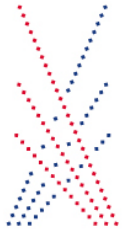

BRITISH ACADEMY
OF MANAGEMENT

BAM
CONFERENCE

3RD-5TH SEPTEMBER
ASTON UNIVERSITY BIRMINGHAM UNITED KINGDOM

This paper is from the BAM2019 Conference Proceedings

About BAM

The British Academy of Management (BAM) is the leading authority on the academic field of management in the UK, supporting and representing the community of scholars and engaging with international peers.

http://www.bam.ac.uk/

Searching for pattern in FTSE250 companies' financials

Ya-Ping Yin[1] and George Katechos, Hertfordshire Business School, University of Hertfordshire, de Havilland Campus, Hatfield, Herts, AL10 9EU

Abstract

This study takes an interpretivist approach to the revelation and sense-making of the business rationales and strategic choices behind the reported corporate financials for the FTSE250 companies over the 2000 – 2017 period. Through exploratory factor analysis and by defining the extracted latent factors as salient business models, the study reveals five distinct business models for the FTSE250 companies over the study period. The principal business model is profit-oriented and focuses on exploitation of existing resources, but it is complemented by several higher-order exploratory business models to fulfil a full set of corporate value-creating functions. A financialisation motive is an essential part of several business models. Moreover, the factor scores depict a changing pattern in the adoption of different business models over time. The research findings reveal a value-driven, multi-dimensional, ambidextrous approach to corporate financial management.

Key words: financial accounts, financialisation, dynamic capabilities, business models, exploratory factor analysis

1. Introduction

A growing academic literature has argued that over the past three decades the corporate conduct in the advanced economies has become increasingly financialised[i]. Apart from the traditional corporate activities that are based on processes of material transformation and core business services provision, corporate firms have significantly increased their activities involving the creation, acquisition, and trading of real and financial assets. Correspondingly, the corporate accounts have also documented significant changes in the disclosed accounting and financial information with substantial increases in financial values relative to core operational costs and earnings. For example, in the US, one prominent change is the marked growth in financial assets held in firm portfolios (Davis 2016). Relative to sales, the median financial asset holdings across the non-financial US corporations rose more than 50 percent between 1971 and 2014, from 27.0 percent to 41.8 percent. Similarly, in the UK, among the FTSE250 companies that are the focus of this study, the average share of financial assets in total assets rose from 26.4 percent in 2000 to 48.6 percent in 2017, and the net M&A value grew by 20.1 percent per year on average in comparison with the average annual growth rate of 8.5 percent for sales revenue over the same period.

The existing financialisation literature is primarily concerned with the search for supporting empirical evidence and the assessment of its impact on other economic aspects, e.g., aggregate consumption and investment (e.g., Onaran, Stockhammer & Grafl, 2011).

[1] For correspondence: y.p.yin@herts.ac.uk.

However, the search for evidence appears to be largely casual and fragmental. At the macro level, financialisation is typically indicated by the growing divergence between GDP growth and growth of aggregate financial stocks and flows, rising FDI flows, and rising household debt. At the firm level, the usual indicators of financialisation include a rising share of intangible investment relative to traditional physical investments, and rising levels of M&A and share-buy-back (SBB) activities[ii]. To our best knowledge, however, little attempt has been made to utilise the full set of corporate accounts to systematically investigate the emerging salient patterns of corporate conduct and performance or to ascertain their underlying generative mechanisms that reflect business / financial strategic choices.

Whilst the financialisation literature is primarily empirical without paying a close attention to its microfoundation as a competitive strategy, a separate and predominantly theoretical literature has emerged on the new thinking about corporate competitive advantages that derive from corporate dynamic capabilities (DCs) and the design and implementation of business models (BMs). Some recent efforts have been made to articulate the relationship between strategy, dynamic capabilities, and business models (e.g., Teece, 2018). Nevertheless, as various researchers (e.g., Laya, Markendahl, & Lundberg, 2018; Teece, 2018; Bouwman, Molina-Castillo, & de Reuver, 2016) have argued repeatedly, empirical-contextual research on DCs and BMs is still largely sporadic.

The purpose of the current study is to integrate various strands of literature on DCs, BMs, and financialisation to conduct a systematic examination of the salient patterns of corporate conduct and performance, using a full set of disclosed financial accounts for the FTSE250 companies since the start of the new millennium. Specifically, our research objectives include:

- To extract the hidden composite factors that underpin the disclosed corporate accounting and financial information using dimension-reduction techniques
- To interpret the extracted factors as business models by articulating the relationship between DCs, BMs, and financialisation
- To ascertain the essential characteristics of the extracted business models and to empirically measure their significance over time

The critical assumption of our approach is that the reported financials are generated by several common latent factors that arguably reflect corporate strategic decisions and conducts along a few distinct dimensions. Using DataStream as the source of information, we assemble a comprehensive dataset that covers key corporate financials from the income statements, cash flow statements, and balance sheets for the FTSE250 companies over the past two decades. Due to the nature of the dataset (e.g. firms' entry into and exit from the list of FTSE250 firms over time), and given the rising level of complexity in the corporate landscape (hence the special features of the underlying data generating process, or DGP, for the corporate accounting and financial information to emerge), we do not super-impose a particular analytical lens on the dataset but instead employ the tool of principal components analysis (PCA) and exploratory factor analysis (EFA) to reveal the key dimensions and latent factors that are hidden in the wide array of corporate accounting and financial variables. Drawing from relevant literature (e.g. a hierarchy of corporate DCs and

BMs), we then interpret such factors as business models that represent specific combinations of resources and capabilities to target specific value-creating functions, i.e., value proposition, value realisation, and value appropriation. Due to different risk-return profiles of the value-creating functions, the set of business models has a hierarchical order in corporate management of financial resources. The empirical work has revealed five distinct business models for the FTSE250 companies over the study period. The principal business model is found to be profit-oriented and focuses on the exploitation of existing resources, but it is complemented by several higher-order business models to fulfil the full set of corporate value-creating functions. A financialisation motive is an essential part of several business models. The calculation of factor scores has revealed a clear pattern of a rising level of financialisation before the global financial crisis but more reliance on other value-creating BMs in more recent years.

