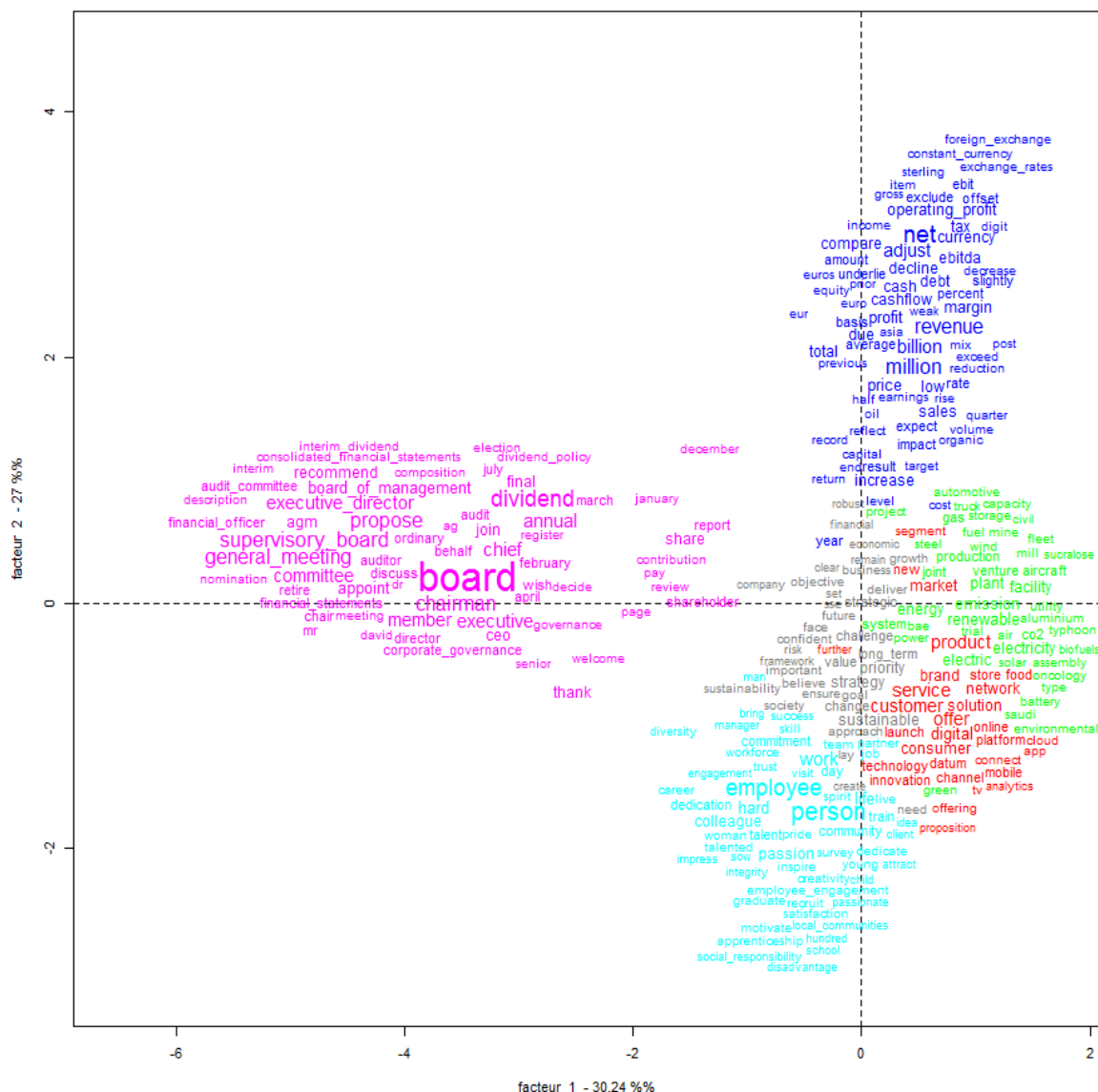


Figure 3: The six categories of CEOs' discourse

Two of these six categories really stand out and constitute an expected discourse of a financial disclosure exercise. Category 5 *Financial Results* makes extensive use of the financial semantic field and, more specifically, the vocabulary involved in presenting financial results (*revenue, operating profit, margin, cash-flow, cash, EBITDA, etc.* are some of the most frequently used terms). Category 6 *Governance* covers the discourse on governance organization (*board, chairman, executive, CEO*) and control and audit procedures (*committee, audit, auditor, independent, etc.*), which is also to be expected for this type of disclosure. Category 2 *Strategy* involves notions of managed change (*change, confident, believe*) and a future firmly in hand (*priority, long term, focus, approach, objective, direction*). These three major themes are part of the conventional content, a sort of compulsory routine, for CEOs' letters and are fairly uniform across all business sectors and all countries.

On the other hand, Categories 1, 3 and 4 contain some more unexpected semantic registers. The common characteristic of these categories is that they all address intellectual capital, with some nuances that explain their emergence as distinct categories (see below). CEOs seem to use their letters to shareholders as a less structured means of communication for disclosing information about their firms' intellectual capital.

The first of the three categories of discourse about intellectual capital more specifically concerns consumers, products and brands, as well as customer data and digital communication. This is Category 1 *Relational capital* in Table 1. Another category uses a lexicon that addresses the resources implemented for “green” production and natural risk management (Category 3 *Environmental Capital*). The third category clearly covers employees and the work environment, with discourse about employees' talent and passion being overrepresented (Category 4 *Human Capital*). **Table 2** lists the most commonly used terms for each of these categories.

Category 1 “Relational capital”	Category 3 “Environmental Capital”	Category 4 “Human Capital”
service offer product customer digital solution network market brand consumer platform data store channel expand technology online launch innovation mobile tv content connect commerce develop demand introduce offering	emission renewable plant facility electric energy electricity gas venture production system treatment aircraft co2 cancer carbon vehicle solar therapy air wind natural green environmentally	person employee work hard life colleague passion day commitment community talent train dedication trust woman inspire pride creativity team culture talented young skill career employee engagement satisfaction motivate success proud spirit

Table 2: Terms that are overrepresented in the categories dealing with intellectual capital

A sub-corpus was extracted for more refined analysis of the CEOs' discourse on intangible capital. This corpus contains the elementary context units in Categories 1, 3 and 4. The sub-corpus as a whole was subjected to a fresh text analysis to achieve finer granularity with regard to CEOs' discourse about intellectual capital. This sub-corpus is made up of 157,397 occurrences, with 8,092 different forms, including 3,500 hapax, which account for 43.25% of the forms and 2.22% of the occurrences.

4.2 Text analysis of the “intangible capital” sub-corpus

The second text analysis of a sub-corpus devoted to the topic of intellectual capital produces a four-category classification of CEOs' presentations of intellectual capital (Table 3). Two of the categories identified in the first text analysis are still present. They are the categories centred on environmental capital and human capital. The main effect of the second, more granular, analysis is to separate relational capital into two components: digital capital and customer capital (Figure 4).

	Colour code¹⁵	Name	% of forms analysed
Category 1	Red	Human Capital	26.3
Category 2	Green	Customer Capital	30.3
Category 3	Turquoise	Digital Capital	17.7
Category 4	Violet	Environmental Capital	12.6

Table 3: Values of the four categories of intangibles

¹⁵ It would have been more informative to keep the same colours for the categories that subsist, but Iramuteq assigned the colour codes and we cannot change them.

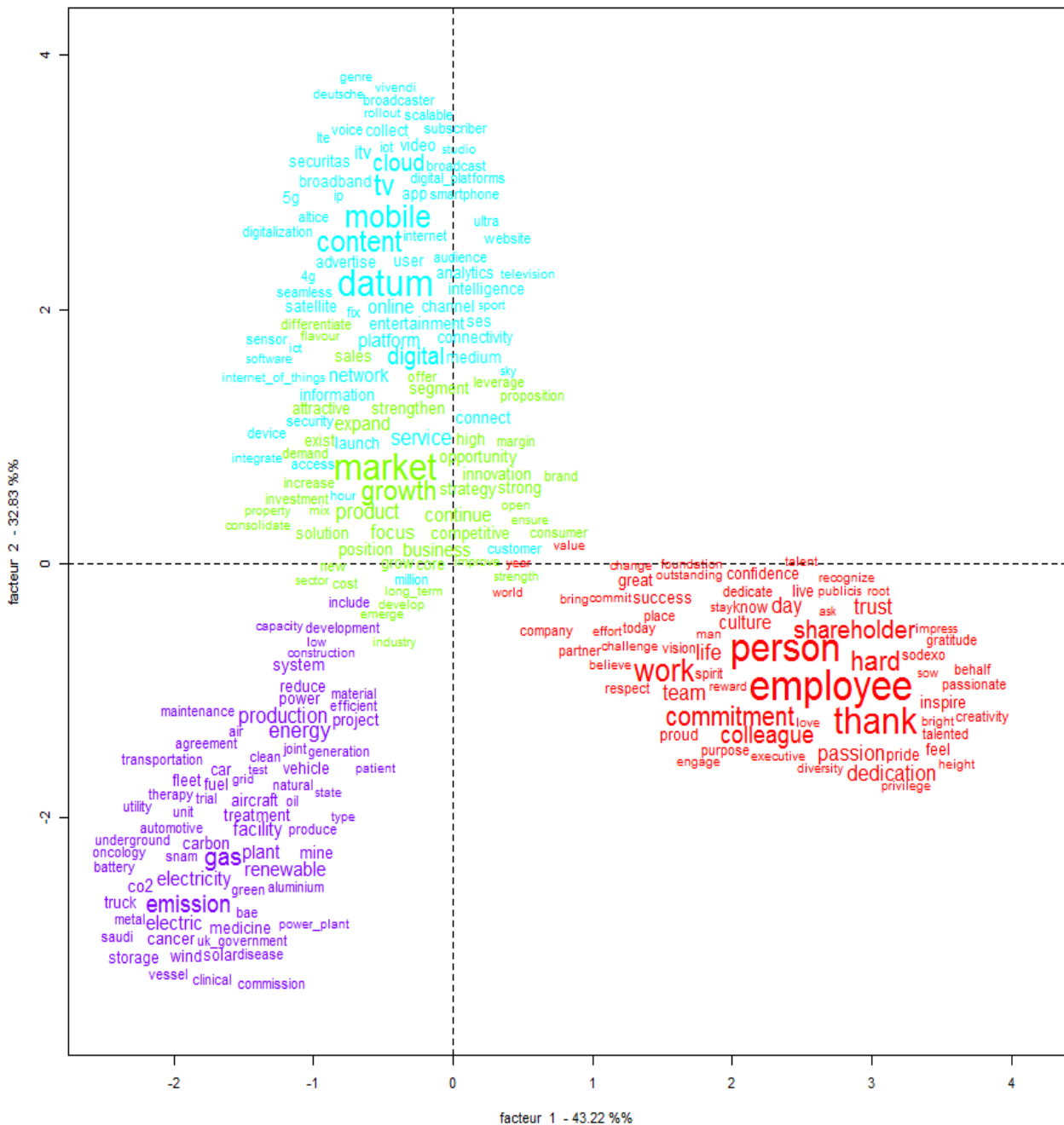


Figure 4: Four categories of CEOs discourse about intangible capital

Category 1 *Human Capital* still centres on people (*employee, person, colleague*), their attitudes and their state of mind (*commitment, trust, passion, dedication, proud, confidence, inspire*). CEOs speak of culture and work, but there is little mention of the processes and investments that could be used to recruit, retain, encourage or train employees (Table 4).

