



# Relative exploration and firm performance: Why resource-theory alone is not sufficient?

Krishna Raj Bhandari<sup>a,\*</sup>, Sudhir Rana<sup>b</sup>, Justin Paul<sup>c</sup>, Jari Salo<sup>d</sup>

<sup>a</sup> Department of Economics and Management, University of Helsinki, Latokartanonkaari 5, P.O. BOX 27, FI-00014 Helsinki, Finland

<sup>b</sup> Fortune Institute of International Business, India

<sup>c</sup> University of PR, San Juan, PR, USA and Distinguished scholar, IIM, Kerala

<sup>d</sup> Department of Economics and Management, University of Helsinki, Finland

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## ABSTRACT

The resource-based theory states that having valuable, rare, inimitable, non-substitutable, and organized (VRIN-O) resources and capabilities give firms a sustainable performance. However, by integrating the attention-based view, we raise a question as to why VRIN-O resources alone are not sufficient for sustainable performance. We introduce the variable - decision-makers' attention- as a key moderator in achieving sustainable performance so that VRIN-O/capability and capability/resource heterogeneity may last longer. To test this relationship, we examine how the needs of firms to balance their exploration and exploitation efforts, called relative exploration anchored to resource-based theory is influenced by CEO's attention towards entrepreneurial orientation and market orientation as moderators. Using a panel data set of 269 firms listed on the Nordic NASDAQ stock exchange, we find an inverted U-shaped relationship between relative exploration and long-term performance, while the attentions of the CEO have a positive moderation effect. Thus, using the attention-based view complements the resource-based theory in explaining sustainable competitive advantage especially in the dynamic environment.

## 1. Introduction

“The central argument is that firm behavior is the result of how firms channel and distribute the attention of their decision-makers.”

-Ocasio, W. (1997). *Strategic Management Journal*, 18(S1), 187–206. p.187

Resource-based theory (RBT)<sup>1</sup> (Barney, 1991; Barney, Wright, and Ketchen, 2001; Barney, Ketchen, and Wright, 2011) states that the valuable, rare, inimitable, non-substitutable, and organized (VRIN-O)<sup>2</sup> resources<sup>3</sup> (Barney and Hesterly, 2010) and capabilities are the cornerstones of a sustainable competitive advantage which is based on the assumptions that ‘strategic resources are heterogeneously distributed across firms and these differences are stable over time’. However, as illustrated in the opening quotes, Ocasio (1997) argues that the behavior of a firm is the result of spreading the attention of their decision-makers. Further, he suggests the following: “But a full understanding of

competitive advantage and firm heterogeneity requires that we integrate an attention-based view of the firm with resource and industry perspectives to develop a dynamic theory of business strategy and value creation” (p.205). Thus, VRIN-O resource/ capability and capability/resource heterogeneity can last given the attention-based view (ABV) perspective. In line with his suggestions, this study links resource-based theory and attention-based view as two legs of the strategy tripod, while outlining the industry perspective as a third leg of the strategy tripod for further research at the end.

While RBT is not sufficient alone, with this view Ocasio (1997) also asserted that the attention-based view alone cannot explain what are the sources of the firm's competitive advantages? Yes, understanding firm heterogeneity is possible for looking at a business at a *particular point in time*, but it has no explanatory power on why firm heterogeneity lasts under intra-industry rivalry over a longer period. Thus, we concur with Ocasio (1997) on channeling and distribution of entrepreneurial drive with the market and customer-first philosophies are key

\* Corresponding author at: Department of Economics and Management, University of Helsinki, Finland P.O. BOX 27, Latokartanonkaari 5, FI-00014, Helsinki.

E-mail addresses: [krishna.bhandari@helsinki.fi](mailto:krishna.bhandari@helsinki.fi) (K.R. Bhandari), [jari.salo@helsinki.fi](mailto:jari.salo@helsinki.fi) (J. Salo).

<sup>1</sup> Although the term *resource-based theory* can be traced back at least to Conner (1991), this term seldom appeared in print in the 1990s. The 1991 conceptualization used *the resource-based view* which in 2011 morphed into *resource-based theory*.

<sup>2</sup> The 1991 conceptualization argued VRIN resources which have been modified by Barney and colleagues in later publications Barney and Hesterly (2010).