The rest of the paper is organised as follows. The next section reviews the relevant literature that helps to clarify the multi-dimensional and hierarchical structure of the generative mechanisms for the corporate accounting and financial information to emerge. Building on the existing literature, we attempt to synthesise the different strands of literature and articulate the relationship between DCs, BMs, and financialisation. Section 3 describes the dataset and study design. Section 4 implements the PCA and EFA procedures and presents and discusses the empirical findings. The final section makes some concluding remarks and suggestions for future research.

2. Review of literature on DCs, BMs, and financialisation

The primary reason why we do not super-impose a specific perspective on the conduct and performance of a (business) firm is because there is a vast literature on a wide range of aspects of the corporate life. For example, insofar as the nature of the firm is concerned, the literature has perceived the firm alternatively as:

- a pure theoretical construct of a representative production unit that transforms economic inputs into economic outputs, as in the neoclassical theory of the firm
- a legal entity that constitutes a plethora of contractual and non-contractual relations and obligations, as in the transaction cost theory and institutional theory of the firm (Coase, 1937; Hart and Moore, 1990; Williamson, 2002)
- a vehicle for habits and routines to emerge and evolve, as in the evolution theory of the firm (Hodgson and Knudsen, 2004)
- a financial partnership in many bilateral and multilateral financial arrangements, as in the principal-agent (Jensen and Meckling, 1976), shareholder value-based (Rappaport, 1998), and stakeholder value-based (Freeman, 1984) theories of the firm
- a connecting node in the physical and virtual networks of economic and social activities and organisations, as in the complex adaptive systems view of the firm (West, 2017)
- bundle of resources and capabilities (our primary perspective)

Correspondingly, the firm is assumed to pursue different goals of profit maximisation, transaction cost minimisation, alignment of the principal-agent relation, maximisation of the shareholder value, achievement of the optimal capital structure, or satisfaction of competing stakeholder demands. The specification of the goal is critically important for corporate strategic choices and actions. It is unrealistic to go into any detail of such a vast literature, so we are highly selective in choosing the relevant literature that will help us in conceptualising and understanding the underlying generative mechanisms of the reported accounting and financial information as well as the conceptual basis for interpreting the extracted dimensions/latent factors. For that purpose, we primarily take the Penrosian view of the firm as bundles of resources and capabilities, and we draw mainly from several related strands of research concerning the resource-based view (RBV), dynamic capabilities, business models, and financialisation.

We start with the resource-based view of the firm (RBV). The RBV builds on the Penrosian view of the firm as bundle of resources rather than of contracts or transactions as in other theories (Demil and Lecocq, 2010). It can be regarded as a direct alternative (and largely complementary) perspective to the Structure-Conduct-Performance (SCP) paradigm that regards the external market structure – which is typically measured by the number of players on a market, the size of each player, and the substitutability of their products – as the determinant factor shaping corporate conduct and performance. In contrast, the RBV focuses on the firm internal resources and processes. The essence of the RBV perspective is that the performance of a firm depends critically on the ownership and control of business resources (e.g. physical, human, and organisational assets), especially those that are valuable, rare, inimitable, and non-substitutable (the so-called VRIN attributes of resources). A firm can achieve sustained competitive advantage by strategically implementing firm-specific configurations of different resources and ensuring the complementarity between resources and internal operating systems (the RBV is extensively discussed in Penrose, 1959; Prahalad and Hamel, 1990; Barney, 1991; Nelson, 1991; Peteraf, 1993; Teece, Pisano, and Shuen, 1997). Although research along the line of the RBV introduced the concept of capability (Amit and Schoemaker, 1993), the RBV is generally silent on how to develop and maintain a firm's resources over time (Teece, et al., 1997) or explicitly and systematically reveal the logical connections between resources and sustained competitive advantages in dynamic environments. Filling this conceptual gap is the main task of the subsequent research on firms' dynamic capabilities.

The formal intellectual work on DCs (Teece, et al., 1997) builds on the RBV and other related concepts such as organisational routines (Nelson and Winter, 1982), absorptive capacity (Cohen and Levinthal, 1990), and combinative capabilities (Kogut and Zander, 1992). This line of enquiry is relatively recent and still evolving rapidly. Given the ever-rising array of potential business resources (especially human-created knowledge-based intangible assets) and the seemingly endless possibilities of selecting and combining business resources in dynamic internal and external environments, it is little surprise that there are alternative perspectives, definitions, categorisations, and characterisations of DCs. In this study, we mainly focus on the following strands of research on DCs in the literature: the definition and characterisation of DCs by Eisenhardt and Martin (2000); the classification of DCs into

sensing, seizing, and reconfiguring capabilities and the characterisation of their corresponding microfoundations by Teece (2007), and the hierarchical classification of DCs by Ambrosini et al. (2009).

Eisenhardt and Martin (2000) define dynamic capabilities as a set of specific and identifiable processes (e.g. product development, strategic decision making, and alliancing) that integrate and reconfigure the resource base of a firm for value creation in dynamic environments. Whilst acknowledging that DCs are idiosyncratic in their details and path-dependent in their emergence, they argue that DCs have significant commonalities across firms in the sense that DCs are more homogeneous, fungible, equifinal (or simultaneous and spontaneous emergent), and substitutable than is usually assumed. The properties of DCs vary in different market environments: in moderately dynamic markets such as the pharmaceutical industry, DCs are detailed, analytic, stable processes with predictable outcomes. Whereas in high-velocity markets such as many services sectors, DCs are simple, highly experiential, iterative (non-linear), and fragile processes with unpredictable outcomes. They attribute such differences to the adoption of different learning mechanisms (e.g. repeated business practices, codification of experience into technology and formal procedures, learning from mistakes) that guide the evolution of DCs under different market conditions.

