



When the tail wags the dog? Digitalisation and corporate reporting

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ABSTRACT

To facilitate digital corporate reporting and enable computers to 'read' accounting information, standard-setters must construct a taxonomy to assign contextual 'metadata' that codifies disclosures arising from accounting concepts, standards and practices. But digitalisation poses a problem for corporate reporting. Within internationally accepted accounting practice, 'principles-based' standards give companies significant discretion in deciding what they disclose and how they report accounts of their activity. How would the principles-based nature of corporate reporting be influenced by the construction of a taxonomy that seeks to specify all accounting disclosures? Drawing on literature examining the constitutive potential of classification and formal representation, we use our case study of the digitalisation project undertaken by the global standard-setter, the IASB, to understand how digitalisation intervenes on standard-setting and reporting practice despite the intentions of standard-setters. Our results detail how standard-setters sought to minimise the impact of digitalisation by modelling the taxonomy only on disclosures explicitly required by accounting standards. We reveal the circumstances that led the IASB to change its taxonomy design by seeking to capture not only what should be reported (as prescribed in extant accounting standards) but also what was being reported (as prescribed in a new classification called 'Common Practices'). We analyse the process by which international accounting disclosure practices were judged to be 'common', and demonstrate how the 'Common Practices' classification was perceived by early users of the taxonomy. When interpreting the IASB's Common Practices (what is) as disclosure standards (what should be), digitalisation generates a self-validating feedback loop that can generate more homogenous corporate reporting and push International Financial Reporting Standards beyond the principles-based approach they were designed to engender. Although standard-setters became increasingly aware of the influence of the digital (machine-readable) 'tail' on the traditional reporting (human-readable) 'dog', their attempts to take tighter control of the taxonomy development process strengthened user perceptions that the taxonomy and its 'Common Practices' represented an authoritative view of what should be reported. Our results reveal the process by which digital reporting both represents and intervenes in accounting, and how digitalisation impacts key accounting debates. As digitalisation attempts to provide a universal codification of reporting disclosures, it valorises comprehensive machine-friendly disclosure rules over principles, which offer standardised comparability over entity-specific communication. Our study also offers a perspective on the relations between information representation and intervention that moves beyond a study of passive, 'reactive' conformance to consider how representations can intervene despite the intentions of those generating the representation. In doing so, we reveal the constitutive potential of digital representations in generating 'non-passive' conformance.

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1. Introduction

Although accounting research has long recognised the corporate report as an active and non-neutral device possessing a constitutive capacity to shape social, organisational and economic relations (Hines, 1988; Robson et al., 2017; Robson & Young, 2009), the

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influence of technological change on the corporate reporting process has received comparatively less attention.

Studies of corporate reporting have tended to focus on illuminating and analysing the interdependencies between reporting practices and innovations, and the social, institutional, political and ideological context in which they are embedded. A body of literature providing important insights on the formation of corporate reporting standards has been generally examined through the role of institutions, ideologies, power and people (Burchell et al., 1985; Himick & Brivot, 2018; Pelger, 2016; Robson, 1994; Young, 2006) whilst the technological context in which corporate reports themselves are standardised, constructed and disclosed is seldom brought to the fore.

The technological context in which reporting takes place has gained greater resonance in recent years as the corporate reporting process becomes digitalised. Regulators across the world have increasingly required listed firms to submit their corporate annual reports in digital XBRL-based formats that can be read by machines. To accommodate digitalisation¹ and allow firms to comply with digital XBRL-based mandates, accounting standard-setters must construct a taxonomy that enables computers to 'read' and transmit accounting information. As an essential device for operationalising digital corporate reporting, the taxonomy provides a representation of accounting that codifies the disclosures that arise from accounting concepts, principles, standards and practices.

Yet, digitalisation poses a problem for corporate reporting. Within internationally accepted accounting practice, companies have significant discretion in deciding what they disclose and choosing how they report accounts of their activity. 'Principles-based' standards such as those issued by the International Accounting Standards Board (IASB) specifically enable corporate reports to be tailored to fit to firm circumstances. Digitalisation brings forth the need to represent this principles-based system in a standardised taxonomy that seeks to classify and represent all accounting disclosures.

To understand the problem that digitalisation and taxonomy development poses for corporate reporting, we turn to literature examining the active nature of classification and formal representation. Across the social sciences, studies highlight the constitutive power of information representations prevalent in labels, categorisations, models and rankings (Barnes, 1983; Hacking, 1986; MacKenzie & Millo, 2003; Espeland & Sauder, 2007; Pollock & D'Adderio, 2012; Fourcade & Healy, 2013). By provoking reflexivity and social action, depictions of information are seen as having the power to both *represent* and *intervene*. Collectively, the literature explains how individuals and organisations react to informational representations of themselves or their activity. In doing so, those represented may seek to instigate behaviour perceived to move away or towards their information representation. In the latter case, information representations have the means to construct the phenomena they describe.

Prior research also considers why and how some representations generate conformance whilst others instil indifference or resistance. Studies examine how the nature of reflexivity, reaction, and conformance is embedded in the specific and complex relations between the representation and the represented (MacKenzie & Millo, 2003; Pollock & Williams, 2009). Although conformance is often depicted as a passive or mechanical process, it

may be expressly resisted (Pollock et al., 2018).

We draw on these collective insights to explore the nature of reflexivity, reaction, and conformance in relation to the taxonomy. In doing so, we pose our first research question: how is the principles-based nature of accounting standards and corporate reporting practice influenced by the construction of a taxonomy that seeks to classify and represent all accounting disclosures?

To address this question, we focus on the digitalisation of global corporate reporting standards issued by the IASB. We undertake a detailed case study of the digitalisation project to analyse the manner in which the International Financial Reporting Standards (IFRS) taxonomy was constructed as a digital representation of accounting standards and build a dataset comprised of interviews, observation and documentary evidence during the key phases of the project.

The setting offers a novel case where the expressed intention of standard-setters was to shield reporting from the impact of digitalisation and ensure that the taxonomy did not intervene on accounting standard-setting or practice. Nevertheless, standard-setters had to adjust practices to accommodate digitalisation, despite their initial intentions. Our second research question seeks to understand why and how did this happen: how do information representations that are designed not to intervene generate conformance?

To pursue this research question, we investigate the nature of conformance in the corporate reporting arena, and the role of digitalisation in offering a machine-friendly representation of the accounting world. Although this representation was intended to mirror the existing, 'analogue' depiction of accounting, we examine the unintended consequences of digitalisation that have subtle but constitutive powers.

Our results detail how accounting standard-setters sought to minimise the impacts of digitalisation on existing standard-setting processes by modelling the taxonomy only on disclosures explicitly required by accounting standards. We reveal the specific circumstances that led the IASB to significantly change its taxonomy design by seeking to capture not only what *should* be reported (as prescribed in extant accounting standards) but also what *was* being reported (as prescribed in a new classification called 'Common Practices').

We reveal the process by which international accounting disclosure practices were judged to be 'common', and demonstrate how the 'Common Practices' classification was perceived by early users of the taxonomy in preparing digitised corporate reports. By interpreting the IASB's Common Practices (*what is*) as disclosure standards (*what should be*), the digitalisation process generates a self-validating feedback loop that can generate more homogenous corporate reporting and push IFRS beyond the principles-based approach they were designed to engender.

Although standard-setters became increasingly aware of the influence of the digital (machine-readable) 'tail' on the traditional reporting (human-readable) 'dog', their attempts to take tighter control of the taxonomy development process only risked strengthening user perceptions that the taxonomy and its 'Common Practices' represented an authoritative view of what *should* be reported.

We use the empirical case to develop our broad contributions. Firstly, we reveal the means by which digital reporting both represents and intervenes in accounting, and how digitalisation impacts key accounting debates. By providing a '(re)presentation' of the existing accounting model, the taxonomy is active in exposing tensions in the future direction of corporate reporting and accounting: whether reporting should focus on entity-specific communication (each firm should tell its own story) to enhance relevance or whether it should focus on comparability (to enhance

¹ Following extant literature (e.g. Gebre-Mariam & Bygstad, 2019; Knudsen, 2020; Leonardi & Treem, 2020), we use the term digitalisation to refer to the broader organisational and social processes associated with digitisation. In turn, digitisation refers to the process of converting data from a traditional, analogue format to a digital format.

user decision-making), and as a consequence whether accounting standards should focus on principles (to guide entity-specific disclosures) or rules (to enhance comparability)? As the taxonomy must provide a universal codification of corporate reporting disclosures, digitalisation valorises comprehensive machine-friendly disclosure *rules* over *principles*. We demonstrate how digitalisation 'opaquely' influences key policy and theoretical debates within contemporary accounting by shaping the nature of what is being standardised, and related standard-setting processes.

Secondly, we offer a theoretical perspective on the relations between information representation and intervention to understand the processes of reflexivity, reactivity and conformance where intervention is specifically resisted. Although the information representation is not intended to intervene, resistance becomes conformance. Following Pollock et al. (2018), we move beyond a study of passive, 'reactive' conformance to consider the nature of 'non-passive' conformance – examining how representations can intervene despite the intentions of those generating the representation. Unlike prior studies, the taxonomic representation is not intended to supplant existing representations – it is only created to enable digitalisation. Its constitutive power derives from its machine readable depiction of the world based on consistency, completeness and homogeneity – everything must have a place – even 'common practices' that were formerly unrecognised and unstandardised. The need for digital interoperability at the technological level generates self-validating feedback loops that enable practice to resemble its digital representation. In the digital realm, our study enables us to see where the digital representation gains its unintentional but generative capacity.

The next section explain how corporate reporting is being digitalised before section 3 introduces the analytical concepts used to explicate our case. Section 4 describes the methods used to collect and analyse our dataset whilst section 5 presents our empirical material. This section introduces the digitalisation project, analyses the design and development of corporate reporting taxonomies, and examines the processes undertaken in (re)presenting the existing accounting model and introducing new classifications. The analysis closes by explaining why and how the IFRS Foundation increasingly incorporated digitalisation considerations into its standard-setting processes, before demonstrating how taxonomy usage interacts with existing accounting practices. Section 6 discusses the implications of the analysis and summarises the findings and contributions of the paper.

2. Standard-setting and digitalisation

We broadly situate our study within the body of literature focussed on revealing and explaining the interdependencies between corporate reporting and the wider context in which it is embedded (Robson et al., 2017; Robson & Young, 2009). Numerous studies have sought to analyse and understand the relations between corporate reporting and institutions, ideologies, power and people (e.g. Arnold, 2012; Burchell et al., 1985; Himick & Brivot, 2018; Jiang et al., 2018; La Torre et al., 2020; Morley, 2016; Pelger, 2016; Pelger & Speiß, 2017; Power, 1992; Robson, 1994; Young, 2003; Young, 2006; Zhang et al., 2012). A common theme evident in this body of work concerns how corporate reporting standards and practices both shape and are shaped by their wider context. Whilst this literature informs us how corporate reporting interacts with its social, organisational and institutional context, the influence of technology has received comparatively little attention. Although Robson et al. (2017:36–37) urge investigating "the process by which financial accounts are collectively constructed (their production) and the mechanisms by which such accounts travel to, and are utilized by, different audiences", the technological context

in which accounting standards are made, and corporate reports assembled and disseminated has rarely been brought into focus.

The technological context in which accounting standard-setting and reporting is embedded has gained importance as the corporate reporting process becomes digitalised. Regulators across the world have been introducing legislation requiring firms to submit their corporate reports in a digital format. For example, the Structured Disclosure requirements in the US have mandated larger US-based listed firms to submit digital corporate reports since 2009 (SEC, 2009), and the European Single Electronic Format requires all EU-listed firms to file digital corporate reports using the IFRS taxonomy from 2020 (European Commission, 2019).

Digitisation depicts the process by which human-readable information such as words, sentences and music are converted into a digitised form that can be transmitted and read by machines. Human-readable data such as letters, numbers and sounds are converted into binary digits or bits (i.e. 0 and 1s that are typically transmitted as the absence or presence of an electrical or light signal) grouped together in sets (bytes) according to a specific code or schema (e.g. ASCII). As a consequence, digitisation requires human-readable information to be structured so it can be encoded and transmitted in discrete binary units.

The influence of digitisation is commonly obscured from view. Data discarded from a music signal on conversion to an mp3 file is beyond the gaze and audibility of most listeners. Yet, significant backstage activity is undertaken during digitisation. The conversion of machine-readable information into a binary language understood by computing devices introduces new processes and representations that can challenge existing social relations and practices.

