Value-based management in banking: The effects on shareholder returns

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Abstract

In this study, we explore the drivers of total shareholder returns (TSR) in commercial banks, and investigate whether banks subscribing to Value-based Management (VBM) outperform the non-adopters in terms of TSR. We estimate a TSR model using data from 132 listed commercial European and North American banks. First, we demonstrate that banks that have publicly adopted VBM in their operative Management Control Systems (MCS) outperform non-VBM-banks. On average, VBM-adopters generate a 5.8%-points higher annual TSR. They also outperform non-VBM-banks in terms of profitability, growth, and liquidity. Second, we find that banks focus on key performance indicators (KPIs) such as the cost-income ratio, which are sub-optimal indicators of TSR. We suggest the implementation of indicators that are more closely related to TSR, such as return on assets or loan loss provisioning. So far, only a few banks (10%-45%) have considered these KPIs in their MCS. A shift towards our suggested KPIs might even further improve the performance of VBM-adopters. Controlling for macro-economic factors, our findings are stable before and after the financial crisis in 2008.

Keywords: Value-based management, banks, total shareholder return, value drivers.

JEL classification: G21; M10; M41; M46.

1. INTRODUCTION

The banking industry currently faces fundamental changes: Regulators intend to strengthen the resilience of the banking industry and impose new regulatory requirements (Basel III). These requirements imply additional costs and demand a relative increase in equity (e.g., Pokutta and Schmaltz, 2011). Banks can more easily attract new funds by publicly committing to maximizing shareholder value and using a pertinent governance system such as Value-based Management (VBM). Several studies outside the banking industry have already demonstrated that the adoption of VBM improves financial performance (Firk et al., 2018; Firk et al., 2016; Haspeslagh et al., 2001; Knauer et al., 2018; Lingle and Schiemann, 1996; Rapp et al., 2011; Wallace, 1997). By implementing VBM, a bank ensures that its activities, incentive schemes and reporting target shareholder value maximization (Muheki et al., 2014). This is done by identifying and actively managing the financial and operative drivers of shareholder value (Koller et al., 2010). The extant literature suggests that a bank could signal its commitment to VBM by (i) declaring the maximization of shareholder value as the overall objective, (ii) implementing management practices that put this commitment into action, and (iii) using incentive plans that align managers' interests with those of shareholders (e.g., Burkert and Lueg, 2013; Firk et al., 2016; Fiss and Zajac, 2004; Rapp et al., 2011). Banks can convey this information through their annual reports.

However, many banks still miss the opportunities that VBM offers, and refrain from publicly prioritizing value maximization. This could be the consequence of some shareholders being more interested in the strategic than in the financial aspects of their investment in a bank (Loderer and Zgraggen, 1999). In other cases, the institutional context may stigmatize VBM as a socially illegitimate practice (Fiss and Zajac, 2004). Last, critics of VBM have illustrated circumstances that lead to a myopic focus on short-term results (Kaplan and Norton, 2001, p. 378-379). In this case, critics conjecture that VBM-adopters could even underperform non-adopters in terms of long-term shareholder value creation (Jensen, 2010). With this study, we address a main gap of VBM-research concerning the VBM-performance relationship in the banking industry (we discuss notable exceptions in section 2.2: Fiordelisi and Molyneux, 2010; Ittner et al., 2003). This research gap is particularly surprising as the banking industry is pivotal to the economy, and employs substantially different business models to manufacturing and service firms. Furthermore, the new banking regulation Basel III asks banks to hold a substantial amount of core capital, making VBM as a way of managing shareholder funds efficiently more relevant than ever. Likewise, recent developments in auditing and business reporting support the basic ideas of VBM. In particular, Integrated Reporting suggests that annual reports provide audited evidence to comprehensively explain how managing selected value drivers and stakeholder relations ensures shareholder-centered governance (Lueg et al., 2016). There is plentiful evidence of firms that superficially subscribe to VBM but do not thoroughly implement it. Some firms may claim to use VBM but are incapable of identifying and managing the most material key performance indicators (KPIs) that drive TSR (Ittner and Larcker, 2001). Others are not willing to fully implement VBM as they want to avoid the adversities of managing the relevant KPIs if it upsets stakeholders (Firk et al., 2016; Goutas and Lane, 2009), or decouple selected practices to ensure unreasonable bonuses for top executives (Sanders and Tuschke, 2007). In conclusion, there is a relevant research gap in understanding whether VBM-adopting banks outperform non-adopters, and how they achieve this. The objective of the study is to answer the following research question: *How do VBM-adopting banks perform compared to non-adopters?*

To address this question, we investigate 132 listed banks from North America and Europe over 11 years (1,452 annual observations). We compare VBM-adopters to non-adopters by proposing a TSR regression model that employs individual bank stock returns and estimates KPIs that drive TSR. We further analyze the annual reports of the VBM-adopters in more detail to better understand current implementation gaps.

The remainder of this paper is organized as follows. Section 2 discusses the relevant literature. Section 3 describes our approach and our data. Section 4 reports the results. Section 5 explains the contributions and limitations of this study, and suggests topics for future research.

2 LITERATURE REVIEW

2.1 Value-based Management and its effect on shareholder value

2.1.1 The conceptual literature on VBM

The conceptual literature on VBM lacks a profound theoretical base (Ittner and Larcker, 2001; Lueg and Schäffer, 2010; Zimmerman, 2001). Instead, this field of research mainly relies on books written by consultants (Koller et al., 2015; Stewart, 1991). Despite this ontological dearth, we attempt to explicate the main reasons why VBM might improve organizational performance. The term VBM describes managerial activity (also 'practice' or 'system') aimed at ex-ante creating shareholder value ('value creation'). As its cornerstone, VBM focuses on a top-level financial metric with relevance to shareholders. This metric captures the value of the different strategic choices (portfolios) of a firm. VBM then employs value driver trees that span the entire firm and mathematically decompose this metric into (non-)financial value drivers. Thereby, VBM quantifies strategies, exposes the internal logic of organizational activities, and explains the feasibility of a firm's business model (Larsen et al., 2014; Lueg et al., 2015). Ideally, VBM should form the basis of compensation (Koller et al., 2010).

There are several reasons why VBM fosters shareholder value: First, the identification of value drivers enables managers to better understand the consequences of their actions. VBM provides a framework for managers on how to maneuver uncertainties and engage in the most value-creating strategies and pertinent activities. The MCS should support managers in doing so by means of budgets, performance evaluations, and customer profitability analyses. By assigning certain value drivers to specific managers, VBM also creates accountability (Koller et al., 2010).