No matter how the definitions of DCs differ across researchers, firms develop DCs to fulfil specific corporate functions. Thus, one approach to the examination of DCs is to classify them into different types according to the corporate functions that they help to fulfil. In this spirit, Teece (2007) identified three classes of dynamic capabilities: sensing, seizing, and reconfiguring capabilities and ascertained the corresponding microfoundations (i.e. specific organisational or strategic processes that underpin each capability) and actionable activities. 'Sensing' refers essentially to the continuous scoping, probing, gathering, processing, and cognition of relevant information about market conditions and opportunities that arise internally and externally across both the local and global markets. In a traditional product-oriented or service-oriented firm, the sensing capabilities depend critically on a number of core microfoundations: the cognitive and creative capacities of the individuals within the firm; networking procedures; R&D processes; internal and external communications channels and mechanisms; procedures for training and learning.

'Seizing' refers to the configuration and transformation of business resources into new values through new products, services, and processes. Seizing capabilities are embedded in a set of specific organisational and strategic processes that govern the selection of product architectures, business models, firm boundaries decisions and control mechanisms, and loyalty and commitment building schemes (Chesbrough, 2010; Teece, 2010). For our purpose, we note that parallel to the development of the literature on DCs there is a rapidly growing literature on the design and implementation of innovative business models as a core competitive advantage (e.g., Shafer, Smith, & Linder, 2005; Morris, Schindehutte, & Allen 2005; Demil and Lecocq, 2010; George and Bock, 2011; Fielt, 2011; Zott, Amit, and Masa, 2011) or a key seizing capability (Teece, 2018). As Chesbrough (2010) succinctly puts it, the same idea or technology taken to market through two different business models will

generate different market outcomes. The existing BM literature has been predominantly concerned with the definition of the business model, description and categorisation of its primary components, and articulation of the relationship between different components. Since the BM can be argued to be an even more abstract and foundational concept than DC, it is unsurprising that the BM literature is still in a state of flux[iii]. Although the definition of a business model still varies widely, a common and useful theme is that a business model must provide a complete description of the firm's value creation logic, i.e. value identification and proposition, value realisation, and value capture and appropriation (for example, see the discussion in Morris, Shirokova, and Shatalov, 2013; and Teece, 2018). Therefore, a firm's strategic choices and processes should be selected and implemented according to the criteria of completeness, cohesion, and complementarity in terms of the business model value logic.

Although corporate capabilities and business models possess the properties of relative internal cohesiveness and stability, they do undergo qualitative changes over time and may become totally unfit for new environments. Especially in highly dynamic environments, the act of forming new capabilities-BMs by one player will trigger off counter-moves by the rivals; as a result, the original capabilities-BMs become progressively obsolete. Moreover, once routines have been established and tried-and-trusted processes have been set in motion, firms tend to become complacent and rigid over time (Leonard-Barton, 1992), so they frequently rely on fine-tuning their current capabilities rather than introducing significant enhancements or investing in new ones. Nevertheless, the law of diminishing returns to fine-tuning will eventually set in and the firm must undertake more radical reconfiguration. 'Reconfiguring' refers to the continuous alteration of the resource base and realignment of the resource base to changing environments and market opportunities. The key supporting microfoundations for building reconfiguring capabilities include procedures and processes of internal restructuring (e.g. decentralisation), co-specialisation, re-organisation of governance structure, organisational training and learning procedures, and knowledge management.

The formation and evolution of DCs involve individual and organisational cognition and learning at different levels, e.g. from repeated practices, to knowledge accumulation, to knowledge articulation, and to formal codification of knowledge (Eisenhardt and Martin, 2000; Zollo and Winter, 2002). Accordingly, there is a hierarchical structure to the evolution of DCs in terms of the level of knowledge complexity. Ambrosini et al. (2009) presented one hierarchical scheme of DCs. At the bottom of the hierarchy lies the *incremental* DCs which are relatively simple, iterative, and stable. Such capabilities usually operate directly on the configuration of the existing resource base and are usually adequate for corporate survival in relatively stable environments. At this level, there is little change to the firm's resource base. As the environment becomes more turbulent and the firm's conventional competitive advantages are eroded, the firm must alter the resource base to enhance existing capabilities and develop new ones. Capabilities developed at this stage are termed *renewing* capabilities and are of a higher order than the incremental capabilities. The third level of DCs is termed *regenerative*. In hyper environments, existing DCs are no longer relevant and simple alteration to the resource base is insufficient for sustaining competitive advantages.

Therefore, the firm must rethink radically about the processes used to create, extend, and recombine resources. Therefore, regenerative DCs do not operate directly on the resource base, but on the modification of the lower level DCs and, through which, indirectly on the resource base.

To briefly summarise, a central theme through the RBV, DC and BM literature is that corporate firms must constantly make strategic choices that will operate directly or indirectly on the resource base. Moreover, to differentiate each other in a dynamically competitive environment, firms' strategic choices have a hierarchical order in developing DCs-BMs to serve the full set of the business value functions, i.e., value proposition (e.g., through R&D and marketing), value realisation (e.g. through routine operations within the firm and across the production networks), and value appropriation (e.g., through cash extraction, M&A, and share-buy-back schemes).

Although the literature on DC, BM, and strategy are largely developed separately, various studies have attempted to examine the link between such concepts (for example, see the discussion of the relationship between BM and strategy in Porter, 2001; Shafer, et al, 2005; Zott and Amit, 2008; George and Bock, 2011). In a recent paper, Teece (2018) attempts to further clarify the relationship between DCs, BMs, and strategy by stating *"Business models, dynamic capabilities, and strategy are interdependent. The strength of a firm's dynamic capabilities help[s] shape its proficiency at business model design. Through its effect on organization design, a business model influences the firm's dynamic capabilities and places bounds on the feasibility of particular strategies"*. In the remainder of this section, to help with the design and interpretation of our empirical work, we try to build on the existing effort to further articulate the relationship between DC, BM, and financialisation.