<sup>3</sup> Following Barney (2002), the terms “resources” and “capabilities” will be used interchangeably in this article

contributions towards strategic management literature. Also, that attention structures and the implementation of effective procedural and proper communication channels can be the major factors that determine the adaptive capabilities, or for that matter, dynamic capabilities (Teece, Pisano, & Shuen, 1997; Teece, 2007; Teece, 2014) of a firm.

We utilized the relevant literature belonging to organizational ambidexterity (OA) and performance to study long-term performance impact of organizational ambidexterity (Uotila, Maula, Keil, & Zahra, 2009) as relative exploration to understand how the resource-based theory may manifest in this construct with its salient VRIN-O features. Organizational ambidexterity (OA), defined as a balancing of exploration & exploitation-related learning activities as suggested by March (1991), has been considered in the literature through many lenses. For instance, the attention of the firm's leader (Zaccaro, Gilbert, Thor, & Mumford, 1991); dynamic capabilities of the firm (O'Reilly and Tushman, 2008; Barreto, 2010; Teece et al., 1997; Teece, 2007; Teece, 2014); and the relationship between resource ambidexterity and performance (Auh and Menguc, 2005; GEERTS, BLINDENBACH-DRIESSEN, & GEMMEL, 2010). It also centered on managerial and organizational flexibility (Khazanchi, Lewis, & Boyer, 2007).

Looking at various theoretical approaches available in the literature to study the OA demanding the effect of organizational or environmental contingencies on the firm performance, it is concluded by us that the synthesis on how both the attentions (Ocasio, 1997; Laamanen, 2019) to the entrepreneurial orientation of a firm leader (CEO EO) and the market orientation (CEO MO) can help us in exploring and exploiting different opportunities to enhance the performance of the firm. However, the mechanism on how both EO and MO supported by CEO's attention get enacted in an organization is yet to be addressed in a longitudinal setting.

Following Keil, Maula, and Syrigos (2017) suggestion that Ocasio's attention-based view of the CEO towards entrepreneurship, we paid similar attention to CEOs enacting mechanisms of MO – i.e. looking at customer focus to link the marketing research with general management and strategic management as well. Therefore, the research call by Ocasio (1997) joins the pursuits of resource-based theory (RBT) by Barney (1991), and attention-based view (ABV) by Ocasio (1997), to give us a greater understanding of the relative exploration, entrepreneurial orientation (EO), and market orientation (OA) that affects a company while generating the sustainable performance of the firm, and cross-fertilizes the two differing approaches.

The attention of top management is a rare resource in itself. Also, considering the ongoing debate in the strategic management literature (Barney, Ketchen, and Wright, 2011), several pertinent questions arise during this argument. Such as (1) Why are VRIN-O resources on their own are not the only necessary and sufficient conditions for sustainable performance; and why do we not introduce decision-makers' attention as a key moderator in achieving sustainable performance? (2) Whether a CEO's attention as an enabling mechanism of entrepreneurial drive and customer or market focus matters for the organizations when pursuing relative exploration conceptualized as a manifestation of VRIN-O advantage in the organization?

Thus, the present study aims to make several contributions to the literature. The study brings the attention-based view (ABV) (Ocasio, 1997; Laamanen, 2019) into the discussion of balancing exploration related activities and exploitation related activities anchored in the RBT. Considering business environment dynamics and the pace of the firm innovation, the study raises two different issues. The first issue is that RBT alone (i.e. focus on relative exploration contributing to VRIN-O advantage) is not sufficient to create a sustainable competitive advantage. The second issue is whether the combination of CEOs' attention as an enabling mechanism of EO and MO helps to improve the firm's performance, while also helping the firm to outperform its competitors (Hamel & Prahalad, 1994; Li, Zhao, Tan, & Liu, 2008), in such environments.

More importantly, Cho and Hambrick (2006) explored the entrepreneurial attention but purely from the perspective of attention-based view in the absence of the RBT. We filled important research gaps in the literature, as there was a discerned need for a quantitative and longitudinal study on the role of CEOs' EO and CEOs' MO as attention when it enables entrepreneurial drive and customer focus. Please note that CEOs' EOs and MOs contributions in the organizations have been studied during this research for the first time as moderators.