Second, VBM-based compensation aligns the interests of managers to those of shareholders. This is generally done through stock option plans. Thereby, it influences managerial behavior and reduces agency costs (Borisov and Lueg, 2016; Lueg, 2008).

Third, VBM-based reporting creates transparency toward shareholders, which in turn facilitates access to capital. Recent developments in auditing and financial reporting (e.g., Integrated Reporting) recommend that annual reports should provide audited evidence on how managing relevant value drivers and stakeholder relations ensures shareholder-centered governance (Ittner and Larcker, 2001; Ittner et al., 2003, p. 719; Lueg et al., 2016).

These three reasons are the theoretical basis of our claim that VBM-adoption positively affects shareholder value. They also show that VBM consists of a very comprehensive set of diverse management practices. It is crucial to notice that VBM refers to the intricate process of 'value creation'. Hence, it is not synonymous with the ex-post measurement of shareholder value ('value capture'). For instance, a firm is not automatically a VBM-adopter because it reports its EVA, mentions that shareholders matter, or because it creates a high TSR (Toft and Lueg, 2015). VBM rather "supports decision making directed toward the objective of shareholder value creation" (Burkert and Lueg, 2013, p. 5). Studies on VBM have demonstrated that there are substantial differences in VBM-sophistication, and that these differences can be reliably detected from analyzing annual reports (Burkert and Lueg, 2013; Firk et al., 2019; Firk et al., 2016; Fiss and Zajac, 2004; Rapp et al., 2011). The extant literature suggests that VBM has been thoroughly implemented if an audited annual report confirms the three issues we just raised (e.g., Burkert and Lueg, 2013; Firk et al., 2019; Fiss and Zajac, 2004; Rapp et al., 2011): (i) a firm should publicly declare its main goal of maximizing shareholder value (ii) a firm should explain how management practices put this commitment into action (iii) a firm should use incentive plans that align managers' interests with those of shareholders. We describe in section 3 how this translates into our measurement of VBM-adoption.

2.1.2 Empirical evidence on the relationship between VBM and shareholder value

Consistent with the conceptual literature, several empirical studies outside the banking industry have demonstrated that comprehensive VBM improves financial performance using archival and survey data (Lueg and Schäffer, 2010).

As far as archival data is concerned, Rapp et al. (2011) analyzed the narratives of annual reports of 178 German listed firms from 2002 to 2008 and translated this into a binary coding for VBM-adoption. They find that VBM-adoption is substantially related with positive abnormal stock returns, particularly during the adoption phase. Additionally, Firk et al. (2016) investigated a mixed sample of the S&P500 and the MSCI Europe indices from 2005 to 2010. They provide evidence that VBM is associated with higher residual income, and that this relationship is complemented by financially-oriented ownership and national shareholder orientation (similar: Firk et al., 2019). Using data from 235 acquisitions, Knauer et al. (2018) provide further evidence for this positive relationship and demonstrate that market reactions to M&A-announcements are more positive for firms that use VBM metrics. Wallace (1997) investigated 40 firms that use residual income metrics for executive compensation plans. He discovered that—with fewer investments in assets and higher asset utilization—shareholder value (measured as residual income) increases more for these firms than for matched peers.

As to survey data, Lingle and Schiemann (1996) conclude from their cross-sectional survey from the US that 83% of the exemplary "measurement-managed organizations" rank in the top third of their

industry. Based on an international survey, PA Consulting (2003) shows that adopters of sophisticated VBM outperform the control group in terms of TSR by approximately 5%. Haspeslagh et al. (2001) conducted an international, cross-sectional survey for a set of 22 VBM-related problems. The authors find a positive, statistically significant relationship between VBM and perceived performance (which was also corroborated with TSR). These empirical results further support our conjecture that adopting comprehensive VBM will also create shareholder value in banking.

2.2 Tentative evidence of VBM in banking

Our paper studies the drivers of shareholder value (measured as TSR) of VBM-banks vs. non-VBM banks. Thus, stock returns, VBM, and banks are the three pivotal dimensions that characterize our paper. Only Ittner et al. (2003) follow the same three dimensions. Other papers either focus on other performance measures (e.g., EVA, ROA, ROE), do not address VBM, or do not study banks. Below, we discuss what makes our paper unique and what it shares with other papers.

Like this paper, Ittner et al. (2003) study the relation between VBM and stock returns for financial firms. In Ittner et al. (2003), the VBM information for 140 US financial firms (<50% banks) is collected via a survey. The authors cannot find evidence that VBM affects either one-year or three-year stock returns. This is contrary to their expectations. In contrast to Ittner et al. (2003)—and to obtain more conclusive results—we employ a more homogenous sample (100% banks). Furthermore, we use public VBM-information (based on annual reports) and not anonymous survey data. Second, we investigate potential drivers of VBM-excess return. Studies exploring performance measures other than stock returns (like EVA, ROE, and ROA) and without measuring differences in VBM-sophistication are still relevant for our work as they employ similar explanatory variables. Fiordelisi and Molyneux (2010) proxy TSR by using EVA for a sample of 239 listed and unlisted European banks over 10 years. They find that shareholder value (i.e., EVA) is driven by high cost-efficiency, high-income diversification, high loan loss provisions, and low market risk exposure. As to macro-drivers, EVA is lower as GDP growth decreases. Similar to Fiordelisi and Molyneux (2010), we use firm-specific profitability-, growth-, and cost factors, controlling for macroeconomic persistence. In contrast to Fiordelisi and Molyneux (2010), our factors are not ad hoc assumptions but motivated by a formal decomposition of the discounted future cash flows to shareholders. Finally, EVA is part of VBM and should only proxy shareholder value for unlisted banks (Fiordelisi and Molyneux, 2010). As our sample only contains listed banks, we do not employ EVA. Athanasoglou et al. (2008) studied the profitability of Greek banks (measured by ROA) covering the period from 1985 to 2001. They report that higher capitalized banks, banks with lower loan loss provisions, banks with higher productivity growth, and banks with lower operating expenses achieve higher profitability. Across all banks, ROAs increase in economic upturns and in scenarios of high inflation. As in Athanasoglou et al. (2008), we proxy default risk by loan loss provisions, and the bank type by the log of total assets. However, our risk costs are more specific for the banking sector using the tier 1 capital ratio instead of the leverage ratio (Equity/Total Assets) as in Athanasoglou et al. (2008). Furthermore, we use the cost-income ratio, which is frequently used by banks to measure and signal operational efficiency, instead of operating expenses over total assets as used in Athanasoglou et al. (2008). Dietrich and Wanzenried (2011) studied the ROA-performance of Swiss banks with pre- and post-crisis sub-samples. They identified unconditional and conditional factors. Among the unconditional factors, they find that efficient banks, banks with large lending expansion, banks with a high proportion of non-interest income, and non-listed banks tend to achieve higher ROAs before and during the crisis. Among the conditional factors, they find that banks with a low equity ratio during the crisis, banks with low loan loss provisions during the crisis, state-owned banks, and medium-sized banks had higher ROAs during the crisis. Banks with low funding costs before the crisis tend to have higher ROAs. During the crisis, funding costs are not a significant driver for bank profitability. We share with Dietrich and Wanzenried (2011) the proxies for cost efficiency and risk. By contrast to Dietrich and Wanzenried (2011), our approach innovates on the direct measurement of TSR and VBM-sophistication. We have cross-benchmarked our factor choices against studies beyond the ones discussed here. As the primary research objective usually deviates from ours (e.g., explaining tax effects, etc.), we have decided to briefly mention them in the factor selection process, but not to discuss them at length here.