From the literature discussion, it appears that DCs are embedded in firm-specific tasks, routines, processes, and more complex corporate functions. The development of DCs requires intentional individual and corporate learning, knowledge accumulation, and practice. However, the development of DCs provides no guarantee for financial success – astute use of financial strategy and BMs is also necessary. BM can be regarded as a more foundational concept than strategy, and its essence lies with its value-creating logic: resources and capabilities must be mobilised to create value through value proposition, realisation, and appropriation. Different BMs possess different logic, mechanisms, potentials and corresponding organisational structures of value creation. Apart from strategic design and direction, the emergence of BMs also involves self-organising and spontaneous emergent properties. In an increasingly connected world through technological, social, and economic networks, the emergence of BMs for value creation is also increasingly beyond the confines of strategic design and managerial control.

Strategic decisions and actions on the resource base, either directly through operational decisions or indirectly through the configurations of DCs and BMs have financial implications. To maintain the firm as a going business concern, the firm must satisfy a plethora of financial obligations and constraints, such as liquidity and solvency, principal-agent relation, delivery of shareholder value and stakeholder value. Whatever the goal of the firm is, in terms of financial management the firm must maintain a healthy liquidity and

solvency state whilst at the same time build the asset base for future growth. Different BMs have different return-risk profiles and their value-creating potentials are not always congruent. The task of financial management has become even more challenging since the 1990s due to the rapid advent of ICT and ICT-mediated social and business innovations, and hence the emergence of new logic and forms of business organisation (e.g. the rising 'sharing economy' and 'platform economy'). Consequently, the focus of financial management has shifted away from the narrow resource base to a wider and higher-order set of DCs and BMs that can help deliver a better risk-return trade-off – hence the rise of "financialisation".

The financialisation literature so far provides no consensus view on the definition or measurement of financialisation, but the concept has been generally used to indicate the process of ever-wider and deeper permeation and influence of financial instruments, institutions, and markets (see e.g. Milberg and Winkler, 2010; Haslam, et al. 2012; Michailidou, 2016). Several recent studies argue that there has been a shift in the corporate financial strategy away from tangible investments and long-term growth to maximisation of enterprise value or specifically shareholder value since the 1980s (Modell and Yang, 2018; Barane, A.I. and Hake, E.R., 2018; Davis, 2018). The emphasis on enterprise/shareholder value has important implications for the conventional logic, forms, and organisational structure of corporate activities. For example, in the advanced economies, corporate firms have increasingly specialised in knowledge-intensive innovation, production, and investment, especially investment in intangible assets (e.g. patented technology, software, databases, trademarks, franchise agreements, and customer and supplier lists). Another distinctive trend is the significant rise in the creation, acquisition, and trading of an ever-larger array of real and financial assets. Accordingly, the disclosed corporate accounts have documented a rising divergence between the growth in financial stocks (assets and liabilities) and the growth in flows and, concurrently, a significant rise in the volatility and risks of corporate activities (see the evidence in the subsequent section). Therefore, to us, financialisation at the firm level is inherently associated with the BM concept – in contrast to a conventional BM that governs pricing and output decisions, for example, a financialised BM contains a distinctive value-creating potential through the use of financial instruments and financial strategy.

The rising complexity in the strategic choices and interactions over the physical and virtual networks also implies that the separation between economic activities and the resource base has become ever wider and a rising share of economic activities operate indirectly on the resource base, usually through the constant innovation of financial strategies that reconfigure the resource base or renovate competitive capabilities. There are sound economic rationales for individual firms to adopt a combination of different business models in such a networked environment.

The literature and our discussion so far suggest that the underlying generative mechanisms for corporate accounting and financial information is structured and underpinned, at least partially, by strategies, DCs, and BMs. The inherent structure of the reported accounting and financial information for individual firms also emerges out of the double-entry book-keeping

practices in the system of corporate accounts internally and through the contractual relations with upstream suppliers and downstream clients externally. Therefore, not only the internal set of accounts are connected and fully articulated but also the information is structurally connected across different firms, albeit the external connection among the FTSE250 companies is partial as they also relate to many other firms.

Therefore, in order to make sense of the underlying structure and rationales of the reported accounting and financial information, and also to help with the interpretation of the latent factors, we argue that:

- For individual firms, most of the firm-specific accounting and financial information shares a common DGP (with some exceptions such as market value that also have significant external generative mechanisms)
- The DGP is multi-dimensional and structured
- For all firms, either individually or in aggregate, the disclosed accounting and financial information is structured/organised around several main dimensions or underpinned by several common latent factors
- These common latent factors can be regarded as a hierarchy of business models that represent specific configurations of the resource base and capabilities to create value in distinctive mechanisms
- A set of hierarchical and complementary business models are required to fulfil the full set of the business value logic or value functions (including risk management)

To empirically implement and test the above ideas, we collect our data from the full set of corporate accounts, i.e., income statements, cash flow statements, and balance sheets, and infer the latent composite factors (which we name BMs) using the techniques of PCA and EFA. The next section introduces the dataset and study design.

