Rainer Lueg, Raluca Elena Paraschiv*

# Diffusion Patterns in Small vs Large Capital Markets – the Case of Value-Based Management**

## Abstract

We empirically study the diffusion of value-based management (VBM) in small capital markets. Specifically, we analyse the factors that influence VBM adoption in Danish-listed firms. Based on a hand-collected data set covering 665 firm years from 2002 to 2010, we find that the same factors influence the diffusion of VBM in both large and small capital markets. Specifically, we find that large firms with a higher percentage of institutional ownership and with a CEO whose education is business-related are more likely to adopt VBM. Additionally, the control variables reveal a significant positive correlation between VBM adoption and leverage, capital intensity, liquidity, and the characteristics of top executives. Furthermore, we find that manufacturing and utility firms are more likely to adopt VBM than service or trade firms. Contrary to the mainstream opinion, we contribute to the literature that findings from large capital markets appear to be transferable to firms in small capital markets.

Keywords: value-based management, shareholder value, Denmark, diffusion theory, upper echelons, ownership, risk, capital markets
(JEL: M10, M40, M41, M42, M48)

## Introduction

Within the last few decades, firms have come under increased pressure to focus on maximising shareholder value. Hostile takeovers, institutional investors with large equity positions in firms, more active supervisory boards, and increasingly competitive global capital markets have all contributed to this increased pressure (Ryan Jr. & Trahan, 1999). One way to emphasise shareholder value is by adopting value-based management (VBM): VBM provides an integrated management strategy and management control system specifically designed to increase shareholder

* *Rainer Lueg* (corresponding author): Professor of Managerial Accounting, Leuphana University, Institute of Management, Accounting and Finance, Universitätsallee 1, 21335 Lüneburg – Germany and University of Southern Denmark, Department of Business and Management, Universitetsparken 1, 6000 Kolding – Denmark. lueg@leuphana.de.
*Raluca Elena Paraschiv*: Research Assistant, Department of Business and Management, Universitetsparken 1, 6000 Kolding – Denmark. ralucaparaschiv86@yahoo.com

** Date submitted: June 4, 2020.
Date accepted after double-blind review: August 3, 2022.
**Acknowledgements**: We appreciate the helpful comments by Daniela Balica, Yassin D. Bouzzine, Raluca Oprita, and the anonymous reviewers.

 DOI: 10.5771/0935-9915-2023-1-1

value (Lueg & Schäffer, 2010; Ryan Jr & Trahan, 2007). The increasing interest in VBM led to the publication of a series of academic articles on which factors influence VBM adoption: These studies find that VBM adoption depends on size (Athanassakos, 2007; Firk et al., 2019; Firk et al., 2016; Rapp et al., 2011), ownership structure (Firk et al., 2019; Firk et al., 2016; Fiss & Zajac, 2004; Lovata & Costigan, 2002), top executives' characteristics (Athanassakos, 2007; Burkert & Lueg, 2013; Fiss & Zajac, 2004; Naranjo-Gil et al., 2009), operating performance (Athanassakos, 2007; Rapp et al., 2011; Ryan Jr. & Trahan, 1999), industry membership (Ryan Jr. & Trahan, 1999), leverage (Firk et al., 2019; Rapp et al., 2011), and capital intensity (Firk et al., 2019; Lueg, 2008). Most of this research focuses on large capital markets such as the U.S. (Firk et al., 2016; Ryan Jr. & Trahan, 1999), Germany (Fiss & Zajac, 2004; Rapp et al., 2011), Canada (Athanassakos, 2007), or the U.K. (S. Cooper & Crowther, 2008).

However, there is little research on the diffusion of VBM in small capital markets. Our main contribution to the literature is some evidence that the insights drawn from large capital markets may also hold for firms in small capital markets. As it stands, seminal authors in this field question if such transferability is legitimate (Burkert & Lueg, 2013; Firk et al., 2016; Fiss & Zajac, 2004). Firk et al. (2016) highlight that small capital markets allegedly present a different setting for VBM and that the known rules of large capital markets may not apply. First, unlike large capital markets, small ones possess low liquidity: low liquidity implies that capital resources are immobile, which decreases the pressure to deliver performance (Young & O'Byrne, 2001). Second, small capital markets exhibit less institutional ownership: their low liquidity prevents large institutional buyers from establishing an influential position in the firms, and, thus, prevents them from exerting influence. Without these pressures, firms in small capital markets will be less predisposed to adopt VBM (Fiss & Zajac, 2004). Third, small capital markets have more small firms. VBM was developed as a remedy against the separation of management and ownership in large firms (Young & O'Byrne, 2001), thus, it is less likely to find similar adoption rates in small capital markets. These different contextual factors warrant a separate investigation of small capital markets. This assemblage of arguments is, however, purely deductive and has not been tested empirically. Our study contributes such a test to the literature. This insight is important: allegedly, limited generalizability intimidates executives in small capital markets not to adopt best practices, and it obstructs our understanding, as academics, of diffusion. We pose the research question: *Do the large-market antecedents also drive VBM adoption in small capital markets?*

The Danish capital market provides a suitable environment for such an investigation since it can be defined as a small capital market (as previously also argued by Thinggaard & Kiertzner, 2008). First, the Copenhagen Stock Exchange's total market capitalisation represents only 0.45 % of the global market. Second, it hosts only just over 100 non-financial firms. Third, the Danish market only has a small num-

ber of large issuers: many of the Danish listed firms are medium to small size firms where family and foundation ownership are prevalent. Fourth, past research has addressed the claim that liquidity has been a recurring, but not permanent, challenge in this market (Frost et al., 2006; Thinggaard & Kiertzner, 2008).

Our findings show that even though small capital markets are different from large capital markets, the factors that influence the diffusion of VBM are quite similar. A CEO's educational background in business and economics, firm size, and concentrated institutional ownership can positively predict VBM adoption in Denmark. Additionally, control variables reveal a significant positive correlation between VBM adoption and high leverage, high capital intensity, high liquidity, and large boards of top executives. Furthermore, firms in the manufacturing and utility industries are more likely to adopt VBM than those in the service or trading industries.

## Literature Review and Hypothesis Development

### Denmark's Development Toward a Shareholder Value Orientation

Our investigation focuses on the period 2002–2010, during which shareholder value became popular in the Danish capital market, and large changes in VBM occurred that are worth studying. Traditionally, Danish firms were oriented toward the interest of various stakeholders without prioritising shareholders (Caspar Rose & Mejer, 2003), but this started to change with the publication of the Nørby Committee's Report on Corporate Governance (Selskabsstyrelsen, 2001). The Nørby Committee was appointed in March 2001 by the Minister for Economic and Business Affairs in response to the government's wish to strengthen the board of directors' culture in Danish firms as part of its business strategy, at that time known as.dk21. In Danish firms, the board of directors has a central role in taking decisions on strategic objectives. Thus – aiming at preparing Danish firms to compete in the global market – the government focused on board culture. The Nørby Committee's Report starts by discussing the origins of shareholder value and its application across different regimes, especially in Anglo-American vs European markets. While the Committee does not use the academic term VBM, it highlights that corporate governance practices in Denmark should uphold shareholder primacy (i.e., VBM). This stance is the result of a long-term view that reflects the interests of relevant stakeholders (similar to Business_Roundtable, 2019; Harrison, 2019; Jensen, 2010; Martin et al., 2009). Consequently, exemplary shareholder-oriented governance might include short- or mid-term decisions of management

or board members that shareholders do not condone.[1] The Nørby Committee provides commendable examples of what they consider strong shareholder-oriented governance (VBM): the examples include both generic forms and text from actual governance codes of listed firms from Denmark and abroad (Selskabsstyrelsen, 2001, p. 81-121).

The Copenhagen Stock Exchange incorporated the Nørby Committee's recommendations in its disclosure requirements for listed firms immediately after the report's publication. These recommendations draw on Anglo-American governance, such as the abolition of shares with dual-class voting rights and separation between the supervisory board and the board of managing directors. Even though these recommendations were not legally binding, Danish firms were asked to adhere to them on a comply-or-explain-basis (C. Rose & Dolata, 2010). Rose and Dolata (2010) find that, by 2008, Danish firms adhered to 70 % of the recommendations, either by complying or explaining why they had chosen another policy. Another sign that indicated an increase in VBM diffusion was the spread of stock-based compensation. The latter is considered to be a powerful tool for aligning the interests of management with those of the firm's owners and for adopting a shareholder value approach (Firk et al., 2016). Bechmann and Jørgensen (2003) found that, by the end of 2001, around half of all listed firms employed these tools.

## Value-Based Management

VBM is an integrative management approach that works toward the goal of shareholder value orientation. VBM aligns a firm's overall objectives, measures, and incentive systems by focusing on the key drivers of value (Koller et al., 2015). It is an all-encompassing management control system that focuses on shareholder value enhancement in capital budgeting, goal setting, investor communication, and compensation (Ittner et al., 2003; Ryan Jr. & Trahan, 1999). Comprehensive VBM should span all levels of the firm and affect all employees (G. Stern, 2004). Based on the conceptual and empirical literature, firms tend to use VBM in three ways. The first is decision facilitation (Demski, 1994), where VBM information is used to scan the environment and provide information for planning and decision-making. Seminal papers where VBM has only this usage are Burkert and Lueg (2013) and

1 Own translation of Selskabsstyrelsen (2001, p. 37): "The Committee finds that the shareholders – by virtue of their capital contributions and risk – have a legitimate expectation that the Board of Directors will safeguard their long-term interests. With its decisions and dispositions, the company's management must work toward long-term value creation in the company and in the interests of the shareholders. However, it is not enough for management to focus unilaterally on the interests of shareholders. The best possible protection of the shareholders' interests presupposes that consideration for other stakeholders is included to the relevant extent. A company that solely seeks to safeguard the interests of shareholders in the short term may destroy the opportunity to create shareholder value in the long term by not taking due account of the company's other stakeholders, whose acceptance of the company's activities can be a crucial precondition for further development."

