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## Strategy and capital budgeting techniques: the moderating role of entrepreneurial structure

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Zahida Sarwary

Department of Business Studies,  
Kristianstad University,  
Elmetorpsvägen 15, 291 39 Kristianstad, Skåne, Sweden  
Email: zahida.sarwary@hkr.se

**Abstract:** This study explores how Miles and Snow's (1978) typology of strategy relates to a firm's choice of capital budgeting techniques (CBT) when the firm operates in a competitive market. Furthermore, it explores how this relationship is contingent on entrepreneurial structure. The study is based on data from 62 small and medium-sized enterprises (SMEs) operating on First North. The empirical data was collected using a survey and secondary data from annual reports and analysed with content analysis. The results show that an analyser strategy is positively related to the choice of sophisticated CBT, and a defender strategy is positively related to the choice of non-sophisticated CBT. Moreover, entrepreneurial structure positively moderates the relationship between prospector strategy and the choice of non-sophisticated CBT. The study also provides practical insights on how to align strategy, CBT, and structure among SMEs operating on competitive markets.

**Keywords:** strategy; strategic planning tools; capital budgeting techniques; CBT; organisational structure; entrepreneurial structure; content analysis.

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**Biographical notes:** Zahida Sarwary is an Assistant Professor in Corporate Finance at Kristianstad University, Sweden. She holds a PhD in Corporate Finance from Lund University and her research interests are within financial management, management control and corporate finance for SMEs.

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### 1 Introduction

Understanding how various capital budgeting techniques (CBT) are chosen has long been of interest to scholars in business administration (see review by Sarwary, 2019). CBT are defined as a tool box of techniques with systematic rules, and is argued to be useful tools in strategic planning (Klammer, 1973). Researchers generally agree that the systematic

rules of CBT are useful in guiding decision makers in the choice of investments that are of strategic importance (e.g., Verbeeten, 2006). The decision makers' choice of CBT is suggested to be determined by the firm's strategy, which identifies the type of systematic rules considered important in deciding on investments (e.g., Chen, 2008).

The role of a firm's strategy in the choice of CBT has been explored in previous research (e.g., Haka, 1987; Chen, 2008). However, the literature has not yet presented any direct evidence for an association between them (e.g., Chen, 1995, 2008; Haka, 1987; Langfield-Smith, 1997; Fisher, 1995). This may be explained, as suggested by Kald et al., (2000, p.198), by the 'multifaceted' conceptualisation of strategy. The conceptualisations developed by Miles and Snow (1978), Porter (1980) and Gupta and Govindarajan (1984) provide important groundwork in the field of strategy. Several researchers posit that the typology of Miles and Snow (1978) holds greater promise for understanding the relationship between firm strategy and choices of strategic planning tools than the classification schemes of Porter (1980) and Gupta and Govindarajan (1984). This may be the case, because Miles and Snow (1978) considered a larger body of organisational features than the others, which makes their typology more stable for identifying the strategic position of the firm (Kald et al., 2000). Their typology incorporates strategic orientations, structures, internal processes, and environmental factors, which are absent in other typologies (Segev, 1989). Miles and Snow also posit that there must be a good fit in the relationship between the firm's strategy pattern and choice of CBT to optimise the use of CBT (c.f. Shortell and Zajac, 1990). Miles and Snow (1978) identified four generic strategies: prospector, defender, analyser, and reactor (these labels are also used for the organisations that use the strategies). The prospector continually searches for new markets/products; the defender focuses on keeping a stable and mature position in its markets/products; the analyser adopts a mix of the strategies of the prospector and the defender, and the reactor has no clear direction in regard to markets/products (Miles and Snow 1978).

Prior research suggests that firms with a strategy focused primarily on having a long-term, mature, and stable position in the market/products would be motivated to choose sophisticated CBT (SCBT), which allows the decision maker to identify investments that have a long-term orientation and are based on stable information (Haka, 1987; Chen, 1995, 2008; Langfield-Smith, 1997).

Conversely, firms that adopt a strategy primarily focused on rapid expansion by continually searching for new market and product opportunities would be driven towards choosing non-sophisticated CBT (NSCBT). These techniques allow decision-makers to identify investments that secure financial capability for continuous expansion and use information that streams from new markets/products (Haka, 1987; Chen, 1995, 2008).

Researchers have put considerable effort into understanding how strategy triggers the choice of CBT (e.g., Chen, 1995, 2008; Haka, 1987, 1989). Some argue that this relationship is significantly influenced by external and internal contextual factors (e.g., Langfield-Smith, 1997). This has resulted in numerous contingency-based studies in the field of strategy and management control (Chenhall, 2003; Otley, 1980; Fisher, 1995). A review by Chenhall (2003) found that the relationship between strategy and CBT is sensitive to the structural arrangements of the organisation. This suggests that, regardless of which strategy a firm adopts, it needs one that matches the environment within which it operates. This implies that firms in stable markets would have to match their strategy with a formalised and controlled structure, while those in competitive

markets would have to match their strategy with an entrepreneurial structure. A structural match would confirm the choice of CBT, while a mismatch would lead to a change in the choice of CBT.

Scholars suggest that crucial contingencies in the relationship between strategy and strategic planning tools are most relevant in competitive markets (Giacosa et al., 2016; Cadez and Guilding, 2008). As a result, decision-makers are forced to take an active role in matching the focus of their strategy with the structure of the firm and its alignment with the choice of strategic planning tools. This is consistent with Chenhall and Moers (2015), who argues that such contingencies are a matter of survival in competitive markets, whereas in stable markets such a match could play a passive role without disturbing the effectiveness of the firm. Hence, understanding the choice of CBT in competitive markets and the conditions under which it emerges could advance our understanding of the dynamics and importance of structural matches and mismatches with a firm's strategy.