3. Dataset and study design

All the data for the FTSE250 companies is obtained from DataStream. Although DataStream records hundreds of accounting and financial variables, data availability, which is indicated by the number of asterisks associated with a variable (e.g. the highest availability is indicated by ***), varies significantly across the variables. A variable selection criterion was introduced: any variable with two asterisks and more will be selected. The imposition of that criterion cut the number of selected variables to 33. Even so, due to the entry into and exit from the list of companies that constitute the FTSE250 index as well as blank cells, the dataset still had to be cleaned. Following the cleaning procedure, the final dataset contains 28 variables for varying number of firms over the period 2000 – 2017. The list of the variables includes: Total assets, Intangible amortisation, Capital expenditure, Cash reserve, Current asset, Inventory, Other intangible assets, Fixed assets, Cash dividends, Free cash flow per share, Revenue, Operating profit, EBITDA, Interest on debt, Equity income, Market value, M&A, Cost of sale, Employment, Salary, Current liability, Cash inflow from financing,

Cash inflow from operations, Cash outflow to investment, SBB, R&D, Debt, and Stock. The following table shows the number of firms for each year in the final dataset.

Table 1: Number of firms for each year in the final dataset:

Year	No. of firms
2000	142
2001	146
2002	158
2003	165
2004	173
2005	176
2006	179
2007	185
2008	193
2009	196
2010	200
2011	213
2012	228
2013	241
2014	245
2015	248
2016	250
2017	250

A summary of the average annual growth rate and volatility for the key variables is shown below.

Table 2: Growth and volatility of key financials*, FTSE 250, 2000 - 2017 (%):

Financials	Growth	Volatility
Tangible asset	11.72	304.43
Capital expenditure	10.87	486.11
Cash	13.72	238.12
Fixed asset	13.86	503.33
Total intangibles	9.82	455.35
Cash dividends	15.22	333.66
Revenue	8.54	242.55
Operating profit	13.77	368.17
EBITDA	14.85	376.85
Interest expenses	3.96	621.07
Interest income	9.82	600.18
Equity income	65.66	779.59
Market value	7.56	108.87
Mergers & acquisitions (net)	20.13	403.00

Cost of sale	7.07	241.15
No. of employment	4.57	397.01
Total employment costs	7.31	226.32
Current liabilities	9.52	291.62
Cash outflow to investments	19.17	549.44
SBB	15.12	396.29
R&D	12.61	495.39
Debt	10.64	334.39
Stock	37.41	594.22

*: growth = average annual growth rate for whole period; volatility = standard deviation/mean*100.

Table 2 shows a clear divergence between the growth in financial stocks and the growth in flows. It also shows a substantial (and rising, unshown) level of volatility in all the variables. From our literature review, it appears justified to employ the PCA and EFA techniques to the dataset. Both PCA and EFA are dimension reduction techniques, so both share many similarities, but there are also important differences. PCA is ideally suited for successively identifying the main dimensions (called principal components) along which most of the variations in the variables are explained by the components, but there is no conceptual structure placed on the extracted components and hence it is difficult to interpret the meaning of the components. In comparison, EFA assumes that there is a common set of latent factors that generate the common variations in the variables, with the variables still retaining some specific individual variations. The measured latent factors can be interpreted and appropriately labelled. As we argued above, in this study, we label them as business models.

4. Results and interpretation

Given the richness of our dataset, it is possible to conduct PCA and EFA in different ways. For the current study, we pool the data for all the companies in all the years and conduct PCA to extract orthogonal (or independent) components that represent the main dimensions along which the accounting and financial variables are organised (results not shown to save space)[iv]. By applying the criterion of the eigenvalues being greater or equal to unity, the PCA procedure identifies five distinct components, with the first principal component explaining 53% of the total variance and the five components together explaining 77% of the total variance in the dataset. Therefore, the 23 selected accounting and financial variables for the FTSE250 companies do appear to be organised around just a few dimensions over the 18-year period.

Subsequently we have applied EFA to the pooled data to extract the common factors. In keeping with our conceptual discussion of the hierarchical order of DCs and business models, we apply the principal components factors (pcf) option in Stata to extract the factors. The results are reported below. Like the PCA procedure, the EFA has identified 5

distinct latent factors. The following table reports the relevant information concerning the five factors. The five common factors also explain 77% of the total variance in all the variables.

Table 3: PCF factors for FTSE250 companies over 2000-2017:

Factor analysis/correlation Number of obs = 3,586
Method: principal-component factors Retained factors = 5
Rotation: orthogonal varimax (Kaiser off) Number of params = 130

Factor	Variance	Difference	Proportion	Cumulative
Factor1	14.395	11.566	0.514	0.514
Factor2	2.829	0.917	0.101	0.615
Factor3	1.912	0.514	0.068	0.683
Factor4	1.399	0.350	0.050	0.733
Factor5	1.049	.	0.038	0.771

LR test: independent vs. saturated: chi2(378) = 1.7e+05 Prob>chi2 = 0.0000

In EFA, it is a common practice to rotate the solutions so that the most significant (in a quantitative, not statistical sense) factor loadings are easier to identify and interpret. The next table reports the five factors and the rotated factor loadings together with the level of uniqueness in the variance of each variable (i.e., the proportion of variance that is not explained by the five common factors). Apart from fcf_ps (free cash flow per share) and MV, the total variances in all the other variables are largely explained by the five common factors, a finding consistent with our earlier conceptual discussion.