Firk et al. (2021), as well as the sub-construct value-based management control system of Fiss & Zajac (2004). The second is decision influencing (Demski, 1994), where VBM information is used to provide incentives and evaluate outcomes. Several pertinent sources highlight this usage (e.g., Biddle et al., 1997; Ittner et al., 2003; Young & O'Byrne, 2001), as well as the sub-construct stock option plans of Fiss & Zajac (2004). The third is external reporting (Koller et al., 2015), where VBM information is used to create accountability to shareholders (Stewart, 1991) as well as stakeholders (Jensen, 2010). This reporting may range from describing selected espoused, decoupled practices to actually implemented VBM of high sophistication (Burkert & Lueg, 2013; Fiss & Zajac, 2006). Fiss and Zajac (2004) also propose a subconstruct, internationally accepted accounting standards, and thereby cover all three usages.

However, not all researchers focus on all usages at once, depending on their theoretical perspective or data availability. Likewise, not all firms may adopt VBM in such a comprehensive way. According to Ansari et al. (2010), diffusing practices, once adopted, are adapted in different ways to fit the specific characteristics of the firm. Thus, some firms may adopt VBM in the capital budgeting (decision facilitating) and compensation dimensions (decision influencing), while others may adopt it only in the investor communication dimension (reporting). Also, VBM moves away from traditional accounting measures such as earnings per share and net profit (Koller et al., 2015): it prefers financial metrics that also account for the cost of capital – for example, economic value added (EVA) or cash flow return on investment (CFROI) – that are consistent with the principles of economic income (Bromwich & Walker, 1998). These features of VBM will be the basis of our operationalisation of VBM as a dependent variable (see Section on dependent variables).

## Diffusion Theory

This section outlines current developments in diffusion theory, which form the theoretical background of this study. Diffusion studies have different foci. Some investigate patterns of diffusions, i.e., which internal and external factors predict an adoption (DiMaggio & Powell, 1983; Fiss et al., 2012). Others investigate the diffusion process, i.e., differences between early and late adopters (Kennedy & Fiss, 2009; Rogers, 1962; Tolbert & Zucker, 1983) or the diffusion adaptation, i.e., how the practice itself changes as it diffuses (Ansari et al., 2010; Lueg & Carvalho e Silva, 2021; Strang & Macy, 2001). The goal of our study is to demonstrate that diffusion patterns are similar across large and small capital markets. Therefore, we focus on well-known firm-related predictors of VBM adoptions. Firms that tend to adopt innovative practices give either rational or social accounts for doing so (Ansari et al., 2010; Strang & Macy, 2001).

Firms that adopt based on rational accounts aim for palpable economic benefits, such as cost-effectiveness (Rogers, 1962). They either gauge the benefits of the innovative practice through their own analysis or infer benefits from observing previous adopters. One example of a rational account for VBM is ownership structure. Institutional investors are highly focused on profitability and demand that the firm is managed in their interest. As their number among other shareholders increases, VBM adoption becomes more likely (Firk et al., 2016).

Firms that adopt based on social accounts mobilise reasons beyond the narrow paradigm of rational choice. For instance, they may adopt for political reasons, to gain legitimacy with stakeholders, or to imitate practices of successful competitors (Ansari et al., 2010; Modell, 2012; Strang & Macy, 2001). An example of a social account reason for VBM is top executive characteristics that constitute personal rather than economic reasons for adoption. CEOs' and CFOs' preferences for calculative representation, conventionalism, uncertainty avoidance, and risk aversion have all been associated with VBM diffusion (Burkert & Lueg, 2013; Firk et al., 2019).

The mainstream interpretation of the timing of social and rational accounts is Tolbert and Zucker's (1983) two-stage model: they find early adopters to be rational and late adopters to be motivated by social accounts. Recent research has challenged this sequence and provides evidence that both accounts appear simultaneously over the whole diffusion process (Daniel et al., 2012; Kennedy & Fiss, 2009; Lueg & Carvalho e Silva, 2021; Modell, 2009). The sequence in the diffusion process is not the focus of this study: rather, we aim at a holistic understanding and address both rational and social accounts in the hypothesis development.

## Hypotheses Development

Diffusion theory investigates two large groups of factors that affect VBM adoptions: social accounts and rational accounts (Lueg & Carvalho e Silva, 2021; Tolbert & Zucker, 1983). Our hypotheses cover both groups. We also develop a hypothesis for firm size since the leitmotif of our study is the transferability of insights from VBM to small capital markets (and small firms).

Some of the most relevant factors in social accounts are the characteristics of top executives (Liu & Ji, 2022). Hambrick and Mason's (1984) upper-echelon theory argues that both strategic choices and firm performance are associated with top executive characteristics. Specifically, educational background, age and tenure may influence the susceptibility of top executives to adopting innovative management accounting practices, i.e., whether to adopt VBM and to what extent (Burkert & Lueg, 2013; Naranjo-Gil et al., 2009). Upper echelons theory argues that by choosing management practices such as VBM, top executives structure decision situations to fit their view of the world. Thereby, the likelihood of adopting an innovative management accounting practice depends on how this practice fits with

managers' existing mental models, which are often shaped by their educational backgrounds (Burkert & Lueg, 2013). A person educated in engineering can be expected to have a different cognitive base from someone educated in history and law (Hambrick & Mason, 1984), and the existing empirical research supports the notion that executives' educational backgrounds influence the adoption of management control systems (Burkert & Lueg, 2013; Firk et al., 2019; Naranjo-Gil et al., 2009). Empirical studies conclude that CEOs with an educational background in business and economics are more likely to initiate strategic change in response to regulation (Grimm & Smith, 1991), to voluntarily disclose non-mandatory information with relevance to shareholders (Lewis et al., 2014), and to publicly commit to shareholder value primacy (Fiss & Zajac, 2004). These arguments suggest that educational background affects the likelihood of VBM adoption. VBM has its origins in the fields of accounting and finance (Seal, 2010), and so it is considered that top executives educated in business administration or economics should be more prone to adopt VBM than those with an educational background in other areas. Consequently, we propose the following hypothesis:

*H1: If a firm's CEO has an educational background in business administration or economics, that firm will be more likely to adopt VBM.*

A preeminent factor in rational accounts is institutional ownership (Aghion et al., 2013). Institutional investors comprise pension/mutual funds, banks, insurance firms, and foundations. Several studies report on the pressure that institutional investors can exert on top executives to prioritise value creation (Burkert & Lueg, 2013; Firk et al., 2019; Firk et al., 2016; Fiss & Zajac, 2004; Lovata & Costigan, 2002). Institutional investors holding a substantial proportion of shares might discipline management since the free-rider problem associated with dispersed ownership would be alleviated (Burkert & Lueg, 2013; Firk et al., 2019). Unlike small investors, institutional investors have great expertise and are more capable of absorbing the costs of monitoring executives and engaging in active ownership (Burkert & Lueg, 2013). Empirical research confirms that VBM adopters exhibit more concentrated institutional ownership than non-adopters (Burkert & Lueg, 2013; Firk et al., 2019; Lovata & Costigan, 2002). Hence, we hypothesise:

*H2: The higher the percentage of a firm's ownership by institutional investors, the more likely a firm will be to adopt VBM.*

Firm size is likely to be an important factor in adopting VBM, and there is empirical evidence that firm size relates to the sophistication of management control systems. For example, when investigating the use of different capital budgeting practices among Swedish firms, Sandahl and Sjogren (2003) find that large firms use sophisticated capital budgeting methods to a higher degree than small ones.

Empirical evidence on VBM also suggests that larger firms espouse a more complex definition of (non-)financial performance. This increases the sophistication of management control systems used for decision-making and measurement of shareholder value (Athanassakos, 2007; Ryan Jr. & Trahan, 1999). Cooper and Petry (1994) argue that, as firms grow, the number of potentially profitable investment opportunities increases, and staffing levels and computing power must also grow to evaluate them, leading to the creation of new departments or expansion of existing ones.

Furthermore, VBM adoption requires significant resources that make it affordable only for large firms. For example, Haspeslagh et al. (2001) found that firms that had successfully adopted VBM invested a lot of time, effort, and money in training large numbers of their employees. Their research shows that 62 % of the successful VBM firms reported training more than 75 % of their managers in VBM concepts, whereas only 27 % of the unsuccessful firms trained the same percentage of their management staff. Hence, we hypothesise:

*H3: The larger a firm is, the more likely a firm will be to adopt VBM.*

## Sample Selection and Data Collection

### Sample Selection

Extant work on VBM adoption focuses on large capital markets, such as Germany (Burkert & Lueg, 2013; Fiss & Zajac, 2004; Rapp et al., 2011), Canada (Athanassakos, 2007), the U.S. (Firk et al., 2016; Ryan Jr. & Trahan, 1999), and the U.K. (S. Cooper & Crowther, 2008). We chose the Danish setting to test if similar diffusion patterns exist in small capital markets. As VBM adoptions are time-intense (KPMG, 2003), we started our data collection in 2002 and allowed for a period of nine years until 2010. This makes sense because the Nørby Report was published in 2001. The sample for this study comprised all firms listed on the Copenhagen Stock Exchange (Nasdaq Nordic OMX) during the sample period 2002–2010. The observation period appeared appropriate as it started immediately after the enactment of the Nørby Committee's recommendations in December 2001 (Selskabsstyrelsen, 2001), which constituted a major step towards promoting VBM in Danish firms. By the end of 2010, 190 firms were listed on the Copenhagen Stock Exchange. Following standard procedure, we eliminated 76 firms from the financial sector (Athanassakos, 2007; Firk et al., 2019; Lovata & Costigan, 2002; Rapp et al., 2011; Schmaltz et al., 2019), five firms due to double listings (i.e., the corresponding firm has two types of share classes listed), seven firms with foreign ISINs, and one firm with no publicly available data.