On the empirical front, this study is not our mere wish but it is anchored in the research call for further research moving from cross-sectional survey-based designs (Rauch, Wiklund, Lumpkin, & Frese, 2009, p. 781) with unique context as Nordic firms which we feel this stream of research needs desperately. On the methodological front, we extend the newly emerging research on CEO's attention as an enabler of organization-wide EO as started by Keil et al. (2017) through the use computer-aided text analysis (CATA) as a measurement method and that can handle endogeneity, common method variance, and unobserved heterogeneity.

In the following section, we outline the relative exploration literature. Followed by this, we develop the main hypothesis and the moderating effects related to the hypotheses. Then, we argue the methodology and use system GMM (Generalized Methods of Moments) as an analysis method. The subsequent section discusses the findings and concludes the paper with implications for further research and practice.

## 2. Relative exploration and firm performance

Literature review (Gupta, Smith, & Shalley, 2006; García-Lillo, Úbeda-García, & Marco-Lajara, 2017) summarizes a divided school of thought when it comes to understanding whether exploration and exploitation have direct links to long-term performance, or if contingency effects exist. Out of major four streams of research, three streams focused on the orthogonality of exploration and exploitation resulting into linear (O'Reilly and Tushman, 2008), contingency effects (Raisch, Birkinshaw, Probst, & Tushman, 2009), no effect (Bierly and Daly, 2007) relationship with performance<sup>4</sup>. However, a small stream of research argues as per the original definition of March (1991) that exploration and exploitation are opposing forces and must be studied as two ends of a continuum (Uotila et al., 2009). We contribute to this narrow stream of research in multiple ways in developing our hypothesis 1.

First, we focus on the right definition in its true spirit based on the original conceptualization of March (1991), exploration activities include 'things captured by terms such as search, variation, risk-taking, experimentation, play, flexibility, discovery, innovation' (March, 1991: 71). Conversely, exploitation activities include 'such things as refinement, choice, production, efficiency, selection, implementation, execution' (March, 1991:71). Dissection of the literature by Uotila et al. (2009) suggested that this concept has been expanded into multiple disciplines such as; managerial economics, technology and innovation management, organization theory, and strategic management, to name a few. However, this stream of literature got mixed findings based on different conceptualization and measurements mainly based on orthogonal assumptions (Gupta et al., 2006).

It is evident from human life also, their major focus remains on income and less focus on health, family, and social relationships lead to sick life during the later phase of life. This analogy goes side by side exploitation focus vs exploration focus. However, towards a balanced life, one needs to balance both incomes, health, and relations. Organizational health (De Smet, Schaninger, and Smith, 2014) and strategic agility (e Cunha, Gomes, Mellahi, Miner, and Rego, 2020) literature also support this notion. Therefore, for an organization to be

<sup>4</sup> Performance has been measured in differing ways in each type of studies as well.

successful in the long-run, balancing exploitation and exploration focus (we call it relative exploration) must be the strategic choice.

Second, the differences in findings mainly emerge due to the different operationalizations: in some studies, it has been used as a multiplication of exploration and exploitation, in others, it has been used as summation, and in some, a subtraction. We further the research initiated by Uotila et al. (2009) with a new measurement as a ratio between exploration divided by the sum of exploration and exploitation using these dichotomies as two ends of a continuum (Gupta et al., 2006).

Third, these two concepts are contradictory and self-reinforcing. Overemphasis on exploration leads to 'failure trap' and the overemphasis on exploitation leads to 'success trap'. This argument is so powerful and has been accepted widely but in different conceptualization and operationalizations using *orthogonal* assumptions (Bierly & Daly, 2007; Birkinshaw & Gupta, 2013; Gracia-Lillo et al., 2017; He & Wong, 2004; Junni, Sarala, Taras, & Tarba, 2013; Rauch et al., 2009) but jeopardizing the original spirit of the concepts as exploration and exploitation are contradictory and hence must be studied as *two ends of a continuum*.

However, making sure that the exploration focus generates timely performance impact we need to balance it together with exploitation orientation. The intricate balance, thus, builds a culture of commitment, open-mindedness, and shared idiosyncratic vision and path-dependence to the firm history, too ambiguous for others to understand and copy from the outside, and has 'social complexity' for competitors to adapt (Barney, 1991; Barney, Wright, and Ketchen, 2001; Barney, Ketchen, and Wright, 2011).