Table 4: Rotated factor loadings (pattern matrix) and unique variances:

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Uniqueness
t_asset	0.681	0.145	0.257	0.115	0.060	0.433
amo_int	-0.040	0.701	-0.020	0.013	0.269	0.435
cap_exp	0.942	0.036	0.149	-0.039	-0.028	0.088
cash	0.272	0.187	0.788	-0.006	0.002	0.269
c_asset	0.913	0.158	0.206	0.171	-0.011	0.069
inventory	0.946	0.037	0.073	0.107	-0.021	0.086
int_asset	0.140	0.790	0.158	0.075	0.180	0.293
fix_asset	0.953	0.039	0.059	0.191	-0.009	0.051
cash_div	0.842	0.035	-0.201	-0.142	0.023	0.230
fcf_ps	0.005	0.001	-0.015	0.037	-0.178	0.967
revenue	0.946	0.257	0.009	0.049	-0.006	0.036
op_profit	0.983	0.041	0.008	-0.036	0.020	0.031

ebitda	0.950	0.047	0.008	-0.184	0.025	0.061
int_debt	0.909	0.074	-0.046	-0.008	0.019	0.167
eq_inc	0.775	0.015	0.032	-0.457	0.043	0.187
mv	0.116	0.563	0.108	-0.072	0.295	0.566
ma_net	0.496	0.056	-0.020	0.720	0.080	0.226
cost_sale	0.806	0.414	-0.016	0.066	-0.056	0.172
n_emp	-0.009	0.725	-0.073	0.017	-0.352	0.345
salary	0.561	0.697	0.101	0.019	-0.155	0.165
c_liab	0.732	0.182	0.206	0.483	-0.007	0.155
cashi_fin	-0.293	-0.050	0.689	0.402	-0.057	0.273
cashi_op	0.970	0.048	-0.093	0.015	0.027	0.047
casho_inv	0.917	0.044	0.109	0.176	0.009	0.115
sbb	0.092	0.014	0.717	-0.211	0.026	0.432
rd	-0.012	0.064	-0.025	0.043	0.809	0.338
debt	0.933	0.063	0.034	0.141	0.014	0.104
stock	0.954	-0.023	-0.035	0.107	-0.001	0.077

The factor loadings measure the correlation coefficients between the variables (in the rows) and the factors (across the columns). Factor 1 is significantly correlated with half of all the variables including operating profit, cash inflow from operations, fixed assets, stock, ebitda, inventory, revenue, current assets, debt, interest payment on debt, cash outflow to investment, cash dividend, cost of sale, equity income, and current liabilities. Thus, factor 1 seems to be profit-oriented and focuses on the exploitation of existing resources – including both physical and financial assets. It is certainly the most resource-intensive and requires the support of a wide range of operational routines and processes to create value through the conventional core businesses. Therefore, we define factor 1 as “Resource exploitation BM”.

Factor 2 loads significantly on four variables: intangible assets, employment, intangible amortisation, and salary. By the current accounting standards, only externally acquired intangibles are recognised and recorded in company balance sheets and internally developed intangibles are mostly treated as expenses. Therefore, the two variables concerning intangibles reflect the book values of external acquisition and subsequent obsoleteness of intangibles. Together with the significant loading on employment and salary, we term factor 2 “Intangible assets and human capital accumulation BM”.

The interpretation of the remaining three factors is more straightforward and we term them “Cash management BM”, “External acquisition and consolidation BM”, and “R&D-driven BM” respectively.

Some key observations can be made about the identified business models. First, to fulfil the full set of corporate value functions, a core set of distinct (independent) and complementary business models are required. This is not surprising either from a corporate organisation or value-creating logic perspective, as corporate activities and processes are usually delineated either by nature (which give rise to wages and salaries, rents, interests)

or by function (administration, marketing, sales) in practice and different value functions have different risk-return trade-offs.

Second, there is a hierarchical order in the BMs in terms of the requirements for resources and capabilities. The five extracted BMs are consistent with, but not restricted to any single one of, the main theories that have been developed concerning the motives and conduct of corporate firms. The most prominent BM focuses on the generation of earnings and profits, so the common emphasis of profit maximisation in the literature does have some empirical support. The second most prominent model relates to firms' intentional investment in firm-specific human and non-human intangible capital. As is well articulated in the transaction cost theory of the firm, investments in transaction-specific assets such as specific skills or knowledge, brand name or reputation, and dedicated capacity, can improve the efficiency of transactions. There is also an element of financialisation in BM2 as the treatment of intangibles in corporate accounts is found significant for influencing shareholder value (see, e.g., Hirschey, Richardson, & Scholz, 2001; Hirschey & Richardson, 2001; Hirschey & Richardson, 2002). The financialisation motive is the strongest in BM3 and BM4, as a wide range of corresponding processes are related to asset trading, asset acquisition and SBB activities. The last BM is solely associated with R&D expenditure without the support of any other business process. This fact is perhaps consistent with the literature finding that corporate exploration through R&D is associated with a rising level of risk (e.g., Grabowski & Vernon, 1990) and thus FTSE250 companies have taken a prudential approach to R&D activities.

Finally, to shed further light on how different BMs strengthen or deteriorate over time, we calculate the average factor scores for the five factors for the FTSE250 companies in every year and report the results in the table below. The interpretation of the scores is that the higher the score is the stronger the corresponding BM becomes. So, for example, a higher score for factor 4 indicates that FTSE250 companies were more reliant on financialisation schemes to extract value, probably mainly for shareholders. It is immediately clear that the FTSE250 companies relied more heavily on financialisation before and during the global financial crisis than after the crisis. Not surprisingly, the use of the other BMs, particularly those associated with accumulation of intangible and human assets and R&D, was much less significant before and during the crisis than after the crisis. What is perhaps encouraging is the downward trend in the use of financialised BMs coupled with an upward trend in the use of the other BMs in the last six to seven years.