This procedure resulted in a final sample of 101 firms with 909 possible firm-year observations. However, not all firms were listed in all years (135 cases), and not all annual reports were not publicly available (109 cases). Thus, the final sample consists of 665 firm-year observations. We collected a variety of additional informa-

tion, such as industry, leverage, ROE, ROA, beta, book-to-market, growth, capital intensity, stock liquidity, and the number of members on the board of directors. Table 1 summarises the sample selection, and Table 2 provides information on the selected firms.

**Table 1. Sample Selection**

| | **No of firms** |
|---|---|
| *Cross-sectional perspective* | |
| Firms listed on OMX NASDAQ CPH (2002–2010) | 190 |
| - financial firms | 76 |
| - foreign ISIN | 7 |
| - double listings | 5 |
| - missing data | 1 |
| Final sample | 101 |
| | **No of firm years** |
| *Firm year perspective* | |
| Maximum firm years for the sample period | 909 |
| - years without listing | 135 |
| - missing annual reports | 109 |
| Firm years in the final sample | 665 |

**Table 2. Descriptive Information on the 101 Firms in the Sample**

| **Employees*** (full-time equivalents) | | **Sales*** (mil. DKK) | | **Market capitalisation*** (mill. DKK) | | **Industry** (SIC code) | |
|---|---|---|---|---|---|---|---|
| <100 | 29 | <100 | 23 | <100 | 17 | Manufacturing | 55 |
| <500 | 20 | <500 | 19 | <500 | 34 | Trade | 4 |
| <1,000 | 15 | <1,000 | 14 | <1,000 | 12 | Services | 24 |
| <5,000 | 23 | <5,000 | 24 | <5,000 | 20 | Transportation, | 18 |
| <10,000 | 7 | <10,000 | 9 | <10,000 | 4 | public utilities | |
| <50,000 | 6 | <50,000 | 8 | <50,000 | 11 | and | |
| <100,000 | 0 | <100,000 | 3 | <100,000 | 2 | construction | |
| <150,000 | 1 | <350,000 | 1 | <200,000 | 1 | | |
| | **101** | | **101** | | **101** | | **101** |

* At the end of 2010

## Data Collection

### Dependent Variables

For the dependent variables, we replicated the procedure used by Fiss and Zajac (2004). We measured the degree of VBM adoption by the three dimensions discussed above: operational (i.e., decision facilitation: Burkert & Lueg, 2013; Demski, 1994; Firk et al., 2021), communication (i.e., external reporting: Burkert & Lueg, 2013; Fiss & Zajac, 2006; Koller et al., 2015), and compensation (i.e., decision influencing: Biddle et al., 1997; Demski, 1994; Ittner et al., 2003; Young & O'Byrne, 2001). Fiss and Zajac's (2004) approach, or parts of it, have been widely used in later studies (Burkert & Lueg, 2013; Firk et al., 2019; Firk et al., 2016). In this study, we hand-collected data from the firms' annual reports (similar: Burkert & Lueg, 2013; Firk et al., 2019; Firk et al., 2016; Fiss & Zajac, 2004; Lovata & Costigan, 2002; Rapp et al., 2011). This gave two distinct advantages: first, the data are relatively objective. The annual reports represent the main source of capital market communication, are audited, and are an important means of self-presentation for the firms. Second, we avoided adverse selection and non-response since we looked at all available years. To collect the data, we reviewed each of the annual reports, in particular the management and governance reports. To ensure consistency, we defined decision rules ex-ante.

To determine if a firm adopted VBM in the operational dimension *(Operat)*, we documented if firms use VBM metrics such as Economic Value Added (EVA), Shareholder Value Added (SVA) or Cash Flow Return on Investment (CFROI) for their investment decisions or risk management. Differences between these metrics tend to be small (Biddle et al., 1997; Lueg & Toft, 2022; Toft & Lueg, 2015), but adopting them shows a credible commitment to shareholder-oriented management (Firk et al., 2019; Rapp et al., 2011). Some firms are not explicit about the metrics in their operations (possibly because some of them are trademarks, e.g., EVA). In these cases, we replicated the approach used by Höpner (2005) that considers hurdle rates to satisfy the shareholders' demands and profitability targets for the segments or the firm as a whole. These include targets for EBIT margin, ROIC, and/or profit ratios.

The second dimension is managerial compensation *(Comp).* The salaries of top executives consist of a fixed and a variable component. The variable compensation, which may take the form of cash bonuses or stock-based compensation, is in the interest of shareholders because it generates incentives to increase profitability. We classify a firm as a VBM adopter in the compensation dimension if the firm links variable compensation to specific profitability targets. There are several ongoing, complex discussions in the literature as to what constitutes VBM-conforming targets for compensation. These range from questioning how ex-ante risk can be considered for ex-post compensation (Christensen et al., 2002) to discussions of whether VBM should entrench (Bebchuk & Tallarita, 2020) or enlarge (Harrison,

2019) the number of executive targets to the insight that residual income figures such as EVA are incoherent targets for managers that do not run full-fledged investment centres (J. M. Stern et al., 2001). We also include traditional profitability measures besides genuine VBM metrics such as EVA for several reasons. First, Biddle et al. (1997) explain the conceptual superiority of VBM metrics over traditional profitability measures but empirically demonstrate that the former is not a substantially better predictor of stock returns. Due to this inductive insight, VBM adopters might consider using traditional measures as a key metric (for an extended discussion of other evidence, see Feltham et al., 2004; O'Byrne, 1999; Toft & Lueg, 2015). Second, it is reasonable for VBM adopters to incorporate mid-term metrics in compensation contracts if these reflect important milestones of achievements for the executives (Datar & Rajan, 2018; Koller et al., 2015). Third, Burkert and Lueg (2013) argue that traditional profitability measures are eligible for VBM adopters who demonstrate their shareholder orientation by choosing to list on the stock market and who provide other substantiated evidence of VBM orientation in their operative systems. This is the case in our sample.

As to the communication dimension *(I.R.),* Fiss and Zajac (2004) assume that firms adopting internationally accepted accounting standards (e.g., IFRS or US-GAAP) provide more transparency to shareholders. Our study cannot replicate this approach since the Danish Financial Accounting Act of 2002 requires all listed firms to comply with IAS/IFRS when preparing consolidated financial statements. Therefore, we replicated the procedure used by Höpner (2005) and assessed a firm's adoption of VBM in the communication dimension from two points of view: information quality and investor relations. Specifically, an annual report has high quality if it provides insightful information about segment reporting and the firm's strategy. Furthermore, we considered a firm to have adopted VBM in the communication dimension if it had a comprehensive investor relations strategy. The strategy's presence was established by the existence of an investor relations department, organised roadshows, capital market days and analysts' meetings, published quarterly reports, general shareholders' meetings of high quality and conversations with the top 10 shareholders, the analysts and the institutional investors. We considered a firm to be a VBM adopter if it adopted at least 50 % of the aforementioned procedures.

All the dependent variables were coded using dummy variables: 0 if the firm did not adopt VBM in the respective dimension, and 1 if it did. We also created a dummy variable to account for the full sophistication of VBM. If a firm adopted VBM in all of the three dimensions, then this variable *(VBM)* was coded with 1, and 0 otherwise.

## Independent Variables

We collected data to create three independent variables: institutional ownership, CEO's educational background, and firm size. Annual data on firm size (Size) was

collected from the ORBIS database. The firm size was measured by the natural logarithm of total assets (Rapp et al., 2011).

We collected ownership data from the annual reports and GreensOnline, a database that contains information on the largest firms in Denmark. We measured institutional ownership *(Instit)* as the percentage of shares owned by institutional investors each year. In Denmark, investors owning 5 % or more of a firm's stock must report their holdings to the firm, and this information is published in the firm's annual report. Because a large number of Danish firms have dual-class shares with different voting rights, data were collected based on the percentage of voting rights owned by institutional investors rather than on the shares' ownership.

Information on the CEO's educational background (*CEO_ed)* came from the annual reports and GreensOnline. These sources were supplemented by LinkedIn, Bloomberg Business Week, and the Financial Times markets research website. The information about the CEOs' education was coded using dummy variables as follows: CEOs with a scientific bachelor/master's degree in economics, accounting, business administration, or an MBA were classified as having a business educational background, and they were coded with 1. If we did not find this information, we used business school affiliation as a proxy, for example, being a graduate of either Aarhus School of Business or Copenhagen Business School. All other CEOs were considered as not having a business education and were coded with 0.

## Control Variables

We collected standard control variables from ORBIS and the DataStream Advance database. When unavailable, we hand-collected them from the annual reports. We used beta (Beta) as a proxy for market risk (Burkert & Lueg, 2013; Firk et al., 2019; Lovata & Costigan, 2002) and computed it at the end of each year. We controlled for operating performance using return on assets (ROA) and return on equity (ROE) (Fiss & Zajac, 2004; Rapp et al., 2011). Both indicators were computed using earnings before taxes (EBT) divided by the book value of assets and the book value of equity, respectively. The growth of the firm (Growth) was also used as a control variable and computed as current sales deflated by sales of the year before last (Rapp et al., 2011). We controlled for the strategic direction and stock market valuation using the book-to-market ratio (Book to market). We used two variables for idiosyncratic risk: leverage and capital intensity. Financial leverage (Leverage) was calculated as long-term debt to total assets (Rapp et al., 2011). We measured capital intensity (Capital intensity) as the natural logarithm of the value of fixed assets deflated by the number of employees. We computed stock liquidity (Liquidity) as annual share turnover deflated by market capitalisation at the end of the year.

We controlled for industry using four dummy variables representing manufacturing *(Manufact_ind)*, trading *(Trading_ind)*, services *(Services_ind)*, and utilities, trans-

portation and building *(Utilit_ind)*. We used the first-digit standard industrial classification (SIC) as follows: if a firm's 1-digit SIC was 2 or 3, then it was classified as being a manufacturing firm; if it was 5, as a trading firm; if it was 0, 7, or 8, as a service firm; and, finally, if it was 1 or 4, as belonging to the utilities, transportation and building industry.