The literature review has revealed that previous VBM-studies did not look at potential TSR drivers. With non-VBM studies, we share potential drivers for TSR. However, the studies do not systematically test for a comprehensively implemented VBM. Moreover, none of the studies compares their empirical drivers with those that banks internally manage and monitor (as revealed in their annual reports). Therefore, we are the first ones studying the excess TSR of VBM-banks and its underlying manageable drivers.

3 DATA AND EMPIRICAL MODEL

3.1 Selection of sample and data

We limit our investigation to retail banks, which eliminates many of the confounding variables present in a multi-industry sample (Ittner et al., 2003). Furthermore, we only include listed banks, since only these provide TSR as a performance measure. Our selection process is based on the Bankscope database, starting with all listed banks headquartered in either Europe or North America (n=30,378 banks). We include two regions to ensure a material sample size (n=22,140). We only include banks with a minimum market capitalization of 500 million USD in 2011 to minimize biases due to limited stock market liquidity (n=311). To ensure homogeneity, we exclude Turkish banks because of their different (Islamic banking) business model. Furthermore, we exclude pure investment banks, custody banks, and asset managers because of their particular business models, which are not directly comparable to universal banks (n=238). In the next step, we eliminate insurance firms from the sample. Lastly, all banks with initial stock market listing later than 2001 are excluded. This leaves us with a sample of n=132 banks with annual accounting and stock return data spanning from 2001 to 2011. We choose this specific period to test the robustness of our results through economic turbulence. We start in the post-crisis year of the dotcom-bubble (2001) and stop in the post-crisis year of the financial crisis (2011). To avoid con-founding effects for the European sample, we do not extend it to the start of the Euro-currency-crisis (2012).

We use TSR as a performance variable for two reasons. First, it is a direct and timely reflection of shareholder wealth with less noise than proxies such as accounting numbers (Ittner et al., 2003; Rapp et al., 2011). Second, managers can only influence it through VBM. This makes TSR less susceptible to endogeneity (Dechow and Skinner, 2000; Lueg and Schäffer, 2010).

3.2 Identification of VBM-adoption

To classify banks as VBM-adopters validly and reliably, we follow established classification processes. We hand-collect data from annual reports and use our interpretations of the narratives to determine VBM-adoption. To be classified as a comprehensive VBM-adopter, the audited annual reports of the banks have to fulfill three criteria: the bank (i) declares its main goal to be the maximization of shareholder value (Burkert and Lueg, 2013; Firk et al., 2019; Firk et al., 2016), (ii) mentions the implementation of an MCS that serves this end (Burkert and Lueg, 2013; Firk et al., 2019; Firk et al., 2016; Rapp et al., 2011), and (iii) uses stock (option) plans at least for the executive officers (Firk et al., 2019; Fiss and Zajac, 2004). If all of these three criteria are fulfilled, we classify a bank as a comprehensive VBM-adopter with a dummy variable (‘1’), and ‘0’ otherwise. To avoid rating biases, we used two raters, who independently browsed the annual reports and classified the 132 banks as VBM-adopters. The raters corroborated their results with the presentation of investor relations websites as well as keyword searches in international newspaper archives. The interrater reliability is 95% and conflicting classifications were resolved through discussion with the rest of the author team (similar: Firk et al., 2016).

3.3 Identification of VBM-drivers

Our model should contain the most relevant drivers of TSR. We deductively decompose a bank-specific TSR into its components to avoid model over- or under-specifications. We continue by selecting the variables we will use in our statistical application for each of the identified components, including control variables. All related data are obtained from Bankscope.

3.3.1 TSR decomposition

VBM drives TSR of a bank through seven value driver components: (1) Profitability [NI I0, NFC0, NTI0]; (2) Growth [g]; (3) Risk [LLP]; (4) Risk cost [k_e]; (5) Efficiency [AE0]; (6) Liquidity risk [k_e]; and (7) Bank type [NII0, NFC0, NTI]. We demonstrate this through the following analytical decomposition of TSR. According to the discounted cash flow (DCF) model, the stock price is the sum of all future shareholder cash flows (as of today) discounted at the cost of equity k_e (Koller et al., 2010, p.769ff):

$$S_0 = \sum_{t=1}^{\infty} \frac{E_0(CFE_t)}{(1+k_e)^t} \qquad (1)$$

Legend:

CFE_t: Residual cash flow to shareholders

k_e: Cost of equity

The cash flow to shareholders of each period comprises the accounting categories net income, net equity changes (increase/decrease), and other comprehensive income (OI_t):

$$S_0 = \sum_{t=1}^{\infty} E_0(NI_t + \Delta EQ_t + OI_t)(1 + k_e)^t \quad (2)$$

Legend:
NI_t: Net income
ΔEQ_t: Changes in equity
OI_t: Other comprehensive income

Net interest income NI_t can be further decomposed:

$$S_0 = \sum_{t=1}^{\infty} E_0((NII_t - LLP_t + NFC_t + NTI_t - AE_t) + \Delta EQ_t + OI_t)(1 + k_e)^t \quad (3)$$