By adopting Miles and Snow's (1978) typology, this study seeks to explore how strategy relates to the choice of CBT among small and medium-sized firms (SMEs) operating in a competitive market. Further, it expands on a limited research field (c.f. Dayan et al., 2016) and explores how this relationship depends on entrepreneurial structure. Entrepreneurial structure is characterised by two dimensions: innovation and flexibility. Innovation deals with activities such as product development, technology implementation, or research and development. Flexibility deals with decentralised and vertical structure. This could advance our understanding of the importance of structural matches and mismatches with strategy and its alignment with various CBT. The choice of SMEs was inspired by Knight and Cavusgil (2004), who suggest that matches and mismatches between structure and strategy is especially crucial for SMEs operating in a competitive market, which are often faced with the choice of 'go big or go home'.

Thus, this study, based on SMEs operating on competitive markets and with a focus on entrepreneurial structure uses the unique data of SMEs who operates on the NASDAQ First North stock exchange.<sup>1</sup> Firms operating on First North are characterised as SMEs that operates on competitive markets. This paper also aims to make empirical contributions of a combination of survey and secondary data from annual reports, analysed with content analysis. Lastly, it seeks to provide practical insights into how to align strategy, structure, and CBT in competitive markets.

## **2 Literature review**

### *2.1 Capital budgeting techniques*

Over the years, a number of CBT have evolved to guide the evaluation of investments of strategic importance. Previous research has mainly divided CBT into two categories: SCBT<sup>2</sup> and NSCBT<sup>3</sup>.

SCBT include the elements of long-term orientation, information intensity, and financial objectives. SCBT are argued to have a long-term orientation because they require information about all potential cash flows, the returns and the costs during the lifespan of the investment (White and Miles, 1996). This makes the techniques

information intensive (Yeo and Qiu, 2003). The requirement to have information for a variety of dates emphasises the greater suitability of SCBT to predictable environments where such information can be obtained with high accuracy (Yeo and Qiu, 2003; Chen, 2008). Lastly, they are focused on financial measures because these cash flows are then discounted at a market-driven interest rate to identify which investment(s) will have the highest net worth (Copeland and Weston, 1986; Hillman and Keim, 2001).

NSCBT include the elements of short-term orientation and less information intensiveness, and allowing for non-financial objectives. NSCBT are argued to have a short-term orientation because they identify which investments have the earliest prospect of profitability (Cooper et al., 2002). This means that decision makers do not have to consider as much information as they would for techniques with a longer-term orientation, because NSCBT focus on available information availability till the time of the decided payback period, and ignore information beyond that period (Danielsson and Scott, 2006), which might be suitable in less predictable environments. Lastly, NSCBT allows for non-financial objectives because it contains techniques such as gut feeling and routines (Danielsson and Scott, 2006), which are suggested to be useful in a less predictable environment (Powell, 1993).

## *2.2 Strategy and the choice of CBT: the Miles and Snow typology*

The Miles and Snow (1978) typology is argued to incorporate strategic orientations, structures, internal processes, and environmental factors to a greater extent than the typologies of Porter (1980) and Gupta and Govindarajan (1984). This makes the typology of Miles and Snow (1978) more useful for understanding the relationship between the strategy and the choice of CBT (Shortell and Zajac, 1990; Simons, 1987). Miles and Snow found that organisations can be identified according to four generic strategies that lead to internal consistency in how they respond to the environment. Miles and Snow label the organisations: prospector, defender, analyser, and reactor. Where the first three use generic strategies, the reactor uses an amalgamation of strategies and is often criticised for its lack of a clear consistent strategy. Thus, this study follows the recommendation in previous research (e.g., Shortell and Zajac, 1990; Slater et al., 2007) to exclude the reactor from consideration.

### *2.2.1 Prospector and the choice of CBT*

Firms pursuing a prospector strategy have been argued to be positively related to choosing NSCBT (e.g., Chen, 1995, 2008; Haka, 1987, 1989). An NSCBT is of interest to the prospector for several reasons. First, to a prospector, non-financial objectives such as being the 'first-in' to new markets/products are more important than financial objectives (Simon, 1990). This predisposes the firm to choose techniques such as NSCBT that are more appropriate for achieving non-financial objectives (Haka, 1987). Second, a prospector is generally acknowledged to be facing financial constraints (e.g., Zajac and Shortell, 1989; Segev, 1987; Rossi, 2014b) because of their ongoing rapid growth (Chen, 2008). This could motivate the prospector to choose NSCBT to identify investments with quick payoffs to secure the financial capacity for continuous expansion. This, in turn, implies that the prospector is more short-term oriented than, for instance,

the defender. Lastly, because the prospector is continually operating in new markets/products, they often fail to predict the parameters necessary for the use of SCBT (Sundem, 1975; Schall and Sundem, 1980; Haka, 1989). Thus, they are more inclined to choose NSCBT that requires less information (Yeo and Qiu, 2003).

Hypothesis 1 Pursuit of a prospector strategy is positively related to the choice of NSCBT.

### *2.2.2 Defender and the choice of CBT*

Firms with a defender strategy focus primarily on maintaining their core domain in the market by continually searching for a long-term, mature, limited, and stable position in their market/products (Miles and Snow, 1987; Parnell and Wright, 1993; Smith et al., 1989). Researchers generally agree that firms pursuing a defender strategy will be more inclined to choose SCBT (Chen, 2008, 1995; Haka, 1987, 1989; Ho and Pike, 1998; Simons, 1987). They suggest this is because firms in stable markets and with a limited number of products are more likely to have predictable environments (Haka, 1987, 1989). The predictable environment provides the defender with stable information and the ability to estimate SCBT parameters, which also makes them more likely to choose SCBT (Chen, 1995, 2008; Haka, 1987, 1989). Others argue that because defenders have a limited number of products they can prioritise more financial objective measures (Govindarajan and Gupta, 1985; Simons, 1990). This also makes them likely to choose SCBT. Lastly, defenders' goal of a long-term position in their market/products is suggested to be an important determinant in the choice of SCBT because those techniques focus on the long-term net worth of investments that are of strategic importance (Swain and Haka, 2000).