In Denmark, the board of directors has a central role when it comes to making decisions on firms' strategic core areas. Moreover, management is a matter common to both the supervisory board and the board of directors, with both boards being held formally responsible. Top executives often align with decisions made by the supervisory board (Lausten, 2002). Therefore, we controlled for the influence of the board of directors *(No_memb)* by using the board size as a control variable. Finally, we controlled for time effects by including year dummy variables in all analyses (random-effects model). Return on assets (ROA), return on equity (ROE), book-to-market, and growth were winsorised at the 2 % level, while liquidity was winsorised at the 1 % level. Furthermore, ROE and book-to-market were undetermined for firm years with a negative book value of equity.

**Table 3. Descriptive Statistics of the Variables**

| Variable | Obs | Mean | SD |
|---|---|---|---|
| Operat | 665 | 0.30 | 0.46 |
| IR | 665 | 0.76 | 0.43 |
| Compen | 665 | 0.61 | 0.49 |
| VBM | 665 | 0.23 | 0.42 |
| CEO_ed | 658 | 0.41 | 0.49 |
| Instit | 665 | 0.16 | 0.19 |
| Size | 665 | 13.97 | 2.01 |
| ROE | 657 | 3.28 | 36.52 |
| ROA | 665 | 1.04 | 18.37 |
| Leverage | 665 | 0.15 | 0.14 |
| Growth | 658 | 1.20 | 0.62 |
| Book to market | 658 | 0.74 | 0.54 |
| Beta | 661 | 0.73 | 0.56 |
| Capital intensity | 649 | 6.62 | 1.21 |
| Manufact_ind | 665 | 0.56 | 0.50 |
| Trading_ind | 665 | 0.03 | 0.18 |
| Services_ind | 665 | 0.22 | 0.41 |
| Utilit_ind | 665 | 0.18 | 0.39 |
| Liquidity | 500 | 0.73 | 1.04 |
| No memb | 657 | 7.00 | 2.11 |

*A full description of all variables and data sources is available in the appendix.*

**Table 4. Pearson Correlation Coefficients**

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Operat | | | | | | | | | | |
| 2. IR | 0,309 ** | | | | | | | | | |
| 3. Comp | 0,282 ** | 0,475 ** | | | | | | | | |
| 4. VBM | 0,850 ** | 0,309 ** | 0,446 ** | | | | | | | |
| 5. CEO_ed | 0,200 ** | 0,110 ** | 0,182 ** | 0,191 ** | | | | | | |
| 6. Instit | 0,115 ** | -0,048 | 0,068 | 0,114 ** | -0,001 | | | | | |
| 7. Size | 0,347 ** | 0,335 ** | 0,383 ** | 0,360 ** | 0,169 ** | -0,089 * | | | | |
| 8. ROE | 0,230 ** | 0,070 | -0,010 | 0,197 ** | 0,035 | 0,001 | 0,371 ** | | | |
| 9. ROA | 0,244 ** | 0,037 | -0,044 | 0,195 ** | 0,045 ** | 0,014 | 0,405 ** | 0,847 ** | | |
| 10. Leverage | 0,127 ** | -0,005 | 0,149 ** | 0,154 ** | 0,112 * | 0,036 | 0,239 ** | -0,028 | -0,040 | |
| 11. Growth | 0,013 | 0,043 | 0,061 | 0,025 | 0,077 * | -0,039 | -0,022 | 0,016 | -0,043 | -0,067 |
| 12. Book to market | -0,087 * | -0,168 ** | -0,132 ** | -0,033 | -0,087 * | -0,031 | -0,056 | -0,043 | -0,018 | 0,046 |
| 13. Beta | 0,002 | 0,230 ** | 0,243 ** | 0,044 | 0,105 ** | -0,054 | 0,267 ** | -0,109 ** | -0,136 ** | -0,026 |
| 14. Capital intensity | 0,075 | 0,166 ** | 0,280 ** | 0,063 | 0,042 | -0,057 | 0,392 ** | 0,114 ** | 0,117 ** | 0,213 ** |
| 15. Manufact_ind | 0,274 ** | 0,036 | -0,020 | 0,186 ** | 0,071 | 0,147 ** | -0,073 | 0,101 ** | 0,122 ** | -0,114 ** |
| 16. Trading_ind | -0,051 | -0,184 ** | -0,100 * | -0,027 | -0,061 | -0,061 | 0,002 | -0,021 | 0,025 | 0,009 |
| 17. Service_ind | -0,294 ** | -0,101 ** | 0,012 | -0,247 ** | -0,083 * | -0,097 * | -0,313 ** | -0,252 ** | -0,275 ** | -0,126 ** |
| 18. Utilit ind | -0,013 | 0,147 ** | 0,059 | 0,037 | 0,026 | -0,057 | 0,425 ** | 0,147 ** | 0,124 ** | 0,275 ** |
| 19. Liquidity | 0,212 ** | 0,198 ** | 0,283 ** | 0,221 ** | 0,100 * | -0,053 | 0,378 ** | 0,164 ** | 0,058 | 0,019 |
| 20. No memb | 0,290 ** | 0,238 ** | 0,296 ** | 0,263 ** | 0,159 ** | -0,095 * | 0,687 ** | 0,226 | 0,265 ** | 0,153 ** |

| Variable | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|
| 12. Book to market | -0,135 ** | | | | | | | | |
| 13. Beta | -0,018 | -0,096 * | | | | | | | |
| 14. Capital intensity | 0,080 * | 0,148 ** | 0,095 * | | | | | | |
| 15. Manufact_ind | -0,110 ** | -0,111 ** | -0,082 * | -0,197 ** | | | | | |
| 16. Trading_ind | -0,017 | 0,980 * | -0,099 * | -0,017 | -0,215 ** | | | | |
| 17. Service_ind | 0,124 ** | -0,020 | -0,009 | -0,021 | -0,597 ** | -0,100 * | | | |
| 18. Utilit ind | 0,017 | 0,117 ** | 0,161 ** | 0,282 ** | -0,541 ** | -0,090 ** | -0,250 ** | | |
| 19. Liquidity | 0,152 ** | -0,167 ** | 0,308 * | 0,068 | -0,009 | 0,095 * | -0,540 | 0,118 ** | |
| 20. No memb | -0,059 | -0,071 | 0,075 | 0,275 ** | -0,003 | 0,032 | -0,186 ** | 0,186 ** | 0,328 ** |

*p<.05; **p<.01.

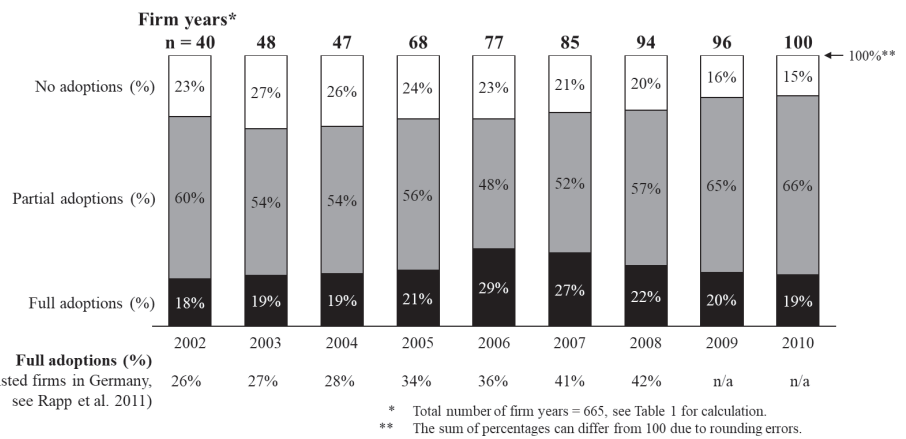
Tables 3 and 4 contain descriptive statistics and the correlation coefficients for the variables, respectively. A summary of the variables' descriptions, together with their respective sources, is given in the appendix. We did not detect relevant multicollinearity among any of the variables (Wooldridge, 2017). We regressed all employed variables (incl. *Operat*, *IR* and *Comp*) for the entire period of 2002–2010 on our main, independent variable *VBM*. All variance inflation factors (VIFs) were below the critical threshold of 10 (Wooldridge, 2017). The highest values were found for ROE (VIF=5.364) and ROA (5.496), while all other VIFs were below the value of 2.5.

## Findings on Value-Based Management in Denmark

### Descriptive Data: Diffusion Pattern

We start by providing a descriptive overview of VBM diffusion in Denmark. We compare it to the simultaneous diffusion in Germany due to the geographic and cultural vicinity of this large capital market, as well as data availability (i.e., Lueg, 2010; Rapp et al., 2011). As shown by Rapp et al. (2011), full VBM adoptions in Germany increased steadily from 26 % to 42 % between 2002 and 2008. We observed the same pattern in Denmark, where VBM adoption (full and partial) steadily increased from 77 % to 85 % between 2002 and 2010. Our number of full (partial) adoptions was lower (higher) than in Rapp et al. (2011) due to diverging definitions: Rapp et al. (2011, p. 180) equate a full adoption with "a management and control system relying on a VBM metric", which is less strict (stricter) than our definition of a full (partial) adoption from above.

**Figure 1. Diffusion of VBM Adoptions in Denmark (2002 to 2010) Compared to Germany**




* Total number of firm years = 665, see Table 1 for calculation.
** The sum of percentages can differ from 100 due to rounding errors.