Within accounting, companies around the world have had to publish corporate reports and accounts that are available to the public and are filed with national regulators. These reports were historically published in paper-based, 'hard copy'. From the 1990s, companies have published an identical, electronic version of the corporate report online typically in Adobe portable document formats (pdf) or in an online format designed for human readability (e.g. HTML). The online versions generally preserve the paper-based arrangement of reporting information. Although accounting disclosures are presented online, they are not fully machine-readable in allowing computers to distinguish, for example, 'amazon' the forest, from Amazon the company. In contrast, digital 'electronic reporting' allows computers to go beyond identifying a collection of bits as a number or word (e.g. 'amazon' and '11,588') as can be undertaken in a pdf document, to recognising the context surrounding a disclosure (e.g. 'Amazon' (the company), and '\$11,588M' (its net profit for 2019, according to US GAAP)). Digital corporate reports are tagged with machine-readable metadata that enable computers to interpret the meaning of a specific disclosure, and thereby automatically extract, transmit, collate, rearrange and compare disclosures across companies.

In the accounting domain, contextual metadata is coded and transmitted using XBRL,² a 'mark-up' language specific to corporate reporting. XBRL enables specific data in corporate reports (numbers and text) to be 'tagged' with metadata (i.e. data about data) such as a concept, definition, sign, currency, reference to accounting standards and relationship to other corporate reporting disclosures. Metadata therefore facilitates the digital transmission of corporate reporting data between systems, firms, regulators and users by enabling disclosures to be communicated with contextual information describing their meaning.

As corporate reporting has evolved within a paradigm designed for human readability (Bauguess, 2018), digitalisation has led to

² eXtensible Business Reporting Language.

major changes in corporate reporting processes. To enable digitalisation, accounting standard-setters must structure the existing accounting model and develop a taxonomy that models and assigns metadata to each disclosure. The corporate report must be broken up, atomised and partitioned into discrete pieces to enable every single accounting disclosure to be identified and assigned distinguishable metadata properties. The resultant metadata taxonomy names, defines, organises and classifies corporate reporting disclosures in a standardised structure that can be understood by machines.³

Building a universal reporting taxonomy presents a challenge for accounting standard-setters. Within corporate reporting, there exists significant reporting flexibility, in terms of choices over disclosures and presentation. The scope for discretion in allowing corporate reports to be tailored to fit to firm circumstances has been a common feature of the 'principles-based' IFRS standards issued by the IASB (Bradbury & Schroder, 2012). Whilst specific mandatory disclosures are explicitly required within accounting standards, firms also have freedom to choose what disclosures are necessary to comply with a specified accounting 'principle'. Consequently, corporate reports contain a mix of disclosures across a spectrum ranging from those items universally supplied by all firms to those disclosures that are unique to a single firm.

As international standard-setters sought to implement digital reporting mandates and construct taxonomies, support for principles-based accounting has persisted. Many regulatory and private sector initiatives aimed to improve the relevance of corporate reports by specifically advocating more material, firm-specific reporting designed to reduce 'boilerplate' disclosures, disclosure levels and disclosure complexity: reporting should 'tell a story' relevant to a firm's circumstances (e.g. ESMA, 2013; FRC, 2011; IASB, 2014; ICAEW, 2013; ICAS, 2010). As reporting relevance depends upon context, firm-specific communication is therefore emphasised over comparability across uniform disclosures (ICAS/NZICA, 2011). In contrast, digitalisation encourages reporting comparability across firms by requiring disclosures to be structured so they can be identified and communicated by machines. Codification within taxonomies enables disclosures to be given the same tags thereby enabling easier, automated comparisons. Digitalisation therefore presents a challenge for principles-based accounting and aggravates the inherent tension between comparability and entity-specific reporting.

In their conceptual frameworks, accounting standard-setters have historically divorced *what* is reported (in terms of criteria for recognition and measurement) from *how* it is reported (criteria for disclosure and presentation within a paper-based document). Consistent with this premise, the IASB explicitly intended that the taxonomy would not interfere with accounting standard-setting and practice (XAC, 2012). As a consequence, the communication medium and technology governing *how* information is reported and associated infrastructural changes (such as XBRL and the taxonomy) are often presented as neutral (IAASB, 2010; XBRL Europe, 2006; XII, 2020).

"XBRL changes the appearance and improves the delivery mechanism for financial statements, *but it does not alter meaning*" (XBRL US, 2008:3 italics added).

"the IFRS taxonomy is *merely a tool* to transform these IFRS financial statements in a machine readable format" (ESMA, 2016:31 italics added)

Accordingly, accounting research on digitalisation has focused predominantly on the impact of XBRL on capital markets and their users (e.g. Bhattacharya et al., 2018; Blankespoor et al., 2014; Kaya & Pronobis, 2016; Kim et al., 2018; Li & Nwaeze, 2018) rather than its impact on standard-setting, and corporate reporting practice. However, the restructuring of corporate reporting information is largely invisible to users who are unaware of the processes that separate, disaggregate, classify and reorganise accounting disclosures.

In this paper, we contest the presumed neutrality of reporting technology and analyse its relevance in key accounting debates: whether corporate reports should focus on providing comparative, standardised information sets based on explicit disclosure rules; or whether reports should focus on providing entity-specific information according to a firm's unique circumstances accordant with general disclosure principles.

3. Metadata, classification and digital representation

To analyse how digital corporate reporting can shape accounting standards and practice, we draw on literature theorising the specific processes involved in constructing a digital representation of accounting.

Contextual metadata must be constructed and assigned in a consistent and standardised manner that can be understood by machines. This process is examined within a stream of literature that analyses the active role of metadata in enabling systems to be interoperable (Mayernik, 2019; McCarthy, 2017; Millerand & Bowker, 2009; Ribes & Bowker, 2009; Star & Lampland, 2009).

The organisation of metadata is based on a data dictionary, or taxonomy, that guides what metadata should be attached to what type of data. However, "what and how the computer can know is very particular" (Ribes & Bowker, 2009, p. 215). Although metadata standards are "most often conceived as being simple technical solutions" (Millerand & Bowker, 2009, p. 150), they seek to constrain phenomena within a particular set of dimensions and, in the process, marginalise phenomena that do not easily 'fit' (Star & Lampland, 2009).

In order to assign metadata and build a taxonomy, accounting disclosures must be identified, organised and classified to enable information to travel across boundaries. Classifications are constructed on the basis of similarities and differences between things in terms of their dimensions, function or resemblance, and different processes can be used to take existing instances of a class as precedents (Barnes et al., 1996; Bowker & Star, 2000). In doing so, classifications attempt to offer universality and provide stability to meanings (Berg & Timmermans, 2000). During this process, distinctions in knowledge are made as classifications enframe, order and arrange the world (Bowker et al., 1996). Classifications formalised in representational models offer a way of fixing the world before rendering it visible, mobile, comparable and interoperable (Berg, 1997; Bloomfield & Vurdubakis, 1997). However, classifications are inherently social in that they depend upon negotiated collective judgements, shared beliefs (Barnes et al., 1996) and the choices made by their classifiers (Nobes & Stadler, 2013). There is no such thing as a natural classification system that "may specify completely the wildness and complexity of what is represented" (Bowker et al., 1996, p. 347). Yet, classifications offer a unitary vision of the world (Bowker, 1996) where the wildness is tamed, and complexity channelled.

Heterogeneity is controlled and obscured by establishing residual categories such as 'other' or 'miscellaneous' (Timmermans et al., 2017). However, trade-offs exist between the comparability offered by homogeneity, and the tailoring needed to deal with

³ The current IFRS Taxonomy can be viewed at: <http://www.ifrs.org/issued-standards/ifrs-taxonomy/>.

heterogeneity and present data specific to one's own circumstances (Trigg & Bodker, 1994). Classification will therefore always involve a social process of abstraction whether making new partitions, reinforcing existing differences, making the invisible visible and the visible invisible (Bowker et al., 1996).

Across the social sciences, literature has highlighted the constitutive power of classification as it produces "discontinuity out of continuity" (Bourdieu, 1991, p. 120). Here, the process of classification offers more than a passive representation and can create social effects that either reinforce or negate that which is being classified (Hacking, 1986, 1996; Kuorikoski & Poyhonen, 2012). Self-referring feedback loops, described by Barnes (1983) as 'bootstrapped induction', can occur where conformance to a classification constitutes practice that is consistent with the classification (Barnes, 1983; Bowker, 1996; Bowker et al., 1996; MacKenzie, 2001; Merton, 1957). Hacking (1996) describes how the 'looping' effects of classifications arise through interactions with those who adopt the classifications. Classifications can gain constitutive power where endorsed by bodies with sufficient perceived authority, represented in devices which are perceived as authentic and used by influential groups. If one assumes a classification is accurate, it will help make the classification more accurate and stable in the future (Bowker, 1996).

The constitutive potential of classification forms part of a wider array of investigations into how formal information representations can both represent and intervene. Literature examining the active nature of specific information representations has studied the constitutive power of labels, categorisations, tables, quadrants and rankings (Barnes, 1983; Hacking, 1986; MacKenzie & Millo, 2003; Espeland & Sauder, 2007; Pollock & Williams, 2009; Pollock & D'Adderio, 2012; Fourcade & Healy, 2013; Mehrpouya & Samiolo, 2016; Pollock et al., 2018). By representing and intervening, depictions of information are found to provoke reflexivity and social action. Individuals react to the categorisations and labels placed upon them (Hacking, 1986), capital market actors are found to temporarily adjust their trading behaviour towards theoretical models represented by tables in easy-to-use market devices (MacKenzie, 2006; MacKenzie & Millo, 2003), and ranked organisations modify their behaviour in response to the evaluative templates on which they are ranked (Espeland & Sauder, 2007; Pollock & Williams, 2009; Pollock & D'Adderio, 2012; Pollock et al., 2018).

Collectively, these studies analyse how individuals and organisations react to informational representations of themselves or their activity, and the literature offers theoretical scope for representations to provoke a range of responses from conformance, to indifference to resistance (Hacking, 1986; Hacking, 1996; Kuorikoski & Poyhonen, 2012; Pollock & D'Adderio, 2012). Those represented may seek to instigate behaviour perceived to move away or towards their information representation. The basis of reflexivity, reaction, and conformance is therefore embedded within the specific and complex relations between the representation and the represented (Kuorikoski & Poyhonen, 2012; MacKenzie & Millo, 2003; Pollock & Williams, 2009).

In studies of conformance, information representations increase their validity by encouraging behaviour that conforms to the representation, and have the means to construct the phenomena they describe. In such circumstances, representations are described as an 'engine' rather than a 'camera' (MacKenzie, 2006). Representations become incorporated into stable, durable and visible artefacts such as official documents that strengthen their perceived validity. As they are reproduced in practice, they become standardised in related activity, and thereby interpreted normatively as accepted 'knowledge' (Bloomfield & Vurdubakis, 1997).

However, representations are not determinative, and alternatives can emerge where practice is perceived to be moving towards

an illegitimate representation (Pollock & Williams, 2009). Pollock et al. (2018) critique prior studies and argue that the means by which the represented conform to the representation is often characterised as a passive or mechanical process – a 'straightforward' process they describe as 'reactive conformance'. In their study of organisations subject to multiple and conflicting rankings, they introduce 'reflexive transformation' as a means to bring a focus on agency, dynamism and the potential for resistance where organisations can seek to shape their evaluative templates.

We aim to extend this line of theorisation to consider the nature of non-passive or 'non-reactive' conformance – examining how representations can intervene despite the intentions of those generating the representation. This marks a point of departure from studies of rankings and evaluative templates that have an explicit or implicit interventionist agenda to influence what they represent (Mehrpouya & Samiolo, 2016). We focus on the role of digitalisation in offering a machine-friendly representation of the accounting world. Although this was intended to mirror the existing accounting world, we examine those aspects of digitalisation that generate unintentional but constitutive capacity. In doing so, we build on those scholarly works that examine the production of the information representations (Pollock & D'Adderio, 2012; Mehrpouya & Samiolo, 2016) as well as their consumption.

In summary, our analytical focus on metadata, classification and information representation is used to consider how the processes of reflexivity, reactivity and conformance occur in a digital setting. We pose two research questions: 1) how is the principles-based nature of accounting standards and corporate reporting practice influenced by the construction of a taxonomy that seeks to classify and represent all accounting disclosures? and 2) how do information representations that are designed not to intervene generate conformance?