Table 5: Average factor scores for FTSE250 companies 2000 – 2017

Year	Factor1	Factor2	Factor3	Factor4	Factor5
2000	-0.075	-0.330	-0.024	0.023	-0.199
2001	-0.079	-0.274	-0.117	0.025	-0.189
2002	-0.073	-0.303	-0.155	0.050	-0.230
2003	-0.074	-0.273	-0.139	0.043	-0.217
2004	-0.070	-0.236	-0.140	0.035	-0.227
2005	-0.057	-0.213	-0.055	0.011	-0.214
2006	-0.046	-0.156	0.041	-0.069	-0.087
2007	-0.039	-0.087	0.092	-0.069	-0.026
2008	-0.035	-0.031	0.060	0.048	-0.048

2009	-0.027	0.018	-0.016	0.001	-0.071
2010	0.004	0.050	-0.006	-0.037	-0.042
2011	0.019	0.069	0.194	0.021	0.006
2012	0.036	0.089	-0.050	0.000	0.043
2013	0.017	0.123	-0.026	-0.015	0.082
2014	0.030	0.127	0.021	0.166	0.151
2015	0.081	0.189	-0.016	-0.037	0.197
2016	0.102	0.254	0.063	-0.012	0.255
2017	0.101	0.353	0.119	-0.146	0.306

5. Conclusion

There have been significant changes in the organisation, conduct, and performance of corporate firms, and hence in the reported accounting and financial information since the start of the new millennium. Since the underlying DGP is highly complex but structured, making sense of the salient patterns and, more challengingly, the underlying business rationales and strategic choices requires a set of appropriate analytical lenses and corresponding techniques. Drawing from several strands of relevant literature, the current study imposes a broad conceptual framework that relates reported financials to latent factors to corporate value functions and business models. A business model is an internally coherent value-creating logic that underpins a specific configuration of resources and capabilities, and the value-creating logic encompasses value identification and proposition, value delivery, and value appropriation. We employ principal component EFA as a dimension reduction and structure identification technique to reveal the common latent factors in the reported financials. We then interpret the latent factors as business models and our empirical work has revealed distinct business models for the FTSE250 companies for the long-run (and for the short-run, not reported here).

We draw several implications from our work. First, in an increasingly competitive, complex and dynamic business world, financial management is not a linear process that runs from the selection and implementation of individual financial strategies to the conventional indicators of financial performance; rather, it is a multi-dimensional ambidextrous approach to the configurations of resources and capabilities that are consistent with specific business models.

Second, business firms adopt a complementary set of business models that correspond to the different segments of the complete set of value-creating logic, i.e. value proposition, delivery, and appropriation. Although there are noticeable differences in the adoption of BMs between the long run and the short run, and although alternative business models may come to prominence from year to year, fundamentally the profit motive dominates in the long run. This difference may reflect different strategic priorities in different time periods as well as organisational reporting, interpretation, learning, and management of the accounting and financial information. In the short-run, due to a host of reasons such as numerous competing demands on firms' financial resources, different time horizons in the materialisation of financial outcomes (e.g. investments and delayed cash flows and

earnings), and strategic financial disclosure, firms are flexible in their choices of alternative business models. Over time, as firms improve the perception of the information environment and better match strategic choices and the perceived information set, the profit motive becomes clearer and profit-oriented, exploitation-focused BM eventually emerges as the dominant business model.

The research findings also have some implications for future empirical studies. The traditional approach that is based on a single dimensional perspective and a linear causal relationship between corporate financial performance and a set of single-metric performance drivers is perhaps too restrictive to reveal the complex underlying structure and relationships in the corporate financials. Instead, a multi-dimensional multi-level approach (e.g. structural equation modelling) is desirable (provided that a panel dataset is available). Moreover, the revealed latent factors and factor scores may be used in further empirical studies of corporate performance. For example, the factor scores can be used to determine the significance of different factors or business models, in lieu of the conventional accounting and financial ratios, for explaining corporate conduct (e.g. R&D intensity) and financial performance (e.g. ROA and ROE).

References:

Ambrosini, V, C Bowman and N Collier (2009). “Dynamic capabilities: An exploration of how firms renew their resource base”. British Journal of Management, 20(S1), S9–S24.

Amit R, Schoemaker PJH. (1993) “Strategic assets and organizational rent”. Strategic Management Journal, 14(1): 33–46.

Barane, A.I. and Hake, E.R. (2018) “The Institutionalist Theory of Capital in the Modern Business Enterprise: Appropriation and Financialization”, Journal of Economic Issues, Vol. 52, Issue 2, pp 430-437.

Barney JB. (1991) “Firm resources and sustained competitive advantage”. Journal of Management 17(1): 99 - 120.

Bouwman, H., Molina-Castillo, F.-J., & de Reuver, M. (2016) “Business model innovation in European SMEs: Some preliminary findings”. BLED 2016 proceedings (pp. 527–538).

Chesbrough, H. (2010). “Business model innovation: Opportunities and barriers”. Long Range Planning, 43(2–3), 354–363.

Coase, Ronald H. (1937). "The Nature of the Firm". Economica. 4 (16): 386–405.

Davis, L. 2016. ‘Identifying the ‘Financialization’ of the Nonfinancial Corporation in the US Economy: A Decomposition of Firm-Level Balance Sheets.’ Journal of Post Keynesian Economics 39 (1): 115–141.

Davis, L. (2018) “Financialization, Shareholder Orientation and the Cash Holdings of US Corporations”, Review of Political Economy, Vol. 30, Issue 1, pp 1-27.

Demil, Benoît and Xavier Lecocq (2010) “Business Model Evolution: In Search of Dynamic Consistency”, Long Range Planning 43 (2010) 227 – 246.
Eisenhardt, K. and J. Martin. (2000). “Dynamic capabilities: What are they?” Strategic Management J. 21, 1105–1121.