## Hypotheses Tests

To determine which factors predict the likelihood that a firm would adopt VBM, we performed a logistics regression for each dimension separately. Tables 5 through 8 show the results of the logistic regressions for the operational, communication, and compensation dimensions and the full adoption, respectively. Model 1 includes the control variables only, while Models 2 through 4 add the independent variables. Model 5 presents the full model with all independent and control variables. A positive sign of coefficient B indicates that the variable directly relates to the use of VBM. A negative sign indicates that as the variable increases, the firm is less likely to employ VBM. The logistic regressions have high Pseudo R2s ranging from.252 to.384.

Hypothesis H1 predicts that CEOs' educational background in business administration or economics positively affects VBM adoption. Models 2 and 5 from Tables 5, 6 and 7 show that CEOs' educational background (CEO_ed) has a positive effect on VBM adoption in all three dimensions but is statistically significant only for the operational (.893, p≤.001 – Model 2;.958, p≤.001 – Model 5) and compensation dimensions (.498; p≤.05 – Model 2;.553 p≤.05 – Model 5). Furthermore, CEOs' educational background has a significant positive effect on the full VBM adoption (.756, p≤.01- Model 2;.865, p≤.001 – Model 5). Hence, we accept hypothesis H1.

Hypothesis H2 predicts that institutional ownership positively affects VBM adoption. Models 3 and 5 from Tables 5, 6 and 7 show that institutional ownership (*Instit*) has a significant positive effect on VBM adoption in the operational (.017, p≤.01 – Model 3;.019, p≤0.01 – Model 5) and compensation dimensions (.018; p≤.01 – Model 3;.019; p≤.01 – Model 5). The effect of institutional ownership on VBM adoption in the communication dimension is negative but not significant. Furthermore, institutional ownership has a significant positive effect on the full VBM adoption (.019, p≤.01 – Model 3;.022, p≤.001 – Model 5). Hence, we accept hypothesis H2.

Hypothesis H3 predicts that firm size positively affects VBM adoption. Models 4 and 5 from Tables 5, 6 and 7 show that firm size (*Size*) has a significant positive effect on VBM adoption in all three dimensions: operational (.441, p≤.01 – Model 4;.434, p≤0.001 – Model 5), communication (.480; p≤.001 – Model 4;.485; p≤.001 – Model 5) and compensation (.546; p≤.001 – Model 4;.580; p≤.001 – Model 5). Furthermore, firm size has a significant positive effect on full VBM adoption (.462, p≤.001 – Model 4;.521, p≤.001 – Model 5). Hence, we accept hypothesis H3.

**Table 5. Logistic Regression Models Predicting the Implementation of VBM in the Operational Dimension (OPERAT)**

| Variables | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | | Model 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | S.E. | | B | S.E. | | B | S.E. | | B | S.E. | | B | S.E. | |
| CEO_ed | | | | 0,893 | 0,237 | *** | | | | | | | 0,958 | 0,246 | *** |
| Instit | | | | | | | 0,017 | 0,006 | ** | | | | 0,019 | 0,006 | ** |
| Size | | | | | | | | | | 0,441 | 0,129 | ** | 0,434 | 0,128 | *** |
| ROE | 0,000 | 0,007 | | 0,000 | 0,007 | | 0,000 | 0,008 | | -0,001 | 0,008 | | -0,005 | 0,008 | |
| ROA | 0,042 | 0,019 | * | 0,040 | 0,018 | * | 0,047 | 0,020 | * | 0,033 | 0,020 | | 0,036 | 0,022 | |
| Leverage | 3,652 | 0,886 | *** | 3,467 | 0,905 | *** | 3,437 | 0,909 | *** | 3,294 | 0,962 | *** | 2,438 | 0,998 | ** |
| Growth | 0,404 | 0,225 | | 0,303 | 0,232 | | 0,420 | 0,231 | | 0,406 | 0,224 | | 0,296 | 0,238 | |
| Book to market | -0,007 | 0,266 | | -0,023 | 0,273 | | 0,054 | 0,270 | | 0,060 | 0,273 | | 0,123 | 0,285 | |
| Beta | 0,148 | 0,267 | | 0,125 | 0,274 | | 0,146 | 0,272 | | -0,025 | 0,290 | | -0,133 | 0,307 | |
| Capital intensity | 0,061 | 0,087 | | 0,080 | 0,089 | | 0,080 | 0,093 | | 0,002 | 0,088 | | 0,029 | 0,096 | |
| Manufact_ind | 1,357 | 0,343 | *** | 1,421 | 0,356 | *** | 1,306 | 0,349 | *** | 1,723 | 0,366 | *** | 1,726 | 0,380 | *** |
| Trading_ind | -0,940 | 0,732 | | 0,171 | 0,727 | | -0,076 | 0,741 | | 0,124 | 0,736 | | 0,524 | 0,739 | |
| Services_ind | -1,172 | 0,524 | * | -1,102 | 0,527 | * | -1,113 | 0,528 | * | -0,771 | 0,538 | | -0,674 | 0,546 | |
| Liquidity | 0,574 | 0,267 | * | 0,534 | 0,273 | * | 0,591 | 0,271 | * | 0,357 | 0,282 | | 0,312 | 0,289 | |
| No_memb | 0,183 | 0,060 | ** | 0,162 | 0,062 | ** | 0,222 | 0,063 | *** | 0,038 | 0,081 | | 0,016 | 0,083 | |
| Constant | -4,872 | 0,975 | *** | -5,137 | 1,017 | *** | -5,611 | 1,055 | *** | -9,196 | 1,659 | | -10,312 | 1,756 | *** |
| Chi-square | 149,490 | | | 163,770 | | | 158,096 | | | 162,201 | | | 185,338 | | |
| D.f. | 18 | | | 19 | | | 19 | | | 20 | | | 21 | | |
| Pseudo R2 (Nagelkerke) | 0,316 | | | 0,335 | | | 0,330 | | | 0,350 | | | 0,380 | | |
| Correctly classified | 0,709 | | | 0,727 | | | 0,712 | | | 0,741 | | | 0,739 | | |

*p<.05; **p<.01; ***p<.001. All models control for the year dummy variable. Utilit_ind is the base variable against which the industry dummy variables are assessed.

**Table 6. Logistic Regression Models Predicting the Implementation of VBM in the Compensation Dimension (Comp)**

| Variables | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | | Model 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | S.E. | | B | S.E. | | B | S.E. | | B | S.E. | | B | S.E. | |
| CEO_ed | | | | 0,498 | 0,238 | * | | | | | | | 0,553 | 0,251 | * |
| Instit | | | | | | | 0,018 | 0,006 | ** | | | | 0,019 | 0,006 | ** |
| Size | | | | | | | | | | 0,546 | 0,115 | *** | 0,580 | 0,121 | *** |
| ROE | 0,003 | 0,005 | | 0,003 | 0,005 | | 0,003 | 0,005 | | 0,004 | 0,005 | | 0,005 | 0,005 | |
| ROA | -0,016 | 0,011 | | -0,018 | 0,011 | | -0,016 | 0,011 | | -0,034 | 0,012 | ** | -0,039 | 0,012 | *** |
| Leverage | 2,517 | 0,872 | ** | 2,254 | 0,872 | ** | 2,391 | 0,884 | ** | 1,754 | 0,879 | * | 1,385 | 0,894 | |
| Growth | 0,250 | 0,201 | | 0,209 | 0,201 | | 0,259 | 0,209 | | 0,245 | 0,208 | | 0,212 | 0,214 | |
| Book to market | -0,346 | 0,225 | | -0,354 | 0,227 | | -0,347 | 0,229 | | -0,240 | 0,234 | | -0,219 | 0,240 | |
| Beta | 0,791 | 0,265 | ** | 0,768 | 0,266 | ** | 0,786 | 0,268 | ** | 0,535 | 0,286 | | 0,461 | 0,297 | |
| Capital intensity | 0,383 | 0,088 | *** | 0,391 | 0,088 | *** | 0,408 | 0,092 | *** | 0,258 | 0,085 | ** | 0,275 | 0,090 | ** |
| Manufact_ind | 0,767 | 0,356 | * | 0,750 | 0,359 | * | 0,692 | 0,367 | | 1,346 | 0,372 | *** | 1,281 | 0,383 | *** |
| Trading_ind | -0,325 | 0,646 | | -0,234 | 0,634 | | -0,220 | 0,668 | | 0,038 | 0,645 | | 0,273 | 0,651 | |
| Services_ind | 1,049 | 0,415 | ** | 1,050 | 0,417 | * | 1,104 | 0,426 | ** | 1,751 | 0,440 | *** | 1,904 | 0,459 | *** |
| Liquidity | 0,990 | 0,288 | *** | 0,984 | 0,290 | *** | 1,037 | 0,293 | *** | 0,710 | 0,301 | * | 0,728 | 0,307 | * |
| No_memb | 0,332 | 0,064 | *** | 0,327 | 0,065 | *** | 0,354 | 0,066 | *** | 0,146 | 0,076 | | 0,156 | 0,078 | * |
| Constant | -5,889 | 0,922 | *** | -6,002 | 0,926 | *** | -6,450 | 0,976 | *** | -11,452 | 1,561 | *** | -12,507 | 1,670 | *** |
| Chi-square | 172,591 | | | 177,013 | | | 182,760 | | | 198,739 | | | 214,124 | | |
| D.f. | 18 | | | 20 | | | 19 | | | 19 | | | 21 | | |
| Pseudo R2 (Nagelkerke) | 0,275 | | | 0,287 | | | 0,284 | | | 0,384 | | | 0,369 | | |
| Correctly classified | 0,731 | | | 0,733 | | | 0,727 | | | 0,754 | | | 0,758 | | |

*p<.05; **p<.01; ***p<.001. All models control for the year dummy variable. Utilit_ind is the base variable against which the industry dummy variables are assessed.