In answering these questions, we aim to shine an analytical light on "the invisible work carried out in the background by actors" (Millerand & Bowker, 2009, p. 152) and thereby foreground the changes that accompany corporate reporting digitalisation. We investigate the roles of metadata specification and classification that are embedded in the processes used to generate digital corporate reports that are compliant with the International Financial Reporting Standards. In the following section, we provide detail on the focus of our analysis and the methods used in our investigation.

4. Research method

To pursue our aims, we undertake a qualitative case study of the digitalisation project led by the global accounting standard-setting organisation, the International Financial Reporting Standards (IFRS) Foundation, which issues international accounting standards (known as IFRS) through their standard-setting body, the IASB. The dataset includes interviews with key actors involved in developing taxonomies and using them in multinational firms, observation of meetings held by those managing digitalisation and a detailed documentary analysis of the digitalisation project and taxonomy development process.

The empirics focus on the efforts made by the IFRS Foundation to enable firms around the world to digitise their corporate reports and accounts. The study concentrates on the activity undertaken to develop an 'IFRS taxonomy' based on international accounting standards (IFRS), the related institutional arrangements and early usage of the taxonomy by large multinational companies. Whilst the focus of the study is on the IFRS Foundation's digitalisation project, the analysis also relates to the digitalisation project being undertaken in the US by the Financial Accounting Standards Board and the Securities and Exchange Commission (SEC), given the

Table 1
Interview participants.

Institutional Role	Interviewee Identifier
Corporate Reporting Standard-Setter	S1–S13
Multinational Preparer	M1–M3
Accountant	A1–A5
Taxonomy Developer	T1–T3
Corporate Reporting Regulator	R1–R3
Consultant	D1–D4

interdependence between the bodies in terms of taxonomy design, personnel, and taxonomy development expertise.

Thirty-two semi-structured interviews were undertaken with thirty-one participants⁴ from major standard-setting organisations and from those directly involved in advising and preparing corporate reports at large multinational firms. Participation by one of the co-authors in the IFRS Foundation project (as a member of the XBRL Advisory Council from 2008 to 2013)⁵ offered contacts related to the digitalisation project. Interviewees were identified purposively from observation and participation in IASB committees and documentary analysis as having significant involvement in developing, setting and/or using corporate reporting taxonomies. Snowball sampling was used to identify further interviewees from discussions in initial interviews.

As part of the conditions of data access and ethical review, only the generalised roles of the interviewees are disclosed in Table 1.⁶ Those representing corporate reporting standard-setters included current and former senior Board members of the IASB, accounting technical managers and IFRS Foundation staff directly involved in creating, maintaining and governing taxonomies, plus senior staff from national corporate reporting standard-setters involved in digitalisation projects in major economies. Multinational preparers worked for companies known as innovators in corporate reporting and/or acted as advisors to the digitalisation project, piloting the early use of taxonomies. They held senior accounting roles in listed firms based in Asia, Europe and North America representing the technology and financial services sectors which reported 2019 revenues of between approximately \$11Bn and \$110Bn. Accountants represented members of the 'big 4' multinational accounting firms or accounting professional bodies who acted as advisors to the digitalisation project. Taxonomy developers had generally held senior roles at corporate reporting standard-setters, and were currently employed as consultants to digitalisation projects across the globe. 'Corporate reporting regulator' denotes interviewees who worked for regulatory authorities mandating or considering digitalisation in major economies. Finally, 'consultants' refers to those advisors of global digitalisation projects who worked for software companies, large data aggregators who distribute digitised information to users, and investor relations companies who assist companies in designing corporate reports.

A semi-structured interview approach was undertaken where all participants were asked about their professional history and their specific roles in relation to the digitalisation project to

understand the context surrounding their responses. Interviewees were then invited to discuss their views on, and understanding and operationalisation of, digitalisation and how they perceived it affected corporate reporting, whilst subsequent questions were derived from their responses and their particular roles and experiences. On average the interviews were approximately 1 hour long and took place between 2012 and 2015, a timeframe that is characterised by significant and intensive taxonomy development activity.⁷ The interviews were recorded,⁸ transcribed, analysed and coded in NVivo.

The documentary analysis focused on the operational and governance committees surrounding the digitalisation project since its inception. A literature review of all professional and academic literature relating to XBRL from 2002 was undertaken. All documentation and minutes published by the IFRS Taxonomy Consultative Group (ITCG) until the end of 2017 were systematically analysed (see below). This committee, comprised of international experts from standard-setters, regulators, software specialists, information providers and 'user' companies, was set up by the IFRS Foundation to review and provide advice on the development of the IFRS taxonomy. Minutes and those documents from IASB meetings relating to the digitalisation project were also systematically analysed until the end of 2017. In addition, documents relating to the taxonomy development processes of other significant corporate reporting frameworks, (such as US GAAP), formed part of the empirical base where they interacted with the development of the IFRS taxonomy. The documentary analysis also included recordings of presentations and public commentary relating to the digitalisation project made by ITCG members, IASB staff and others. Together, the documentation comprised online audio/visual recordings, discussion papers, minutes of meetings, agenda papers and presentation slides/notes. The evidence base was also supported by the observations by two researchers of proceedings and interactions at the IFRS Taxonomy Convention in 2012 and an ITCG meeting in 2015.

To systematically interpret the dataset, the documentary evidence was used to identify themes, historical events and key issues, whilst verifying facts and events discussed in the interviews. Observation was used to identify current and emerging themes, and the interaction between different actors. The first stage of the interview analysis involved listening to the audio recordings and reading the transcriptions. This, together with the documentary and observation analysis, was used to generate higher-level, holistic first cycle codes based on descriptions, events and actions such as the creation of the Common Practices category whilst structural coding sought to identify common issues and concepts such as the tension surrounding principles-based reporting (Gioia et al., 2012; Saldaña, 2016). The next stage sought to evaluate and group together codes to develop a smaller number of detailed, abstract themes in relation to the theoretical framing of the paper – this stage involved an iterative process of reflection and ongoing refinement during the development of the manuscript. The inter-related development of the theoretical framing and themes then dictated the narrative structure of the analysis and the selection of quotes exemplifying the themes (Gioia et al., 2012).

5. Analysis

This section commences by introducing the challenges posed by

⁴ One actor participated in two interviews.

⁵ This remit of this committee was to provide strategic advice concerning XBRL in relation to the development and adoption of taxonomies for IFRS.

⁶ Given the nature of corporate reporting, some interviewees occupied multiple positions at one time, or had held multiple positions during their careers: for example, members of accounting firms worked within, or were seconded to standard-setting organisations and taxonomy development organisations; members of corporate reporting standard-setters later worked as 'freelance' taxonomy developers. The interviewee designations are therefore based on their main role at the time of the interview.

⁷ To facilitate the participation of those residing in different continents, 12 interviews were conducted via video-conferencing.

⁸ One interviewee declined to be recorded and the analysis was based on interview notes.

digitalisation mandates before analysing the different approaches to taxonomy design, and revealing how the IFRS taxonomy developed in relation to its US counterpart. The fourth subsection details the classification processes undertaken to identify 'common' practices before examining how the changes to the governance of the IFRS digitalisation project affected the authority and validity of the taxonomy. The final subsection draws on evidence collected from those involved in applications of digital reporting to understand how firms used the taxonomy in practice.

5.1. The digitalisation of corporate reporting

Digitalisation requires firms to introduce processes to partition and 'tag' the disclosures made in their corporate reports to a metadata 'element' using XBRL. The metadata elements are defined, organised and standardised within a publicly available taxonomy, and firms are required to decide which element in the taxonomy should be tagged to which reporting disclosure.

As regulators introduced digital reporting requirements, standard-setters had to construct a taxonomy encapsulating all their accounting standards to assign metadata to specific disclosures and enable firms to structure their reports so they can be read by machines. Corporate reporting is based on a 'model' of accounting developed over hundreds of years of custom, practice and politics, that is codified within accounting standards and an accompanying conceptual framework. By intention, it does not universally specify every reporting disclosure to give firms the freedom to disclose information consistent with conceptual principles. This 'principles-based system', best encapsulated by the global accounting standards set by the IASB, ensures corporate reports are a heterogeneous mix of mandatory and 'tailored', discretionary disclosures.

Digitalisation posed a problem: the accounting model, upon which the IFRS (and other reporting) taxonomies were based, is non-universal by design whilst digitalisation requires an unambiguous, universal codification. From a digitalisation perspective, taxonomies that encompass all information in the accounting model enable the 'same' corporate reporting disclosure to be tagged to the same taxonomic element by all firms. Where reporting taxonomies do not include all types of reporting disclosures, digital comparability suffers - users are unable to compare specific disclosures across large samples as envisaged by digitalisation.

A good taxonomy needs to be able to cater for a very wide range of circumstances, we have companies with very simple affairs who will only use a few tags, we've got some of the most complex groups on the planet so ... the same taxonomy needs to have sufficient flexibility to cope with it and that's a real art (R2).

To cope with the heterogeneity of global corporate reporting, the 'metadata language', XBRL, enables firms to create and add elements to the taxonomy to represent discretionary items not specifically required by accounting standards. The ability of firms to add to the taxonomy by creating their own elements is described as 'extensibility'.

Digitalisation therefore introduces a new process to corporate reporting practice as firms must tag their disclosures to a given taxonomy. For non-standard, firm-specific disclosures with no appropriate element in the taxonomy, firms face choices: a) they can tag their disclosures to what they judge is the best *available* element in the taxonomy; b) they can add a new, firm-specific element to the taxonomy; c) or they can change their reporting practices to fit the taxonomy. However, only the latter option ensures standardised digital comparability, a key driver of digitalisation.

5.2. Taxonomy design choices

The first reporting taxonomies were developed by interested parties within accounting and IT fields. Early taxonomy developers were organised into national, private sector bodies (for example, XBRL US) which were affiliated to a private sector, international organisation, XBRL International (Troshani et al., 2015). The initial IFRS taxonomies were developed from 2002 by volunteers from XBRL International affiliates and 'big 4' accounting firm partners (Ramin & Prather, 2003). Fig. 1 shows a timeline depicting the key stages in developing the IFRS taxonomy since 2002.

The initial approach used in taxonomy design accepted that reporting taxonomies could not codify the breadth of heterogeneous reporting practice allowed within the accounting model. Taxonomy design focused on codifying only those reporting disclosures required by accounting standards in a smaller, 'core' taxonomy. Firms could then modify and thereby extend the core taxonomy to create their own customised elements to fit their non-mandatory, firm-specific reporting disclosures that were perceived to more effectively communicate corporate performance (Teixeira, 2007).

During this early stage, the IFRS Foundation effectively outsourced the digitalisation of IFRS to IT specialists. In July 2007, taxonomy development was formally placed under the responsibility of IFRS Foundation staff as a 'supporting activity'. An IFRS Foundation XBRL team was formed to develop the taxonomy after technical advice and comprehensive review by an XBRL Quality Review Team (XQRT) and strategic advice on adoption and implementation from an XBRL Advisory Council (XAC). Although this move recognised the increasing importance of digitalisation, IASB members were keen to ensure it remained separate from 'technical' [traditional accounting standard-setting] activity.

Basically [chairperson] and the Board, they are all techies ['technical' accounting standard-setters], they had no interest in [XBRL] whatsoever ... There was interest in other quarters so they kicked it into the Foundation. All the reporting was to [director's] team, rather than to the technical side, and that was sort of how it was nurtured along (S1).

Fundamental principles for taxonomy development stated that the IFRS Foundation XBRL team "do not interpret or establish IFRS, and carry no authority as such" and taxonomy elements are "based off the language of IFRS to the closest extent possible" (XAC, 2012, p. 40).

[taxonomy development] was very much more separated, and I think there are a lot of people that wanted it that way because they didn't want the XBRL teams setting standards by the back door. So defining an element [in the taxonomy], for example, defines the underlying item in the financial statements and people didn't want that to happen (S9).

Although the IFRS Foundation had brought the digitalisation project 'in-house', the taxonomy development process was viewed as a non-core activity and remained under the influence of the IT specialists. In this early stage of taxonomy development, international standard-setters expressly sought to suppress the constitutive capacity of the digital representation. It was forbidden to include anything in the taxonomy that did form part of the 'paper-based' IFRS accounting standards.