Hypothesis 2 Pursuit of a defender strategy is positively related to the choice of SCBT.

### *2.2.3 Analyser and the choice of CBT*

An analyser is argued to adopt a mix of the strategy of the prospector and the defender. An analyser is primarily focused on being a close follower of the prospector by being 'second-in' to new markets/products. At the same time, like the defender, such firms seek to maintain and stabilise their core domain (Miles and Snow, 1978; Shortell and Zajac, 1990; James and Hatten, 1995). Haka (1989) argues that an analyser will be driven towards choosing SCBT. Being a close follower of the prospector allows the analyser to obtain valuable information about the progress of new markets/products (Slater and Narver, 1993). Another source of information for such decision makers is their existing markets/products. Arguably, an analyser has robust information to use in deciding on important investments. The need to handle robust information would enhance the tendency to choose SCBT as compared to NSCBT (c.f. Harpaz and Thomadakis, 1982; Haka, 1987). Others further argue that the duality of analysers allows them to be financial stable, because they have a balance of 'cash cows' and 'stars' (e.g., Miles and Snow, 1978). This is suggested to lead to a focus on financial objectives and long-term performance (c.f. Haka, 1989), which would enhance the choice of SCBT.

Hypothesis 3 Pursuit of analyser strategy is positively related to the choice of SCBT.

### 2.3 *Moderating role of entrepreneurial structure on the relationship between strategy and the choice of CBT*

Previous research has claimed that the link between firm strategy and choice of CBT is significantly influenced by external and internal contextual factors (Langfield-Smith, 1997). Contingency theory has become a dominant paradigm in the field of strategy in relation to CBT (c.f. Gerdin and Greve, 2004; Otley, 1980; Chenhall, 2003; Cadez and Guilding, 2008). A review conducted by Chenhall (2003) found that the relationship between strategy and CBT is sensitive to the structural arrangements of the organisation. Previous research has argued that firms that pursue an exploitation strategy (e.g., defenders) would enhance their performance by adopting a more formalised and non-innovative structure. Firms that pursue a strategy of exploration (e.g., prospectors) would enhance their performance by adopting an entrepreneurial structure (c.f. Chenhall, 2003). However, other researchers argue that the environment within in which the firm operates could indirectly influence the choice of structure. This means that firms in stable market would have to opt for exploitative activities while firms in dynamic markets would have to consider explorative activities in order to capture the opportunities available in the market (e.g., Auh and Menguc, 2005; Chenhall, 2003). This, in turn, would determine the most relevant structure (c.f. Auh and Menguc, 2005).

In particular, it has been suggested that firms operating in dynamic environments have to adopt more explorative than exploitative activities. Exploration entails activities such as constant searching and high risk taking (Umans, 2013; Slater and Narver, 1995). Hence, these firms are more likely to adopt an entrepreneurial structure characterised by innovation and flexibility (c.f. Gurbuz and Aykol, 2009; Auh and Menguc, 2005) to compete with their competitors. Innovation deals with implementing new ideas that create value (Linder et al., 2003) and includes activities such as product development, technology implementation, or research and development. Several researchers argue for the importance of adopting innovation to survive in competitive markets and to not fall behind their competitors (e.g., Naman and Slevin, 1993). Flexibility deals with the activities that allow for a rapid response in a competitive market. Being flexible may involve, for example, having a decentralised and vertical structure to enhance information sharing and reduce lag time between making decisions and taking action (Miles and Snow, 1992; Ruekert et al., 1985). This implies that the entrepreneurial structure of a firm could strengthen or disrupt its strategy depending on whether the structure and the strategy are a match or a mismatch. This could reinforce the choice of various CBT or lead to a change in the choice of CBT.

Hence, this paper suggests that firms with a strategy to expand their products or services would have incentives to choose NSCBT, because they allow firms to identify and prioritise liquid investments that might be used for investment opportunities. Conversely, firms with a strategy of sealing off their products and services in a search for stability would have incentives to choose SCBT, because they allow firms to identify long-term investments (Chen, 2008, 1995; Haka, 1987, 1989). Since these firms are characterised as firms operating in a dynamic environment, they have to have to adopt more explorative than exploitative activities. Exploration entails activities such as constant searching and high risk taking (Umans, 2013; Slater and Narver, 1995). These firms are more likely to adopt an entrepreneurial structure characterised by innovation and flexibility (c.f. Gurbuz and Aykol, 2009; Auh and Menguc, 2005) and would have to

reinforce the choice of NSCBT or lead to a change in the choice of CBT from SCBT to NSCBT.

### *Prospector*

A prospector with an entrepreneurial structure will strengthen its strategy of searching for new market/product opportunities. O'Regan and Ghobadian (2005) showed that prospectors tend to intensify their product development in competitive markets. Kachouie and Sedighadeli (2015) show that a prospector with an entrepreneurial structure will be more effective than one without it, because the increase in innovative activities such as investing in research and development increases knowledge sharing, which reduces costs and speeds up the introduction of new products. Similarly, Parnell and Wright (1993) show that prospectors with an entrepreneurial structure will perform better than analysers and defenders in a competitive market because their strategy and structure match significantly better with a competitive market. This structural match will lead to a higher need for quick payoffs to keep up with the intensified investments in new markets/products. It also increases the lack of predictable information about these markets/products (c.f. Auh and Menguc, 2005). To handle this lack of predictable information and enhance short-term payoffs, the prospector would need to strengthen their use of NSCBT.