**Table 7. Logistic Regression Models Predicting the Implementation of VBM in the Communication Dimension (I.R.)**

| Variables | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | | Model 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | S.E. | | B | S.E. | | B | S.E. | | B | S.E. | | B | S.E. | |
| CEO_ed | | | | 0,423 | 0,272 | | | | | | | | 0,416 | 0,282 | |
| Instit | | | | | | | -0,002 | 0,006 | | | | | -0,003 | 0,006 | |
| Size | | | | | | | | | | 0,480 | 0,116 | *** | 0,485 | 0,118 | *** |
| ROE | 0,004 | 0,006 | | 0,004 | 0,006 | | 0,004 | 0,006 | | 0,005 | 0,006 | | 0,006 | 0,006 | |
| ROA | -0,010 | 0,012 | | -0,012 | 0,012 | | -0,010 | 0,012 | | -0,026 | 0,013 | * | -0,028 | 0,013 | * |
| Leverage | -0,394 | 0,878 | | -0,498 | 0,876 | | -0,383 | 0,878 | | -1,007 | 0,898 | | -1,061 | 0,893 | |
| Growth | 0,143 | 0,207 | | 0,098 | 0,208 | | 0,144 | 0,207 | | 0,207 | 0,214 | | 0,162 | 0,216 | |
| Book to market | -0,848 | 0,248 | *** | -0,853 | 0,249 | *** | -0,849 | 0,248 | *** | -0,803 | 0,254 | ** | -0,794 | 0,254 | ** |
| Beta | 0,632 | 0,307 | * | 0,603 | 0,309 | | 0,634 | 0,307 | * | 0,394 | 0,322 | | 0,383 | 0,322 | |
| Capital intensity | 0,190 | 0,076 | ** | 0,196 | 0,077 | * | 0,189 | 0,076 | * | 0,095 | 0,078 | | 0,096 | 0,078 | |
| Manufact_ind | -1,081 | 0,498 | * | -1,103 | 0,500 | * | -1,058 | 0,502 | * | -0,303 | 0,518 | | -0,257 | 0,526 | |
| Trading_ind | -3,003 | 0,729 | ** | -2,976 | 0,720 | *** | -3,007 | 0,727 | *** | -2,482 | 0,726 | *** | -2,436 | 0,715 | *** |
| Services_ind | -1,457 | 0,528 | ** | -1,459 | 0,529 | ** | -1,456 | 0,528 | ** | 0,637 | 0,551 | | -0,579 | 0,558 | |
| Liquidity | 0,727 | 0,346 | * | 0,689 | 0,348 | * | 0,712 | 0,348 | * | 0,489 | 0,355 | | 0,402 | 0,363 | |
| No_memb | 0,278 | 0,074 | *** | 0,278 | 0,075 | *** | 0,278 | 0,074 | *** | 0,112 | 0,087 | | 0,115 | 0,087 | |
| Constant | -0,477 | 0,866 | ** | -0,572 | 0,870 | | -0,445 | 0,871 | | -5,654 | 1,542 | *** | -5,835 | 1,581 | *** |
| Chi-square | 114,410 | | | 176,584 | | | 111,541 | | | 130,354 | | | 132,734 | | |
| D.f. | 18 | | | 20 | | | 19 | | | 19 | | | 21 | | |
| Pseudo R2 (Nagelkerke) | 0,268 | | | 0,279 | | | 0,270 | | | 0,309 | | | 0,317 | | |
| Correctly classified | 0,803 | | | 0,817 | | | 0,809 | | | 0,836 | | | 0,846 | | |

*p<.05; **p<.01; ***p<.001. All models control for the year dummy variable. Utilit_ind is the base variable against which the industry dummy variables are assessed.

**Table 8. Logistic Regression Models Predicting the Full Implementation of VBM (FULL)**

| Variables | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | | Model 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | S.E. | | B | S.E. | | B | S.E. | | B | S.E. | | B | S.E. | |
| CEO_ed | | | | 0,765 | 0,246 | ** | | | | | | | 0,865 | 0,258 | *** |
| Instit | | | | | | | 0,019 | 0,006 | ** | | | | 0,022 | 0,006 | *** |
| Size | | | | | | | | | | 0,462 | 0,130 | *** | 0,521 | 0,137 | *** |
| ROE | 0,008 | 0,008 | | 0,008 | 0,008 | | 0,005 | 0,008 | | 0,006 | 0,008 | | 0,003 | 0,009 | |
| ROA | 0,031 | 0,018 | | 0,029 | 0,018 | | 0,036 | 0,020 | | 0,016 | 0,021 | | 0,018 | 0,023 | |
| Leverage | 4,692 | 0,935 | *** | 4,509 | 0,948 | *** | 4,533 | 0,957 | *** | 3,966 | 0,984 | *** | 3,370 | 1,043 | *** |
| Growth | 0,464 | 0,238 | | 0,363 | 0,244 | | 0,501 | 0,243 | | 0,454 | 0,237 | | 0,380 | 0,251 | |
| Book to market | 0,338 | 0,277 | | 0,339 | 0,283 | | 0,416 | 0,283 | | 0,420 | 0,286 | | 0,530 | 0,299 | |
| Beta | 0,273 | 0,276 | | 0,264 | 0,281 | | 0,275 | 0,281 | | 0,057 | 0,301 | | -0,028 | 0,316 | |
| Capital intensity | -0,070 | 0,089 | | -0,059 | 0,090 | | -0,066 | 0,094 | | -0,413 | 0,090 | | -0,135 | 0,097 | |
| Manufact_ind | 1,112 | 0,349 | *** | 1,125 | 0,355 | ** | 1,039 | 0,355 | ** | 1,577 | 0,376 | *** | 1,505 | 0,388 | *** |
| Trading_ind | 0,134 | 0,734 | | 0,349 | 0,730 | | 0,182 | 0,740 | | 0,518 | 0,744 | | 0,872 | 0,746 | |
| Services_ind | -1,252 | 0,561 | * | -1,179 | 0,561 | * | -1,183 | 0,565 | * | -0,744 | 0,576 | | -0,666 | 0,585 | |
| Liquidity | 0,654 | 0,276 | * | 0,625 | 0,280 | ** | 0,677 | 0,282 | ** | 0,377 | 0,294 | | 0,38 | 0,302 | |
| No_memb | 0,196 | 0,063 | ** | 0,176 | 0,064 | ** | 0,240 | 0,066 | *** | -0,005 | 0,082 | | -0,005 | 0,087 | |
| Constant | -4,958 | 0,998 | *** | -5,157 | 1,021 | *** | -5,719 | 1,071 | *** | -9,704 | 1,719 | *** | -11,315 | 1,870 | *** |
| Chi-square | 132,907 | | | 142,621 | | | 142,643 | | | 146,851 | | | 169,017 | | |
| D.f. | 18 | | | 20 | | | 19 | | | 19 | | | 21 | | |
| Pseudo R2 (Nagelkerke) | 0,252 | | | 0,271 | | | 0,269 | | | 0,320 | | | 0,353 | | |
| Correctly classified | 0,741 | | | 0,750 | | | 0,747 | | | 0,771 | | | 0,774 | | |

*p<.05; **p<.01; ***p<.001. All models control for the year dummy variable. Utilit_ind is the base variable against which the industry dummy variables are assessed.

The findings regarding these three hypotheses are consistent with the findings on the factors that influence VBM adoption in large capital markets, i.e., educational background (Fiss & Zajac, 2004), institutional ownership (Firk et al., 2019; Firk et al., 2016; Lovata & Costigan, 2002), and size (Athanassakos, 2007; Firk et al., 2019; Firk et al., 2016; Rapp et al., 2011).

### Exploratory Analyses: Control Variables

The logistic regression analyses for the control variables give mixed results. Since we did not develop theory-driven hypotheses on them, we consider them exploratory analyses, and they should not be over-interpreted or generalised.

We find evidence that operating performance (measured by *ROA*) has a *significant positive effect* on VBM adoption in the operational dimension, while it is *negatively related* to VBM adoption in the communication and compensation dimensions. Firms with good financial performance might be predisposed to adopt VBM in the operational dimension because they are committed to delivering strong performance. Poorly performing firms are more likely to adopt VBM in the compensation dimension to force managers to improve performance (Ryan Jr. & Trahan, 1999; Sanders & Tuschke, 2007). However, when considering full VBM adoption, ROA positively correlates with VBM adoption but is not statistically significant. Thus, we cannot claim that operating performance affects VBM adoption (Burkert & Lueg, 2013).

The firm's idiosyncratic risk has a *significant positive effect* on VBM adoption. This is shown by leverage and capital intensity. Consistent with Rapp et al. (2011), we find evidence that leverage has a *significant positive effect* on VBM adoption by Danish firms in all dimensions except communication, where it has a negative but insignificant effect. Creditors may pressure firms to adopt VBM, as they might prefer the margin of safety provided by the fact that VBM takes into consideration the cost of all capital and not just the interest on the debt.

Idiosyncratic risk, measured by capital intensity, has a *significant positive effect* on VBM adoption in the communication and compensation dimensions. These results correspond with Firk et al. (2016) and Burkert and Lueg (2013), who find that idiosyncratic risk, measured by capital invested per employee, is associated with more sophisticated strategic performance measurement subsystems related to communication and compensation. Burkert and Lueg (2013) argue that in a capital-intensive firm, the impact of an individual value-destructive management decision is relatively strong. Hence, executives may be interested in enforcing value-oriented controls for their colleagues or other employees (similar: Firk et al., 2019).

Findings show that firms in the manufacturing industry are more predisposed to adopt VBM than those in the utility industry. As we can see from Tables 5, 6, 7, and 8, almost all *Manufact_ind* coefficients are positive and statistically significant.

Furthermore, firms from the utility industry are more predisposed to adopt VBM than those in the service and trading industries. As we can see from Tables 5, 6, 7, and 8, almost all *Services_ind* and *Trading_ind* coefficients are negative and statistically significant. VBM adoption by manufacturing firms is not an unexpected finding as the level of competition in the market is high, and firms use VBM to gain a competitive advantage (Ryan Jr. & Trahan, 1999). The same cannot be said about the utility industry, which is usually associated with a low level of competition and high regulation and thus no incentive to adopt VBM (S. Cooper & Crowther, 2008). One reason utility firms might adopt VBM is that they tend to be large and so need sophisticated accounting and control systems. These firms use VBM for control purposes and not performance ones.