In commencing work on a new IFRS taxonomy, the IFRS Foundation XBRL team, together with their colleagues in the US, were confronted by observations of taxonomy usage in practice that

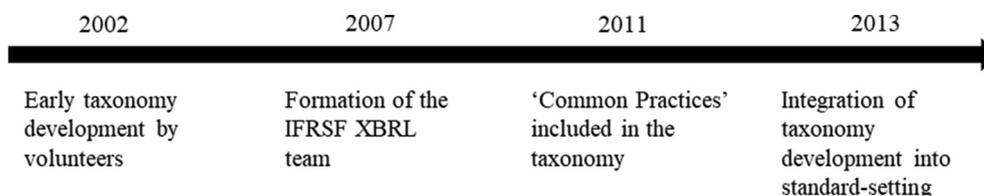


Fig. 1. Timeline depicting the development of the IFRS taxonomy.

exacerbated the tension between the principles-based 'incompleteness' of the accounting model and completeness required by digitalisation.

5.3. The evolution of the IFRS taxonomy

In the US, pilot schemes for digital corporate reporting had been initiated since 2005, and reflections on how firms used taxonomies in practice began to influence US SEC regulators, and later, the IFRS Foundation XBRL team, to radically alter their approach to taxonomy design that challenged the original intentions of the IASB.

US firms initially adopting digital reporting created new elements to suit their reporting disclosures due to the lack of detail inherent in early taxonomies (Boritz & No, 2008). For example, early users of the US GAAP taxonomy sought to significantly extend the core taxonomy where approximately 10%–25% of their digital SEC filings represented taxonomy extensions in 2008–9 (Debrecey et al., 2011a).

However, extensibility (the ability to create new elements) presented a challenge for reporting comparability. Extending the core taxonomy to include new firm-specific elements reduced the comparability between the reports of different firms. To improve comparability, the SEC responded by explicitly encouraging firms to fit their disclosures within the core taxonomy rather than create new taxonomy elements. SEC EDGAR Filing Manual Rule 6.8.4 stated that,

"wherever possible, registrants should assign a standard and other labels for an element defined in a standard taxonomy schema in preference to declaring a new element in a company schema" (SEC, 2010: p.3).

To reduce the need for firms to add firm-specific taxonomy extensions and thereby increase 'cross-firm' comparability, regulators then specifically sought to develop more comprehensive taxonomies that would capture a wider breadth of reporting practice. Consequently, corporate reporting taxonomies have, over time, sought to include an increasing number of elements, including those required by accounting standards but also many discretionary disclosures.

In the US, the reporting taxonomy grew from approximately 2,500 elements in 2006 to approximately 20,000 elements in 2009 to reduce the need for firms to create their own taxonomy extensions (see Debrecey et al., 2011a). This involved identifying more granular disclosure requirements but also common disclosure practices not required by accounting standards. In extending the US GAAP taxonomy, the reporting practices of specific firms were particularly influential, as explained by an interviewee involved in the process.

The good way is to obviously have lots of examples of how people report – that's what [taxonomy developer] did in the States ... [The taxonomy developer] took the example of Microsoft at that time [to develop a workable taxonomy] ... And

then what they have now ... they can fit anything in the US GAAP taxonomy (S11).

As the US GAAP taxonomy became more comprehensive, large firms in the US reduced the number of custom, firm-specific extensions used in their digital filings and conformed to the core taxonomy (SEC, 2014). Digital comparability was favoured over extensibility.

Whilst the US GAAP taxonomy developed as a digital representation of reporting *practices*, developers of the IFRS taxonomy were initially required to build the taxonomy only around the mandatory requirements of accounting *standards*. An attempt was made by IFRS Foundation XBRL staff to develop a more comprehensive, 'practice-driven' IFRS taxonomy to incorporate both disclosures required by IASB standards, illustrative disclosure examples contained within the standards plus the 'model financial statements' published by large accounting firms (S7, S1, S11). However, the inclusion of elements from outside the accounting standards in the revised taxonomy was initially rejected by the IASB, the decision-making authority.

We had a functional taxonomy in IFRS when we just took the illustrative financial statements of the big 4, and used those to build the taxonomy and then [the Chairperson] and others at the IASB, which wanted to have nothing to do with XBRL, said you can't have an element in there if it's not in the standard, and that was the end of that one ... (S11).

However, the IASB received repeated requests to improve the comprehensiveness of the taxonomy to reduce the number of firm-specific extensions and thereby increase the comparability of reporting information. Several interviewees revealed the specific influence of the US SEC in trying to persuade the IASB to base the taxonomy on *practices* as well as *standards*. For example,

We would stick to the IFRS but then very, very soon after that we received something from the US because they had a quite different approach. The US told us '... there are a few issues with your taxonomy; first you are not providing definitions to an element', and that was on purpose because we felt ... that IFRS are good enough to describe an element, no need to provide extra definitions ... But the second issue was that the IFRS taxonomy was too, 'academic' was the word that they used, because we were not close enough to the market ... The US told us 'you should add [more elements] into your taxonomy' (S7).

The US stance derived from their acceptance of international accounting standards (IFRS) for foreign firms listed on US capital markets. In common with other domestic US-listed firms, it was expected that foreign firms would be required to make digital XBRL-based filings to the SEC. This relied on the SEC allowing foreign firms to use the IFRS taxonomy as well as the US GAAP taxonomy.

Initially I think [the SEC] just felt the [IFRS] taxonomy was not good enough. It's so different from the US taxonomy (S2).

... [the lack of comprehensiveness] made the IFRS taxonomy in the US SEC filing space unadoptable ... The [IFRS] taxonomy was not complete enough for them to apply ... At one point the IFRS taxonomy dropped from a 4,500 data point taxonomy down to a couple of thousand ... and the US GAAP taxonomy is and remains ... between 13,000 and 17,000 data points depending on who you talk to but it's a much richer taxonomy (T1).

Consequently, the IFRS taxonomy was amended to include definitions of all elements, even where no definition was included in the accounting standards. The taxonomy moved from merely representing existing accounting standards to providing what was perceived to be new reporting guidance.

The question is how far do we want to go defining things [in the taxonomy] especially if the Board hasn't defined something [in the standards] (S2).

The pressure to align with the US GAAP taxonomy also led to more non-mandatory disclosures being added to the taxonomy. This included new line items, accounting policies, aggregations, disaggregations, subtotals and management commentary that were not required by IFRS. Elements were identified from model financial statements produced by the 'big 4' accounting firms and from observing reporting practices.

Capturing 'common' reporting practices and incorporating them as elements in the taxonomy was, after the initial strong resistance, seen as a helpful and necessary development by some.

The Common Practice elements are quite useful in my opinion to enrich the taxonomy in terms of things that the standards never mention about, or mention but leave space to decide for the filers (S6).

Non-mandatory disclosures were first formally included in the 2011 IFRS taxonomy when a selection of 'Common Practice' disclosures were identified from a sample of approximately 200 IFRS-based accounts across different industry sectors, including all US foreign issuers reporting under IFRS and all IFRS statements from Japanese filers (IFRSF, 2011a). By moving from a normative, 'theoretical' depiction of *required* disclosures to a 'positive' view based on practice, the IFRS taxonomy offered the means to provide an authoritative representation of *expected* disclosures. The project team found that:

"the need for these extensions arose largely from IFRS requirements and the flexibility that IFRS allows for presentation and aggregation" (IFRSF, 2011b: p.1).

Since then, there has been a large growth in the number of non-mandatory elements codified in the IFRS taxonomy. The number of Common Practice elements in the taxonomy had risen from 117 in 2011 taxonomy to 926 by 2016 (IFRSF, 2016a; ITCG, 2014a).⁹ As a consequence, the IFRS taxonomy had grown from 2,545 elements in 2011 to 5,654 elements in 2016 (see Table 2). The Common Practices and illustrative examples are not formally part of accounting standards but have the potential to reinterpret corporate reporting by being represented in an authoritative taxonomy as a result of

⁹ The current IFRS Taxonomy and constituent categorisations is available in different 'views' at: <http://www.ifrs.org/issued-standards/ifrs-taxonomy/>.

digitalisation.

5.4. Identifying 'common' practices

The design of the IFRS Taxonomy had moved from an initial conception of representing accounting standards, to representing accounting practice. In this subsection, we analyse the classification processes that influenced whose 'common' accounting practices came to be codified in the IFRS taxonomy. As voiced by one interviewee,

I think the ... problem with Common Practice is that what do you say should be Common Practice or not? Where do you set the bar? You can have a problem ... Where do you start, where do you stop? So it ... could easily result in a taxonomy that becomes so excessive (S4).

In attempting to distinguish what was 'common' (from what was 'uncommon'), the IFRS Foundation XBRL team examined samples of corporate reporting practice. The first sample, in 2011, comprised 145 commercial/industrial, 25 financial services and 23 insurance financial statements¹⁰ (IFRSF, 2011a). The sectoral distribution of the sample was heavily biased towards manufacturing, transport and communication with very few firms in retail, wholesale, real estate and food & beverage industries (IFRSF, 2011c). The geographic distribution was biased towards the UK (33 firms) followed by Australia (15) and Israel (12). Firms from other major economies were less well represented in the sample used to identify common non-mandatory reporting practices (e.g. Germany (11), China (11), France (7), Brazil (7)) (IFRSF, 2011a).

From 2012, Common Practices were selected from specific industry samples generated from major market indices. Reporting practices were identified both by general volunteers (the 'Detailed Tagging Task Force') and participants from the selected sectors (IFRSF, 2012b).¹¹ The classification process was described in depth:

We take our taxonomy and we just have it in our Excel spreadsheet, the left hand side, and then we have 50 companies going across, all their line items going down. I would literally try to match them to the taxonomy and what doesn't match, then we highlight those to say they're not in the taxonomy. And those that we can't tag to the taxonomy we try to see if they're the same across any of the other 50 companies and then if they are then we investigate them further for potential Common Practice items (S8).

Common Practices were identified where an item was 'regularly' disclosed that was not codified in the current IFRS taxonomy and did not clash with existing standards. For example, the most common Income Statement occurrence in 2011 (Finance Income) was identified in 53 out of 145 commercial/industrial financial statements (IFRSF, 2011a). Qualitative assessments were used to identify disclosures that were rare, but reported in a similar way by those firms that did disclose them. For example, only three occurrences of 'Merger Reserve' were identified from 145 commercial/industrial financial statements (IFRSF, 2011a).

¹⁰ Common practices for financial services companies and insurers were also identified from the reporting taxonomies of the European Banking Authority (FINREP) and the Bermuda Monetary Authority.

¹¹ This was expanded in later years to seek contributions from regulators and accountancy firms (to undertake empirical analysis), and investors and preparers (to provide general feedback) (IFRSF, 2014a).

Table 2
IFRS Taxonomy Categorisations (data elements within each category over time).

Taxonomy Version	'Common Practices'	Illustrative examples and guidance	Accounting standards	Total Elements
2011	117	290	2,138	2,545
2012	692	408	2,669	3,769
2013	772	415	2,618	3,805
2014	862	417	3,765	5,044
2015	884	515	4,027	5,426
2016	926	540	4,158	5,654

Source: ITCG (2014a); IFRS (2016a).

I do see the risk of us adding an element that actually [the IASB] wouldn't like and they wouldn't want to be there. Yes of course we have procedures that should prohibit us from doing that. We run the list of elements before we propose them via the technical directors, we run them by a group of Board members that are selected for the purpose of the review so there is a lot of procedure to avoid having an element that is not good but there is a risk. I mean there are certain elements that ... might be controversial. Our Common Practice levels are low but there is so much variety in the world that in order to get something as a Common Practice element we are using about 10% of our sample, which is very low ... Only the first Common Practice project that we ever went into ... had elements [representing] 40%, 50% of companies, I don't think we ever had elements that were more than 50% (S5).

A list of proposed Common Practice elements was reviewed internally before a taxonomy exposure draft was released (IFRSF, 2011a). After exposure comments were received, new Common Practice elements were added to the taxonomy. Although the IFRS Foundation developed a transparent due process to identify items which were perceived to represent 'common' corporate reporting disclosures, persistent concerns were expressed about the lack of input from reporting participants.

We have requested ... public comment from documents but not many get back to us ... and in fact for the current point for this project we had actually 5 people respond ... Say the [X] industry ... we had 5 representatives from 5 different [X] companies in here watching us do the taxonomy and they're saying 'no we report this and please include this' but what of the others who can't give their input? (S8).