Hypothesis 4 Entrepreneurial structure has a positive moderating effect on the relationship between the pursuit of a prospector strategy and the choice of NSCBT.

### *Defender*

Some defenders have an entrepreneurial structure, which weakens their strategy of searching for a long-term, mature, limited, and stable position in their market/products. O'Regan and Ghobadian (2005) found that defenders with an entrepreneurial, rather than a formalised, structure are more likely to innovate by introducing new products and to increase flexibility by delegating authority. They do this to enhance rapid awareness and response to a competitive market (Miles and Snow, 1992). O'Regan and Ghobadian (2005), along with others (c.f. Slagmulder, 1997), further show that an entrepreneurial structure leads to the defender having less control. This implies that an entrepreneurial structure disrupts the defenders' strategy of focusing primarily on their core domains by seeking long-term, mature, limited, and stable positions. This happens because an entrepreneurial structure increases high risk-taking and reduces the predictability of the environment (c.f. Eisenhardt and Martin, 2000). An unpredictable environment prevents the defender from being able to estimate the necessary parameters of SCBT. An entrepreneurial structure also allows a defender to open up to non-financial objectives and short-term investments. This is consistent with Auh and Menguc (2005), who argue that defenders with an entrepreneurial structure will move toward more innovative and flexible structural activities. This structural mismatch would hinder the choice of SCBT but instead be aligned with the choice of NSCBT, leading to Hypothesis 5:

Hypothesis 5 Entrepreneurial structure has a positive moderating effect on the relationship between the pursuit of a defender strategy and the choice of NSCBT.

### *Analyser*

An analyser, which is argued to have a mixed strategy of a prospector and a defender, will strengthen its strategy towards that of a prospector when adopting an entrepreneurial structure. Slater and Narver (1993) argue that an analyser focuses on having a formalised structure in a stable market and an entrepreneurial structure in a competitive market. Those authors, along with others (Vorhies and Morgan, 2003), further argue that an analyser with an entrepreneurial structure is more likely to adopt innovative and flexible activities so as to not fall too far behind in the market. This implies that analysers with an entrepreneurial structure will weight their mix of strategy more toward that of a prospector, as shown by Laforet (2008), by keeping pace with developments. The analyser will increase its flexibility and innovation to respond more quickly to new opportunities (c.f. Olson and Slater, 2002), and like the prospector, the analyser with an entrepreneurial structure will face a higher barrier to accurately estimating the parameters of SCBT. Dvir et al. (1993) argue that this will lead analysers to prioritise short-term investments and will intensify their expansion into new markets/products. This implies that a structural mismatch would influence analysers to choose NSCBT to deal with a more unpredictable environment and adopt a short-term perspective, which leads to Hypothesis 6.

Hypothesis 6 Entrepreneurial structure has a positive moderating effect on the relationship between the pursuit of an analyser strategy and the choice of NSCBT.

## **3 Method**

In December 2016, paper surveys were sent by regular mail to the CFOs of 194 Swedish firms listed on First North. Firms operating on First North are SMEs with a primary focus on innovation and greater flexibility (NASDAQ, 2018). Previous research that focus on Swedish firms, have primarily focused on large firms (e.g., Brunzell et al., 2013; Daunfeldt and Hartwig, 2014; Holmen and Pramborg, 2009; Sandahl and Sjögren, 2003), with scant research on SMEs (e.g., Alpenberg and Karlsson, 2005). Firms operating on First North are more likely to have an entrepreneurial structure. First North offers firms the benefits of raising capital without the stringent requirements of the main NASDAQ market, Stockholm OMX, but with more requirements than those of non-listed SMEs. As a result, the firms on First North would have greater complexity than non-listed high-growth SMEs, but not as complex as the SMEs listed on the main market. Thus, these firms might have the incentive to choose SCBT as a way to manage their increased complexity. At the same time, these firms have not yet reached the level of complexity of firms listed on the main market (Sandahl and Sjögren, 2003), which primarily choose SCBT, and still have incentives to also choose NSCBT (c.f. Lopez and Hiebl, 2014). By focusing on SMEs on First North, it gives the opportunity for exploring firms that would have incentives to choose from both SCBT and NSCBT.

The choice of CFOs was based on Sirgy (2002), who suggests that CFOs are often in charge of (or participants) in the decisions on investments of strategic importance. Which allows the CFOs to have complete insights into the decisions and is there a good informant (Chen, 2008). Most packages were addressed by name to the CFOs, who were



identified through the firms' websites. In total, it was possible to identify 155 CFOs; the remaining 39 packages were sent to with firms with a request that they be transferred to the CFO. A total of 58 replies were received by the end of January 2017. A reminder was sent out at beginning of February 2017. By the end of March 2017, a total of 67 replies were received.

In the second stage, the 2016 annual reports of 67 firms operating on NASDAQ First North stock exchange were obtained. Annual reports were chosen because they are considered to be an important tool for communicating what happened in the past year to both external and internal stakeholders (Bozzolan et al., 2003).

After filtering out the incomplete questionnaires and excluding annual reports that had a broken year,<sup>4</sup> the study had 62 usable responses. This yielded a response rate of 32%,<sup>5</sup> which is higher than several empirical studies that addresses the use of CBT within the field (e.g., Trahan and Gitman, 1995; Block, 1997; Graham and Harvey, 2001).

### 3.1 Measures

The dependent variable in this study, *the choice of CBT*, was captured through the questionnaire.

The independent variables defender, prospector, and analyser and the moderating variable entrepreneurial structure were captured through a content analysis aided by counts of keywords from the information in the annual reports.