Shares' liquidity has a significant positive effect on VBM adoption across all dimensions and on full VBM adoption. This is plausible since higher liquidity puts pressure on top managers to deliver performance (Young & O'Byrne, 2001).

Furthermore, the board's size has a significant positive effect on VBM adoption across all dimensions and on full VBM adoption. Because, in Denmark, the board of directors has a central role in strategic decision-making, thus, large boards can put more pressure on a firm to adopt VBM.

## Conclusions

This paper investigates if VBM diffusion patterns in small capital markets resemble those in large capital markets. For this purpose, we investigated the Danish capital market. Our study contributes to the existing literature in several ways.

First, the findings show that the same factors have an influence on the diffusion pattern of VBM in both large and small capital markets. Specifically, we find that a CEO's educational background in business administration or economics, firm size, and institutional ownership have a significant positive effect on VBM adoption. We also find that the firm's idiosyncratic risk, measured by leverage and capital intensity, has a positive effect on VBM adoption. The fact that we are able to replicate these results is a major advance, as previous studies were in doubt about the transferability of findings from large capital markets to other settings (Burkert & Lueg, 2013; Firk et al., 2016; Fiss & Zajac, 2004). Our research suggests that the transferability of findings from large capital markets to small capital markets is possible for several reasons. First, some small capital markets, such as Denmark, may be well-developed, and, in this case, although liquidity is a recurring challenge, it is not a permanent one (Frost et al., 2006; Thinggaard & Kiertzner, 2008). This high liquidity keeps performance pressure up (Young & O'Byrne, 2001). Second, small capital markets also host large firms for whom VBM had been developed in the first place (Young & O'Byrne, 2001). A firm that is listed on the stock exchange may feature characteristics of both small and large firms: it is also likely that regulatory standards might warrant highly professional governance and management controls,

such as VBM (Brown et al., 2011). Third, even a modest presence of institutional ownership appears to be sufficient to nudge firms toward VBM. Furthermore, we conjecture that family ownership passed on over generations to multiple heirs requires professional management by institutionalised family offices. These might start exhibiting the same demands as institutional investors (Peng et al., 2018; Zellweger & Kammerlander, 2015). The insight that we observe similar patterns opens up several opportunities to transfer other findings on diffusion patterns, such as the Balanced Scorecard or Corporate Sustainability Management.

Second, we contribute by adding three more items to the list of factors influencing VBM adoption in small capital markets. More precisely, we find that firms in the manufacturing and utility industries are more prone to adopting VBM than those in the trading and service industries. This sub-finding is in contrast to the known pattern of VBM diffusion (Burkert & Lueg, 2013; Messner, 2015). Additionally, firms with high share liquidity and a large board of directors are more inclined to adopt VBM. Despite the basic diffusion pattern being similar, our study explores intriguing nuances of small capital markets.

The limitations of our study also provide avenues for future research. First, even if the Danish capital market is small, it is well-established, and thus, the findings of this paper may not apply to emerging small capital markets that are seen as less information-efficient or less liquid. Future research could focus on studying the diffusion patterns of VBM in emerging capital markets with consistently low liquidity. Alternatively, it might explore novel patterns of diffusion in small capital markets and investigate if these are currently undiscovered patterns in large capital markets. Second, future research could attempt to understand the factors that influence VBM adoption in individual dimensions (operational, communication, and compensation) in more detail. Binary coding of archival data is rather coarse, giving limited credit to differences among adopters (Burkert & Lueg, 2013). Future research could use computer-aided text analysis to account for more variance in the sample (Short et al., 2010). However, despite these limitations, this paper deserves merit for being the first paper that studies the diffusion of VBM in small capital markets. This study closes the gap between large capital markets and small capital markets and suggests that the extant research from large capital markets and VBM is, to a reasonable degree, transferable to small, developed capital markets such as Denmark.

## Appendix: Definition of Variables

| Variable | Description | Source |
|---|---|---|
| | **Dependent variables** | |
| Operat | Dummy variable taking the value of 1 for firm years in which firms have adopted VBM in the operational dimension | Annual reports |
| I.R. | Dummy variable taking the value of 1 for firm years in which firms have adopted VBM in the communication dimension | Annual reports |
| Compen | Dummy variable taking the value of 1 for firm years in which firms have adopted VBM in the compensation dimension | Annual reports |
| VBM | Dummy variable taking the value of 1 for firm years in which firms have adopted VBM in all three dimensions | Own calculation |
| | **Independent variables** | |
| CEO | Dummy variable taking the value of 1 for firm years where the CEO has an economics or business administration education | GreensOnline; Annual reports |
| Instit | Per cent of shares owned by institutional investors | GreensOnline; Annual reports |
| Size | Firm size measured by the logarithm of total assets | ORBIS |
| | **Control variables** | |
| ROE | Measure of operating performance defined as earnings before taxes (EBT) deflated by book value of equity (winsorised at 2 % level and undetermined for firm years with a negative book value of equity) | ORBIS |
| ROA | Measure of operating performance defined as earnings before taxes (EBT) deflated by book value of assets (winsorised at 2 % level) | ORBIS |
| Leverage | Leverage measure calculated as long-term debt to total assets (idiosyncratic risk) | ORBIS |
| Growth | Measure of firm growth calculated as current sales deflated by sales the year before last year (winsorised at 2 % level) | ORBIS |
| Book to market | Measure of stock market valuation defined as book value of equity divided by market capitalisation of equity (winsorised at 2 % level and undetermined for firm years with negative book value of equity) | DataStream Advance |
| Beta | Measure of the firm's market risk computed over 12 months | DataStream Advance |
| Capital intensity | Measure of capital intensity calculated as the logarithm of the value of fixed assets deflated by the number of employees (idiosyncratic risk) | ORBIS |
| Manufact_ind | Dummy variable taking the value of 1 for firms that are classified as manufacturing firms (1-digit-SIC) | ORBIS |
| Trading_ind | Dummy variable taking the value of 1 for firms that are classified as trading firms (1-digit-SIC) | ORBIS |
| Services_ind | Dummy variable taking the value of 1 for firms that are classified as service firms (1-digit-SIC) | ORBIS |
| Utilit_ind | Dummy variable taking the value of 1 for firms that are classified as utility, transportation or building firms (1-digit-SIC) | ORBIS |
| Liquidity | Measure of stock liquidity calculated as annual share turnover deflated by market capitalisation at the end of the year (winsorised at the 1 % level) | NASDAQ OMX Nordic |
| No_memb | Number of members of the board of directors | Annual reports |

## References

Aghion, P., Van Reenen, J., & Zingales, L. (2013). Innovation and institutional ownership. *American Economic Review, 103*(1), 277-304.

Ansari, S. M., Fiss, P. C., & Zajac, E. J. (2010). Made to fit: how practices vary as they diffuse. *Academy of Management Review, 35*(1), 67–92.

Athanassakos, G. (2007). Value-based Management, EVA and stock price performance in Canada. *Management Decision, 45*(9), 1397–1397.

Bebchuk, L. A., & Tallarita, R. (2020). The illusory promise of stakeholder governance. *Cornell Law Review.*, forthcoming.

Bechmann, K. L., & Løchte Jørgensen, P. (2003). *The value and incentives of option-based compensation in Danish listed firms*. Aarhus: CAF Centre for Analytical Finance of Aarhus University.

Biddle, G., Bowen, R., & Wallace, J. (1997). Does EVA beat earnings? Evidence on associations with stock returns and firm values. *Journal of Accounting & Economics, 24*(3), 301–336.

Bromwich, M., & Walker, M. (1998). Residual income past and future. *Management Accounting Research, 9*(4), 391–419.

Brown, P., Beekes, W., & Verhoeven, P. (2011). Corporate governance, accounting and finance: A review. *Accounting & finance, 51*(1), 96–172.

Burkert, M., & Lueg, R. (2013). Differences in the sophistication of Value-based Management – The role of top executives. *Management Accounting Research, 24*(1), 3–22.

Business_Roundtable. (2019). Our Commitment – Statement.Retrieved 1.9.2019, from https://opportunity.businessroundtable.org/ourcommitment/

Christensen, P. O., Feltham, G. A., & Wu, M. G. H. (2002). 'Cost of capital' in residual income for performance evaluation. *Accounting Review, 77*(1), 1–23.

Cooper, D., & Petry, G. (1994). Corporate performance and adherence to shareholder wealth-maximizing principles. *FM: The Journal of the Financial Management Association, 23*(1), 71–78.

Cooper, S., & Crowther, D. (2008). The adoption of value-based management in large UK companies. *Journal of Applied Accounting Research, 9*(3), 148–167.

Daniel, E., Myers, A., & Dixon, K. (2012). Adoption rationales of new management practices. *Journal of Business Research, 65*(3), 371–380. doi: http://dx.doi.org/10.1016/j.jbusres.2011.06.033

Datar, S. M., & Rajan, M. V. (2018). *Horngren's Cost Accounting: A Managerial Emphasis*. Harlow: Pearson.

Demski, J. S. (1994). *Managerial Uses of Accounting Information*: Kluwer.

DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American sociological review, 48*(2), 147–160.

Feltham, G. D., Issac, G. E., Mbagwu, C., & Vaidyanathan, G. (2004). Perhaps EVA does beat earnings – Revisiting previous evidence. *Journal of Applied Corporate Finance, 16*(1), 83–88.

Firk, S., Richter, S., & Wolff, M. (2021). Does value-based management facilitate managerial decision-making? An analysis of divestiture decisions. *Management Accounting Research, 51*(2), 100736.