The identification of 'common practice' was based on judgments made by taxonomy developers and volunteer 'Task Force' members from samples of corporate reports and from the model accounts published by 'big 4' accounting firms. As a consequence, the selection of Common Practices is likely to reflect the interests of those actors identifying disclosures¹² and those involved in preparing statements at those firms. Yet the practices of a relatively small sample of non-US multinationals and 'big 4' model statements may not be reflected elsewhere in the worldwide corporate reporting arena. The analysis proceeds by considering how the taxonomy began to gain its constitutive capacity despite the intentions of the IASB.

¹² For example, the ITCG received feedback from one 'user' of the IFRS Taxonomy in May 2016, who recommended adding 23 Common Practice elements to the taxonomy after analysing the statements of 5 large banks. After review, 21 of the elements were added to the IFRS taxonomy (ITCG, 2016).

5.5. Control vs validation

As detailed above, the IFRS taxonomy had, by 2011, begun to codify definitions and Common Practices not mentioned in the accounting standards, plus illustrative examples not required by the standards. However, nearly all interviewees expressed concern that the taxonomy, and specifically the Common Practices, might be seen by firms as authoritative guidance or 'quasi-standards'.

The risk is that if we add a Common Practice, people treat that as guidance and people treat that as 'this is ... what [the] taxonomy says so this is the way we should describe it' ... Whereas if you read it properly ... it's just meant to be an illustration ... but there is a concern that the taxonomy will drive practice (S5).

The change in taxonomy design offered a means for the digitalisation project to interpret accounting standards by providing visibility, validity, and thereby quasi-standardising specific non-mandatory reporting disclosures. At the same time, the change in taxonomy design also led to new institutional arrangements being introduced that unintentionally amplified the power of the taxonomy to digitally (re)present the existing accounting model.

In 2011, a Trustees' Strategy Review proposed that the IFRS Foundation XBRL team be brought under the direct supervision of IASB technical accounting directors. It noted:

"while XBRL considerations should not dictate the substance of the standard-setting process, the Trustees recognise the growing importance of XBRL requirements ... Consequently, in drafting new standards, the IASB should take into account the need for language that is easily translatable into ... a consistent XBRL taxonomy" (IFRSF, 2012a: p.7).

The proposals acknowledged, for the first time, that the drafting of accounting standards should consider how they would be organised within a metadata taxonomy, and were prompted by a growing recognition that the digitalisation of corporate reporting had become impossible to ignore, and needed to be controlled.

I think many of the Board members had little or no interest in digital reporting, and there was a feeling that well, it's just purely a delivery mechanism, it's an alternative to a bit of paper. Why should we be concerned about how big the page is? What the font size is? Well, if we're not concerned about that then why should we be concerned about digital reporting? I think things have changed somewhat ... There are still some that have that attitude but I think there are others that would believe that one should think about [digital] reporting when thinking about accounting standards. There is an interaction (S9).

Taxonomy development would become part of the standard-setting process rather than occupying a peripheral IT-based role in the IFRS Foundation. The proposals would ensure,

“some level of IASB involvement in the quality assurance process and interaction between IASB project managers and the XBRL team at staff level during the standards development stage” (IFRSF, 2012a: p.20).

The chairperson of the IASB announced that,

“XBRL is no longer an afterthought to our standard-setting activities – something to consider as the final standard is about to be published. Our technical [accounting standard-setting] staff now work with their XBRL colleagues throughout the entire lifecycle of the project, consider tagging implications as the standards are being drafted” (Hoogervorst, 2012: p.3).

However, the Strategy Review proposals prompted respondents to publicly express concerns over the growing influence of the taxonomy on accounting standards and standard-setting. Comment letters conveyed unease about the potential effects of digitalisation as indicated below:

“We have serious concerns about the proposed recommendation to integrate XBRL into the standard-setting process and in addition to include relevant extensions in the existing IFRS taxonomy. At this stage we are of the opinion that the IFRS taxonomy should not be integrated in the IASB standard-setting process, but remain a separate activity of the IFRS Foundation ... XBRL in our view is an important support tool and facilitator for reporting information and we are strongly of the opinion that such a tool should not determine the quality of the standard ... We see a clear risk that the integration would install the tendency to normalise, standardise financial reporting beyond what is the appropriate level of standardisation, and could therefore undermine innovations and development in the standards” (EFRAG, 2011: p.12-13).

“XBRL is merely a tool for encoding the information required by an accounting standard to facilitate electronic communication and analysis, and important though this is, XBRL considerations should certainly not affect the way in which a particular standard develops” (ICAEW, 2011: p.11).

Although the effects of digitalisation, as observed by the EFRAG and the ICAEW, were recognised by IFRS Foundation staff, their solution was to seek to control the impact.

We’d still want ... control of what we think is an appropriate representation of the standards because [of] the same concerns which the Board have raised ... around Common Practice to the extent of ‘how much is that interpreting, driving practice?’ I think the Board would be in control of that rather than enabling, say, regulators or preparers or ... others to do that (S5).

I suggested to [director] ... we should try and integrate [taxonomy development] because I was a bit concerned about the taxonomy not being linked in carefully enough with the standards and the tail wagging the dog and so I said the only way to do this properly is to have the two thought about together (S1).

The IASB faced a problem: growing recognition of the effect of the taxonomy, and particularly Common Practices, in interpreting accounting standards prompted the IASB to take more control over taxonomy development. However, greater control of taxonomy development and its incorporation into formal standard-setting only strengthened perceptions that the taxonomy was a valid IASB-endorsed representation of international accounting

requirements.

Despite the expressed concerns, the Strategy Review proposals were first enacted by the IASB in the 2013 ‘Disclosure Initiative’ that specifically brought together standard-setting and taxonomy staff (IFRSF, 2013a) alongside new procedures for developing the taxonomy. The IFRS Foundation taxonomy team were integrated into technical, accounting standard-setting teams and a new external consultative body, the IFRS Taxonomy Consultative Group (ITCG), was set up to replace the XAC and XQRT (IFRSF, 2014b). Common Practices were to be examined by the ITCG, and then ‘reviewed’ by a panel including 3–5 IASB members to ensure the taxonomy did not add elements that conflicted with its accounting standards (IFRSF, 2016b).

Taxonomy development therefore moved from being a *peripheral* function codifying accounting standards that had already been issued, to an *integral* part of the standard-setting process.

there was something like a Chinese wall between the taxonomy team and the Board. Now there is very, very great permeability interaction between all staff ... [taxonomy developers] are part of the IASB staff (S7).

[Earlier in the digitalisation project] I never saw [Board members] and never heard any comments from [Board members]. A few years ago, there was some involvement, especially when we said ‘hey look at this, this disclosure isn’t written clearly enough that we cannot tell if it’s an instant or a durational tag’. Well, all of a sudden that got to the Board I think ‘Hey, this is interesting!’ – so it is definitely changing (T3).

The effect of the taxonomy on standard-setting was described by many participants in positive terms. ITCG members thought Common Practices might “inform and benefit standard-setting as it provides an empirical feedback loop to the IASB” (ITCG, 2014b, p.1). An IASB member noted that,

“the IFRS taxonomy improves standard-setting, because it forces the IASB and its technical staff to reflect on the precise meaning of words used to describe disclosures within the Standards” (ITCG, 2014c: p.1).

The integration of taxonomy development into standard-setting enabled the IASB to exercise greater control over how standards were interpreted in the taxonomy. In doing so, the IASB sought to contain the effects of the taxonomy. Conversely, however, the move was perceived as validating the taxonomy as an authoritative template of expected disclosure requirements.

Although taxonomy development had been integrated into the standard-setting process, the IASB was keen to stress that a disclosure identified as a Common Practice in the taxonomy did not mean that the disclosure was part of international accounting standards. As described by the IASB Chairperson:

“The XBRL standard should not define, or indeed impede, the Board’s standard-setting activity. In other words, the XBRL tail should not wag the IASB dog” (Hoogervorst, 2012:2).

Internally, however, IFRS Foundation staff recognised the tension between *controlling* the taxonomy and *validating* it. As detailed below, moves to control taxonomy development exacerbated concerns that the taxonomy ‘tail’ could wag the standards ‘dog’.

“the content and structure of the IFRS taxonomy can influence how IFRSs are applied and interpreted ... The design and content of the IFRS taxonomy can influence how entities classify and

present information in financial statements ... Individuals expressed a concern that having the IASB involved in approving the taxonomy creates a risk that the taxonomy will influence IFRS requirements" (IFRSF, 2013b: p.3, 7-8).

In summary, the IFRS Foundation gradually recognised the implications of digitalisation and reacted by bringing it under closer control of the standard-setter, the IASB. However, in doing so, concerns were expressed over whether this strengthens the impact of digitalisation by allowing taxonomy considerations to be explicitly incorporated into the standard-setting process, and providing greater validity to the representation of accounting depicted by the taxonomy. The IFRS Foundation sought to mitigate these concerns through guidance on extensions and firm-specific disclosures, and emphasising that IFRS were principle-based standards (ITCG, 2014d). Although Board members and IFRS Foundation staff attempt to distinguish the taxonomy from the accounting standards, this relies on the *interpretation* of corporate reporting actors. In the final subsection, we analyse how the taxonomy was interpreted by early users of the IFRS taxonomy.

5.6. Interpreting and conforming

The taxonomies are interpreted and used by firms to tag each corporate reporting disclosure and assign it to a particular element in the taxonomy. As described by one preparer involved in piloting IFRS taxonomy usage:

We prepared a pretty large Excel sheet and ... did the same as we'd do for account mapping. We would basically say, 'alright, here is the IFRS taxonomy, and here is the information that we disclose and now how should we map out the information that we disclose to the specific tags of the IFRS taxonomy (P2).

As part of the mapping process described above, the reporting taxonomies were commonly characterised as authoritative 'checklists' (S3).

you say 'look tick, tick, tick, have I looked at this, have I looked at this, have I looked at this, have I looked at that' so I roll down the checklist of things I *should* disclose (S4 emphasis added).

If people are going and tagging stuff they very well might look at the thing and say 'I don't find a tag here, maybe *I'm* doing something wrong' (A1 emphasis added).

The impact of the taxonomy was clearly illustrated by a preparer describing how disclosures were altered to adhere to the perceived 'checklist'.

As part of our exercise of getting consolidated financial statements of [dual-listed multinational] ready for XBRL, we really started with our financial statements. So the first step was not to look at the technology itself but simply to look at the financial statements and then ask ourselves, 'what do we need to change in the financial statements to then make the tagging process easier'? And that included, in the end, renaming some line items in the financial statements to align them more closely with the terminology of the IFRS taxonomy (P2).

The quote describes the effects of digitalisation where reporters move from using their own descriptions of particular line items to fit the labels defined in the IFRS taxonomy. The new digital (re)

presentation of the accounting model included definitions for each taxonomy element, many of which are not defined in accounting standards. Although preparers can tag a disclosure without changing the wording of their disclosures, the taxonomy definitions or labels were perceived to be influential (Bovee et al., 2002).

It's all supposed to be based on concept ... Net Income, Net Profit or Loss, no matter what you call it. It's the same concept and they should all use that same tag but they don't. They're like 'no' they think the label is the concept (A1).

The preparer above described how the taxonomy was 'correct' because it was based on IFRS standards without reflecting on the many voluntary taxonomy elements that the firm had no requirement to conform to (see Table 2).

Obviously *since the IFRS taxonomy is based on the IFRS standards*, it helped us to close our alignment with the terminology that we use within our financial statements and also within the notes to the IFRS standards that we believe is really beneficial to get more clarity, to make it clearer what is contained in those line items (P2 emphasis added).

The taxonomies are also able to influence reporting disclosures in addition to reporting terminology.

We looked at the Common Practice examples that had been introduced in the same manner as we would look at the update of the IFRS taxonomy on a yearly basis and then identified a couple of extensions then that we were able to get rid of (P2).

The key issue is whether firms choose to extend the taxonomy to fit their reporting practices or whether they fit their reporting practices to the taxonomy (Cohen, 2004; Debreceeny et al., 2011b). The process was described in detail:

This also included making decisions about where an extension would be necessary and then ... we looked at the extensions that we had created and then really questioned, do we need an extension? Why do we disclose this information? And there were quite a few points where we had to agree that while a disclosure might have been mandatory quite a few years ago, it had since been abandoned. And as part of the preparation of the financial statements you never really make that match back from the financial statements to the IFRS standards. You roll forward each year's financial statements and if it was in there last year there was probably a good reason why you put it in there and you would have to disclose it again and again (P2).

Where preparers fit their reporting disclosures to those defined in the taxonomy, digitalisation homogenises formerly heterogeneous reporting practices.