#### 3.1.1 Dependent variable: the choice of CBT

CBT was chosen as the dependent variable to capture how frequently the CFOs used the various techniques when deciding which investments of strategic importance to pursue during 2016. The questions was inspired by Graham and Harvey (2001), whose survey has inspired or been used in several studies (e.g., Brounen et al., 2004). This study made some adjustments to Graham and Harvey's (2001) approach. For example, while Graham and Harvey (2001) used the names of the techniques, this study avoided name labels because respondents might claim to use a technique to indicate some advancement (Rappaport, 1979). One factor that might have influenced those surveyed in previous research using Graham and Harvey's (2001) questionnaire is the potential for bias in the descriptions of CBT as 'sophisticated' and 'non-sophisticated'. Those CFOs choosing SCBT have generally been presented as sophisticated, whereas those choosing NSCBT have been presented as less sophisticated (Graham and Harvey, 2001; Adler, 2006). Thus, one cannot exclude the influence that such labels may have had on respondents' answers. This might especially be the case for decision-makers with advanced degrees such as an MBA, to signal that they are 'sophisticated' (Adler, 2006). To avoid this, the CBT were described to the respondents rather than rather than assigning them specific bias-prone labels. Furthermore, this study made three additional techniques (MIRR, ROE, ROA,) available for the respondents because they have been shown to be used by SMEs (Rossi, 2014a, 2015; Trahan and Gitman, 1995). The techniques were described as follows to the CFOs and measured on a seven-point Likert scale ranging from 1 (never) to 7 (always).

- *net present value (NPV)* (Schwab and Lusztig, 1970): compares the present value of the cash flows at the required rate of return of the investment with the initial investment
- *payback* (Bhandari, 1986): has a defined period within which the incremental cash investment in a project is to be recovered from incremental cash inflows
- *internal rate of return (IRR)* (Dudley, 1972): calculates the interest rate for which the present worth of an investment equals zero
- *modified internal rate of return (MIRR)* (Dudley, 1972): calculates the return on investment based on the assumption that cash inflows are reinvested at the cost of the capital of the company
- *accounting rate of return (ARR)* (Dean, 1953): requires the investment to have certain net earnings in relation to the capital invested
- *return on equity (ROE)* (Wet and Toit, 2007): the profit of the investment is divided by the book value of the equity
- *return on assets (ROA)* (Wet and Toit, 2007): the profit of the investment is divided by the book value of the assets
- *real options (RO)* (Scarso, 1996): the cash outflows are divided into sequences to allow for modifications or improvements in an investment as conditions change
- *routines* (Winter, 1995): replication of well-established processes in the evaluation of an investment
- *gut feeling* (Danielsson and Scott, 2006): guided by intuition.

This study followed the path of previous research in dividing CBT into two groups: SCBT and NSCBT (e.g., Graham and Harvey, 2001), in order to distinguish between the different types of CBT. Principal component analysis was performed on the dependent variable CBT.<sup>6</sup>

The results of the factor analysis deviate slightly from those of previous research in the division of the CBT; however, this study continued to label the groups as NSCBT and SCBT because the main characteristics of the groups were not violated. Such deviations have been found in other research. For example, Sarwary and Umans (2017) argue that because SCBT is focused on value maximisation and increasing the wealth of the shareholders, it is not surprising that ROE and ARR (originally belonging to NSCBT) can be grouped with NPV, PI, and MIRR. This is explained by ROE's orientation toward gains in shareholder wealth and ARR's profit orientation (Fama and Miller, 1972). NSCBT slightly deviated from previous research in which IRR and ROP (originally belonging to SCBT) were grouped together with PB, routines, and ROA. However, this is not new. IRR, which calculates the interest rate at which the present worth of an investment breaks even with its expenditures (Dudley, 1972), and ROP are commonly claimed to reduce the downside of unwanted events (Scarso, 1996). These are common characteristics of NSCBT (Sarwary and Umans, 2017). To determine whether the company relies more on SCBT or NSCBT and for dichotomisation purposes, we compared the factor scores of the two components and assigned code 1 to those firms that

had a larger factor score for SCBT choices and code 0 to those firms that had a larger factor score for NSCBT choices.

### 3.1.2 *Independent and moderating variables*

The independent (defender, prospector, and analyser) and moderating variables (entrepreneurial structure) were quantified using a content analysis.<sup>7</sup> Content analysis is frequently used to capture strategy in annual reports (e.g., Guthrie and Parker, 1990). The analysis was performed on the general chairman's letter in all the annual reports (fiscal year 2016). When screening for strategy, the general chairman's letter is commonly analysed (e.g., McConnell et al., 1986; Clatworthy and Jones, 2003) because its contents are not affected by requirements or regulations. In addition, it is the most influential and widely read part of annual reports (Clatworthy and Jones, 2003).

This study did a word count as inspired by Deegan and Ranking (1996), who claim that word counts are more reliable than structure for identifying justification in firms' signals to various stakeholders. Milne and Adler (1999) argue that analysing paragraphs, sentences, and percentage of the page can violate the validity of the analysis because they can deal with several themes, which might make the quantification less accurate. Two approaches were adopted to increase the reliability of the content analysis that used word counts. First, stability was strived for by recoding the text three weeks after the first attempt of coding; second, accuracy was strived for by using predetermined standards for the coding attributes. Hence, the keywords of the Miles and Snow typology were captured from well-established studies in the field,<sup>8</sup> which allowed synonymous words to be screened. The keywords for the moderating variable did not necessarily provide the accuracy of the two aforementioned approaches because of the scarcity of studies fulfilling these requirements. The keywords that were adopted are listed in Appendix 1.

### 3.1.3 *Control variables*

This study used five control variables: *industry*, *firm tenure*, *equity ratio*, *size*, and *ownership concentration*.