Segment	Company
<i>In closing I would like to thank all our employees and partners for their hard work and dedication the business has outstanding people and they have made 2016 a very successful year</i>	GlaxoSmithKline PLC
<i>Our people as the chairman highlights in his statement the progress that we continued to make in the year is due to our employees around the world I would like to thank them for their hard work and ongoing drive and passion to deliver our strategic ambitions</i>	IMI PLC
<i>People I would like to thank all our employees across Tate & Lyle for their continued hard work and dedication over the last year and I look forward to working alongside them in the next financial year as we continue to deliver on our objectives</i>	Tate & Lyle PLC
<i>With the help of our engaged employees we will continue to work hard at creating value for our customers and other stakeholders and fulfill our ambition to make affordable microelectronics for people everywhere to enjoy a better quality of life</i>	ASML Holding NV
<i>I would like to thank our employees they have consistently shown great commitment fortitude and hard work through a challenging year these attributes when combined with Cobham's specialist capabilities and our leading positions in attractive markets lies at the core of what Cobham offers</i>	Cobham PLC

Table 4: Most characteristic text segments for the Human capital category

This category is heterogeneous to a degree, with companies from a wide variety of business sectors, including luxury goods, retail, fast moving consumer goods (FMCG) and hospitality. In every case, however, these business sectors are reliant on manpower, as in the case of companies with large numbers of employees because of the nature of their business (retail, hospitality) or in the case of companies that need highly qualified manpower (luxury goods).

A further text analysis within this category shows three recurring themes in the discourse about human capital (Table 5). The first theme is the link between employees' commitment, a word that occurs very frequently, and a mainly qualitative assessment of results (*result, record, contribution, objective, creating value*), using the vocabulary of gratitude (*thank, gratitude, acknowledge*) and trust (*trust, support, confidence*). The second theme describes and highlights employees' abilities (*talented*), using a vocabulary about working together (*team, staff, hard work, colleague*), along with working conditions and rewards (*award, improvement plan, event, comfortable*). The latter theme puts a teleological organisational identity into perspective. This is expressed in the form of a mission (*mission, vision, purpose, pioneer*), as propitious conditions for thorough understanding of consumers'

expectations (*people’s life, connect, consumer, desire, understand*) and technological innovation (*innovation, technology, quality*).

“Link between employees’ commitment and results” theme	“Employees’ abilities and working together” theme	“Relationship between the firm’s mission and innovation” theme
<i>On this note I would like to thank Novo Nordisk s employees for their contributions to our results in 2016 (Novo Nordisk)</i>	<i>During a recent visit to south east Asia I was delighted to see the recognition Tesco is receiving as a very attractive employer I want it to be recognised how hard our colleagues have worked during the past year and thank them for their commitment through difficult times (Tesco)</i>	<i>[...] are the essence of our service offering and of our mission to improve quality of life our colleagues are the face of Sodexo our competitive advantage is rooted in the wealth of talent cultures and experience of our teams (Sodexo)</i>

Table 5: Recurring themes in the Human Capital category

Category 2, Customer Capital, includes marketing language on the market orientation of the firms (Table 6). The discourse recounts aggressive strategies to conquer markets (*market, growth, expand, business, segment, competitive, position, strong, opportunity, sales, demand, increase*) based on working to innovate and adapt products (*product, innovation, portfolio, brand*).

Segment	Company
<i>Prospects against the backdrop of mixed macroeconomic and market conditions the combination of our strong competitive position diversified and resilient businesses and ability to consolidate our fragmented markets further is expected to lead to continued growth</i>	Bunzl PLC
<i>BSN medical has leading market positions in several attractive medical product categories and provides a new growth platform with future industry consolidation opportunities the medical solutions company shares similar positive market characteristics customers and sales channels as our incontinence business</i>	Svenska Cellulosa AB
<i>Medium term fundamentals across Europe remain robust with continued GDP growth supporting spending in all our major markets although low fuel prices continue to encourage increased capacity which impacts yields Easyjet has performed strongly in a highly competitive market by focusing on building number one positions in selected markets and strong cost control</i>	Easyjet
<i>Both our business segments consumer and Tesa contributed to Beiersdorf’s success in 2016 with our strong brands attractive product</i>	Beiersdorf

Segment	Company
<i>innovations and a further increased presence in emerging markets we have again gained market share and raised our sales in both business segments</i>	
<i>We invested approximately 500 million in our existing business building a platform to deliver continued performance and growth effective capital spend will enhance operating efficiency optimise our asset base and continuously improve our market positioning across Europe and the Americas enabling us to deliver added value to our customers</i>	Smurfit Kappa group

Table 6: Most characteristic text segments for the Customer Capital category

Further text analysis of Category 2 *Customer Capital* reveals three themes in the discourse (Table 7). The first theme is clearly separate and includes an entire vocabulary about income growth (*return, investment, performance, dividend, business, advantage, growth, improvement*) stemming from market expansion through diversification (*diversify, expansion, market share*), which may be geographical (*international, expansion*), or diversified distribution channels (*presence, store, online*). The next two themes are fairly similar. The first deals with products from the point of view of optimising the production process (*product, process, chain, productivity*), with the aim of cutting costs (*reduce, achieve, optimise, efficient*), launching new products (*customer, innovative, launch*) and improving perceived quality (*quality, upgrade*). The other theme also deals with products, but from the perspective of firms' capability to anticipate changes in consumer behaviour and expectations (*anticipate, shape, consumer, increasingly, sophisticate, respond*), which is seen as a prerequisite for innovation and adapting products (*open, innovation, transition, modern*). It is only logical that companies in the mass consumption sector, such as Heineken, SvenskaCellulosaAbsca (SCA), Adidas and Beiersdoff, are overrepresented in this category.

“Market expansion” theme	“Competitive products” theme	“Innovation and adaptation of products to consumer demand” theme
<i>Continued international revenue growth we will continue to grow internationally capitalising on good growth in digital markets and diversifying our sources of revenues in Australia recent improvement in performance has given us the confidence to consolidate our challenger position with more marketing investment (William Hill PLC)</i>	<i>We work close to our customers to lead the technological development and launch new and leading products and solutions that contribute to improved customer productivity profitability and sustainability efficient time to market processes as well as a continuous focus on application knowledge are crucial for our success (Sandvik)</i>	<i>Failure to anticipate changes in the market environment including new customer requirements competition ecosystems and business models enabled by digitalization Kone aims to be the industry leader by investing into research and development and having an open innovation approach (Kone)</i>

Table 7: Recurring themes in the Customer Capital category

Categories 3 *Digital Capital* and 4 *Environmental Capital* can be seen as the emerging categories of intellectual capital, insofar as they concern relatively new activities featuring high levels of risk and uncertainty and requiring financial and human investment. It is only logical therefore, for CEOs to use their letters to disclose information about these items.

Category 3 *Digital Capital* features an entire discourse on digital transformation, centred on collecting and using data (*data, cloud, platform, information, analytics, collect, intelligence*), the capability to use the different communication channels (*mobile, tv, video, connect*) and the capability to create and disseminate content (*content, entertainment, advertise*) (Table 8).

Segment	Company
<i>Enhance capability in digital innovation and the internet of things over the last three years we have developed market leading digital platforms across the customer lifecycle from sales and service through to account management and billing.</i>	Rentokil Initial
<i>Apart from lower fares and our new Boeing sky interiors many of these improvements will be to our digital platform where we have significantly invested in both our website and mobile app to deliver new leisure plus and business plus products.</i>	Ryanair

Table 8: Most characteristic text segments for the Digital Capital category

It is only logical that companies in the communication and telecommunications sectors should be overrepresented in this category, but it also includes many companies in more traditional sectors, which communicate about the digital experience or the use of customer data. As was the case for the other categories, a text analysis was conducted

within this category. It revealed four themes, of which two are virtually exclusively related to a business sector. These themes are content production, highlighted in the communication and media sector, and activities related to the explosion of smartphone use, that are discussed by companies in the telecommunications sector to a great extent. Insofar as these two themes are limited to a specific activity sector, we decided to eliminate the findings. Two other themes emerged from the CEOs discourse. These two themes are more noteworthy, because they are less dependent on the sector (Table 9). The first theme could be called “digital marketing capabilities”. It links the capability to collect masses of data (*cloud, internet of things - IoT, infrastructure, ecosystem, manage, develop, scalable, apps, database*), knowledge of customers (*customer, life, mobility, data*) and product innovation (*innovation, product, service, open innovation*). The second theme is “big data management”. It highlights analysis (*analytics, predictive, analyse*) and data security (*information, security, system, data, transparency*). The latter theme appears to be an inevitable risk factor as firms undergo digital transformation.

Theme “digital marketing capabilities”	Theme “big data management”
<i>Kone will use IBM’s Watson IoT Cloud Platform to collect and store equipment data build applications and develop new solutions in order to create added value to its customers with cloud-based services (Kone)</i>	<i>Historical data meaning compiled information concerning past incidents is continuously fed into our country based Securitas Operation Centers (SOC) during the transition to group wide digital systems the volumes of available historical data will increase exponentially enabling Securitas to analyze and better understand past present and future incidents (Securitas)</i>

Table 9: Recurring themes in the Digital capital category

Category 4 *Environmental capital* stems from the environmental discourse, which most commonly involves more environmentally friendly and energy-efficient production (*production, facility, plant, renewable, project, reduce*) (**Table 10**). This category also addresses the notion of risk management. The firms most represented in this category belong to the manufacturing sector and the energy sector.

Segment	Company
<i>Sandvik mining and rock technology launched battery driven loaders drill rigs and more efficient engines this will enhance the productivity environmental performance and safety of customer operations particularly in remote controlled mining activities.</i>	Sandvik
<i>Which is why it proposes solutions on land and at sea and takes concrete actions to limit land-based pollution meanwhile the group has taken its own transformation up a gear since its launch in 2015.</i>	Suez

Table10: Most characteristic text segments for the Environmental capital category

The text analysis of the *Environmental Capital* category reveals three very distinct themes (Table 11). The first theme is narrowly circumscribed and concerns energy transition (*environmental, transition, energy transition*) with regard to the efforts needed to reduce energy consumption (*reduce, low, energy efficiency, consumption*) and switch to renewable energy sources (*electricity, solar, renewable, alternative*). The second theme addresses the transformation of production tools and processes (*machine, technology, construction, manufacture, design, improve, efficient, monitor*) in order to produce more environmentally friendly products (*safe, ecological, light, recycle*) insofar as it corresponds to market demand (*grow, demand, need, consume, population*). The third theme recounts the alliances forged or being forged (*project, development, joint-venture, acquisition, partnership, partner, announce, unite*) to increase environmental capital rapidly as a strategic move (*strategic, stake, strengthen*) with the aim of deriving business benefits (*success, business, deliver*).

“Energy transition” theme	“Capability to produce environmentally friendly products” theme	“Green alliances” theme
<i>Circular product life cycle alternative solutions such as alternative fuels tractions and remanufacturing that minimize the impact of the product lifecycle by promoting a circular economy renewable energy CO2 and other air emissions are the most material aspects (CNH Industrial)</i>	<i>We introduced a number of innovations in 2016 including specialty materials that help the automotive industry in its quest to make vehicles lighter and safer and a new technology enabling the production of highly concentrated omega 3 fish oil (Koninklijke</i>	<i>Acquisitions completed in 2016 include Accutest laboratories in the USA the fifth largest full service environmental testing company in the United States Bateman projects in Africa specialists in process plant design and site engineering services (SGS)</i>

Table 11: Recurring themes in the Environmental Capital category

In conclusion, the text analysis of CEOs’ letters to shareholders shows a four-category classification, in which two categories had already been identified (human capital and customer capital) and two are new (digital capital and environmental capital). A more

granular analysis of the discourse made it possible to qualify the themes addressed in each category. The findings are summarised in **Figure 5**.