Legend:
NI I_t: Net interest income
LLP_t: Loan loss provisions
NFC_t: Net fee and commission income
NTI_t: Net trading income
AE_t: Administrative expenses, e.g. HR, IT

Assuming that expected future cash flows grow at a constant rate g, the stock price can be expressed as follows:

$$S_0 = \sum_{t=1}^{\infty} \frac{\left((NII_0 - LLP_0 + NFC_0 + NTI_0 - AE_0) + \Delta EQ_0 + OI_0\right)(1 + g)^t}{(1 + k_e)^t}$$

$$= \frac{(NII_0 - LLP_0 + NFC_0 + NTI_0 - AE_0) + \Delta EQ_0 + OI_0}{k_e - g} \quad (4)$$

As stated above, this leads to the following seven value drivers: (1) Profitability [NI I_0, NFC_0, NTI_0]; (2) Growth [g]; (3) Risk [LLC]; (4) Solvency risk cost [k_e]; (5) Efficiency [AE_0]; (6) Liquidity risk cost [k_e]; and (7) Bank type [NII_0, NFC_0, NTI].

3.3.2 Potential drivers of TSR and control variables

For empirical testing, we choose data that reflect these seven components of TSR (plus control variables) based on the extant literature.

(1) Profitability: Studies tend to approximate the overall profitability of banks with ROE or ROA. Using a sample of 273 large banks from 28 countries, Moussu and Petit-Romec (2014) suggest that pre-crisis ROE is a value destructor rather than a value generator. Additionally, studies tend to employ ROA as a preferred measure of profitability (Athanasoglou et al., 2008; Beccalli, 2007; Dietrich and Wanzenried, 2011; García-Herrero et al., 2009). Thus, we also choose ROA to operationalize profitability in our main model. Since ROE is the most popular performance metric of banks in practice and some academic studies (Chen and Zhang, 2007; García-Herrero et al., 2009), we also consider an alternative model containing ROE.

(2) Growth: We choose revenue growth as a variable for this component. It is a prominent driver of TSR (Anthony and Ramesh, 1992), shareholder value in banking (in this case a driver of EVA:

Athanasoglou et al., 2008; Chen and Zhang, 2007; Fiordelisi and Molyneux, 2010), also with specific respect to VBM (Firk et al., 2016; Rapp et al., 2011).

(3) Risk (default risk): Default risk constitutes the main risk type of banks (between 70% and 90% of total risk-weighted assets). All types of provisioning—and non-performing loan-factors—belong to this group. We choose 'loan loss coverage' (LLC) to proxy default risk (like Curcio et al., 2017; Fiordelisi and Molyneux, 2010) because it focuses on this year's loss and future expected losses as opposed to pure provisions for loan losses.

(4) Solvency risk cost (capital adequacy): Capital adequacy compares risk-taking (measured by risk-weighted assets) to the loss absorption capacity (measured by equity). All equity-related factors belong to this group. We chose the tier 1 ratio to represent the capital adequacy (cf. Baele et al., 2007; Koller et al., 2010).

(5) Efficiency: We measure efficiency using the common cost-income ratio (CIR) (consistent with Baele et al., 2007; Dietrich and Wanzenried, 2011; Fiordelisi and Molyneux, 2010; Koller et al., 2010).

(6) Liquidity risk cost: As outsiders such as us cannot compute the official liquidity coverage ratio (cf. BCBS, 2010), we use a stylized liquidity coverage ratio based on Basel III-regulation labeled 'contingency' and defined as liquid assets over customer deposits (Chiaramonte and Casu, 2017).

(7) Bank type: Bank types differ mainly in their business mix (Lueg et al., 2019). The latter is generally associated with size, as large banks have diversified portfolios that stretch across several types of businesses (cf. Walter, 1997, chapter 3). Hence, we also select size as a variable and define it as the natural logarithm of total assets (Rapp et al., 2011). Size has also been used as a determinant of shareholder value in other studies we discussed above (Athanasoglou et al., 2008; Baele et al., 2007; Dietrich and Wanzenried, 2011; Fiordelisi and Molyneux, 2010; García-Herrero et al., 2009; Koller et al., 2010).

We also employ control variables that determine current stock prices. Since bank income is cyclical, we control for the *macro-economic environment* (similar: Fiordelisi and Molyneux, 2010). We opt for *(8) the 2-year-interest rate level* and *(9) GDP-growth* (Athanasoglou et al., 2008; Chen and Zhang, 2007; Dietrich and Wanzenried, 2011; García-Herrero et al., 2009). We also control for the stock market environment (Koller et al., 2010). We choose *(10) price-book ratio (PB ratio)* to control for expectations (Rapp et al., 2011). We also pick the *(11) MSCI Finance index* to control for industry returns (Koller et al., 2010). Finally, a *(12) lagged TSR*-variable (TSR-1) accounts for the persistence of TSR. We select the first-order lag as suggested by Rapp et al. (2011), and Wooldridge (2009).

3.4 The econometric model

After selecting the data for each potential value driver, we estimate the following panel model using the EViews software.

$$TSR_{i,t} = C + \beta_1 ROA_{i,t} + \beta_2 gRev_{i,t} + \beta_3 LLC_{i,t} + \beta_4 TI_{i,t} + \beta_5 CIR_{i,t} + \beta_6 Contingency_{i,t} + \beta_7 Size_{i,t} + \beta_8 2Y - 1R_{i,t} + \beta_9 gGDP_{i,t} + \beta_{10} PBratio_{i,t} + \beta_{11} MSCI\ \ Finance_{i,t} + \beta_{12} TSR_{i,t-1} + e_{i,t} \quad (5)$$

Due to negative serial correlation among the residuals, we follow the proposition of Wooldridge (2009) and estimate our model with firm fixed effects. We also estimate the first differencing (FD) estimator as a robustness check. To ensure unbiased estimators, we test for endogeneity in the explanatory variables (Wooldridge, 2009). For this, we regress TSR on all current explanatory variables and the explanatory variables one time-period ahead. If the one time-period variables significantly influence the dependent variable, this must be due to the correlation between the variable and the error term. Our tests identify endogeneity in the variables TSR(-1), ROA, contingency, and Ln assets. An additional Wald test confirms the overall endogeneity of the model. To address endogeneity, we perform 2SLS regression analyses by using instrumental variables instead of the endogenous variable and thus tackle the endogeneity problem. We instrument ROA by ROE, TSR(-1) by MSCI Finance(-1), Ln assets by risk cost, and contingency by 'deposits to assets'. Furthermore, the Breusch-Pagan test detects signs of heteroscedasticity. Therefore, we use robust standard errors throughout the analysis. The Jarque-Bera test reveals that the residuals are not normally distributed. According to Wooldridge (2009), this non-normality is tolerable for our large sample of 132 banks. Further checks (not tabulated) show that this model is robust against alternative specifications of endogeneity and performance, and that there are no contradicting results by splitting the sample according to geographic location or pre/post financial crisis in 2008.