As a result we 'cleaned up' our financial statements ... we aligned the wording to align more closely with the IFRS taxonomy and thus the IFRS standard. We got rid of some disclosures because obviously they had been voluntary disclosures. We rearranged some information because we realised not only would it make the later tagging so much easier (P2).

As evidenced above, and against the intentions of the standard-setters, individual firms are changing historical patterns of disclosure to align with the taxonomy (see also Debreceeny et al., 2011a). This effect was commonly described in positive terms as a form of

'disclosure review', 'quality audit' or checklist that could improve corporate reporting. For example, taxonomy usage was described by one interviewee as having a disciplinary effect on firms' disclosure practices.

We have some evidence that it improves their thinking ... We did some detailed tagging courses where we really worked with preparers and they tagged their financial statements to the IFRS taxonomy ... They said 'look, it makes us reflect upon our disclosures' - which comes back again to this quality aid rather than checklist -and in some cases it made us question why we put this particular disclosure in or why did we use this particular label' ... Some preparers have thought 'look instead of putting something in our ... financial statement, it really belongs in the management commentary'. And I've seen examples where preparers may have put something before in a textual description and [now changed] to a better explanation or better format to make the information feasible (S4).

The evidence above indicates that firms change their reporting practices to fit the taxonomy. Rather than simply offering a back-stage digital representation of the accounting model, usage of the taxonomy intervenes to change practices so they increasingly resemble the taxonomy: the taxonomy tail wags the corporate reporting dog. In doing so, a self-validating feedback loop is generated as the initial digital (re)presentation of practice becomes more accurate and valid as more firms conform to it (MacKenzie & Millo, 2003). Although the IASB sought to resist conformance, their increasing control of, and association with the taxonomy only served to offer more validation to the digital representation.

As a consequence, the development of the taxonomy exacerbated the tension in corporate reporting between firm-specific communication, concordant with a principles-based reporting approach, and cross-firm comparability. This tension was observable in documents, meetings and interviewee comments. For example,

"Integrating XBRL in the standard-setting process may take the IASB away from a principle-based approach to standard-setting, more particularly in the area of disclosures ... Any additional encouragement to promote detailed disclosure at the level of XBRL should not be part of the fundamental IASB or IFRS Foundation remit. Moreover, the IASB has decided to make disclosures more principles-based by indicating the objective of the disclosures, rather than a prescriptive list of disclosures. This step should be encouraged and the IASB should not be stimulated to go in the opposite direction ... In a similar way the integration of extensions in the IFRS taxonomy, reflecting codified common practice that cannot directly be linked to authoritative IFRS literature, may increase the disclosures in IFRS when the emphasis should rather be on reducing them". (EFRAG, 2011: p.12-13)

Despite the expressed concerns and the IASB's own emphasis on firm-specific communication in its 'Disclosure Initiative', the IFRS Trustees' Strategy Review emphasised that the aim of the taxonomy is to "help ensure comparability of financial data for end users" (IFRSF, 2012a, p. 14). Furthermore, "most [ITCG] members said additional structure, definitions, granularity and templates for the primary financial statements would increase comparability and data quality" (ITCG, 2016, p. 2). Taxonomy development was viewed by one standard-setter as an opportunity to provide more reporting guidance for IFRS, consistent with a more 'rules-based' reporting approach based on 'what ought to be' rather than 'what is'.

We've adopted this approach for these common items of just observing practice which is completely at odds with all the other items that we have ... I feel that we should have developed the Common Practice elements ourselves on the basis of what we think companies *should* be reporting and the way they *should* be reporting ... We should specify that list of items and we should do it at the time we issue the standard, and we should then ditch Common Practice (S9 emphasis added).

Despite initiatives promoting flexible, more relevant, firm-specific reporting information, digitalisation generates an opposing force valorising reporting comparability and uniformity. In the following section, we close the paper by discussing the implications of the analysis.

6. Concluding discussion

Our study of the IFRS digitalisation project illuminates how digitalisation has disrupted corporate reporting, and details the effects arising from the requirement to provide a taxonomy that allocates contextual metadata to all corporate reporting disclosures. We use the empirical case to develop our broad contributions.

Firstly, we reveal the process by which metadata specifications and classifications necessitated by the digitalisation project actively shape the nature of accounting standards and corporate reporting. This enables us to see how the requirement to offer a machine-readable representation of accounting affects key debates over the future direction of corporate reporting.

Secondly, we provide a nuanced perspective on the relations between information representation and intervention to understand the processes of reflexivity, reactivity and conformance where intervention is specifically resisted. As the digital representation is not intended to intervene, we characterise the process as non-passive conformance. In doing so, we provide an understanding of the constitutive nature of digital representations. In the discussion below, we explain our results, and develop and elucidate our contributions in relation to the case.

Our analysis illustrates the process by which the construction of a digital taxonomic representation of corporate reporting intervenes and generates conformance to its depiction, despite intentions. The challenge for taxonomy designers was to offer a logical, universal and unambiguous representation of an accounting model depicted as a 'mixed bag of elements' (Himick & Brivot, 2018, p. 40). Our results detail how the IASB sought to minimise the impacts of digitalisation on existing standard-setting processes by initially modelling the taxonomy only on disclosures explicitly required by international accounting standards. Early corporate reporting taxonomies originally sought to address this challenge by codifying and representing all *required* disclosures specified in the standards and thereby preserving the incumbent system of corporate reporting. However, the heterogeneity (or 'wildness') of global corporate reporting practice posed challenges. How should the IFRS taxonomy deal with the residual 'miscellanea' (Star & Lampland, 2009; Timmermans et al., 2017): those disclosures not required by, nor classified within accounting standards?

We reveal how the trajectory of IFRS taxonomy design was shaped by specific institutional circumstances where the IASB were driven by pressure from US regulators who were considering whether to permit IFRS reporters to list and digitally file corporate reports in the US. US regulators aimed to identify and allocate more non-standard disclosures and thereby provide a more comprehensive taxonomy that would accommodate more of the heterogeneity of practice – as part of the anticipated convergence

between international and US accounting standards, they expected the IFRS taxonomy to offer a similar approach. Given the desire for inter standard-setting consistency at that particular time, the IASB aligned their taxonomy with the US approach.¹³

IFRS taxonomy design therefore developed to accommodate the 'miscellaneous' non-mandatory disclosures by creating new categories where corporate reporting disclosures were classified into standard disclosures, illustrative examples, and Common Practices. In our analysis, we illustrate the classification processes undertaken by individuals to identify what was 'common' from a qualitative analysis of a small sample of corporate reports and illustrative templates created by multinational accounting firms. The formation of the new Common Practices classification also, by inference, both creates and marginalises 'Non-Common Practices'. Disclosures classed as 'common' on the basis of small samples gain visibility whilst other voluntary 'non-common' disclosures become less visible (Star & Strauss, 1999).

Over time, taxonomies evolved from a strictly normative, 'standards-driven' representation of what *should be* disclosed to a more positive, empirical representation of practice that sought to capture the reporting behaviour of select firms. At the same time, the reporting practices of non-select firms are marginalised. Through this process, contemporary reporting taxonomies evolved to represent a body of *expected* corporate disclosures.

By incorporating and classifying non-mandatory disclosures as 'common', the taxonomy validates them, and in doing so, influences corporate reporting practices. The taxonomy therefore moved from representing existing standards to generating a new digital layer of standardisation. Codifying non-mandatory practices provides a means by which the taxonomy, presumed by some to be a 'neutral' technological layer, can influence reporters to adjust their practices to conform to the taxonomy. Recursive interaction with, and usage of this layer generates a 'digital' feedback loop that establishes new authoritative expectations of reporting disclosure practices. Evidence presented in the paper indicates that early users changed their reporting practices where the taxonomy becomes inadvertently perceived as a normative expectation. By perceiving the taxonomy as an authoritative disclosure checklist, firms changed their disclosures to conform to the taxonomy. Conformance to the taxonomy generates a self-validating loop that shapes reporting practice to validate the taxonomy as a 'correct' depiction of reporting practice (see Fig. 2).

Although standard-setters became increasingly aware of the influence of the digital (machine-readable) 'tail' on the traditional reporting (human-readable) 'dog', their attempts to take tighter control of the taxonomy development process only risked strengthening user perceptions that the taxonomy and its 'Common Practices' represented an authoritative view of what *should be* reported.

By explicating how feedback loops emerge in digital reporting, our case contributes to the accounting standard-setting literature in revealing how digitalisation, and the generative effects of metadata specification and classification shape and impact key debates. Our results illuminate the process by which digitalisation, and the consequent construction of taxonomies exacerbates a tension in the objectives and future development of corporate reporting and accounting: whether reporting should focus on entity-specific communication (each firm should tell its own story) to enhance relevance or whether it should focus on cross-firm comparability (to enhance user decision-making), and as a consequence whether accounting standards should focus on principles (to guide entity-

specific disclosures) or rules (to enhance comparability)?

Our case demonstrates how the complex, heterogeneous, messy world of corporate reporting is not obviously amenable to metadata modelling. The principles-based nature of international accounting standards presented challenges: there was no universal set of disclosures to model and assign contextual properties. Yet taxonomy design evolved, as discussed above, to offer a universal, machine-readable representation of heterogeneous reporting practices.

In providing a universal codification of reporting disclosures, digitalisation valorises comprehensive machine-friendly disclosure *rules* over *principles*. By generating feedback loops between accounting standards and accounting practices, the digital, machine-readable representation of corporate reporting introduces a mechanism to formalise and quasi-standardise specific 'common' reporting practices. This tendency is particularly acute for those reporting components such as management commentary where there is no explicit requirement to follow IFRS guidance.

Standardising reporting practice increases cross-firm comparability and within-firm consistency by reducing managerial discretion in the reporting process (Schipper, 2003). The justification for standardised reporting frameworks is driven by a need for comparability within the decision-usefulness paradigm: that relative performance is key to decision making, and can facilitate information processing and valuation. However, standardisation impairs firm-specific communication by reducing the variation that firms can use in tailoring reporting to fit their specific circumstances. Both comparability and firm-specific communication are purported to aid information users but principles-based corporate reporting and associated regulatory initiatives both favour the latter (Bradbury & Schroder, 2012). Reporting should 'tell a story' and communicate material disclosures specific to a business. Compliance driven and 'boilerplate' disclosures are discouraged.

By quasi-standardising non-mandatory disclosure practices, digitalisation moves the reporting focus away from firm-specific communication and towards cross-firm comparability. By interpreting the IASB's taxonomy and its Common Practices (*what is*) as disclosure standards (*what should be*), the digitalisation process generates a self-validating feedback loop that can generate more homogenous corporate reporting and push International Financial Reporting Standards away from their principles-based approach. Whether this generates competing initiatives or alternatives to reassert the primacy of more principles-based, tailored reporting remains to be seen.

By demonstrating how digital reporting both represents and intervenes in accounting, we move beyond the essentialist view of digitalisation and XBRL-based reporting frequently held in accounting that depicts corporate reporting technology as a neutral conduit of information that preserves the human-readable status quo (e.g. ESMA, 2016; IAASB, 2010; XBRL Europe, 2006; XBRL US, 2008; XII, 2020). Yet, as we demonstrate, it is more than just a conduit and involves a subtle and opaque restructuring of existing accounting representations. The new 'digital' feedback loop fades into the background where the classification processes distinguishing the 'common' (from the 'non-common') are generally obscured from view. For example, a very small number of companies can be used to establish a disclosure as 'common' – once included in the taxonomy, the disclosure can be interpreted as a quasi-standard and be used by more companies, thereby eventually justifying its 'common' designation. As the corporate reporting taxonomy provides a new representation that does not replace existing accounting standards, it is often underestimated and perceived to be uncontroversial (e.g. ESMA, 2016). As a result, the addition of a new representation of an *existing* model can disguise the subtle changes made to existing accounting standards as they are (re)presented in the taxonomy. Information users are largely

¹³ Despite the IASB's move towards alignment, the IFRS taxonomy was not accepted for digital filing in the US until 2017.