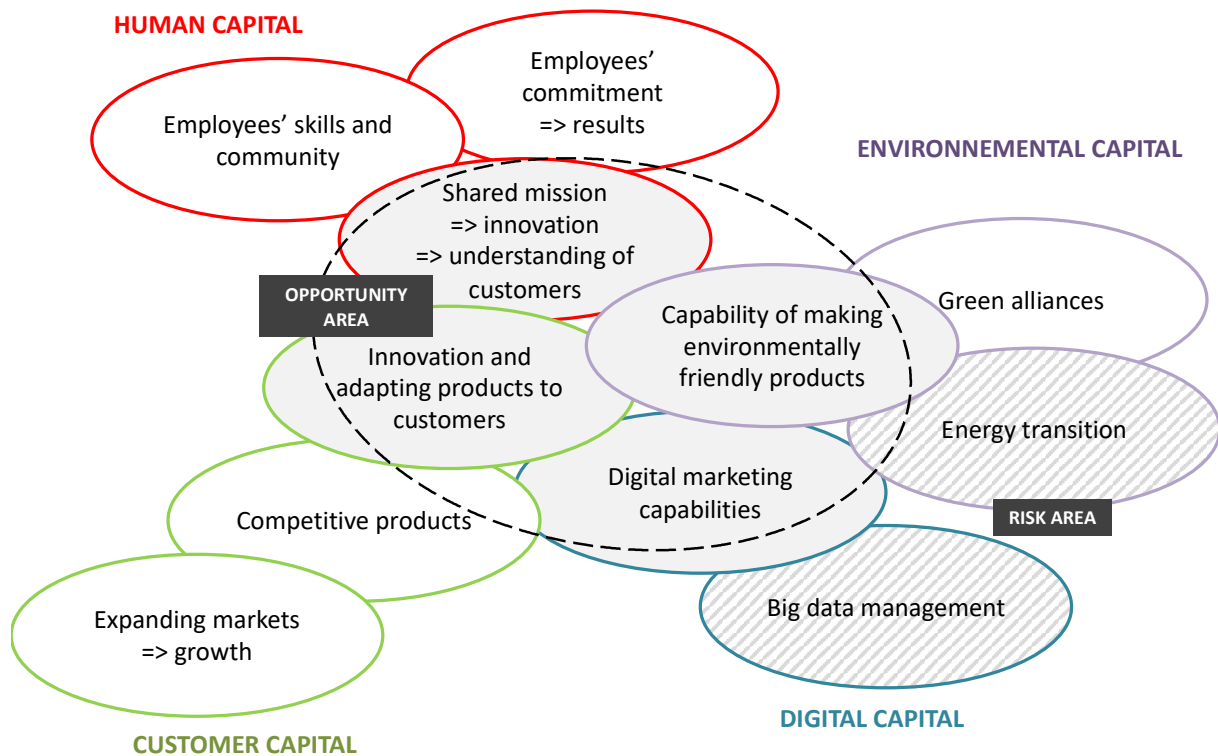


Figure 5: The intellectual capital themes addressed by CEOs

This figure shows that the types of capital identified are clearly distinct, but that each type helps to show the firm’s innovation capability based on a refined understanding of consumers (opportunity area). The discourse is also meant to reassure stakeholders that risks have been identified and managed (risk area). CEOs also highlight the organisational resources used to develop opportunities and mitigate risks (employees’ commitment and skills, green alliances, competitiveness).

5 Discussion: contribution and limitations

The models presented in the previous literature take for granted that intellectual capital is classified into three components (Inkinen et al., 2017; Martin de Castro et al., 2011): human capital, structural capital and relational/customer capital. However, our analysis of CEOs’ discourse shows four components, as indicated in Figure 5. At first glance, our findings confirm the existence of certain components in the previous three-part classifications, such as human capital and customer capital, but their content does not always match that of the previous classifications. At a more fundamental level, the relationships between the components are different and two components—environmental capital and digital capital—seem to be growing in importance. In

contrast, some other components, such as structural capital, seem to have disappeared. Therefore, we are proposing quite a substantial recasting of the classifications.

5.1 Human capital and customer capital are two enduring categories

Human capital is considered to be a key component of intellectual capital and was systematically highlighted in the earliest classifications (Brooking, 1996; Edvinsson & Malone, 1997; Stewart, 1997; Sveiby, 1997a). The concept of human capital was popularised by the work of the Chicago School economists (Becker, 1975; Schultz, 1961), and presented by the “resource-based” view of the firm (Barney, 1991; Wernerfelt, 1984) as a rare and inimitable source of competitive advantage. The literature converged on a definition of human capital that broke it down into a set of knowledge, know-how and behaviour (Martin de Castro et al., 2011, p. 656). Our research confirms that human capital holds a central place in the classification of intellectual capital. More specifically, it is always subject to the same discursive enthusiasm, with CEOs’ discourse making strong references to commitment and talent. Our findings show that the definition of human capital is changing however. It is now seen as the firm’s capability to create an environment that fosters the development of collective work and where employees feel committed and develop their skills to serve a mission that they all understand and share. This is not a surprising finding, since we know that, by its very nature, human capital is something that the firm cannot “own”. Disclosure of something that could never be reported on the balance sheet makes a great deal of sense, when we consider its contribution to value creation. On the other hand, human capital is no longer just knowledge, know-how and behaviour. In this case, it also includes commitment to values and to the social environment. These are two characteristics usually found in organisational capital/structural capital (Martin de Castro et al., 2011), which is not one of the components included in our classification (see above). Therefore, the new conception of human capital shows the persistence of a category that had already been identified, as well as changes in the boundaries between the components.

Our findings also confirm the importance of a second category, **customer capital**. It is found in many classifications and is the most codified part of relational capital (Bontis, 1996; Edvinsson & Malone, 1997; Stewart, 1997). CEOs’ letters speak of revenue growth and optimising production processes, but they also mention the firm’s capability to satisfy consumer expectations. These themes are predominant in CEOs’ discourse, which may stem from the fact that customer capital will provide their firm with a competitive advantage and may even guarantee the future of their business to some extent. Under the circumstances, we define customer capital as a firm’s capability to conquer new markets by developing competitive and innovative products based on a deep understanding of customers’ expectations.

5.2 Environmental capital and digital capital: two emerging categories

Our findings show that two components have been preserved, even though their content has changed, and two new categories have emerged.

First of all, the **environmental capital** component revealed by our research seems to be a new finding that has not been proposed in previous research, or at least not to our knowledge. CEOs seem to be concerned about disclosure of their production systems, polluting activities and their related risks. The point of view here is risk prevention and a desire to reassure shareholders, but the financial point of view on “green” strategies that could constitute a competitive advantage is also present. We can define environmental capital as the firm’s capability to transform the increasing scarcity of natural resources into an opportunity by managing energy transition, modernising production equipment and launching the ecological products that the markets expect.

This emerging intangible capital category probably stems from the pressure put on major firms in recent years to make them accountable for the environmental impact of their business. Since 2000, various actions have been taken, particularly in Europe, to stimulate a dialogue about corporate social responsibility (CSR). European Directive 2014/95/EU on non-financial reporting (“non-financial and diversity information), called the CSR Directive, was passed in 2014, transposed into the domestic laws of most European countries in 2017 and applied to reporting periods starting on or after 1 January 2017. The Directive replaces the CSR report with a “non-financial performance statement”. At the global level, the *Task Force on Climate Disclosure (TCFD)*, a working group that the G20 set up to develop a common financial transparency framework for climate matters has issued its recommendations. Keeping in mind that the companies in our sample are not yet subject to this requirement and that the analysis used the CEOs’ letters from the 2016 annual reports, this new discourse about intellectual capital may be seen as a trend that is consistent with political concerns that were expressed vigorously at COP21.

The other emerging component, **digital capital**, is the result of splitting relational capital into two categories¹⁶. Relational capital is not a new component, but it is the intellectual capital component that is the least well explored (Martin de Castro et al., 2011), because it is the most difficult to codify (Bontis, 1998). It is generally subsumed into customer relationships (Bontis, 1998; Edvinsson & Malone, 1997; Kaplan & Norton, 1992), which our research confirms as a sub-category (see below). As Martin de Castro et al (2011) note, however, this view is too narrow. Our findings confirm this, since a more refined analysis, with a four-category classification, can be used to split relational capital into two components so that digital capital emerges. Digital capital can be defined as the firm’s capability to collect, analyse and secure massive amounts of data. The advent of digital technology is a key and widely publicised characteristic

¹⁶ The other category is customer capital.

of the contemporary economy (Rifkin, 2011). Therefore, it is hardly surprising to see this category of intellectual capital emerge in the CEOs' discourse. Even though our findings reveal that some of these themes are specific to a given sector (communication and telecommunications in particular), further analysis shows that the discourse about digital transformation of organisation (*digital marketing capabilities*) and the capability to collect large amounts of data (*big data management*), are a widespread concern. These themes are completely absent from existing classifications.

Ultimately, the two emerging categories, **environmental capital** and **digital capital**, refer to contemporary themes and lend credence to the authors calling for improving three-component classifications that are deemed to be overly simplistic "rough categorisation" (Inkinen et al., 2017, p. 1163) or obsolete. This new classification can be used to take a fresh look at the structure of intellectual capital that is more in phase with the economic and social developments of the last twenty years, as called for by De Castro et al.: "*the new social and economic trends justify an effort in improving previous proposals*" (2011, p. 652).

5.3 Reallocating structural capital

The biggest gap in our classification seems to be structural capital. This capital is defined as what is left at the office, after the employees have gone home (Edvinsson & Malone, 1997). The literature breaks it down into two sub-categories (Martin de Castro et al., 2011): one related to organisational capital and the other to technological capital.

This decomposition can be used to explain this gap and find the traces of structural capital in the other categories revealed by our research. Technological capital, meaning R&D activities, patents, software and intellectual property rights more generally speaking, is truly absent from CEOs' discourse. This is hardly surprising, since they are now recognised in the accounts under IAS 38 on intangible assets (IAS 38, 1998, revision 2008). Therefore, there is no point in disclosing these elements in the letters to shareholders.

On the other hand, organisational capital components are still useful, and they are split between human capital when they refer to commitment to cultural values or the social climate, and digital capital when they refer to information and telecommunication capability.

These findings are consistent with the overflow hypothesis of Mouritsen (2003b, p. 21), which states that one of the key characteristics of intellectual capital components is their entanglement with each other. They are more frequently entangled than intangible assets, for the latter have less blurred boundaries and are reported in the accounts using accepted valuations. Furthermore, intellectual capital components are entangled with tangible assets, as is the case for environmental capital, which refers to knowledge about the firm's optimum management of environmental issues, along with the physical infrastructure required to deploy these practices. Such entanglements

between the different intellectual capital components and intangibles and between intangibles and tangible assets make the issue of their financial disclosure all the more urgent, especially with regard to standards to make such disclosure more useful.