4 RESULTS

4.1 Descriptive analysis

We identify 20 of the 132 banks as comprehensive VBM-adopters fulfilling criteria (i) to (iii) in 2011 (15.2%). This rate may seem low; however, it only depicts the adopters of comprehensive VBM-practices. Similar to us, Ittner et al. (2003) document for 140 US financial service firms that almost 67% had implemented VBM or were considering it. Yet, they clarify that only 12.1% can be considered extensive users of VBM. Similarly, Firk et al. (2016) assess the rate of comprehensive users in the S&P500 and the MSCI Europe to be between 16%-20% in 2005-2010. These adoption rates are close to ours. Like other studies, we focus on this selected group of extensive/comprehensive adopters. Hence, we classified 112 banks as non-adopters. Table 1 exhibits the descriptive statistics.

Table 1: Descriptive statistics

*Panel A reports the descriptive statistics of our sample. Panel B presents the Pearson correlations among them. Coefficients are reported with their significance level. (***/**/*: significant at 0.1%/ 1%/ 5% level).*

Panel A: Descriptive statistics

	Mean	Max.	Min.	S.D.	n
TSR	0.053	1.447	-0.942	0.328	1,452
ROA	0.008	0.042	-0.151	0.010	1,452
ROE	0.099	0.443	-3.360	0.163	1,452
Revenue growth	0.091	8.740	-3.421	0.322	1,452
LLC	0.583	331.102	-0.635	8.686	1,452
Tier 1 Ratio	0.107	0.344	-0.037	0.031	1,452
Cost-income ratio	0.601	4.851	-0.254	0.187	1,452
Contingency	0.566	4.468	0.025	0.506	1,452
Ln assets	10.612	15.081	5.167	2.057	1,452
2 year	0.025	0.129	-0.001	0.015	1,452
GDP growth	0.015	0.059	-0.069	0.020	1,452
Price-book ratio	1.701	16.977	0.066	0.902	1,452
MSCI Finance	-0.012	0.355	-0.556	0.253	1,452
VBM-adoption	0.152	1.000	0.000	0.359	1,452

Panel B: Pearson correlations

	TSR	ROA	ROE	Revenue growth	LLC	Tier 1 Ratio	Cost-income ratio	Contin-gency	Ln assets	2 year	GDP growth	Price-book ratio	MSCI Finance	VBM-adoption
TSR	1.000													
ROA	**0.332** ***	1.000												
ROE	**0.320** ***	**0.760** ***	1.000											
Revenue growth	**0.230** ***	**0.091** **	**0.228** ***	1.000										
LLC	0.040	**-0.092** ***	**-0.073** **	-0.047	1.000									
Tier 1 Ratio	**0.081** **	**0.091** **	0.006	-0.017	**0.049** *	1.000								
Cost-income ratio	**-0.173** ***	-0.279	**-0.195** ***	-0.034	0.048	-0.025	1.000							
Contingency	-0.019	**-0.121** ***	-0.045	-0.046	-0.015	**-0.087** **	**0.214** ***	1.000						
Ln assets	**-0.122** ***	**-0.179** ***	-0.003	**-0.088** **	-0.023	**-0.351** ***	**0.163** ***	**0.589** ***	1.000					
2 year	0.050	**0.228** ***	**0.223** ***	0.029	**-0.049** *	**-0.356** ***	**-0.053** **	0.034	**0.066** *	1.000				
GDP growth	**0.144** ***	**0.340** ***	**0.285** ***	**-0.056** **	0.002	-0.038	**-0.058** **	-0.002	**-0.060** *	**0.357** ***	1.000			
Price-book ratio	**0.342** ***	**0.425** ***	**0.381** ***	**0.056** *	-0.019	**-0.065** *	**-0.191** ***	**-0.103** ***	**-0.182** ***	**0.305** ***	**0.361** ***	1.000		
MSCI Finance	**0.463** ***	**0.126** ***	**0.129** ***	**0.088** **	-0.001	0.006	**-0.120** ***	0.004	-0.022	**0.235** ***	0.037	**0.236** ***	1.000	
VBM-adoption	**0.063** *	0.007	**0.077** **	**0.066** *	-0.011	**0.062** *	**0.088** **	**0.144** ***	**0.186** ***	0.023	0.046	**0.104** ***	0.000	1.000

TSR *Annual total shareholder return [%]*

ROA *Net income divided by total assets [%]*

ROE *Net income divided by equity [%]*

Revenue growth *Annual increase in revenue [%]*

LLC *Loan Loss Coverage: Provisions for loan loss divided by reserves for loan loss [%]*

Tier 1 ratio *Core equity divided by Risk-Weighted Assets (RWA) [%]*

Cost-income ratio *CIR: Total cost divided by total income [%]*

Contingency *Liquid assets divided by customer deposits [%]*

Ln assets *Natural log of assets [absolute]*

2 year *Risk-free interest rates set by the central bank over 2 years [%]*

GDP growth *Annual growth of the gross domestic product of the country of residence [%]*

Price-to-book ratio *Stock market value of capital divided by shareholder's equity [%]*

MSCI Finance *Annual rate of return from investing in the MSCI Finance index [%]*

VBM-adoption *Adoption of (i) shareholder value maximization as the main goal; (ii) an MCS that serves this end; and (iii) stock (option) plans at least for the executive officers [dummy]*

The average TSR for all banks over the 11 years was 5.3%. The average ROE of 9.9% is comparable to other studies that report ROEs between 8% and 11% (Beccalli, 2007). The sample mean of the Tier 1 ratio (10.7%) is close to that measured by regulators for a comparable sample (BCBS, 2013).