Firk, S., Schmidt, T., & Wolff, M. (2019). Exploring Value-Based Management sophistication: The role of potential economic benefits and institutional influence. *Contemporary Accounting Research, 36*(1), 418–450. doi: 10.1111/1911–3846.12402

Firk, S., Schrapp, S., & Wolff, M. (2016). Drivers of value creation – The role of value-based management and underlying institutions. *Management Accounting Research, 33*(1), 42–60.

Fiss, P. C., Kennedy, M., & Davis, G. (2012). How golden parachutes unfolded: Diffusion and variation of a controversial practice. *Organization Science, Articles in Advance, 23*(4), 1077–1099.

Fiss, P. C., & Zajac, E. J. (2004). The diffusion of ideas over contested terrain: the (non)adoption of a shareholder value orientation among German firms. *Administrative Science Quarterly, 49*(4), 501–534.

Fiss, P. C., & Zajac, E. J. (2006). The symbolic management of strategic change: Sensegiving via framing and decoupling. *Academy of Management Journal, 49*(6), 1173–1193. doi: 10.5465/amj.2006.23478255

Frost, C. A., Gordon, E. A., & Hayes, A. F. (2006). Stock exchange disclosure and market development: An analysis of 50 international exchanges. *Journal of Accounting Research, 44*(3), 437–483.

Grimm, C. M., & Smith, K. G. (1991). Research notes and communications management and organizational change: A note on the railroad industry. *Strategic Management Journal, 12*(7), 557–562.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: the organization as a reflection of its top managers. *Academy of Management Review, 9*(2), 193–206.

Harrison, J. S., Phillips, R.A. and Freeman, R.E. (2019). On the 2019 Business Roundtable Statement on the purpose of a corporation. *Journal of Management, 46*(7), 1223–1237.

Haspeslagh, P., Noda, T., & Boulos, F. (2001). It's not just about the numbers. *Harvard Business Review, 79*(7), 64–73.

Höpner, M. (2005). Corporate Governance in Transition: Ten Empirical Findings on Shareholder Value and Industrial Relations in Germany (Vol. MPIfG Discussion Paper 01/5). Cologne.

Ittner, C. D., Larcker, D. F., & Randall, T. (2003). Performance implications of strategic performance measurement in financial services firms. *Accounting, Organizations & Society, 28*(7–8), 715–741.

Jensen, M. C. (2010). Value maximization, stakeholder theory, and the corporate objective function. *Journal of Applied Corporate Finance, 22*(1), 32–42.

Kennedy, M. T., & Fiss, P. C. (2009). Institutionalization, framing, and diffusion: The logic of TQM adoption and implementation decisions among U.S. hospitals. *Academy of Management Journal, 52*(5), 897–918.

Koller, T., Goedhart, M., & Wessels, D. (2015). *Valuation: Measuring and managing the value of companies* (6th ed.): Wiley.

KPMG. (2003). *Value Based Management: Shareholder Value Konzepte – Eine Untersuchung der DAX100 Unternehmen* Frankfurt (Main): KPMG.

Lausten, M. (2002). CEO turnover, firm performance and corporate governance: Empirical evidence on Danish firms. *International Journal of industrial organization, 20*(3), 391–414.

Lewis, B. W., Walls, J. L., & Dowell, G. W. (2014). Difference in degrees: CEO characteristics and firm environmental disclosure. *Strategic Management Journal, 35(5), 712–722., 35*(5), 712–722.

Liu, M., & Ji, D. (2022). An overview of the literature on upper echelons. *Accounting Perspectives*, forthcoming.

Lovata, L. M., & Costigan, M. L. (2002). Empirical analysis of adopters of Economic Value Added. *Management Accounting Research, 13*(2), 215–228.

Lueg, R. (2008). *Value-based Management: Empirical Evidence on its Determinants and Performance Effects*. Vallendar: WHU Otto Beisheim School of Management.

Lueg, R. (2010). Shareholder Value und Value Based Management – Wie steuern die HDAX-Konzerne? *Zeitschrift für Controlling, 22*(6), 337–344.

Lueg, R., & Carvalho e Silva, A. L. (2021). Diffusion of the Balanced Scorecard: motives for adoption, design choices, organisational fit, and consequences. *Accounting Forum*, forthcoming.

Lueg, R., & Schäffer, U. (2010). Assessing empirical research on Value-based Management: guidelines for improved hypothesis testing. *Journal für Betriebswirtschaft, 60*(1), 1–47.

Lueg, R., & Toft, J. S. (2022). Earnings less risk-free interest charge (ERIC) and stock returns — A Value-based Management perspective on ERIC's relative and incremental information content. *Journal of Risk and Financial Management, 15*(368), 1–21. doi: 10.3390/jrfm15080368

Martin, J., Petty, W., & Wallace, J. (2009). Shareholder value maximization – Is there a role for Corporate Social Responsibility? *Journal of Applied Corporate Finance, 21*(2), 110–118.

Messner, M. (2015). Does industry matter? How industry context shapes management accounting practice. *Management Accounting Research*(forthcoming).

Modell, S. (2009). Bundling management control innovations: A field study of organisational experimenting with total quality management and the Balanced Scorecard. *Accounting, Auditing & Accountability Journal, 22*(1), 59–90.

Modell, S. (2012). The politics of the Balanced Scorecard. *Journal of Accounting & Organizational Change, 8*(4), 475–489.

Naranjo-Gil, D., Maas, V. S., & Hartmann, F. G. H. (2009). How CFOs Determine Management Accounting Innovation: An Examination of Direct and Indirect Effects. *European Accounting Review, 18*(4), 667–695. doi: 10.1080/09638180802627795

O'Byrne, S. F. (1999). EVA and its critics. *Journal of Applied Corporate Finance, 12*(2), 92–96.

Peng, M. W., Sun, W., Vlas, C., Minichilli, A., & Corbetta, G. (2018). An institution-based view of large family firms: A recap and overview. *Entrepreneurship Theory and Practice, 42*(2), 187–205.

Rapp, M., Schellong, D., Schmidt, M., & Wolff, M. (2011). Considering the shareholder perspective: Value-based Management systems and stock market performance. *Review of Managerial Science, 5*(2), 171–194. doi: 10.1007/s11846–010–0056-z

Rogers, E. M. (1962). *Diffusion of Innovations*. New York: Free Press of Glencoe.

Rose, C., & Dolata, K. (2010). Corporate Governance i danske børsnoterede selskaber.. *Revision & Regnskabsvæsen, nr. 12, pp. 46–57., 12*(1), 46–57.

Rose, C., & Mejer, C. (2003). The Danish corporate governance system: from stakeholder orientation towards shareholder value. *Corporate Governance: An International Review, 11*(4), 335–344.

Ryan Jr, H. E., & Trahan, E. A. (2007). Corporate financial control mechanisms and firm performance: The case of value-based management systems. *Journal of Business Finance & Accounting, 34*(1-2), 111–138.

Ryan Jr., H. E., & Trahan, E. A. (1999). The utilization of Value-Based Management: An empirical analysis. *Financial Practice & Education, 9*(1), 46–58.

Sandahl, G., & Sjögren, S. (2003). Capital budgeting methods among Sweden's largest groups of companies. The state of the art and a comparison with earlier studies. *International Journal of Production Economics, 84*(1), 51–69.

Sanders, W. G., & Tuschke, A. (2007). The adoption of institutionally contested organizational practices: The emergence of stock option pay in Germany. *Academy of Management Journal, 50*(1), 33–57.

Schmaltz, C., Lueg, R., Agerholm, J., & Wittrup, K. (2019). Value-based management in banking: The effects on shareholder returns. *International Journal of Business Science and Applied Management, 14*(1), 35–50.

Seal, W. (2010). Managerial discourse and the link between theory and practice: From ROI to Value-based Management. *Management Accounting Research, 21*(2), 95–109. doi: 10.1016/j.mar.2010.02.007

Selskabsstyrelsen. (2001). *Nørby-udvalgets rapport om Corporate Governance i Danmark: anbefalinger for god selskabsledelse i Danmark*. Copenhagen: Erhvervs- og Selskabsstyrelsen.

Short, J. C., Broberg, J. C., Cogliser, C. C., & Brigham, K. H. (2010). Construct validation using computer-aided text analysis (CATA): An illustration using entrepreneurial orientation. *Organizational Research Methods, 13*(2), 320–347.

Stern, G. (2004). Corporate governance, EVA, and shareholder value. *Journal of Applied Corporate Finance, 16*(2–3), 91–99.

Stern, J. M., Shiely, J. S., & Ross, I. (2001). *The EVA Challenge: Implementing Value-added Change in an Organization*. New York, NY: John Wiley & Sons.

Stewart, G. B. (1991). *The Quest for Value: A Guide for Senior Managers*. New York, NY: Harper Business.

Strang, D., & Macy, M. W. (2001). In search of excellence: fads, success stories, and adaptive emulation. *American Journal of Sociology, 107*(1), 147–182.

Thinggaard, F., & Kiertzner, L. (2008). Determinants of audit fees: Evidence from a small capital market with a joint audit requirement. *International journal of auditing, 12*(2), 141–158.

Toft, J. S., & Lueg, R. (2015). Does EVA beat earnings? A literature review of the evidence since Biddle et al. (1997). *Corporate Ownership and Control, 12*(2), 8–18.

Tolbert, P. S., & Zucker, L. G. (1983). Institutional sources of change in the formal structure of organizations: The diffusion of civil service reform, 1880–1935. *Administrative Science Quarterly, 28*(1), 22–39.

Wooldridge, J. M. (2017). *Introductory Econometrics: A Modern Approach*. Boston, MA: South-Western College Publishers.

Young, S. D., & O'Byrne, S. F. (2001). *EVA and Value Based Management: A Practical Guide to Implementation*. New York, NY: McGraw-Hill.

Zellweger, T., & Kammerlander, N. (2015). Family, wealth, and governance: An agency account. *Entrepreneurship Theory and Practice, 39*(6), 1281–1303.