As intangible capital components contribute more and more to firms' value creation, the accounting distinction between intangible assets and intellectual capital components is brought into question. For example, Gröjer (2001) calls for an inventory of the intellectual capital components used by firms in order to facilitate interpretation of these components. In keeping with his recommendations, our classification is based on the firms' discourse to enhance our knowledge of intellectual capital components without any a priori theoretical framework to dictate its structure and without any dependence on specific business sectors. Analysis of firms' discursive practices should enable us to fill in the gaps of the financial disclosure spectrum beyond the mere accounting of assets and liabilities defined by the conceptual framework, by extending it to elements that contribute to value creation without meeting the rigorous requirements of this text. This classification provides a better reflection of firms' business activity and their discourse about it, both by highlighting new components and by redefining previously identified components, thereby confirming a posteriori the value of updating the existing classifications.

5.4 Limitations and outlook

In addition to the familiar semantic registers relating to strategy, finance and governance, intellectual capital is the only other subject of disclosure in the financial report, which confirms the relevance of our analysis of letters to shareholders. However, there are some limitations. The CEOs' letters are part of the firms' communication aimed primarily at shareholders. Furthermore, the firms' actual practices may not always match the CEOs' discourse completely.

Our research could be expanded in various ways. The research could be duplicated over time to analyse changes in CEOs' discourse about intangible capital components. It would also be helpful to test this classification by repeating the research on a different sample to see if our findings could be put to general use. For example, it would be interesting to expand the analysis to letters written in the context of other standards (e.g. FASB) to see if the same components appear. From another perspective, analysing less institutional discourse, such as tweets, could also help ascertain whether the media has an influence on the content. It could be useful to take a more managerial approach in which managers' opinions of the findings are sought to see if there are any discrepancies between CEOs' discourse and managers' perceptions. Are the perceived focal points the same ones used for disclosures? Finally, case studies of firms where digital capital and environmental capital, which are the emerging components shown by our research, are overrepresented could lead to a more thorough understanding of this new disclosure practice.

6 Conclusion

The purpose of our research was to propose a new intangible capital classification using an inductive approach that relies on an analysis of disclosure practices. As part of the third stage of intellectual capital research, we diverge from the previous classifications, most of which were developed a priori and in a different economic and social context.

We also diverge from the existing models in terms of the approach used in our research. Most intellectual capital research uses an organisational approach to provide tools for running firms and guidance for managers. Our research is more a part of the discussion initiated by the international standards body to guide financial disclosures (IASB, 2017) in order to make them more relevant and increase the usefulness of financial statements. More specifically, we analysed such disclosures, which are deemed to be critical for investors and analysts (Castilla-Polo & Gallardo-Vazquez, 2016a), by looking at the CEOs' discourse.

We also diverge from the existing research by conducting an empirical analysis of disclosure practices, based on a sample of international corporations, without any prior selection by sector. The findings of our text analysis of 241 letters by CEOs' from S&P Euro 350 companies were used to redefine the boundaries and content of the existing classifications.

The intangible capital disclosures of the companies in the sample, beyond the disclosure requirements concerning intangibles reported on balance sheets, is organised around four types of capital: human capital, digital capital, customer capital and environmental capital. Two of these categories, human capital and customer capital, were already present in the previous classifications, but our findings showed the emergence of two new categories, environmental capital and digital capital. The technological component of structural capital is absent. Its organisational component has been split between human capital and digital capital.

Ultimately, our classification can be used to review the classifications developed in another economic and social context. Nearly twenty years after the first attempts to capture intellectual capital, our classification can be used to highlight the pervasiveness of environmental and digital issues that are specific to the third wave of the industrial revolution. A proposal for a disclosure standard for these items, which are critical for value creation, based on the different intellectual capital categories will make it possible to address the new dimensions of this economic context, thereby contributing to the usefulness of financial statements.

References

- Abeysekera, I. (2016). Does the classification of intangibles matter? An equivalence testing. *Advances in Accounting*, 35, 135–142. <https://doi.org/10.1016/j.adiac.2016.02.003>
- Abrahamson, E., & Amir, E. (1996). The information content of the president's letter to shareholders. *Journal of Business Finance & Accounting*, 23(8), 1157–1182.
- Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120.
- Bart, D. (2011). L'analyse de données textuelles avec le logiciel Alceste. *Recherches En Didactiques*, 12, 173–184.
- Barth, M. E., Clement, M. B., Foster, G., & Kasznick, R. (1998). Brand values and capital market valuation. *Review of Accounting Studies*, 3(1–2), 41–68.
- Becker, G. (1975). *Human capital: A theoretical and empirical analysis with special reference to education* (National Bureau of Economic Research). New York.
- Becker-Blease, J. R., & Paul, D. L. (2010). Does Inclusion in a Smaller S&P Index Create Value? *Financial Review*, 45(2), 307–330. <https://doi.org/10.1111/j.1540-6288.2010.00249.x>
- Beldi, A., Chastenet, E., Dupuis, J.-C., & Talfi, M. (2010). Pertinence des méthodes d'évaluation financière des marques. Une étude empirique internationale. *Revue française de gestion*, 36(207), 153–168. <https://doi.org/10.3166/rfg.207.153-168>
- Bessieux-Ollier, C., Schatt, A., Walliser, E., & Zeghal, D. (2014). La reconnaissance du capital immatériel : quels enjeux pour l'évaluation des entreprises ? *Management International*, 18(3), 12-19.
- Bessieux-Ollier, C., & Walliser, E. (2010). Le capital Immatériel : Etat des lieux et perspectives. *Revue Française de Gestion*, 208(8), 85–92.
- Bildik, R., & Gülay, G. (2008). The effects of changes in index composition on stock prices and volume: Evidence from the Istanbul stock exchange. *International Review of Financial Analysis*, 17(1), 178–197. <https://doi.org/10.1016/j.irfa.2006.10.002>
- Bontis, N. (1996). There's a Price on Your Head: Managing Intellectual Capital Strategically. *Business Quarterly*, 60, 40–78.
- Bontis, N. (1998). Intellectual capital: an exploratory study that develops measures and models. *Management Decision*, 36(2), 63–76.
- Bournois, F., & Point, S. (2006). A letter from the president: seduction, charm and obfuscation in French CEO letters. *Journal of Business Strategy*, 27(6), 46–55.

- Brooking, A. (1996). *Intellectual Capital. Core Asset for the Third Millenium Enterprise*. London.
- Camfferman, K., & Zeff, S. A. (2007). *Financial Reporting and Global Capital Markets - A History of the International Accounting Standards Committee, 1973-2000*. Oxford: Oxford University Press.
- Castilla-Polo, F., & Gallardo-Vazquez, D. (2016). The main topics of research on disclosures of intangible assets: a critical review. *Accounting, Auditing & Accountability Journal*, 29(2), 323–356.
- Cazavan-Jeny, A. (2004). Le ratio market-to-book et la reconnaissance des immatériels – une étude du marché français. *Comptabilité - Contrôle - Audit*, Tome 10(2), 99–124.
- Cazavan-Jeny, A., & Jeanjean, T. (2005). Pertinence de l'inscription à l'actif des frais de R&D: une étude empirique. *Comptabilité - Contrôle - Audit*, 11(1), 5. <https://doi.org/10.3917/cca.111.0005>
- Chatzkel, J. (2004). Moving through the crossroads (Commentary). *Journal of Intellectual Capital*, 5(2), 337–349.
- Chekkar, R., & Onnée, S. (2006). Les discours managériaux dans le processus de communication financière: une analyse longitudinale du cas Saint-Gobain. *Entreprises et histoire*, (42), 46–63. <https://doi.org/10.3917/eh.042.0046>
- Cohen, D. (2006). *Trois leçons sur la société post-industrielle*. Paris: Le Seuil.
- Collins, M. C., & Wansley, J. W. (1995). Price and Volume Effects Associated with the Creation of Standard and Poor's Midcap Index. *Journal of Financial Research*, 18(3), 329.
- Corrado, C., Hulten, C., & Sichel, D. (2005). *Measuring Capital in the New Economy*. University of Chicago Press.
- David, P. A., & Foray, D. (2003). Economic Fundamentals of the Knowledge Society. *Policy Futures in Education*, 1(1), 20–49.
- Dean, A., & Kretschmer, M. (2007). Can Ideas be Capital? Factors of Production in the Postindustrial Economy: A Review and Critique. *Academy of Management Review*, 32(2), 573–594.
- Depoers, F. (2000). L'offre volontaire d'information des sociétés cotées: concept et mesure. (French). *Comptabilité Contrôle Audit*, 6(2), 115–131. <https://doi.org/Article>
- Disle, C., & Janin, R. (2015). La qualité de la communication financière sur le goodwill en IFRS. Pratiques et déterminants du reporting des sociétés du SBF 120 en 2010-2011. *Revue française de gestion*, 249(4), 113–131. <https://doi.org/10.3166/RFG.249.113-131>

do Rosario-Cabrita, M., & Bontis, N. (2008). Intellectual Capital and Business Performance in the Portuguese Banking Industry. *International Journal of Technology Management*, 2008(43), 1–3.

Dumas, G., & Martinez, I. (2015). IAS 38 et activation des dépenses de développement. Comptabilisation opportuniste ou informative ? *Revue française de gestion*, 249(4), 93–111. <https://doi.org/10.3166/RFG.249.93-111>

Dumay, J., & Garanina, T. (2013). Intellectual capital research: a critical examination of the third stage. *Journal of Intellectual Capital*, 14(1), 10–25.

Edvinsson, L. (1997). Developing Intellectual Capital at Skandia. *Long Range Planning*, 30(3), 366–373.

Edvinsson, L., & Malone, M. (1997). *Intellectual Capital Realizing Your Company's True Value by Finding Its Hidden Brainpower*. New York: Harper Collins Publishers, Inc.

Erikson, T. (2002). Entrepreneurial capital: the emerging venture's most important asset and competitive advantage. *Journal of Business Venturing*, 17(3), 275–290.

Fustec, A. (2011). *Thesaurus-Bercy : Référentiel français de mesure de la valeur extra-financière et financière du capital immatériel des entreprises*. Paris: Ministère de l'Economie, des Finances et de l'Industrie.

Gröjer, J.-E. (2001). Intangibles and accounting classifications: in search of a classification strategy. *Accounting, Organizations and Society*, 26(7), 695–713. [https://doi.org/10.1016/S0361-3682\(01\)00023-X](https://doi.org/10.1016/S0361-3682(01)00023-X)

Guthrie, J., Ricceri, F., & Dumay, J. (2012). Reflections and projections: A decade of intellectual capital accounting research. *The British Accounting Review*, 44(2), 68–82.

Holland, J. (2003). Intellectual Capital and the Capital Market - Organisation and Competence. *Accounting, Auditing & Accountability Journal*, 16(1), 39–48.

Hsu, L. C., & Wang, C.-H. (2012). Clarifying the Effect of Intellectual Capital on Performance: The Mediating Role of Dynamic Capability. *British Journal of Management*, 23(2), 179–205.

IASB. Immobilisations incorporelles, Pub. L. No. 1126/2008, IAS 38 22 (2008). Retrieved from <http://www.focusifrs.com/content/view/full/4387>

IASB. (2010). *Management Commentary: a framework for presentation*. Londres: IFRS.

IASB. (2017, March). Disclosure Initiative - Principles of Disclosure. IFRS Foundation.

IASB. (2018a, March). Conceptual Framework for Financial Reporting. IFRS Foundation.

IASB. (2018b, June). Staff paper - Disclosure Initiative : Principles of Disclosure. IFRS Foundation.