*Industry* was included, as suggested by Ibrahim (2013), who argues that SCBT might be more appropriate for manufacturing firms because of their heavy capital commitment in long-term assets. Because of the small sample, two broad categories of industries, service and manufacturing, were used.<sup>9</sup> Service was coded as 0 and manufacturing as 1.

*Firm tenure* was measured in age, which is suggested to influence the choice of CBT on a business strategy level because the firm gains knowledge of its market/products over time (Brounen et al., 2004). Greater age is suggested to enhance the choice of SCBT because the firm has a greater amount of information (c.f. Danielsson and Scott, 2006).

*Equity ratio* was measured as a percentage as inspired by Sarwary and Umans (2017), who argue that the equity ratio allows for financial stability and to be long-term oriented, where a high equity ratio is suggested to enhance the choice of SCBT. Equity ratio was measured as total equity/total assets (Sarwary and Umans, 2017).

*Size* is perhaps the most common control variable in the field of CBT. Previous research suggests that large firms choose SCBT (e.g., Graham and Harvey, 2001). One explanation to this, is that SCBT might be more appropriate for large firms that are

more likely to be able to satisfy the underlying assumptions of SCBT (Danielsson and Scott, 2006). Firm size was measured in total sales, using a logarithmic scale for the year 2016.

*Ownership concentration* was measured as the share sum (%) of the three majority owners (Ben-Amar et al., 2014). Ownership concentration was included because Sarwary and Umans (2017) posited that strong ownership concentration could enhance the choice of SCBT. Scholars suggests that strong owners is interested in investments that will increase market value for shareholders, (Copeland and Weston, 1986; Hillman and Keim, 2001), and hence choose SCBT that is oriented towards identifying investments that maximise the market value of shareholders (White and Miles, 1996).

#### 4 Analysis and results

The findings indicate that the firms are diverse in their choice of CBT and operate in a market where being a prospector (mean 26.57) is more common than being a defender (mean 24.11) or an analyser (mean 19.96). Further, the firms show a high entrepreneurial structure (mean 25.98). These results could potentially be explained by the stock market on which the firms are listed. The firms further show a high equity ratio (mean 53.57), indicating a high solvency among the firms. The shareholder concentration (mean 48.71) among the firms is high and could potentially be explained by the relatively less stringent requirements for share distribution on First North.<sup>10</sup>

The correlation matrix indicates that NSCBT is positively correlated with defenders, firm tenure, and entrepreneurial structure. SCBT is positively correlated with analysers and ownership concentration, but negatively correlated with defenders. Thus, in line with expectations, analysers are positively related to the choice of SCBT and high shareholder concentration and SCBT is positively related, because SCBT are mainly focused on maximising firm wealth. Defenders are negatively related to entrepreneurial structure, which indicates that defenders do not adjust their structure to the competitive market they operate within, but might keep their defensive nature.

To test the hypotheses developed in this study, binary logistic regression was conducted.<sup>11</sup> Due to the small sample size, the results were divided into three models. Model 1 presents the results of the prospector strategy, model 2, those of the defender strategy, and model 3, those of the analyser strategy. The logistic regression models, which controlled for industry, were excluded in the presentation of these models because they did not affect the results. Lastly, a standardised score was used for the independent variables and the moderating variables for models 4–6.

The results show that being a prospector has no relationship with the choice of NSCBT. Thus, Hypothesis 1 is rejected. However, in contrast to expectations, the defender has a significant relationship with the choice of NSCBT ( $\beta = -0.204^{***}$ ), leading to a rejection of Hypothesis 2. Interestingly, these results go against suppositions in previous research (e.g., Chen, 1995, 2008; Haka, 1987, 1989). Lastly, the analyser has a significant relationship with the choice of SCBT ( $\beta = 0.118^{***}$ ). Therefore, Hypothesis 3 is supported.

**Table 1** Means, standard deviations, and correlations

<i>Variables</i>	<i>Mean</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
1 NSCBT	.52	.										
2 SCBT	.53	.	.00									
3 Defender	24.11	13.87	.66**	-.38**								
4 Prospector	26.57	10.60	.21	-.13	.30*							
5 Analyster	19.96	15.61	-.34	.55**	-.44**	-.19						
6 Entrepreneurial structure	25.98	11.75	.51**	-.27	-.69**	.23	-.37**					
7 Industry	.56	.	-.00	-.23	.09	.12	-.03	-.10				
8 Equity ratio	53.57	39.94	-.01	.15	-.04	.05	.18	-.06	-.03			
9 Firm tenure	15.83	9.87	.35**	.01	.36**	.08	-.02	.30*	.01	-.05		
10 Firm size	16.81	2.55	.10	-.08	.18	.19	-.08	-.01	.06	.16	.28*	
11 Shareholder concentration	48.71	16.05	.00	.38**	-.14	-.26	.17	-.15	.18	.11	.16	.05

Notes: \*\*\*p<0.001; \*\*p<0.01; \*p<0.05; †p<0.10;  
 SCBT (sophisticated CBT); NSCBT (non-sophisticated CBT)

**Table 2** Binary logistic regression: the relationship between strategy and CBT

Variables	Model 1			Model 2			Model 3		
	SCBT-prospector			SCBT-Defender			SCBT-Analyser		
	B	Std. error	Odds ratio	B	Std. error	Odds ratio	B	Std. error	Odds ratio
Ownership concentration	.065**	.023	1.067	.085*	.033	1.089	.100**	.037	1.105
Firm size	-.023	.141	.868	-.085	.218	.919	-.028	.175	.972
Firm tenure	-.059*	.054	.918	-.027	.055	.973	-.129*	.057	.879
Equity ratio	-.001	.008	.999	-.004	.012	.996	-.012	.009	.988
Prospector strategy	-.036	.037	.964						
Defender strategy				-.204***	.059	.815			
Analyser strategy							.118***	.033	1.126
Constant	-.600	2.407		2.929	3.851		-4.593	3.114	
Model Chi-2	17.292**			44.611***			42.606***		
Classification	73.7%			89.5%			82.5%		
Cox & Snell R <sup>2</sup>	.262			.543			.484		
Nagelkerke R <sup>2</sup>	.349			.724			.647		
Hosmer & Lemeshow	4.963			4.687			10.971		