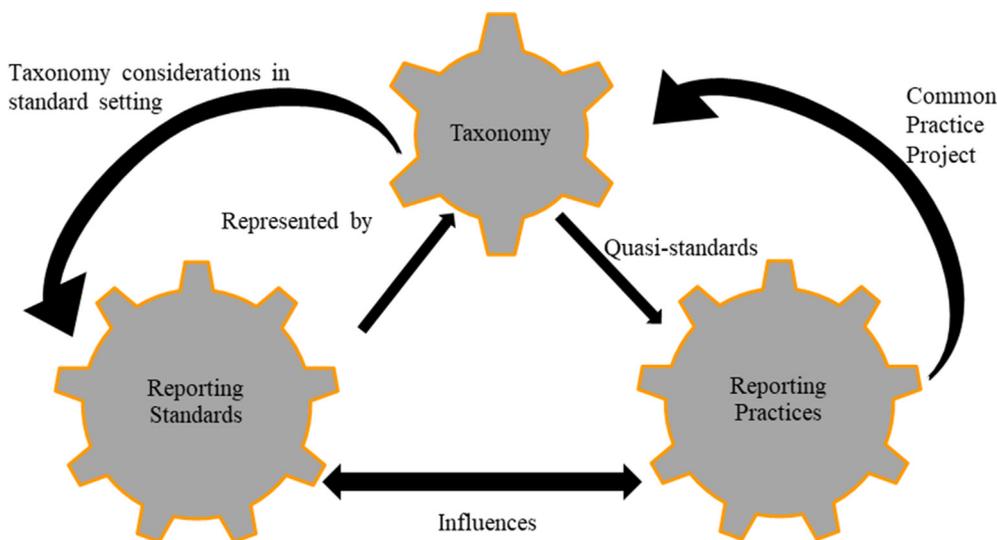


Fig. 2. Self-validating feedback loops.

unaware of the processes undertaken to separate, classify and remodel accounting information. However, digitalisation is active in shaping the nature of what is being standardised, and related standard-setting processes.

By illuminating the role of technology and demonstrating how digitalisation ‘opaquely’ influences key policy and theoretical debates within contemporary accounting, we build upon studies of corporate reporting and standard formation that demonstrate interdependencies between accounting standards, practices and their embedded social, institutional, political and ideological context. More specifically, we contribute to social and institutional studies of financial reporting by expounding on the inter-relationships between the construction of corporate reports (information creation) and means by which they ‘travel’ to their audience (information dissemination) (Robson et al., 2017). In doing so, we bring the technological context to the fore in thinking about how techno-accounting relations influence accounting standards and corporate reporting practices, and seek to stimulate research on accounting digitalisation beyond its impacts on capital markets and the information environment of capital market users (e.g. Bhattacharya et al., 2018; Blankespoor et al., 2014; Kaya & Pronobis, 2016; Kim et al., 2018; Li & Nwaeze, 2018).

We continue the discussion by explaining how the study contributes to our understanding of the nature of relations between information representation and intervention. Our case offers a theoretical perspective on the processes of reflexivity, reactivity and conformance where intervention is specifically resisted. Like other formal representations of information, the taxonomy is generative in encouraging behaviour that reinforces and conforms to the representation (Espeland & Sauder, 2007; MacKenzie, 2006; MacKenzie & Millo, 2003). In our case, although the information representation is not intended to intervene, resistance becomes conformance.

In the discussion below, we also reflect on aspects of our case that develop our understanding of the relations between digital representation and intervention, and how the nature of specifically digital representation is able to generate conformance that is characterised as something other than a mechanical, passive, ‘reactive’ process.

In explaining the nature of ‘non-passive conformance’, we first consider the means by which the digital representation was able to intervene. The constitutive power of the taxonomy derives from its

need to provide a machine readable depiction of the world. To enable digitalisation, metadata properties must be identified and allocated to enable information to be converted and transmitted as binary digits. The logical organisation and representation of metadata therefore necessitated changes in the information which it is representing. A specific aspect of our study is how metadata modelling and classifications interact with existing information representations.

Metadata standards assign contextual meaning to existing information standards, but they do not replace them. Metadata specifications must fit within existing information architecture, interacting with and shaping existing information representations and classifications – accounting standard-setters did not intend for the taxonomy to intervene (Mehrpouya & Samiolo, 2016). The taxonomic representation is designed neither to usurp nor override existing information representations but provides a new, standardised, representation of accounting disclosures that interacts with the existing reporting standards, systems and practices. The specification of metadata introduces a new digital representation that must nestle within existing representations and thereby provide a (re)presentation of existing standards with which it co-exists. Whilst metadata representations are shaped by the ‘imprint’ of the underlying information standards to which they assign contextual properties, they shape the underlying standards by having to offer a machine-readable representation of the world.

What the computing machine can ‘read’ is specific (Ribes & Bowker, 2009). Given the limited contextual understanding of machines, complexity is simplified (McCarthy, 2017) and ambiguity is airbrushed away via the use of ‘miscellaneous’ or ‘other’ categories (Star & Lampland, 2009). In ‘organising context’, modelling is reductive – nuances can be lost. Formal representations provide a “structured representation of a more richly textured work practice” (Berg, 1997, p. 408). We extend current literature by emphasising how metadata representations are not only reductive, but provide a machine-readable depiction of the world that is unambiguous and universal. The logic embedded in metadata modelling provides a formalist, rational interpretation of the world. Digitalisation relies on comparability: it directs computers to identify what is the ‘same’ and what is distinct to facilitate digital transmission and communication. Computers require discrete, unambiguous definitions of ‘sameness’ that may be difficult to identify from the wildness of practice. Nevertheless, information is atomised, partitioned and

identified during a process of (re)presentation in which contextual properties are assigned. Discrete elements must be placed somewhere in the metadata model – *everything must have a place*.

In a machine-readable “desire for systemicity” (Bloomfield & Vurdubakis, 1997, p. 649), digitalisation valorises a modelling logic that aims to rationally and unequivocally organise information. The metadata representation offers an ordered depiction of the world where wildness is tamed or omitted. Digitalisation, in its need to offer unambiguous representations of information to machines, valorises standardisation over tailoring. Yet encoding a specific understanding of the world occludes others (Mayernik, 2019; McCarthy, 2017). By valorising a machine-readable view of the world, we see the generative power of metadata.

Although the machine-readable vision of the world and the associated metadata specification gave the digital representation constitutive capacity, this was expressly resisted. In the second part of our explication of ‘non-passive conformance’, we consider the interactions between those governing the taxonomic representation and those using it. In highlighting the processes of digitalisation and focusing on both the production and consumption of the taxonomy, we build on Pollock et al.’s (2018) critique that conformance is often depicted as a passive, reactive process, and consider how digital representations generate ‘non-passive’ (or ‘non-reactive’) conformance.

The digital taxonomy was not intended to supplant existing ‘analogue’ information – it is only created to enable digitalisation. The notion that the digital ‘tail’ could wag the traditional accounting ‘dog’ was seemingly recognised and understood. However, attempts to weaken the generative effects of the digital self-validating feedback loop only strengthened its power. As recognition that the taxonomy and its Common Practices could be interpreted as a quasi-authoritative view of what should be reported, construction of the taxonomy became more centrally embedded in international standard-setting activity. As discussed in Section 5 and summarised in Fig. 1, taxonomy development moved from being undertaken by volunteers from XBRL International affiliates, to permanent staff at the IFRS Foundation, albeit separated from traditional accounting standard-setting. By 2013, IFRS taxonomy considerations were formally embedded within core accounting standard-setting with oversight of non-mandatory disclosures being undertaken by senior IASB members.

The moves were prompted by recognition of the impact of the taxonomy and the fear that codified non-mandatory disclosures could be interpreted as standards. Yet, changes in governance arrangements surrounding the taxonomy, its publication alongside incumbent accounting standards all provide the taxonomy with authority. This was motivated by a desire to control how the taxonomy intervened on standard-setting and practice. The analysis demonstrates the dilemma faced by standard-setters: institutional moves to introduce transparent due processes to oversee and control digitised (re)presentations of existing standards have the unintended effect of increasing their authority. Controlling the formal representation to moderate its generative effects only served to increase its representational validity (thereby increasing its generative capacity). Through this process, we see how the digital representation was able generate non-passive conformance.

In the digital realm, our study shows where the digital representation gains its unintentional but generative capacity. Digital affordances are embedded in the interactions between the people, metadata, governance arrangements and processes used to generate digital information. In highlighting the processes of digitalisation that generate ‘non-passive’ conformance, we offer a detailed, nuanced account of conformance to representation as something more than a mechanical, reactive process.

Looking further afield, our case also links to wider debates about

the impact of digitalisation on other aspects of rule-making and standards. The growing fields of Regulatory and Compliance Technology (RegTech) rely on transforming regulatory terminology into unambiguous, machine-readable taxonomies (Bauguess, 2018; Butler & O’Brien, 2019). Within the legal sphere, the semantic contractual terms of computable, ‘smart’ contracts must be expressed in ways in which computers can ‘know’ (Werbach & Cornell, 2017). In attempting to make human constructs amenable to computers, such technology trends towards inflexibility (Bamberger, 2010).

We close the paper by highlighting its limitations and offering avenues for future research. While care has been taken to balance the perspectives and insights garnered from the dataset, the analysis is limited by its reliance on the interpretation of the documentary materials, observation and interviews. The findings of this study are derived from a qualitative analysis of people and organisations beginning to construct and use taxonomies of principles-based standards such as IFRS. Whilst the findings are based largely on the views of those developing, regulating and using the taxonomies in their early stages, future quantitative and qualitative research is recommended to assess the implications of digitalisation once the IFRS taxonomy has been established long enough to enable a longitudinal comparison of disclosure practices. Further research could usefully explore the relationship of the taxonomy to other standardising mechanisms to further understand what is being standardised, who is doing the standardising and the where standardisation takes place.

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References

- Arnold, P. J. (2012). The political economy of financial harmonization. *Accounting, Organizations and Society*, 37, 361–381.
- Bamberger, K. A. (2010). Technologies of compliance: Risk and regulation in the digital age. *Texas Law Review*, 88/4, 669–739.
- Barnes, B. (1983). Social life as bootstrapped induction. *Sociology*, 17/4, 525–545.
- Barnes, B., Bloor, D., & Henry, J. (1996). *Scientific knowledge: A sociological analysis*. Athlone Press.
- Bauguess, S. W. (2018). The role of machine readability in an AI world. *SEC*.
- Berg, M. (1997). Of forms, containers, and the electronic medical record: Some tools for a sociology of the formal. *Science, Technology & Human Values*, 22/4, 403–433.
- Berg, M., & Timmermans, S. (2000). Orders and their others: On the constitution of universalities in medical work. *Configurations*, 8/1, 31–61.
- Bhattacharya, N., Cho, Y. J., & Kim, J. B. (2018). Leveling the playing field between large and small institutions: Evidence from the SEC’s XBRL mandate. *The Accounting Review*, 93/5, 51–71.
- Blankespoor, E., Miller, B. P., & White, H. D. (2014). Initial evidence on the market impact of the XBRL mandate. *Review of Accounting Studies*, 19/4, 1468–1503.
- Bloomfield, B. P., & Vurdubakis, T. (1997). Visions of organization and organizations of vision. *Accounting, Organizations and Society*, 22/7, 639–668.
- Boritz, J. E., & No, W. G. (2008). The SEC’s XBRL voluntary filing program on EDGAR. *Current Issues in Auditing*, 2/2, 36–50.
- Bourdieu, P. (1991). *Language and symbolic power*. Polity Press.
- Bovee, M., Ettredge, M. L., Srivastava, R. P., & Vasarheyli, M. A. (2002). Does the year 2000 XBRL taxonomy accommodate current business financial reporting practice? *Journal of Information Systems*, 16/2, 165–182.
- Bowker, G. C. (1996). The history of information infrastructures: The case of the international classification of diseases. *Information Processing & Management*, 32/1, 49–61.
- Bowker, G. C., & Star, S. L. (2000). Invisible mediators of action: Classification and the ubiquity of standards. *Mind, Culture & Activity*, 7/1-2, 147–163.
- Bowker, G. C., Timmermans, S., & Star, S. L. (1996). Infrastructure and organizational transformation: Classifying nurses’ work. In W. Orlikowski, G. Walsham, M. R. Jones, & J. I. DeGross (Eds.), *Information technology and changes in organizational work* (pp. 344–370). UK: Chapman & Hall.