As expected, TSR correlates with all variables we selected in the respective value driver categories, except for LLC and CONTINGENCY. Likewise, most of the remaining value drivers correlate with ROA and ROE, which have often been chosen as the dependent performance variables by other studies. Last, our dummy variable for VBM-adoption is positively correlated with TSR, ROE, and all drivers of TSR, except ROA and LLC. This is remarkable since the VBM-dummy-variable is a rather crude measure for such an intricate phenomenon as VBM, which usually impairs significant correlations (Burkert and Lueg, 2013). Hence, the significant correlations appear to corroborate the suggestion that both that our criteria (i) to (iii) carry valid information content for stock market participants, and that our coding procedure is reliable.

4.2 Performance of VBM-adopters vs. non-adopters

4.2.1 The TSR outperformance of VBM-adopters

We report the results for the fixed effects two-stage least square (FE-2SLS) model with robust standard errors in Table 2.

Table 2: Main results incl. fixed effects two-stage least squares model (FE-2SLS)

*Panel A shows the outperformance of VBM-adopters in terms of TSR compared to the group of non-adopters. Panel B presents the FE-2SLS model of the drivers of TSR in 6 variations (all banks, only VBM-banks, and non-VBM-banks alternatively employing ROA or ROE as a driver). Panel C shows which variables matter as drivers of TSR, and to what degree banks try to monitor these drivers (implementation gap). Coefficients are reported with their significance level. (***/**/*/†: significant at 0.1%/ 1%/ 5%/ 10% level). The sample size is reduced from n=1,452 to n=1,320 due to the employment of the lagged performance variable (TSR-1) for each of the 132 banks. Our tests for endogeneity identify TSR(-1), ROA, contingency, and Ln assets as endogenous. Hence, we perform the FE-2SLS regression analyses by instrumenting ROA by ROE, TSR(-1) by MSCI Finance(-1), Ln assets by risk cost, and contingency by deposits to assets.*

Panel A: Performance difference of VBM-adopters

		All banks (n=1,320)	VBM-adopters (n=200)	Non-adopters (n=1,120)	Outperformance VBM-adopters	p-value
(y) Performance	**TSR mean**	0.053	0.102	0.044	0.058 **	0.016 *(t-test)*
	TSR median	0.063	0.109	0.053	0.056 **	0.012 *(Mann-Whitney-test)*

Panel B: Models

Panel C: Implementation gap among VBM-adopters

		All banks (n=1,320)		VBM-adopters		Non-adopters					
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Variable managed by VBM-adopter	Variable not managed by VBM-adopter *(gap)*
Value drivers of TSR	Variables	Coefficient S.E.	Coefficient S.E.	Coefficient S.E.	Coefficient S.E.	Coefficient S.E.	Coefficient S.E.		
Constant		0.477 1.661	2.154 2.173	-0.195 0.116	-0.116 0.090	0.052 †. 0.097	0.131 0.129		
(1) Profitability	ROA	8.314 *** 2.504	- -	19.016 †. 10.630	- -	8.248 *** 2.294	- -	45%	55%
alternative:	ROE	- -	0.470 *** 0.139	- -	0.306 0.284	- -	0.365 ** 0.120	75%	25%
(2) Growth	Revenue growth	0.217 *** 0.043	0.226 *** 0.047	0.084 0.112	0.123 0.126	0.221 *** 0.039	0.170 ** 0.053	35%	65%
(3) Risk (default risk)	LLC	0.002 *** 0.000	0.001 *** 0.000	0.003 0.088	-0.058 0.119	0.002 *** 0.000	0.002 *** 0.000	10%	90%
(4) Risk cost (capital adequacy)	Tier 1 Ratio	0.631 0.513	0.527 0.468	0.037 0.065	0.040 0.092	-0.251 * 0.101	-0.364 * 0.151	75%	25%
(5) Efficiency	Cost-income ratio	-0.116 †. 0.070	-0.071 0.135	- -	- -	- -	- -	60%	40%
(6) Liquidity	Contingency	0.102 0.113	0.678 * 0.272	- -	- -	- -	- -	0%	100%
(7) Bank type	Ln assets	-0.059 0.149	-0.242 0.202	- -	- -	- -	- -	0%	100%
control	2 year	-6.510 *** 0.752	-5.866 *** 0.746	-10.746 *** 1.594	-10.504 *** 1.538	-6.882 *** 0.829	-6.603 *** 0.840		-
control	GDP growth	2.804 *** 0.639	2.408 *** 0.713	1.111 1.139	1.198 1.210	3.340 *** 0.742	3.697 *** 0.766		-
control	Price-book ratio	0.118 0.068	0.081 0.059	0.200 *** 0.046	0.218 *** 0.048	0.117 * 0.055	0.121 * 0.057		-
control	MSCI Finance	0.544 *** 0.060	0.523 *** 0.059	0.762 *** 0.118	0.746 *** 0.126	0.534 *** 0.062	0.541 *** 0.063		-
control	TSR(-1)	-0.300 *** 0.029	-0.337 *** 0.038	-0.259 *** 0.049	-0.245 *** 0.049	-0.296 *** 0.028	-0.283 *** 0.029		-
	R-squared	**0.550 0.495**	**0.440 0.371**	**0.629 0.568**	**0.605 0.541**	**0.532 0.476**	**0.522 0.465**		
	Adjusted R-squared	**0.495**	**0.371**	**0.568**	**0.541**	**0.476**	**0.465**		
	F-statistic	**9.214**	**9.214**	**9.615**	**9.367**	**9.223**	**9.105**		

TSR *Annual total shareholder return [%]*

C *Constant*

*ROA** *Net income divided by total assets [%]*

ROE *Net income divided by equity [%]*

Revenue growth *Annual increase in revenue [%]*

LLC *Loan Loss Coverage: Provisions for loan loss divided by reserves for loan loss [%]*

Tier 1 ratio *Core equity divided by Risk-Weighted Assets (RWA) [%]*

Cost-income ratio *CIR: Total cost divided by total income [%]*

Contingency *Liquid assets divided by customer deposits [%]*

Ln assets *Natural log of assets [absolute]*

2 year *Risk-free interest rates set by the central bank over 2 years [%]*

GDP growth *Annual growth of the gross domestic product of the country of residence [%]*

Price-to-book ratio *Stock market value of capital divided by shareholder's equity [%]*

MSCI Finance *Annual rate of return from investing in the MSCI Finance index [%]*

TSR(-1) *Annual total shareholder return lagged by one year [%]*

** includes RORWA (Income before Interests and Taxes (IBIT) divided by Risk-Weighted Assets (RWA) [%]) in case banks use RORWA instead of ROA.*