IIRC. (2011). *Towards integrated reporting communication value in the 21st century*. Available at: www.theiirc/international-ir-framework.

Illia, L., Sonpar, K., & Baur, M. W. (2014). Applying Co-occurrence Text Analysis with ALCESTE to Studies of Impression Management. *British Journal of Management*, 2(25), 352–372.

Inkinen, H., Kianto, A., Vanhala, M., & Ritala, P. (2017). Structure of Intellectual Capital - An International Comparison. *Accounting, Auditing & Accountability Journal*, 30(5), 1160–1183.

Jacquot, T. (1998). *Discours stratégique et Stratégie du discours des dirigeants d'entreprise* (Thèse de Doctorat en Sciences de Gestion). Versailles Saint Quentin.

Jacquot, T., & Point, S. (2000). Le management symbolique des ressources humaines: Une analyse des dirigeants en Europe. *Revue de Gestion Des Ressources Humaines*, 38, 116–132.

Kaplan, R., & Norton, D. (1992). The balanced scorecard: measure that drive performance. *Harvard Business Review*, 70(1).

Kaplan, R. S., & Norton, D. P. (2001). Transforming the Balanced Scorecard from Performance Measurement to Strategic Management (Part1). *Accounting Horizons*, 15(1), 87–104.

Kaplan, Robert, & Norton, D. (1992). The balanced scorecard: measure that drive performance. *Harvard Business Review*, 70(1).

Kaufmann, L., & Schneider, Y. (2004). Intangibles: A synthesis of current research. *Journal of Intellectual Capital*, 5(3), 366–388.

Kianto, A., Hurmelinna-Laukkanen, P., & Ritala, P. (2010). Intellectual capital in service- and product-oriented companies. *Journal of Intellectual Capital*, 11(3), 305–325.

KPMG. (2012). *Integrated reporting: performance insight through better business reporting* (Integrated Reporting). KPMG.

Lenormand, G., & Touchais, L. (2008). La pertinence des actifs incorporels avec les IFRS. *Finance Contrôle Stratégie*, 11(2), 173–201.

Lev, B. (2001). *Intangibles: management, measurement, and reporting*. Washington, D.C.: The Brookings Institution.

Lev, B., Radhakrishnan, S., & Zhang, W. (2009). Organization Capital. *Abacus*, 45(3), 275–298.

- Marr, B., & Chatzkel, J. (2004). Intellectual capital at the crossroads: managing, measuring, and reporting of IC. *Journal of Intellectual Capital*, 5(2), 224–229.
- Marr, B., Gray, D., & Neely, A. (2003). Why do firms measure their intellectual capital? *Journal of Intellectual Capital*, 4(4).
- Martin de Castro, G., Delgado-Verde, M., Lopez-Saez, P., & Navas-Lopez, J. (2011). Towards an “Intellectual Capital-Based View of the Firm”; Origins and Nature. *Journal of Business Ethics*, 98(4), 649–662.
- Martinez-Torres, M. R. (2006). A Procedure to Design a Structural and Measurement Model of Intellectual Capital: An Exploratory Study. *Information and Management*, 43(5), 617–626.
- Mayaffre, D. (2014). *Plaidoyer en faveur de l'Analyse de Données co(n)Textuelles. Parcours cooccurrentiels dans le discours préseidentiel français (1958-2014)*. Proceedings presented at the 12th International Conference on Textual Data Statistical Analysis, Paris.
- Meritum. (2002). *Guidelines for Managing and Reporting on Intangibles (Intellectual Capital Report)*. Madrid: Fundacion Airtel.
- Mouritsen, J. (1995). European Financial Reporting-Denmark. *Accounting, Auditing & Accountability Journal*, 8(5), 94.
- Mouritsen, J. (2003). Intellectual capital and the capital market: the circulability of the intellectual capital. *Accounting, Auditing & Accountability Journal*, 16(1), 18–30.
- Mouritsen, J. (2006). Problematizing intellectual capital research: ostensive versus performative IC. *Accounting, Auditing & Accountability Journal*, 19(6), 820–841.
- Mouritsen, J., & Roslender, R. (2009). Critical Intellectual Capital. *Critical Perspectives on Accounting*, 20(7), 801–803.
- Murthy, V., & Mouritsen, J. (2011). The performance of intellectual capital: Mobilising relationships between intellectual and financial capital in a bank. *Accounting, Auditing & Accountability Journal*, 24(5), 622–646.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242–266.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company*. New York.
- Normand, R., & Garon, R. (2013). Etude comparative des logiciels d'aide à l'analyse de données qualitatives: de l'approche automatique à l'approche manuelle. *Recherches Qualitatives*, 154.
- OCDE. (2008). *Actifs immatériels et création de valeur* (Réunion du conseil de l'OCDE au niveau ministériel). OCDE.

OCDE. (2013). *New sources of growth: Knowledge-Based Capital - Key analyses and policy conclusions* (Synthesis report). OCDE.

Osborne, J. D., Stubbart, C. I., & Ramaprasad, A. (2001). Strategic Groups and Competitive Enactment: A Study of Dynamic Relationships Between Mental Models and Performance. *Strategic Management Journal*, 22(5), 435–454.

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

Piette, I., & Rouleau, L. (2008). Le courant discursif en théorie des organisations: un état des lieux. *Cahier de Recherche Du GÉPS*, 2(2).

Platet, F., & Giordano-Spring, S. (2011). Des entreprises responsables : à l'égard de qui et à quel propos ? Une étude du message du Président de sociétés cotées françaises. *Management & Avenir*, (45), 62–79. <https://doi.org/10.3917/mav.045.0062>

Plattet-Pierrot, F. (2009). *L'information financière à la lumière d'un changement de cadre conceptuel comptable : Etude du message du Président des sociétés cotées françaises*. Université de Montpellier 1, Montpellier.

Point, S. (2007). L'art de gérer les impressions dans les lettres des dirigeants. *Revue Française de Gestion*, 3(172), 33–48.

Point, S., & Trébucq, S. (2015). “Accountability” or providing an “account”. The example of the SBF 120 CEOs. *Revue Française de Gestion*, 41(247), 27–44.

Pupion, P.-C., Leroux, E., Latouille, J.-J., & Paumier, A. (2006). Vers un nouveau mode de gestion de l'Education nationale inspiré des enseignements des théories de l'agence et des parties prenantes. *Politiques et Management Public*, 2(24), 41–68.

Reed, K. K., Lubatkin, M., & Srinivasan, N. (2006). Proposing and Testing an Intellectual Capital-Based View of the Firm. *Journal of Management Studies*, 43(4), 867–893.

Reinert, M. (1983). Une méthode de classification descendante hiérarchique: application à l'analyse lexicale par contexte. *Les Cahiers de l'analyse de Données*, 2(8), 187–198.

Reinert, M. (1986). Un logiciel d'analyse lexicale. *Les cahiers de l'analyse de données*, 4(11), 471–481.

Reinert, M. (1987). Classification Descendante Hiérarchique et analyse lexicale par contexte - Application au corpus des poésies d'A.Rimbaud. *Bulletin of Sociological Methodology*, 1(13), 53–90.

Reinert, M. (2001). Alceste, une méthode statistiques et sémiotique d'analyse du discours: application aux “Rêveries du promeneur solitaire.” *Revue Française de Psychiatrie et de Psychologie Médicale*, 5(49), 32–36.

Ricol Lasteyrie - EY. (2018). *Profil financier du CAC 40* (No. 12e édition).

Rifkin, J. (2011). *The third revolution: how lateral power is transforming energy, the economy and the world* (Palgrave MacMillan).

Roos, G., & Roos, J. (1997). Measuring your Company's Intellectual Performance. *Long Range Planning*, 30(3), 413–426.

Schultz, T. W. (1961). Investment in human capital. *American Economic Review*, 51(1), 1–17.

Stewart, T. A. (1997). *Intellectual Capital: The New Wealth of Organization*. New York.

Subramaniam, M., & Youndt, M. A. (2005). The Influence of Intellectual Capital on the Types of Innovative Capabilities. *Academy of Management Journal*, 48(3), 450–463.

Sveiby, K. E. (1997). The Intangible Assets Monitor. *Journal of Human Resource Costing & Accounting*, 2(1), 73–97.

Tayles, M., Pike, R. H., & Sofian, S. (2007). Intellectual capital, management accounting practices and corporate performance. *Accounting, Auditing & Accountability Journal*, 20(4), 522–548.

von Krogh, G., Ichijo, K., & Nonaka, I. (2000). *Enabling Knowledge Creation*. Oxford: Oxford University Press. Retrieved from <https://global.oup.com/academic/product/enabling-knowledge-creation-9780195126167?cc=fr&lang=en>

Wernerfelt, B. (1984). A Resource-Based View of the Firm. *Strategic Management Journal*, 5(2), 171–180.

Yuthas, K., Rogers, R., & Dillard, J. F. (2002). Communicative action and corporate annual reports. *Journal of Business Ethics*, 41(2), 141–157.

Zeghal, D., & Maaloul, A. (2011). The accounting treatment of intangibles - A critical review of the literature. *Accounting Forum*, 35(4), 262–274.

Appendix 1: The Index as of 31 December 2016

Bloomberg code	Name	Bloomberg code	Name
IIILN	3I GROUP PLC	KINVBSS	KINNEVIK AB - B
ABBNVX	ABB LTD-REG	LIFP	KLEPIERRE
ABESQ	ABERTIS INFRAESTRUCTURAS	KNEBVFH	KONE OYJ-B
ABNNA	ABN AMRO GROUP NV-CVA	ADNA	DELHAIZE GROUP
ANASQ	ACCIONA SA	DSMNA	KONINKLIJKE DSM NV
ACFP	ACCOR SA	KPNNA	KONINKLIJKE KPN NV
ACSSQ	ACS ACTIVIDADES	PHIANA	KONINKLIJKE PHILIPS NV
ADENVX	ADECCO GROUP AG-REG	KNIN VX	KUEHNE + NAGEL INTL AG-
ADSGY	ADIDAS AG	ORFP	L'OREAL
AGNNA	AEGON NV	LHNVX	LAFARGEHOLCIM LTD-REG
AENASQ	AENA SME SA	MMBFP	LAGARDERE SCA
AGSBB	AGEAS	LANDLN	LAND SECURITIES GROUP
AGKLN	AGGREKO PLC	LXSGY	LANXESS AG
AIFP	AIR LIQUIDE SA	LGENLN	LEGAL & GENERAL GROUP
AIRFP	AIRBUS SE	LRFP	LEGRAND SA
AKZANA	AKZO NOBEL	LDOIM	LEONARDO SPA
ALFASS	ALFA LAVAL AB	LINGY	LINDE AG
ALVGY	ALLIANZ SE-REG	LLOYLN	LLOYDS BANKING GROUP
ALOPF	ALSTOM	LSELN	LONDON STOCK EXCHANGE
ATCNA	ALTICE NV - A	LONNVX	LONZA GROUP AG-REG
ATCBNA	ALTICE NV - B	LUXIM	LUXOTTICA GROUP SPA
AMSSQ	AMADEUS IT GROUP SA	MCFP	LVMH MOET HENNESSY
AALLN	ANGLO AMERICAN PLC	EMGLN	MAN GROUP PLC
ABIBB	ANHEUSER-BUSCH INBEV	MANGY	MAN SE
ANTOLN	ANTOFAGASTA PLC	MHGNO	MARINE HARVEST
MAERSKADC	AP MOELLER-MAERSK A/S-A	MKSLN	MARKS & SPENCER GROUP
MAERSKBDC	AP MOLLER-MAERSK A/S-B	MBIM	MEDIOBANCA SPA
MTNA	ARCELORMITTAL	MRKGY	MERCK KGAA