- Bradbury, M. E., & Schroder, L. B. (2012). The content of accounting standards: Principles vs rules. *The British Accounting Review*, 44, 1–10.
- Burchell, S., Clubb, C., & Hopwood, A. G. (1985). Accounting in its social context: Towards a history of value added in the UK. *Accounting, Organizations and Society*, 10/4, 381–413.
- Butler, T., & O'Brien, L. (2019). Understanding RegTech for digital regulatory compliance. In T. Lynn, J. G. Mooney, P. Rosati, & M. Cummins (Eds.), *Disrupting finance: FinTech and strategy in the 21st century* (pp. 85–102). Cham: Palgrave MacMillan.
- Cohen, E. E. (2004). Compromise or customize: XBRL's paradoxical power. *Canadian Accounting Perspectives*, 3/2, 187–206.
- Debreceny, R. S., Farewell, S. M., Piechocki, M., Felden, C., & Graning, A. (2011b). Does it add up? Early evidence on the data quality of XBRL filings to the SEC. *Journal of Accounting and Public Policy*, 29, 296–306.
- Debreceny, R. S., Farewell, S. M., Piechocki, M., Felden, C., Graning, A., & D'Eri, A. (2011a). Flex or break? Extensions in XBRL disclosures to the SEC. *Accounting Horizons*, 25/4, 631–657.
- EFRAG. (2011). *Report on the Trustees Strategy review*. Final comment letter. EFRAG.
- ESMA. (2013). *Feedback statement: Considerations of materiality in financial reporting*. ESMA.
- ESMA. (2016). *Feedback statement on the consultation paper on the Regulatory Technical Standard on the European Single Electronic Format*. ESMA.
- Espeland, W. N., & Sauder, M. (2007). Rankings and reactivity: How public measures recreate social worlds. *American Journal of Sociology*, 113/1, 1–40.
- European Commission. (2019). Commission delegated regulation 2018/815. *Official Journal of the European Union*, OJ L 143, 1–792, 29.5.2019.
- Fourcade, M., & Healy, K. (2013). Classification situations: Life-chances in the neoliberal era. *Accounting, Organizations and Society*, 38, 559–572.
- FRC. (2011). *Cutting clutter*. London: FRC.
- Gebre-Mariam, M., & Bygstad, B. (2019). Digitalization mechanisms of health management information systems in developing countries. *Information and Organization*, 29, 1–22.
- Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2012). Seeking qualitative rigor in inductive research. *Organizational Research Methods*, 16/1, 15–31.
- Hacking, I. (1986). Making up people. In T. C. Heller (Ed.), *Reconstructing individualism* (pp. 161–171). Stanford University Press.
- Hacking, I. (1996). The looping effects of human kinds. In D. Sperber, D. Premack, & A. J. Premack (Eds.), *Causal cognition: A multidisciplinary debate* (pp. 351–383). Oxford University Press.
- Himick, D., & Brivot, M. (2018). Carriers of ideas in accounting standard-setting and financialization: The role of epistemic communities. *Accounting, Organizations and Society*, 66, 29–44.
- Hines, R. D. (1988). Financial accounting: In communicating reality, we construct reality. *Accounting, Organizations and Society*, 13/3, 251–261.
- Hoogervorst, H. (2012). *Opening speech, 2012 IFRS taxonomy convention*. IFRSF.
- IAASB. (2010). *XBRL: The emerging landscape*. IFAC.
- IASB. (2014). *IASB meeting 19-20 Nov staff paper 11c*. IFRSF.
- ICAEW. (2011). *Report on the Trustees Strategy review: Comment letter*. ICAEW.
- ICAEW. (2013). *Financial reporting disclosures: Market and regulatory failures*. ICAEW.
- ICAS. (2010). *Making corporate reports readable*. ICAS.
- ICAS, & NZICA. (2011). *Losing the excess baggage*. ICAS & NZICA.
- IFRSF. (2011a). *IFRS taxonomy 2011: Interim release*. IFRSF.
- IFRSF. (2011b). *IFRS Foundation concludes pilot XBRL initiative with public companies listed in the US* Accessed 1/4/11 <http://www.ifrs.org/News/XBRL/US+XBRL+pilot+conclusion.htm?m=print>.
- IFRSF. (2011c). *The IFRS taxonomy 2011 interim release: Common-practice concepts*. IFRSF.
- IFRSF. (2012a). *IFRSs as the global standards: Report of the IFRS foundation Trustees' Strategy Review 2011*. IFRSF.
- IFRSF. (2012b). *XBRL Detailed Tagging Task force 2012: Call for participants*. IFRSF.
- IFRSF. (2013a). *IASB announces new staff group to focus on Disclosure Initiative: Press release 10 Oct*. IFRSF.
- IFRSF. (2013b). *IFRS Advisory Council meeting 25-26 Feb agenda paper 4*. IFRSF.
- IFRSF. (2014a). *IFRS taxonomy Common Practice project: Call for participation*. IFRSF.
- IFRSF. (2014b). *Due process oversight committee 28 Mar staff paper 3b*. IFRSF.
- IFRSF. (2016a). *IFRS taxonomy 2016 webinar, 13 April*. IFRSF.
- IFRSF. (2016b). *Due process handbook*. IFRSF.
- ITCG. (2014a). *ITCG meeting 29 May agenda paper 1*. IFRSF.
- ITCG. (2014b). *Summary of the ITCG discussions 11 Dec conference call*. IFRSF.
- ITCG. (2014c). *Summary of the ITCG discussions 28 Oct meeting*. IFRSF.
- ITCG. (2014d). *ITCG meeting 11 Dec agenda paper 1*. IFRSF.
- ITCG. (2016). *Summary of the ITCG discussions 25 Oct meeting*. IFRSF.
- Jiang, J., Wang, I. Y., & Wangerin, D. D. (2018). How does the FASB make decisions? A descriptive study of agenda-setting and the role of individual board members. *Accounting, Organizations and Society*, 71, 30–16.
- Kaya, D., & Pronobis, P. (2016). The benefits of structured data across the information supply chain. *Journal of Accounting and Public Policy*, 35/4, 417–436.
- Kim, J. B., Li, B., & Liu, Z. (2018). Information-processing costs and breadth of ownership. *Contemporary Accounting Research*, 36/4, 2408–2436.
- Knudsen, D.-R. (2020). Elusive boundaries, power relations and knowledge production. *International Journal of Accounting Information Systems*, 36, article 100441.
- Kuorikoski, J., & Poyhonen, S. (2012). Lopping kinds and social mechanisms. *Sociological Theory*, 30/3, 187–205.
- La Torre, M., Dumay, J., Rea, M. A., & Abhayawansa, S. (2020). A journey towards safe harbour: The rhetorical process of the IIRC. *The British Accounting Review*, 52, article 100836.
- Leonardi, P., & Treem, J. W. (2020). Behavioral visibility: A new paradigm for organization studies in the age of digitization, digitalization and datafication. *Organization Studies*, 41/12, 1601–1625.
- Li, S., & Nwaeze, E. T. (2018). Impact of extensions in XBRL disclosure on analysts' forecast behavior. *Accounting Horizons*, 32/2, 57–79.
- MacKenzie, D. (2001). Physics and finance: s-Terms and modern finance as a topic for science studies. *Science, Technology & Human Values*, 26/1, 115–144.
- MacKenzie, D. (2006). *An engine, not a camera*. Cambridge Massachusetts: MIT Press.
- MacKenzie, D., & Millo, Y. (2003). Constructing a market, performing theory: The historical sociology of a financial derivatives exchange. *American Journal of Sociology*, 109(1), 107–145.
- Mayernik, M. S. (2019). Metadata accounts: Achieving data and evidence in scientific research. *Social Studies of Science*, 49/5, 732–757.
- McCarthy, M. T. (2017). The semantic web and its entanglements. *Science, Technology & Society*, 22/11, 21–37.
- Mehrpouya, A., & Samiolo, R. (2016). Performance measurement in global governance: Ranking and the politics of variability. *Accounting, Organizations and Society*, 55, 12–31.
- Merton, R. K. (1957). *Social theory and social structure*. Free Press.
- Millerand, F., & Bowker, G. C. (2009). Metadata standards: Trajectories and enactment in the life of an ontology. In M. Lampland, & S. L. Star (Eds.), *Standards and their stories: How quantifying, classifying, and formalizing practices shape everyday life* (pp. 149–165). Cornell University Press.
- Morley, J. (2016). Internal lobbying at the IASB. *Journal of Accounting and Public Policy*, 35, 224–255.
- Nobes, C., & Stadler, C. (2013). How arbitrary are international classifications? *Accounting, Organizations and Society*, 38, 573–595.
- Pelger, C. (2016). Practices of standard-setting – an analysis of the IASB's and FASB's process of identifying the objective of financial reporting. *Accounting, Organizations and Society*, 50, 51–73.
- Pelger, C., & Speiß, N. (2017). On the IASB's construction of legitimacy - the case of the agenda consultation project. *Accounting and Business Research*, 47/1, 64–90.
- Pollock, N., D'Adderio, L., Williams, R., & Leforestier, L. (2018). Conforming or transforming? How organizations respond to multiple rankings. *Accounting, Organizations and Society*, 64, 55–68.
- Pollock, N., & D'Adderio, L. (2012). Give me a two-by-two matrix and I will create the market: Rankings, graphic visualisations and sociomateriality. *Accounting, Organizations and Society*, 37/8, 565–586.
- Pollock, N., & Williams, R. (2009). The sociology of a market analysis tool: How industry analysts sort vendors and organize markets. *Information and Organization*, 19, 129–151.
- Power, M. (1992). The politics of brand accounting in the UK. *European Accounting Review*, 1/1, 39–68.
- Ramin, K. P., & Prather, D. A. (2003). Building an XBRL IFRS taxonomy. *Certified Public Accountant*, 73/5, 50–54.
- Ribes, D., & Bowker, G. C. (2009). Between meaning and machine: Learning to represent the knowledge of communities. *Information and Organization*, 19, 199–217.
- Robson, K. (1994). Inflation accounting and action at a distance: The sandilands episode. *Accounting, Organizations and Society*, 19/1, 45–82.
- Robson, K., & Young, J. J. (2009). Socio-political studies of financial reporting and standard-setting. In C. S. Chapman, D. J. Cooper, & P. B. Miller (Eds.), *Accounting, organizations and institutions* (pp. 341–366). Oxford University Press.
- Robson, K., Young, J. J., & Power, M. (2017). Themed section on financial accounting as a social and organisational practice: Exploring the work of financial reporting. *Accounting, Organizations and Society*, 56, 35–37.
- Saldana, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Sage.
- Schipper, K. (2003). Principles-based accounting standards. *Accounting Horizons*, 17/1, 61–72.
- SEC. (2009). *Interactive data to improve financial reporting: Final rule*. SEC. RIN 3235-AJ71.
- SEC. (2010). *Staff observations from review of interactive data financial statements*. SEC.
- SEC. (2014). *Staff observations of custom tag rates*. SEC.
- Star, S. L., & Lampland, M. (2009). Reckoning with standards. In M. Lampland, & S. L. Star (Eds.), *Standards and their stories: How quantifying, classifying, and formalizing practices shape everyday life* (pp. 3–24). Cornell University Press.
- Star, S. L., & Strauss, A. (1999). Layers of silence, arenas of voice: The ecology of visible and invisible work. *Computer Supported Cooperative Work*, 8/1-2, 9–30.
- Timmermans, S., Tietbohl, C., & Skaperdas, E. (2017). Narrating uncertainty: Variants of uncertain significance in clinical exome sequencing. *BioSocieties*, 12/3, 439–458.
- Trigg, R. H., & Bodker, S. (1994). From implementation to design: Tailoring and the emergence of systemization in CSCW. In *Proceedings of the 1994 ACM conference on CSCW* (pp. 45–54).
- Troshani, I., Parker, L. D., & Lymer, A. (2015). Institutionalising XBRL for financial reporting. *Accounting and Business Research*, 45/2, 196–228.
- Werbach, K., & Cornell, N. (2017). Contracts ex machina. *Duke Law Journal*, 67, 313–382.
- XAC. (2012). *XBRL Advisory Council meeting 7 March*. IFRSF.
- XBRL Europe. (2006). *Response to call for evidence: Mandate to CESR regrading technical advice on possibly implementing measures concerning the Transparency*

- Directive. XBRL Europe.
- XBRL US. (2008). *XBRL US GAAP taxonomy preparers guide*. XBRL US.
- XII. (2020). *Comment letter: Interconnected standard-setting for corporate reporting. XII*.
- Young, J. J. (2003). Constructing, persuading and silencing: The rhetoric of accounting standards. *Accounting, Organizations and Society*, 28, 621–638.
- Young, J. J. (2006). Making up users. *Accounting, Organizations and Society*, 31, 579–600.
- Zhang, Y., Andrew, J., & Rudkin, K. (2012). Accounting as an instrument of neoliberalism? *Accounting, Auditing & Accountability Journal*, 25/8, 266–1289.