To align with environmental changes, managers need to balance variance increasing activities with exploitation needs. These explorations related activities are future solutions, features, or breakthroughs as well. However, in doing such activities, managers or entrepreneurial managers may face a perpetual search loop by focusing solely on exploration, which can be similarly dangerous, and while doing this they may fall prey to 'failure leads to search and change which leads to failure which leads to more search, and so on' (Levinthal and March, 1993: 105–106).

Fourth, based on resource-based theory (RBT) (Barney, 1991) VRIN-O resources generate sustainable competitive advantage. However, how these resource attributes are achieved is implicit in RBT assumptions. Through our conceptualization, we build a linkage between scarce and VRIN-O resource allocation and the productive sets of activities in the firm. In a dynamic environment, resource scarcity is a norm rather than the exception in an organization and seeking an optimum balance (March, 1991) in allocating these resources linked to exploration and exploitation activities is crucial. Apart from a few exceptions, thus, the original conceptualization of March (1991) has remained without proper recognition and validation in its original spirit, and literature has misused his citation to a greater extent.

Fifth, a very compelling argument on the need for relative exploration as a balance is based on Uotila et al. (2009). Generally, firms are designed to perform in short-term as share markets need quarterly reports and it punishes if profit falls which makes firms focus on reducing variety, increasing efficiency, and improving adaptation to current internal environments. However, this short-term exploitation focus comes at the expense of long-term performance which demands exploration related activities which are predominantly the manifestation of VRIN-O attributes of RBT. This takes place due to reduced variety and the adaptation to the external environment becoming 'liabilities' in a dynamic environment. Exploitation focus breeds a self-reinforcing success and exploitation focus further. However, these short-term performance improvements might come at the expense of long-term performance, because the reduced variety and the adaptation to a certain external environment become liabilities as environments change over time. Firms that emphasize exploitation activities might lack the capability to adapt to significant environmental changes, and

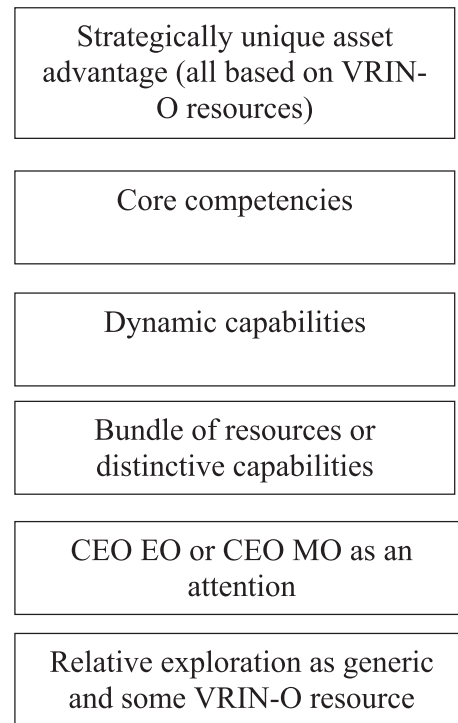


Fig. 1. Relative exploration, CEO EO, CEO MO, and Path to Sustainable Competitive Advantage (Modified from Sirmon et al. (2007)).

thus the recipe that makes these firms successful in the short-term might endanger their success long-term.

Sixth, Fig. 1 shows the pathways to sustainable competitive advantage developed further from Sirmon, Hitt, and Ireland (2007). Though the figure is comprehensive for all three hypotheses in our study, we discuss the pathways regarding relative exploration and sustainable competitive advantage. During the initial phase, there are normally a mix of generic resources and some VRIN-O resources leveraged in pursuing relative exploration as learning. While these resources either are bundled amongst themselves or through a market or other complementing resources (in this case CEO EO and CEO MO, discussed in hypotheses 2 and 3 later). Through this reconfiguration dynamic capabilities (Teece et al., 1997; Teece, 2007; Teece, 2014) that guide firms to sense, seize, and orchestrate to explore and exploit opportunities will be developed. After the refined processing of dynamic capabilities, difficult to imitate competencies (core competencies) that will develop in the organization which propels all resources and capabilities to strategic asset advantage level with all VRIN-O criteria resulting in sustainable competitive advantage.