Panel A (Table 2) compares the TSR-performance of VBM-adopters to non-adopters using T-tests of means and Mann-Whitney tests of medians. Our analysis reveals that banks using VBM as an operative MCS significantly outperform non-adopters. Looking at the mean (median) of VBM-banks, the annual TSR is 5.8% (5.6%) higher and almost significant at the 1% level. This means that VBM-adopters created an average TSR of 10.2%, which is almost twice as high as the TSR of 5.3% for the same period for the entire sample (cf. Table 1). The finding that VBM-adopters outperform non-adopters with respect to TSR is consistent with findings on listed firms in other industries (Haspeslagh et al., 2001; Rapp et al., 2011). Yet, Ittner et al. (2003, p. 736f) cannot find evidence that VBM affects TSR in financial service firms. This differing result might first be a consequence of us employing panel data from audited annual reports instead of a cross-sectional survey. Second, our sample size is ten times larger, which equips our models with higher statistical power also to detect small and medium-sized effects.

4.2.2 The drivers of the outperformance of VBM-adopters

Panel B (Table 2) sheds light on why the VBM-adopters outperform non-adopters by showing the drivers of TSR using the FE-2SLS-models. Overall, the Adj. R2 are satisfactory, ranging from 0.371 to 0.568 ($p<0.000$). Models 1 and 2 relate to the entire sample of banks, while models 3 and 4 assess VBM-adopters only, and models 5 and 6 deal with non-adopters only. As predicted, models 3 and 4—which use data from VBM-adopters only—can explain substantially more variance of the TSR (Adj. R2 from 54.1% to 56.8%) than models 5 and 6, which use data from non-adopters (46.5% to 47.6%). The higher R2 indicates that VBM-adopters better manage the value drivers of TSR that our analytical model predicted. As a result, they substantially affect TSR. Non-adopters appear to lack managerial focus on these drivers, which appears to explain why the same value drivers are less impactful and generate lower TSR in their cases.

Models 2, 4, and 6 use ROE instead of ROA as a driver of TSR, since ROE is a more popular measure of bank profitability in practice. In this respect, it is quite noteworthy that the coefficients of ROA are much higher and more significant (8.248 to 19.016) than those of ROE (0.306 to 0.470) across models 1 to 6. Furthermore, the explanatory power is higher when we use ROA (model 1 adj. R2: 49.5%) instead of the popular ROE (model 2 adj. R2: 37.1%). This leads to the insightful finding that ROA is a more relevant driver of TSR than ROE (previous indications: Athanasoglou et al., 2008; Beccalli, 2007; Dietrich and Wanzenried, 2011; García-Herrero et al., 2009).

As predicted, LLC (representing default risk) and revenue growth (representing growth) are other significant drivers of TSR (Anthony and Ramesh, 1992). However, it is quite unexpected that the popular tier 1 ratio (representing risk cost) is insignificant in models 1 to 4. The reason may be that—even though monitoring the capital ratio is important—most banks in the study already have a tier 1

ratio above the requested rate (over the eleven years, only a few have had a tier 1 ratio lower than 6%). Therefore, further increasing the ratio does not add (regulatory) value. If tier 1 ratios are too high, their impact might even be negative because high tier 1 ratios might signal underinvested capital to shareholders. We observe that phenomenon in our study for models 5 and 6, where higher tier 1 ratios are associated with lower TSR.

As we conjectured, a lower cost-income ratio (representing efficiency) increases TSR (model 1). The relationship is, however, only significant at the 10%-level, which is why we removed the variable from the subsample models 3 to 6.

Further, contingency (representing liquidity) also has a positive sign. This is in line with the great focus of attention this KPI has received since the introduction of the new liquidity requirements of BASEL III (cf. BCBS, 2010; Chiaramonte and Casu, 2017).

Ln assets (representing the bank type through its size) is not significant in models 1 and 2. Together with the cost-income ratio and contingency, we remove these variables from the subsample models 3 to 6. Yet, the sign of the coefficient is quite remarkable, as it appears to state that increasing size could harm TSR. This would be at odds with researchers such as Goodhart (2011), who argue that bank managers increase assets by making the banks too-big-to-fail, and thereby increase shareholder value and their bonuses. Even though the argument sounds plausible, we cannot support it with the findings of this study. Instead, the negative coefficient of Ln assets aligns with the previous findings of Fiordelisi and Molyneux (2010). We thereby rather lend support to Walter (1997) and Baele et al. (2007), who conclude that large size might be detrimental to creating superior shareholder value and hence outweighs the benefits of just averting bankruptcy (the too-big-to-fail argument).

4.2.3 Implementation gaps and upside potential for VBM-adopters

In addition to answering our research questions of how VBM-adopters perform compared to non-adopters, we try to uncover implementation gaps among VBM-adopters. Ittner et al. (2003) compare the "importance of long-term success" to the "extent goals [are] set" based on their survey data. We derive the importance of value drivers from the significant coefficients in our FE-2SLS-model. The extent to which banks manage KPIs is apparent from the annual reports. We simply had to register which KPIs are emphasized by the banks as relevant for their VBM.

Panel C (Table 2) gives an overview of how many banks emphasize the KPIs that our model found most relevant. The most popular KPIs are ROE and the tier 1 ratio (used by 75% of the banks that adopted VBM). The cost-income ratio is emphasized by 60% of the banks. Other KPIs that were reported very prominently in connection with VBM (outside our model and hence not reported in Panel C) are income before interest and taxes (IBIT) growth (55%), earnings per share (45%), net interest margin (NIM), business mix (net interest income divided by net revenue), and geography mix (relative net interest income by region) (each 25%). Therefore, on the one hand, this shows that VBM-adopters focus on KPIs, which are not the most relevant drivers of TSR. On the other hand, we identify implementation gaps of VBM, since only 45% of the VBM-adopters emphasize the most relevant driver ROA, only 35% focus on revenue growth, and only 10% emphasize their management of loan loss coverage. Our finding falls in line with Ittner et al. (2003, p. 739), who state that "average measurement practices of firms pursuing similar strategies or value drivers currently are not optimal in this industry." In conclusion, even the 20 banks with comprehensive VBM still have upside potential in creating share-holder value by focusing more on ROA, revenue growth, and loan loss coverage.