Bloomberg code	Name	Bloomberg code	Name
AKEFP	ARKEMA	B4BGY	METRO AG
AHTLN	ASHTREAD GROUP PLC	METSOFH	METSO OYJ
ASMLNA	ASML HOLDING NV	MLFP	MICHELIN (CGDE)
ASSABSS	ASSA ABLOY AB-B	MCROLN	MICRO FOCUS INTERN.
GIM	ASSICURAZIONI GENERALI	MICSS	MILLICOM INTL CELLULAR-
ABFLN	ASSOCIATED BRITISH FOODS PLC	MNDILN	MONDI PLC
AZNLN	ASTRAZENECA PLC	MUV2GY	MUENCHENER RUECKVER
ATLIM	ATLANTIA SPA	NG/LN	NATIONAL GRID PLC
ATCOASS	ATLAS COPCO AB-A SHS	NESNVX	NESTLE SA-REG
ATCOBSS	ATLAS COPCO AB-B SHS	NXTLN	NEXT PLC
ATOFP	ATOS SE	NNNA	NN GROUP NV
AV/LN	AVIVA PLC	NOKIAFH	NOKIA OYJ
CSFP	AXA SA	NRE1VFH	NOKIAN RENKAAT OYJ
BABLN	BABCOCK INTL GROUP PLC	NDASS	NORDEA BANK AB
BA/LN	BAE SYSTEMS PLC	NHYNO	NORSK HYDRO ASA
BALNVX	BALOISE HOLDING AG - REG	NOVNVX	NOVARTIS AG-REG
BBVASQ	BANCO BILBAO VIZCAYA	NOVOBDC	NOVO NORDISK A/S-B
BAMIIM	BANCO BPM SPA	NZYMBDC	NOVOZYMES A/S-B SHARES
SABSQ	BANCO DE SABADELL SA	OMLLN	OLD MUTUAL PLC
SANSQ	BANCO SANTANDER SA	OMVAV	OMV AG
BIRGID	BANK OF IRELAND GROUP PLC	ORAFP	ORANGE
BKIASQ	BANKIA SA	ORKNO	ORKLA ASA
BARCLN	BARCLAYS PLC	OSRGY	OSRAM LICHT AG
BDEVLN	BARRATT DEVELOPMENTS PLC	PPBID	PADDY POWER BETFAIR
BASGY	BASF SE	PNDORADC	PANDORA A/S
BAYNGY	BAYER AG-REG	PGHNVX	PARTNERS GROUP HOLD.
BMWGY	BAYERISCHE MOTOREN WERKE	PSONLN	PEARSON PLC
BMW3GY	BAYERISCHE MOTOREN WERKE-	RIFP	PERNOD RICARD SA

Bloomberg code	Name	Bloomberg code	Name
BEIGY	BEIERSDORF AG	PSNLN	PERSIMMON PLC
BLTLN	BHP BILLITON PLC	UGFP	PEUGEOT SA
BNPFP	BNP PARIBAS	PAH3GY	PORSCHE AUTOMOBIL
BOLSS	BOLIDEN AB	PSMGY	PROSIEBENSAT.1 MEDIA
ENFP	BOUYGUES SA	PROXBB	PROXIMUS
BP/LN	BP PLC	PRULN	PRUDENTIAL PLC
BNRGY	BRENNTAG AG	PRYIM	PRYSMIAN SPA
BATSLN	BRITISH AMERICAN TOBACCO	PUBFP	PUBLICIS GROUPE
BLNDLN	BRITISH LAND CO PLC	QIAGY	QIAGEN N.V.
BT/ALN	BT GROUP PLC	RRSLN	RANDGOLD RESOURCES
BNZLLN	BUNZL PLC	RANDNA	RANDSTAD HOLDING NV
BRBYLN	BURBERRY GROUP PLC	RB/LN	RECKITT BENCKISER
CABKSQ	CAIXABANK S.A	REESQ	RED ELECTRICA
CAPFP	CAPGEMINI SE	RENNA	RELX NV
CPILN	CAPITA PLC	RELLN	RELX PLC
CARLBDC	CARLSBERG AS-B	RNOFP	RENAULT SA
CCLLN	CARNIVAL PLC	RTOLN	RENTOKIL INITIAL PLC
CAFP	CARREFOUR SA	REPSQ	REPSOL SA
COFP	CASINO GUICHARD PERRACHON	RIOLN	RIO TINTO PLC
CNALN	CENTRICA PLC	ROGVX	ROCHE HOLDING AG-
LISPSE	CHOCOLADEFABRIKEN LINDT-	RR/LN	ROLLS-ROYCE HOLDINGS
LISNSE	CHOCOLADEFABRIKEN LINDT-	RBSLN	ROYAL BANK SCOTLAND
CHRDC	CHR HANSEN HOLDING A/S	RDSALN	ROYAL DUTCH SHELL
CDIFP	CHRISTIAN DIOR SE	RDSBLN	ROYAL DUTCH SHELL
CFRVX	CIE FINANCIERE RICHEMONT-	RSALN	RSA INSURANCE GROUP
CLNVX	CLARIANT AG-REG	RWEGY	RWE AG
CNHIIM	CNH INDUSTRIAL NV	RYAID	RYANAIR HOLDINGS PLC
COBLN	COBHAM PLC	SAFFP	SAFRAN SA
COLOBDC	COLOPLAST-B	SGELN	SAGE GROUP PLC/THE

Bloomberg code	Name	Bloomberg code	Name
COLRBB	COLRUYT SA	SBRYLN	SAINSBURY (J) PLC
CBKGY	COMMERZBANK AG	SPMIM	SAIPEM SPA
SGOFF	COMPAGNIE DE SAINT GOBAIN	SAMPOFH	SAMPO OYJ-A SHS
CPGLN	COMPASS GROUP PLC	SANDSS	SANDVIK AB
CONGY	CONTINENTAL AG	SANFP	SANOFI
ACAFF	CREDIT AGRICOLE SA	SAPGY	SAP SE
CSGNVX	CREDIT SUISSE GROUP AG-REG	SCHNSE	SCHINDLER HOLDING AG-REG
CRHID	CRH PLC	SCHPVX	SCHINDLER HOLDING-PART
DMGTLN	DAILY MAIL&GENERAL TST-A	SUFP	SCHNEIDER ELECTRIC SE
DAIGY	DAIMLER -REGISTERED SHARES	SDRLN	SCHRODERS PLC
BNFP	DANONE	SECUBSS	SECURITAS AB-B SHS
DANSKEDC	DANSKE BANK A/S	SGROLN	SEGRO PLC
DSYFP	DASSAULT SYSTEMES SA	SESGFP	SES
DCCLN	DCC PLC	SVTLN	SEVERN TRENT PLC
DBKGY	DEUTSCHE BANK AG-	SGSNVX	SGS SA-REG
DB1GY	DEUTSCHE BOERSE AG	SHPLN	SHIRE PLC
LHAGY	DEUTSCHE LUFTHANSA-REG	SIEGY	SIEMENS AG-REG
DPWGY	DEUTSCHE POST AG-REG	SIKVX	SIKA AG-BR
DTEGY	DEUTSCHE TELEKOM AG-REG	SEBASS	SKANDINAV. ENSKILDA
DWNIGY	DEUTSCHE WOHNEN SE	SKABSS	SKANSKA AB-B SHS
DGELN	DIAGEO PLC	SKFBSS	SKF AB-B SHARES
DLGLN	DIRECT LINE INSURANCE GROUP	SKYLN	SKY PLC
DIASQ	DISTRIBUIDORA INTERNAC.	SN/LN	SMITH & NEPHEW PLC
DNBNO	DNB ASA	SMINLN	SMITHS GROUP PLC
DENERGDC	DONG ENERGY A/S	SKGID	SMURFIT KAPPA GROUP
DSVDC	DSV A/S	SRGIM	SNAM SPA
EOANGY	E.ON SE	GLEFP	SOCIETE GENERALE SA
EZJLN	EASYJET PLC	SWFP	SODEXO SA

Bloomberg code	Name	Bloomberg code	Name
EDENFP	EDENRED	SOLBBB	SOLVAY SA
EDFFP	EDF	SOONVX	SONOVA HOLDING AG-
EDPPL	EDP-ENERGIAS DE PORTUGAL SA	SSELN	SSE PLC
ELUXBSS	ELECTROLUX AB-SER B	STANLN	STANDARD CHARTERED
ENGSQ	ENAGAS SA	SLALN	STANDARD LIFE ABERDEEN
ELESQ	ENDESA SA	STLNO	STATOIL ASA
ENELIM	ENEL SPA	STMIM	STMICROELECTRONICS NV
ENGIFP	ENGIE	STERVFH	STORA ENSO OYJ-R SHS
ENIIM	ENI SPA	SUBCNO	SUBSEA 7 SA
ERICBSS	ERICSSON LM-B SHS	SEVFP	SUEZ
EBSAV	ERSTE GROUP BANK AG	SCABSS	SVENSKA CELLULOSA AB
EIFP	ESSILOR INTERNATIONAL	SHBASS	SVENSKA HANDELSBANKEN-
ESSITYBSS	ESSITY AKTIEBOLAG-B	UHRVX	SWATCH GROUP AG/THE-BR
EXPNLN	EXPERIAN PLC	UHRNSE	SWATCH GROUP AG/THE-REG
FERGLN	FERGUSON PLC	SWEDASS	SWEDBANK AB - A SHARES
RACEIM	FERRARI NV	SWMASS	SWEDISH MATCH AB
FERSQ	FERROVIAL SA	SLHNVX	SWISS LIFE HOLDING AG-REG
FCAIM	FIAT CHRYSLER AUTOMOBILES	SRENVX	SWISS RE AG
FORTUMFH	FORTUM OYJ	SCMNVX	SWISSCOM AG-REG
FMEGY	FRESENIUS MEDICAL CARE AG &	SY1GY	SYMRISE AG
FREGY	FRESENIUS SE & CO KGAA	TATELN	TATE & LYLE PLC
GFSLN	G4S PLC	TW/LN	TAYLOR WIMPEY PLC
GALPPL	GALP ENERGIA SGPS SA	TDCDC	TDC A/S
GASSQ	GAS NATURAL SDG SA	TEL2BSS	TELE2 AB-B SHS
G1AGY	GEA GROUP AG	TITIM	TELECOM ITALIA SPA
GEBNVX	GEBERIT AG-REG	TITRIM	TELECOM ITALIA-RSP
GTONA	GEMALTO	TEFSQ	TELEFONICA SA