Seventh is about the three approaches committed to learning on how organizational values and belief systems help in learning orientation, open-mindedness, and shared vision (Sinkula, Baker, & Noordewier, 1997). These values normally manifest through an entrepreneurial orientation that guides as a rudder of the boat (i.e. organizational learning orientation) so that it can sail into the right direction to balance both exploration and exploitation (March 1991; Uotila et al., 2009; Jancenelle, 2019) and enhance adaptive and generative learning (Senge, 1990). While a firm is busy in reaping the benefits of existing capabilities (Teece et al., 1997; Teece, 2007; Teece, 2014) and core competencies in short-term without investing for the future, the firm falls into a trap called 'tyranny of the served market' (Hamel & Prahalad, 1991, p. 83) which demands to balance of exploitation (or adaptive) and exploration (generative) learning. Therefore, relative exploration as a balancing act is used in this study to reflect this basic mechanism.

A balance of these two dimensions, operationalized as relative

exploration, suggests that there is an optimum level of performance, as the expected relationship is curvilinear. Too little or too much of relative exploration is detrimental to a firm's performance. Too low a level of relative exploration implies that innovation, search, and experimentation is too low and that the organization is geared towards short-term profit maximization at any cost, which often results in a profit trap or exploitation trap. Though a positive slope between the relative exploration and firm performance does exist, it is on the lower band.

Similarly, too high a level of relative exploration implies that innovation, search, and experimentation are perpetual but without generating rent or benefits, and products developed for the longer horizon result in exploration or search trap. Consequently, when exploration and exploitation are conceptualized as two ends of a continuum (Gupta et al., 2006; Uotila et al., 2009; Jancennele, 2019), intermediate degrees of both exploration and exploitation should yield higher performances than an exclusive focus on either of these types of learning. However, empirical tests of this inverted U-curve are relatively limited.

Though our study seems like a replication study of Uotila et al. (2009), we are contributing on different nine attributes developed in hypothesizing to explain the conceptualization anchored in VRIN-O attributes based on RBT and resource-advantage pyramid as per Fig. 1 as a theoretical lens in explicating the relative exploration, a unique dataset from the Nordic markets, and using annual reports as a data source in contrast to news articles in previous research. We use computer-aided text analysis (CATA) departing from normal survey-based research full of common-method variance to measure the exploration and exploitation as done by Uotila et al. (2009) but our data source is the annual reports in contrast to news items in their study. This has not only enabled us to study the relationship between relative exploration and firm performance but has also enabled the longitudinal study. We argue that the annual report as a data source is a better approach to study and understand the organization's relative exploration approach. Also, extant research is predominantly cross-sectional and survey-based without handling for common method variance, endogeneity, and unobserved heterogeneity. We remedy these methodological and specification errors. A novel approach taken by us is to anchor the relative exploration construct in qualifying VRIN-O attributes based on the RBT.

As the firm is blinded by the obvious, it cannot adapt to any major external environmental changes. The rules of the game and the road the firm traveled to come to this peak performance in the short-term make the firm susceptible to failure as it is evident from the case of 'Nokia Mobile Phones' business. Thus, to avoid either 'success trap' or 'failure trap' an optimum balance of exploration and exploitation conceptualized as relative exploration (Uotila et al., 2009) is a must. At a low level of relative exploration, the focus is on exploitation activities, while at a high level of relative exploration the firm focuses mainly on exploration activities. However, at the mid-level, these contradictory activities embedded in relative exploration, self-reinforcing, two ends of a continuum generate an optimum performance.

Therefore:

Hypothesis 1: The relative exploration orientation of the firm exhibits a curvilinear (inverted U-shaped) relationship to the future financial performance of the firm.

### 3. The interplay of CEO entrepreneurial orientation and relative exploration

Dawson (2014) defines a moderator variable is any variable affecting the relationship between two or more variables. Our understanding based on the literature is that the moderator variable, CEO EO is a variable that affects the strength of the relationship between relative exploration and performance. CEO EO has five sub-dimensions: autonomy, innovativeness, risk-taking, proactiveness, and competitive aggressiveness (Lumpkin and Dess, 1996; Keil et al., 2017; Hughes, Chang, Hodgkinson, Hughes, & Chang, 2020) in a given firm which was

proved 'to vary independently of each other in a given context' (Lumpkin and Dess, 1996, p.151). We develop nine compelling arguments to explain the arrows representing the relations between constructs rather than the constructs themselves.