5 DISCUSSION

5.1 Synthesis of results

Our empirical results show that the strongest drivers of TSR are high ROA and revenue growth, as well as more (less) conservative loan loss coverage (also cf. Curcio et al., 2017; Dietrich and Wanzenried, 2011). The results are in line with findings on non-banks, where the return on invested capital (ROIC) and revenue growth are also the main drivers (Chen and Zhang, 2007; Koller et al., 2010). In contrast, the very popular KPIs ROE, tier 1 ratio, and cost-income ratio have a substantially lower impact on TSR. Our comprehensive VBM-model of the drivers of TSR thereby integrates the results from the previous literature. Chen and Zhang (2007) also report that profitability in accounting measures drives stock returns. We share the positive relation between loan loss provisions and TSR with Fiordelisi and Molyneux (2010). We are among the first to report a significant relationship between revenue growth and TSR in the banking industry (for earlier evidence cf. Anthony and Ramesh, 1992). Given our sample size, we believe that our bank-specific VBM-model carries implications for retail banks beyond the sample population (for non-banks: Burkert and Lueg, 2013).

5.2 Main contributions

This paper has investigated how VBM-adopters perform compared to non-adopters in the banking industry. We show that VBM-adopters generate higher TSR, and we uncover which drivers of VBM cause this outperformance. We then identified the untapped potential of VBM among adopters in an exploratory manner. Our findings carry several implications for research and practice. First, we add to the scarce evidence on VBM in the banking industry and demonstrate that comprehensive VBM-adopters outperform non-adopters (cf. Fiordelisi and Molyneux, 2010; Ittner et al., 2003). Our study is the first to use longitudinal, archival data on VBM in banking (cf. Ittner et al., 2003) in connection with a direct measure of shareholder return (TSR) (cf. Fiordelisi and Molyneux, 2010). In particular, using external TSR is an improvement over accounting or perceived measures which managers can directly influence, and which would hence cause endogeneity biases when assessing the impact of VBM (Dechow and Skinner, 2000; Ittner et al., 2003; Lueg and Schäffer, 2010). Thereby, we are the first ones to show that banks adopting VBM outperform non-adopters in TSR on average by 5.8% ($p=0.016$). This result corroborates findings from non-financial industries (Firk et al., 2018; Haspeslagh et al., 2001; Knauer et al., 2018; Lingle and Schiemann, 1996; PA_Consulting, 2003; Rapp et al., 2011).

Second, we provide a VBM-model incorporating direct drivers of TSR to explain why VBM-adopters outperform non-adopters. We have analytically deducted the model with seven main value drivers. Due to this analytical nature, our generic model should not just be limited to the application in the banking industry but could be employed in other industries as well (cf. the argumentation of Messner, 2016). This is remarkable since governance mechanisms and management control are often seen as locally embedded practices that are not easily transferable across cultures or contexts. Of course, researchers would then need to choose different, non-banking-specific variables to empirically represent the analytical value driver categories of the general model.

Third, we make suggestions on how even comprehensive VBM adopters can improve their management practices further. A comparison of the importance of each KPI for creating TSR (based on our model) and the emphasis VBM-adopters place on these KPIs (according to the narratives in the annual reports) revealed several implementation gaps in VBM. Only a few VBM-adopters (10-45%) actively manage the most substantial drivers of TSR (ROA, revenue growth, loan loss coverage). However, VBM-adopters place great emphasis on KPIs that do not equally contribute to TSR (ROE, tier 1 ratio, cost-income ratio). The reason for this could be that these latter ratios are legitimized practices in the banking industry. This might have led to a coercive isomorphism in the entire industry, where banks just have to stick to normative expectations (c.f. Fiss and Zajac, 2004). This might keep banks from making innovations in MCSs and optimally managing to enhance shareholder value. Our evidence indicates that banks might want to break with some of these KPI-paradigms to focus on the strongest drivers of TSR.

6 CONCLUSION

6.1 Summary

The objective of the study was to find how the banks adopting VBM perform compared to non-adopters. We found that VBM-adopters outperform non-adopters in the banking industry. Specifically, the TSR was 5.8%-points higher for VBM-adopters. The outperformance can be attributed to several value drivers. Specifically, high return on assets (ROAs), high revenue growth, and conservative loan loss coverage tend to generate higher TSRs. Our subsequent analyses of annual reports of VBM-adopters suggested that there is still substantial upside potential in improving the implementation of VBM since many banks focus on KPIs that are not the most relevant drivers of TSR.

6.2 Limitations and future research

The limitations of our study suggest several avenues for future research. First, we investigated only commercial retail banks. Future research would benefit from a slightly adapted variable choice in the model that is susceptible to different bank types and adequately incorporates their operational particularities (e.g., accrued products or risk positions). Second, we used archival data and investigated a deductive model that is derived from decomposing TSR. Future research could employ field research and extend our predominantly financial model by non-financial indicators of banks' operational performance, such as customer attitudes, strategic alignment, or operative efficiency indicators (e.g., Ittner et al., 2003). Third, we acknowledge that a binary measurement of comprehensive VBM-adoption using only publicly available data simplifies the complex decision and control mechanisms in banks (Firk et al., 2016). Future research could attempt to measure our VBM-construct in more detail to find differences among VBM adopters, not just among adopters and non-adopters as in our case. As one direction in research, this could be done by combining archival and field data (see e.g., Burkert and

Lueg, 2013). Another direction could be to use computer-aided text analysis (CATA) to systematically and objectively extract more information on VBM from the complex narratives of annual reports. Fourth, we have imputed the rational motive of shareholder value maximization to VBM-adopters and we assumed that all banks would have the capability of implementing VBM. As discussed, not all banks might yet set TSR as their single priority (Fiss and Zajac, 2004; Goutas and Lane, 2009; Kaplan and Norton, 2001, p. 378-379; Loderer and Zgraggen, 1999; Sanders and Tuschke, 2007). Banks might have non-value-based motives (not) to adopt VBM. Outside the banking industry, these motives have proven to be linked to the attitudes toward VBM of single executives, financial stakeholders, regulators, and society at large (Burkert and Lueg, 2013; Firk et al., 2016; Fiss and Zajac, 2004). Future research should start by investigating which factors lead to (comprehensive) VBM-adoption in banking (similar to Burkert and Lueg, 2013; Fiss and Zajac, 2004). Then, research could follow the example of Firk et al. (2016), who have integrated such contextual, motivational aspects into a performance model as moderating variables.

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