Bloomberg code	Name	Bloomberg code	Name
GENDC	GENMAB A/S	TELNO	TELENOR ASA
GIVNVX	GIVAUDAN-REG	TELIASS	TELIA CO AB
GKNLN	GKN PLC	TENIM	TENARIS SA
GSKLN	GLAXOSMITHKLINE PLC	TRNIM	TERNA SPA
GLENLN	GLENCORE PLC	TSCOLN	TESCO PLC
GRFSQ	GRIFOLS SA	HOFPP	THALES SA
GBLBBB	GROUPE BRUXELLES LAMBERT	TKAGY	THYSSENKRUPP AG
HMSOLN	HAMMERSON PLC	FPPF	TOTAL SA
HASLN	HAYS PLC	TPKLN	TRAVIS PERKINS PLC
HEIGY	HEIDELBERGCEMENT AG	TLWLN	TULLOW OIL PLC
HEIONA	HEINEKEN HOLDING NV	UBIIM	UBI BANCA SPA
HEIANA	HEINEKEN NV	UBMLN	UBM PLC
HEN3GY	HENKEL AG & CO KGAA VORZUG	UBSGVX	UBS GROUP AG-REG
HMBSS	HENNES & MAURITZ AB-B SHS	UCBBB	UCB SA
RMSFP	HERMES INTERNATIONAL	UMIBB	UMICORE
HEXABSS	HEXAGON AB-B SHS	ULNA	UNIBAIL-RODAMCO SE
HSBALN	HSBC HOLDINGS PLC	UCGIM	UNICREDIT SPA
IBESQ	IBERDROLA SA	UNANA	UNILEVER NV-CVA
IMILN	IMI PLC	ULVRLN	UNILEVER PLC
IMBLN	IMPERIAL BRANDS PLC	UU/LN	UNITED UTILITIES GROUP
ITXSQ	INDUSTRIA DE DISENO TEXTIL	UPMFH	UPM-KYMMENE OYJ
INDUASS	INDUSTRIVARDEN AB-A SHS	FRFP	VALEO SA
INDUCSS	INDUSTRIVARDEN AB-C SHS	VIEFP	VEOLIA ENVIRONNEMENT
IFXGY	INFINEON TECHNOLOGIES AG	VWSDC	VESTAS WIND SYSTEMS A/S
INGANA	ING GROEP NV	DGFP	VINCI SA
IHGLN	INTERCONTINENTAL HOTELS	VIVFP	VIVENDI
ITRKLN	INTERTEK GROUP PLC	VODLN	VODAFONE GROUP PLC
ISPIM	INTESA SANPAOLO	VOEAV	VOESTALPINE AG
ISPRIM	INTESA SANPAOLO-RSP	VOWGY	VOLKSWAGEN AG

Bloomberg code	Name	Bloomberg code	Name
IAGLN	INTL CONSOLIDATED AIRLINE-DI	VOW3GY	VOLKSWAGEN AG-PREF
INVEBSS	INVESTOR AB-B SHS	VOLVBSS	VOLVO AB-B SHS
ISSDC	ISS A/S	VNAGY	VONOVIA SE
IGIM	ITALGAS SPA	WRT1VFH	WARTSILA OYJ ABP
ITVLN	ITV PLC	WEIRLN	WEIR GROUP PLC/THE
JMATLN	JOHNSON MATTHEY PLC	WTBLN	WHITBREAD PLC
BAERVX	JULIUS BAER GROUP LTD	WMHLN	WILLIAM HILL PLC
SDFGY	K+S AG-REG	WDIGY	WIRECARD AG
KBCBB	KBC GROEP NV	MRWLN	WM MORRISON SUPER.
KERFP	KERING	WKLNA	WOLTERS KLUWER
KYGID	KERRY GROUP PLC-A	WPPLN	WPP PLC
KGFLN	KINGFISHER PLC	YARNO	YARA INTERNATIONAL ASA
		ZURNVX	ZURICH INSURANCE GROUP

Appendix 2: Companies excluded from the sample and the reasons for their exclusion

Bloomberg code	Name	Financial sector	Not IFRS compliant	More than one class of shares	Not European	Not in index in 2017
IIILN	3I GROUP PLC					
ABBNVX	ABB LTD-REG					
ABNNA	ABN AMRO GROUP NV-CVA					
ADENVX	ADECCO GROUP AG-REG					
AGNNA	AEGON NV					
AGSBB	AGEAS					
ALVGY	ALLIANZ SE-REG					
ATCBNA	ALTICE NV - B					
MAERSKB DC	AP MOLLER-MAERSK A/S-B					
GIM	ASSICURAZIONI GENERALI					
ATCOBSS	ATLAS COPCO AB-B SHS					
ATOFFP	ATOS SE					
AV/LN	AVIVA PLC					
CSFP	AXA SA					
BALNVX	BALOISE HOLDING AG - REG					
BBVASQ	BANCO BILBAO VIZCAYA ARGENTA					
BAMIIM	BANCO BPM SPA					
SABSQ	BANCO DE SABADELL SA					
SANSQ	BANCO SANTANDER SA					
BIRGID	BANK OF IRELAND GROUP PLC					
BKIASQ	BANKIA SA					
BARCLN	BARCLAYS PLC					

Bloomberg code	Name	Financial sector	Not IFRS compliant	More than one class of shares	Not European	Not in index in 2017
BDEVLN	BARRATT DEVELOPMENTS PLC					
BMW3GY	BAYERISCHE MOTOREN WERKE-PRF					
BLTLN	BHP BILLITON PLC					
BNPFP	BNP PARIBAS					
BLNDLN	BRITISH LAND CO PLC					
CABKSQ	CAIXABANK S.A					
LISPSE	CHOCOLADEFABRIKE N LINDT-PC					
LISNSE	CHOCOLADEFABRIKE N LINDT-REG					
CBKGY	COMMERZBANK AG					
ACAFF	CREDIT AGRICOLE SA					
CSGNVX	CREDIT SUISSE GROUP AG-REG					
DANSKED C	DANSKE BANK A/S					
DBKGY	DEUTSCHE BANK AG-REGISTERED					
DB1GY	DEUTSCHE BOERSE AG					
DWNIGY	DEUTSCHE WOHNEN SE					
DLGLN	DIRECT LINE INSURANCE GROUP					
DNBNO	DNB ASA					
DENERGD C	DONG ENERGY A/S					
ELESQ	ENDESA SA					
EBSAV	ERSTE GROUP BANK AG					
ESSITYBS S	ESSITY AKTIEBOLAG-B					
FERGLN	FERGUSON PLC					

Bloomberg code	Name	Financial sector	Not IFRS compliant	More than one class of shares	Not European	Not in index in 2017
RACEIM	FERRARI NV					
FREGY	FRESENIUS SE & CO KGAA					
GENDC	GENMAB A/S					
GRFSQ	GRIFOLS SA					
GBLBBB	GRUPE BRUXELLES LAMBERT SA					
HMSOLN	HAMMERSON PLC					
HEIONA	HEINEKEN HOLDING NV					
HSBALN	HSBC HOLDINGS PLC					
INDUASS	INDUSTRIVARDEN AB-A SHS					
INDUCSS	INDUSTRIVARDEN AB-C SHS					
INGANA	ING GROEP NV					
ISPIM	INTESA SANPAOLO					
ISPRIM	INTESA SANPAOLO-RSP					
INVEBSS	INVESTOR AB-B SHS					
ISSDC	ISS A/S					
IGIM	ITALGAS SPA					
BAERVX	JULIUS BAER GROUP LTD					
KBCBB	KBC GROEP NV					
KINVBSS	KINNEVIK AB - B					
LIFP	KLEPIERRE					
LANDLN	LAND SECURITIES GROUP PLC					
LGENLN	LEGAL & GENERAL GROUP PLC					
LLOYLN	LLOYDS BANKING GROUP PLC					

Bloomberg code	Name	Financial sector	Not IFRS compliant	More than one class of shares	Not European	Not in index in 2017
LSELN	LONDON STOCK EXCHANGE GROUP					
EMGLN	MAN GROUP PLC					
MHGNO	MARINE HARVEST					
MBIM	MEDIOBANCA SPA					
MRKGY	MERCK KGAA					
MCROLN	MICRO FOCUS INTERNATIONAL					
MNDILN	MONDI PLC					
MUV2GY	MUENCHENER RUECKVER AG-REG					
NNNA	NN GROUP NV					
NDASS	NORDEA BANK AB					
OMLLN	OLD MUTUAL PLC					
PPBID	PADDY POWER BETFAIR PLC					
PGHNVX	PARTNERS GROUP HOLDING AG					
PRULN	PRUDENTIAL PLC					
QIAGY	QIAGEN N.V.					
RENNA	RELX NV					
RELLN	RELX PLC					
RBSLN	ROYAL BANK OF SCOTLAND GROUP					
RDSBLN	ROYAL DUTCH SHELL PLC-B SHS					
RSALN	RSA INSURANCE GROUP PLC					
SAMPOFH	SAMPO OYJ-A SHS					
SCHPVX	SCHINDLER HOLDING-PART CERT					
SDRLN	SCHRODERS PLC					
SGROLN	SEGRO PLC					

Bloomberg code	Name	Financial sector	Not IFRS compliant	More than one class of shares	Not European	Not in index in 2017
SHPLN	SHIRE PLC					
SIKVX	SIKA AG-BR					
SEBASS	SKANDINAVISKA ENSKILDA BAN-A					
GLEFP	SOCIETE GENERALE SA					
SOONVX	SONOVA HOLDING AG-REG					
STANLN	STANDARD CHARTERED PLC					
SLALN	STANDARD LIFE ABERDEEN PLC					
STMIM	STMICROELECTRONIC S NV					
SHBASS	SVENSKA HANDELSBANKEN-A SHS					
UHRVX	SWATCH GROUP AG/THE-BR					
UHRNSE	SWATCH GROUP AG/THE-REG					
SWEDASS	SWEDBANK AB - A SHARES					
SLHNVX	SWISS LIFE HOLDING AG-REG					
SRENVX	SWISS RE AG					
SY1GY	SYMRISE AG					
TITRIM	TELECOM ITALIA-RSP					
UBIIM	UBI BANCA SPA					
UBSGVX	UBS GROUP AG-REG					
ULNA	UNIBAIL-RODAMCO SE					
UCGIM	UNICREDIT SPA					
UNANA	UNILEVER NV-CVA					
VOW3GY	VOLKSWAGEN AG-PREF					

Bloomberg code	Name	Financial sector	Not IFRS compliant	More than one class of shares	Not European	Not in index in 2017
VNAGY	VONOVIA SE					
WDIGY	WIRECARD AG					
ZURNVX	ZURICH INSURANCE GROUP AG					
Eff. d'occurrences			8	13	1	26

Appendix 3: Groups in the sample

Bloomberg code	Name	Bloomberg code	Name
ABESQ	ABERTIS INFRAESTRUCTURAS	PHIANA	KONINKLIJKE PHILIPS NV
ANASQ	ACCIONA SA	KNINVX	KUEHNE + NAGEL INTL -
ACFP	ACCOR SA	ORFP	L'OREAL
ACSSQ	ACS ACTIVIDADES CONS Y	LHNVX	LAFARGEHOLCIM LTD-
ADSGY	ADIDAS AG	MMBFP	LAGARDERE SCA
AENASQ	AENA SME SA	LXSGY	LANXESS AG
AGKLN	AGGREKO PLC	LRFP	LEGRAND SA
AIFP	AIR LIQUIDE SA	LDOIM	LEONARDO SPA
AIRFP	AIRBUS SE	LINGY	LINDE AG
AKZANA	AKZO NOBEL	LONNVX	LONZA GROUP AG-REG
ALFASS	ALFA LAVAL AB	LUXIM	LUXOTTICA GROUP SPA
ALOFP	ALSTOM	MCFP	LVMH MOET HENNESSY
ATCNA	ALTICE NV - A	EMGLN	MAN GROUP PLC
AMSSQ	AMADEUS IT GROUP SA	MKSLN	MARKS & SPENCER
AALLN	ANGLO AMERICAN PLC	B4BGY	METRO AG
ABIBB	ANHEUSER-BUSCH INBEV	METSOFH	METSO OYJ
ANTOLN	ANTOFAGASTA PLC	MLFP	MICHELIN (CGDE)
MAERSKADC	AP MOELLER-MAERSK A/S-A	MICSS	MILLICOM CELLULAR-
MTNA	ARCELORMITTAL	NG/LN	NATIONAL GRID PLC
AKEFP	ARKEMA	NESNVX	NESTLE SA-REG
AHTLN	ASHTREAD GROUP PLC	NXTLN	NEXT PLC
ASMLNA	ASML HOLDING NV	NOKIAFH	NOKIA OYJ
ASSABSS	ASSA ABLOY AB-B	NRE1VFH	NOKIAN RENKAAT OYJ
ABFLN	ASSOCIATED BRITISH FOODS	NHYNO	NORSK HYDRO ASA
AZNLN	ASTRAZENECA PLC	NOVNVX	NOVARTIS AG-REG
ATLIM	ATLANTIA SPA	NOVOBDC	NOVO NORDISK A/S-B
ATCOASS	ATLAS COPCO AB-A SHS	NZYMBDC	NOVOZYMES A/S-
BABLN	BABCOCK INTL GROUP PLC	OMVAV	OMV AG