Notes: \*\*\*p<0.001; \*\*p<0.01; \*p<0.05; †p<0.10  
 SCBT (Sophisticated CBT); NSCBT (Non-sophisticated CBT);  
 Industry variables are omitted

**Table 3** Binary logistic regression: moderating effect of entrepreneurial structure on the relationship between strategy and CBT

Variables	Model 4			Model 5			Model 6		
	SCBT-Prospector			SCBT-Defender			SCBT-Analyser		
	B	Std. error	Odds ratio	B	Std. error	Odds ratio	B	Std. error	Odds ratio
Ownership concentration	.067*	.034	1.069	.087*	.038	1.091	.100*	.046	1.105
Firm size	-.018	.198	.982	-.092	.237	.912	-.016	.217	.984
Firm tenure	-.045	.058	.956	-.022	.060	.978	-.088	.070	.916
Equity ratio	-.002	.016	.998	-.008	.012	.992	-.011	.012	.989
Prospector strategy	-.022	.064	.979						
Defender strategy				-.156**	.060	.856			
Analyszer strategy							.088*	.044	1.093
Entrepreneurial Structure	-.260***	.081	.771	-.125†	.073	.882	-.153†	.083	.858
Prospector*Entrepreneurial structure	-.854†	.046	.426						
Defender*Entrepreneurial structure				.747	.715	2.111			
Analyszer*Entrepreneurial structure							-.758	.931	.469
Constant	4.466	3.661		4.960	4.357		-.908	4.596	
Model Chi-2	34.435***			47.964***			46.237***		
Classification	87.7%			86.0%			91.2%		
Cox & Snell R <sup>2</sup>	.674			.571			.556		
Nagelkerke R <sup>2</sup>	.505			.762			.742		
Hosmer & Lemeshow	9.083			5.382			11.514		

Notes: \*\*\*p&lt;0.001; \*\*p&lt;0.01; \*p&lt;0.05; †p&lt;0.10

SCBT (Sophisticated CBT); NSCBT (non-sophisticated CBT);

Industry variables are omitted

The results indicate that entrepreneurial structure has a significant positive moderating effect on the relationship between a prospector and the choice of NSCBT ( $\beta = -0.854\ddagger$ ), indicating support for Hypothesis 4. Moreover, an entrepreneurial structure moderates neither the relationship between a defender and the choice of NSCBT nor the relationship between an analyser and the choice of NSCBT, which led to rejection of Hypotheses 5 and 6.

Lastly, the results show that ownership concentration has a relationship with the choice of SCBT, and entrepreneurial structure has a relationship with the choice of NSCBT.

## 5 Discussion and conclusions

This paper explored how different types of strategy affect the choice of CBT as a strategic planning tool and aimed to understand the moderating role of entrepreneurial structure among SMEs operating on First North.

In line with expectations, the analyser is shown to be associated with the choice of SCBT, which is explained by their goal of robustness in their analysis (Haka, 1987; Sarwary and Umans, 2017). Moreover, an entrepreneurial structure has a positive relationship with the choice of NSCBT among prospectors, which is not surprising since innovation and flexibility enhance the use of NSCBT (c.f. Auh and Menguc, 2005).

Ownership concentration is positively related to the choice of SCBT. This could be explained by the preference of strong owners for maintaining the long-term net worth of their firms versus that of a diffuse ownership, which might prefer to enhance share prices (Pinches, 1982).

The results show no support for associating prospectors with the choice of NSCBT, as suggested in previous research (e.g., Chen, 1995, 2008). This could be explained by the prospector's focus on being first-in on markets/products (Miles and Snow, 1978). Mintzberg and Waters (1982) state that firms with the characteristics of a prospector are more likely to prioritise being first-in markets/products against an evaluation of the investment. In line with this study's expectations, the results support entrepreneurial structures' positive moderating effect on the relationship between a prospector and the choice of NSCBT. This could be explained by the firms' already high level of exploration. Firms' exploratory behaviour may intensify when they adopt an entrepreneurial structure, which could jeopardise their survival, but could also explain why prospectors, already accustomed to high risk, choose to use NSCBT.

Surprisingly, the defender is associated with the choice of NSCBT rather than SCBT, which goes against the mainstream suggestions of previous research (e.g., Chen, 1995, 2008; Haka, 1987, 1989). This might be explained by a defender's knowing its environment well, and therefore forgoing a full analysis and being guided instead by intuitive judgements and experience (c.f. Weston and Brigham, 1981).

An entrepreneurial structure did not moderate the relationship between the strategy of a defender or an analyser and the choice of CBT. This may be because analysers highly value robustness and being second-in (Miles and Snow, 1978), which makes the reinforcement of an entrepreneurial structure irrelevant. Defenders, however, would only weaken their strategy to some extent, to maintain their core focus on mature, limited, and stable positions (c.f. Auh and Menguc, 2005). This might explain why defenders do not intensify their use of NSCBT when moderated by an entrepreneurial structure.