Fielt, E. (2011) Business Service Management, Volume 3 – Understanding business models, Smart Services CRC.
Freeman, R.E. 1984, Strategic Management: A Stakeholder Approach. Pittman, Marshfield, MA.
George, G. and A.J. Bock (2011) “The Business Model in Practice and its Implications for Entrepreneurship Research”, Entrepreneurship Theory and Practice, Special Issue: Future of Entrepreneurship. 35 (1), 83–111.
Grabowski, Henry and John Vernon (1990) “A NEW LOOK AT THE RETURNS AND RISKS TO PHARMACEUTICAL R&D”, Management Science, Vol. 36, No. 7, pp. 804-821.
Hart, Oliver and John Moore (1990). "Property Rights and the Nature of the Firm," Journal of Political Economy, 98(6), pp. 1119-1158.
Haslam, Colin; Tord Andersson; Nicholas Tsitsianis; Ya Ping Yin (2012) Redefining Business Models: Strategies for a Financialized World, July 2012, Routledge.
Hirschey, M., V. J. Richardson., and S. Scholz (2001) “Value relevance of nonfinancial information: The case of patent data”. Review of Quantitative Finance and Accounting 17(3): 223-235.
Hirschey, M., and V. J. Richardson (2001) “Valuation effects of patent quality: A comparison for Japanese and US firms”. Pacific-Basin Finance Journal 9(1): 65-82.
Hirschey, M, and Vernon J. Richardson (2002) “Information content of accounting goodwill numbers”. Journal of Accounting and Public Policy 21(3): 173-191.
Hodgson, Geoffrey M. and Thorbjørn Knudsen (2004) “The firm as an interactor: firms as vehicles for habits and routines”, Journal of Evolutionary Economics, Volume 14, Issue 3, pp 281–307.
Huber, George P. (1991) “Organizational Learning: The Contributing Processes and the Literatures”, Organization Science, Vol. 2, No. 1, Special Issue: Organizational Learning: Papers in Honor of (and by) James G. March. (1991), pp. 88-115.
Jensen, Michael C.; Meckling, William H. (1976). "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure". Journal of Financial Economics. 3 (4): 305–360.
Kogut, B., U. Zander. (1992). “Knowledge of the firm, combinative capabilities, and the replication of technology”. Organ. Sci. 3, 383 - 397.

Laya, Andres; Jan Markendahla & Stefan Lundberg (2018) “Network-centric business models for health, social care and wellbeing solutions in the internet of things”, Scandinavian Journal of Management 34, 103–116.
Leonard-Barton, D. (1992). “Core capabilities and core rigidities: A paradox in managing new product development”. Strategic Management Journal, 13, 111–125.
Michailidou, D. (2016) The Inexorable Evolution of Financialisation: Financial Crises in Emerging Markets, Palgrave Macmillan UK.

Milberg, William and Deborah Winkler (2010) “Financialisation and the dynamics of offshoring in the USA”, Cambridge Journal of Economics, 34(2):275-293.
Modell, Sven; Yang, Chunlei (2018) “Financialisation as a Strategic Action Field : An Historically Informed Field Study of Governance Reforms in Chinese State-Owned Enterprises”, Critical Perspectives on Accounting, Vol. 54, 41 – 59.
Morris, M.; M. Schindehutte, & J. Allen (2005) “The entrepreneur's business model: Toward a unified perspective”. Journal of Business Research, 58(6), 726-735.
Morris, M.; G. Shirokova, and A. Shatalov (2013) “The Business Model and Firm Performance: The Case of Russian Food Service Ventures”, Journal of Small Business Management 51(1), pp. 46–65.
Nelson RR. (1991) “Why do firms differ, and how does it matter?” Strategic Management Journal, Winter Special Issue 12: 61–74.
Onaran, Özlem; E.Stockhammer and L.Grafl (2011) “Financialisation, income distribution and aggregate demand in the USA”, Cambridge Journal of Economics, 35, 637–661.
Penrose ET. (1959). The Theory of the Growth of the Firm. Wiley: New York.
Peteraf MA. (1993). “The cornerstones of competitive advantage”. Strategic Management Journal 14(3): 179–191.
Porter, M.E. (2001). “Strategy and the Internet”. Harvard Business Review, 79(3), 62–79.
Prahalad CK, Hamel G. (1990). “The core competence of the corporation”. Harvard Business Review 68(3): 79–91.
Rappaport, Alfred (1998). Creating Shareholder Value: A guide for managers and investors. New York: The Free Press. pp. 13–29.
Shafer, S M., H. Jeff Smith, Jane C. Linder (2005) “The power of business models”, Business Horizons, 48, 199 - 207.
Teece, DJ (2007). “Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance”. Strategic Management Journal, 28(13), 1319–1350.
Teece, D.J. (2010) “Business models, business strategy and innovation”, Long Range Planning, 43 (2), 172 - 194.
Teece, David J. (2018) “Business models and dynamic capabilities”, Long Range Planning, 51, 40 – 49.
Teece DJ, Pisano G, Shuen A. (1997). “Dynamic capabilities and strategic management”. Strategic Management Journal, 18(7): 509–533.
West, Geoffrey (2017) Scale: The Universal Laws of Life and Death in Organisms, Cities and Companies, hardcover, London: the Orion Publishing Group.
Williamson, Oliver E. (2002). "The Theory of the Firm as Governance Structure: From Choice to Contract," Journal of Economic Perspectives, 16(3), pp. 171-195.
Zollo, Maurizio and Sidney G. Winter (2002) “Deliberate Learning and the Evolution of Dynamic Capabilities”, Organization Science, Vol. 13, No. 3, May–June 2002, pp. 339–351.
Zott, C., R. Amit, and L. Masa (2011) “The Business Model: Recent Developments and Future Research”, Journal of Management, 37: 1019-1042.

[i] A cursory search of the key word "financialization" in Scopus returned a total of 1,935 publications from 1992 to mid-2018 with 43% being published between 2016 and mid-2018.

[ii] More evidence of financialisation at the macroeconomy and firm level is documented in Michailidou (2016) and Haslam et al. (2012).

[iii] For example, in their review of the BM definition, Zott, Amit, and Massa (2011) have identified four alternative approaches that regard BM as: (i) a unit of analysis, (ii) a system-level, holistic way of doing business, (iii) a concept distilled from firm's activities, and (iv) an explanation of value creation and capture.

[iv] We have also conducted EFA for the 250 companies for every year and revealed 15 distinct BMs, but only 4 to 6 BMs were adopted in each year. Therefore, there was a significant variation in the combination of different BMs from year to year. Due to space limit, the year-to-year EFA results are not reported here but will be made available upon request.