Bloomberg code	Name	Bloomberg code	Name
BA/LN	BAE SYSTEMS PLC	ORAFP	ORANGE
BASGY	BASF SE	ORKNO	ORKLA ASA
BAYNGY	BAYER AG-REG	OSRGY	OSRAM LICHT AG
BMWGY	BAYERISCHE MOTOREN WERKE	PNDORAD C	PANDORA A/S
BEIGY	BEIERSDORF AG	PSOJLN	PEARSON PLC
BOLSS	BOLIDEN AB	RIFP	PERNOD RICARD SA
ENFP	BOUYGUES SA	PSNLN	PERSIMMON PLC
BP/LN	BP PLC	UGFP	PEUGEOT SA
BNRGY	BRENTAG AG	PAH3GY	PORSCHE AUTOMOBIL
BATSLN	BRITISH AMERICAN TOBACCO	PSMGY	PROSIEBENSAT.1 MEDIA
BT/ALN	BT GROUP PLC	PROXBB	PROXIMUS
BNZLLN	BUNZL PLC	PRYIM	PRYSMIAN SPA
BRBYLN	BURBERRY GROUP PLC	PUBFP	PUBLICIS GROUPE
CAPFP	CAPGEMINI SE	RRSLN	RANDGOLD RESOURCES
CPILN	CAPITA PLC	RANDNA	RANDSTAD HOLDING NV
CARLBDC	CARLSBERG AS-B	RB/LN	RECKITT BENCKISER
CCLLN	CARNIVAL PLC	REESQ	RED ELECTRICA SA
CAFP	CARREFOUR SA	RNOFP	RENAULT SA
COFP	CASINO GUICHARD PERRACHON	RTOLN	RENTOKIL INITIAL PLC
CNALN	CENTRICA PLC	REPSQ	REPSOL SA
CHRDC	CHR HANSEN HOLDING A/S	RIOLN	RIO TINTO PLC
CDIFP	CHRISTIAN DIOR SE	ROGVX	ROCHE HOLDING AG-
CFRVX	CIE FINANCIERE RICHEMONT-	RR/LN	ROLLS-ROYCE HOLDINGS
CLNVX	CLARIANT AG-REG	RDSALN	ROYAL DUTCH SHELL
CNHIIM	CNH INDUSTRIAL NV	RWEGY	RWE AG
COBLN	COBHAM PLC	RYAID	RYANAIR HOLDINGS PLC
COLOBDC	COLOPLAST-B	SAFFP	SAFRAN SA
COLRBB	COLRUYT SA	SGELN	SAGE GROUP PLC/THE

Bloomberg code	Name	Bloomberg code	Name
SGOFP	COMPAGNIE DE SAINT GOBAIN	SBRYLN	SAINSBURY (J) PLC
CPGLN	COMPASS GROUP PLC	SPMIM	SAIPEM SPA
CONGY	CONTINENTAL AG	SANDSS	SANDVIK AB
CRHID	CRH PLC	SANFP	SANOFI
DMGTLN	DAILY MAIL&GENERAL TST-A	SAPGY	SAP SE
DAIGY	DAIMLER AG-	SCHNSE	SCHINDLER HOLDING AG-
BNFP	DANONE	SUFP	SCHNEIDER ELECTRIC SE
DSYFP	DASSAULT SYSTEMES SA	SECUBSS	SECURITAS AB-B SHS
DCCLN	DCC PLC	SESGFP	SES
LHAGY	DEUTSCHE LUFTHANSA-REG	SVTLN	SEVERN TRENT PLC
DPWGY	DEUTSCHE POST AG-REG	SGSNVX	SGS SA-REG
DTEGY	DEUTSCHE TELEKOM AG-REG	SIEGY	SIEMENS AG-REG
DGELN	DIAGEO PLC	SKABSS	SKANSKA AB-B SHS
DIASQ	DISTRIBUIDORA INTERNAC.	SKFBSS	SKF AB-B SHARES
DSVDC	DSV A/S	SKYLN	SKY PLC
EOANGY	E.ON SE	SN/LN	SMITH & NEPHEW PLC
EZJLN	EASYJET PLC	SMINLN	SMITHS GROUP PLC
EDENFP	EDENRED	SKGID	SMURFIT KAPPA GROUP
EDFFP	EDF	SRGIM	SNAM SPA
EDPPL	EDP-ENERGIAS DE PORTUGAL SA	SWFP	SODEXO SA
ELUXBSS	ELECTROLUX AB-SER B	SOLBBB	SOLVAY SA
ENGSQ	ENAGAS SA	SSELN	SSE PLC
ENELIM	ENEL SPA	STLNO	STATOIL ASA
ENGIFP	ENGIE	STERVFH	STORA ENSO OYJ-R SHS
ENIIM	ENI SPA	SUBCNO	SUBSEA 7 SA
ERICBSS	ERICSSON LM-B SHS	SEVFP	SUEZ
EIFP	ESSILOR INTERNATIONAL	SCABSS	SVENSKA CELLULOZA AB
EXPNLN	EXPERIAN PLC	SWMASS	SWEDISH MATCH AB
FERSQ	FERROVIAL SA	SCMNVX	SWISSCOM AG-REG

Bloomberg code	Name	Bloomberg code	Name
FCAIM	FIAT CHRYSLER AUTOMOBILES	TATELN	TATE & LYLE PLC
FORTUMFH	FORTUM OYJ	TW/LN	TAYLOR WIMPEY PLC
FMEGY	FRESENIUS MEDICAL CARE AG &	TDCDC	TDC A/S
GFSLN	G4S PLC	TEL2BSS	TELE2 AB-B SHS
GALPPL	GALP ENERGIA SGPS SA	TITIM	TELECOM ITALIA SPA
GASSQ	GAS NATURAL SDG SA	TEFSQ	TELEFONICA SA
G1AGY	GEA GROUP AG	TELNO	TELENOR ASA
GEBNVX	GEBERIT AG-REG	TELIASS	TELIA CO AB
GTONA	GEMALTO	TENIM	TENARIS SA
GIVNVX	GIVAUDAN-REG	TRNIM	TERNA SPA
GKNLN	GKN PLC	TSCOLN	TESCO PLC
GSKLN	GLAXOSMITHKLINE PLC	HOFP	THALES SA
GLENLN	GLENCORE PLC	TKAGY	THYSSENKRUPP AG
HASLN	HAYS PLC	FPPF	TOTAL SA
HEIGY	HEIDELBERGCEMENT AG	TPKLN	TRAVIS PERKINS PLC
HEIANA	HEINEKEN NV	TLWLN	TULLOW OIL PLC
HEN3GY	HENKEL AG & CO KGAA VORZUG	UBMLN	UBM PLC
HMBSS	HENNES & MAURITZ AB-B SHS	UCBBB	UCB SA
RMSFP	HERMES INTERNATIONAL	UMIBB	UMICORE
HEXABSS	HEXAGON AB-B SHS	ULVRLN	UNILEVER PLC
IBESQ	IBERDROLA SA	UU/LN	UNITED UTILITIES GROUP
IMILN	IMI PLC	UPMFH	UPM-KYMMENE OYJ
IMBLN	IMPERIAL BRANDS PLC	FRFP	VALEO SA
ITXSQ	INDUSTRIA DE DISENO TEXTIL	VIEFP	VEOLIA ENVIRONNEMENT
IFXGY	INFINEON TECHNOLOGIES AG	VWSDC	VESTAS WIND SYSTEMS
IHGLN	INTERCONTINENTAL HOTELS	DGFP	VINCI SA
ITRKLN	INTERTEK GROUP PLC	VIVFP	VIVENDI
IAGLN	INTL CONSOLIDATED AIRLINE- DI	VODLN	VODAFONE GROUP PLC

Bloomberg code	Name	Bloomberg code	Name
ITVLN	ITV PLC	VOEAV	VOESTALPINE AG
JMATLN	JOHNSON MATTHEY PLC	VOWGY	VOLKSWAGEN AG
SDFGY	K+S AG-REG	VOLVBSS	VOLVO AB-B SHS
KERFP	KERING	WRT1VFH	WARTSILA OYJ ABP
KYGID	KERRY GROUP PLC-A	WEIRLN	WEIR GROUP PLC/THE
KGFLN	KINGFISHER PLC	WTBLN	WHITBREAD PLC
KNEBFH	KONE OYJ-B	WMHLN	WILLIAM HILL PLC
ADNA	DELHAIZE GROUP	MRWLN	WM MORRISON SUPER.
DSMNA	KONINKLIJKE DSM NV	WKLNA	WOLTERS KLUWER
KPNNA	KONINKLIJKE KPN NV	WPPLN	WPP PLC
		YARNO	YARA INTERNATIONAL

Appendix 4: List of variables

Variable name	Definition	Source
Company's full name		SP Euro Index
Company's sector	Business sector	Bloomberg
Stock Exchange Listed		Bloomberg
Country	Country where the company issuing shares is registered	Bloomberg
Geographical Business Year of creation	Local or multinational	IFRS 8 Companies' corporate websites
Currency	Reporting currency, converted at the Banque de France fixing of 30 December 2016	Banque de France
Total market value	Market capitalisation at 31/12/2016	Bloomberg
Total book value	Total assets at 31/12/2016	Reference document
Total intangible assets		Reference document
Total equity		Reference document
Total number of shares		Reference document
Total number of employees		Reference document
Net profit/Net loss		Reference document
Operating income		Reference document
Earnings per share		Reference document
Average share price		Bloomberg
Brand name	(IAS 38)	Reference document
Masthead & publishing titles	(IAS 38)	Reference document
Computer software	(IAS 38)	Reference document
Licences and franchises	(IAS 38)	Reference document
Copyrights, patents and others industry property rights	(IAS 38)	Reference document
Recipes, formulae, models, designs and prototypes	(IAS 38)	Reference document
Intangible assets under development	(IAS 38)	Reference document
Goodwill	(IFRS 3)	Reference document
Total amortization value of intangible assets		Reference document
Total long-term assets value		Reference document
Expenses in R&D		Reference document
Expenses in Marketing included with sales, distribution, admin or other expenses		Reference document
Expenses in marketing (only)		Reference document
Number of brands		Global Brand Database ¹⁷

¹⁷ Database maintained by the World Intellectual Property Organization (WIPO).