This paper makes several contributions to research areas such as strategy and strategic planning tools. It updates the research of the relationship between strategy and the choice of CBT (Haka, 1987, 1989; Chen, 1995, 2008). It also brings Chandler's (1962) seminal proposition that 'structure follows strategy' into the field of CBT. The results, which are based on a limited sample (SMEs who operate on First North), also provide the new insight that an entrepreneurial structure moderates the relationship between a prospector and the choice of NSCBT. This study uses a rare mixed method of survey and secondary data from annual reports subjected to content analysis. Lastly, it provides a list of keywords based on previous research that can be used in content analysis when screening for strategy in annual reports.

### 5.1 *Limitations and future research*

While this study contributes to the field of CBT, it has several limitations. The study is based on a small sample, with only 62 useable responses. However, those 62 represent a response rate of 32%, which is higher than that of several empirical studies in the field of CBT (e.g., Trahan and Gitman, 1995; Block, 1997). Due to the small sample, the results of the logistic regression were divided into three models to handle the lack of observations. Moreover, the reliability of the content analysis could have been enhanced by using several coders and comparing the outcomes for discrepancies. However, because the study used the well-established list of keywords from Miles and Snows' (1978) typology, this was not perceived as necessary. This paper also used synonymous words, moving beyond merely adopting the keywords of previous studies (see Appendix 1). Another limitation is that the content analysis was restricted to the chairman's letter in the annual reports as recommended by previous research (e.g., McConnell et al., 1986).

Future research could extend the type of CBT included in studies by going beyond the typical CBT (see Graham and Harvey, 2001). Future research is also encouraged to extend the content analysis to several parts of the annual report. Moreover, future research should use more synonymous keywords, because the language used to describe strategy trends in the annual report might change over time. Lastly, this study was based on SMEs operating in competitive markets and with a focus on entrepreneurial structure. Thus, future research should seek to explore the differences between both stable and dynamic markets and among firms with different types of structure.

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## Notes

- 1 First North was first launched during 2007 and is a multilateral trading facility. Firms listed on First North have less stringent requirements than those listed on Stockholm OMX (NASDAQ, 2018). This is crucial because firms operating under stringent rules are less likely to adopt an entrepreneurial structure (c.f. Laforet, 2008).
- 2 SCBT include NPV, IRR, MIRR, profitability index (PI), and RO (Klammer, 1973) – for further details see Daunfeldt and Hartiwg (2014).
- 3 NSCBT include payback method (PB), ARR, ROA, ROE, and gut feeling (Sarwary and Umans, 2017; Danielsson and Scott, 2006) – for further details see Daunfeldt and Hartiwg (2014).
- 4 The annual reports for a broken year were not included in the analysis (three firms) because the questionnaire asked which techniques had been used during 2016.
- 5 Responses from the respondents that were not included in the final sample were compared with the final sample. An independent t-test was performed to explore whether there was significant differences in the answers. The results show no significant differences.
- 6 Principal component analysis with varimax (absolute value greater than 0.4) was used, as recommended by Stevens (1992) for the factor analysis, with a KMO value of 0.787\*\*\*, which is above the recommended value of 0.6.

- 7 The adopted strategy by the firm is not mutually exclusive, the label of which strategy they adopt has been based on which strategy they lean more towards.
- 8 The keywords were identified from previous studies published in journals ranked as 2 in the Norwegian list and with at least 400 citations.
- 9 Service included the following industries: technology, healthcare, real estate, retail, financial, and consumer services. Manufacturing included industrial goods, industrial materials, and basic materials. The type of industry in which the firm operated was provided by NASDAQ.
- 10 It has fewer requirements for pro forma and published accounts, shareholder spread, and financial start-up capital than more established exchanges. For more details, please see NASDAQ First North Nordic – rulebook, 2016-07-03.
- 11 Relying in our dichotomisation on the factor scores of the techniques, corporation that predominantly use NSCBT was coded as 0 and those predominantly using SCBT as 1.

## Appendix

**Table A1** Keywords

<i>Authors</i>	<i>Defender</i>	<i>Prospector</i>	<i>Analysers</i>	<i>Entrepreneurial-structure</i>
<i>Miles and Snow typology:</i>	Narrow	Opportunities	Combination	Acquisition
Miles and Snow (1978),	Core	Broad	Second-in	R&D
Shortell and Zajac	Stable	Trends	Balance	Flexibility
(1990), Conant et al.	Protect	Search	Imitation	Technology
(1989), Hambrick (1983),	Secure	Scanning	Duality	Emission
McDaniel and Kolari	Cautious	First	Accommodate	Flexibility
(1987), James and Hatten	Satisfier	Aggressive	Matrix	Decentralised
(1995), Simons (1987),	Niche	Expanding	Simultaneously	innovation
Smith et al. (1989), Zajac	Sealing-off	First-in	Portfolio	Dynamic
and Shortell (1989),	Cost-efficient	New	Planning	Loose
Segev (1987), Parnell and	Limited and	Rapid	Formality	Launch
Wright (1993), Shortell	Positioning	Competitive	Comprehensive	Risk-capitalist
and Zajac (1990), Conant		Early	Synergy and	Vertical
et al. (1989), Hambrick	<i>Synonym</i>	Visionary	analysing	Transformative
(1983), McDaniel and	<i>keywords:</i>	Unstable		Reeducate
Kolari (1987), James and	Few	Wide creators	<i>Synonym</i>	Re-organise
Hatten (1995), Simons	Focus		<i>keywords:</i>	
(1987), Smith et al.	Safe		Integration	
(1989), Zajac and		<i>Synonym</i>		
Shortell (1989), Segev	Limited	<i>keywords:</i>	Mix	
(1987) and Parnell and	Concentrated	Dramatic	Hybrid	
Wright (1993).	Turf	Eventful	Routines	
	Maintain	Test	Proactive	
	Existing	Fastest	Robust	
	Established	Emerge	Repetition	
	Neighbor.	Radical	Complete	