First, each sub-dimensions of CEO EO contribute independently to strengthen the main effects of relative exploration and performance. The first dimension of CEO EO includes autonomy<sup>5</sup>. CEO's attention to enable EO (Keil et al., 2017) must be focused in empowering the individual, team, and the organization to come up with new ideas and solutions through experimentation and learning and through delegation and decentralization that may change the competitive landscape and enable sustainable competitive advantage through VRIN-O (Barney, 1991; Barney, Wright, and Ketchen, 2001; Barney, Ketchen, and Wright, 2011) generated and complemented by the interaction of relative exploration and autonomy.

The second dimension of CEO EO is innovativeness<sup>6</sup>. Linking innovativeness posture but keeping the exploration and exploitation in balance is important. The reason is too much focus on experimentation and innovation may be expensive in the long-run as it is detrimental to focus on only profit-maximization or short-term stock price (Uotila et al., 2009). CEO's attention (Keil et al., 2017) to promote innovativeness must be linked with the learning mechanism and absorptive capacity of the firm defined as 'prior related knowledge that confers an ability to recognize the value of new information, assimilate it, and apply it to commercial ends' (Cohen and Levinthal, 1990, p. 128).

The third dimension of CEO EO is risk-taking<sup>7</sup>. Synching the risk-taking approach with learning orientation is of high importance both in the short-term and long-term. While in the short-term we may be on exploitative learning to reap profits, but in the long run, the exploration related activities demand a more risk-taking approach. By enabling CEO's attention in embedding risk-taking behavior in learning, adaptation, and innovation will allow out-competing the competition and thriving even in chaos building an ambiguity which could be understood inside the organization only (Barney, 1991; Barney, Wright, and Ketchen, 2001; Barney, Ketchen, and Wright, 2011) that may be classified as VRIN-O culture.

The fourth dimension of CEO EO is proactiveness<sup>8</sup>. Leading under uncertainty demands proactiveness which harmonizes the explorative learning through the search for a new business model, experimentation, opportunism, opportunity creation, discovery, and recognition. For sustainable competitive advantage satisfying existing needs and demand may be good for the short-run but for the long-run a firm must create new demand, influence trends, and "shape the environment". Such a market-driving innovative culture nourishes the learning code (March, 1991) and absorptive capacity (Cohen and Levinthal, 1990).

The fifth dimension of CEO EO is called competitive aggressiveness<sup>9</sup>. The CEO's attention to enable organization-wide competitive aggressiveness nourishes the learning code in balancing exploration and

<sup>5</sup> "Autonomy refers to the independent action of an individual or a team in bringing forth an idea or a vision and carrying it through to completion" (Lumpkin and Dess, 1997, p. 140).

<sup>6</sup> "A firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes" (Lumpkin and Dess, 1997, p. 142).

<sup>7</sup> "firms with an entrepreneurial orientation are often typified by risk-taking behavior, such as incurring heavy debt or making large resource commitments, in the interest of obtaining high returns by seizing opportunities in the marketplace" (Lumpkin and Dess, 1997, p. 144).

<sup>8</sup> "how a firm relates to market opportunities in the process of new entry. It does so by seizing the initiative and acting opportunistically to "shape the environment," that is, to influence trends and, perhaps, even create the demand" (Lumpkin and Dess, 1997, p. 147).

<sup>9</sup> "A firm's propensity to directly and intensely challenge its competitors to achieve entry or improve position, that is, to outperform industry rivals in the marketplace" (Lumpkin and Dess, 1997, p. 148).

exploitation through relative exploration. Based on the competitive strategy stream of literature (Porter, 1985; Porter and Heppelmann, 2014, 2015) firm must build core advantages either as a low-cost provider or as a differentiator in the market. The strategic clarity in tackling the competition aggressively and building a learning organization that observes, orients, decides, and acts will build dynamic capabilities (Teece et al., 1997; Teece, 2007; Teece, 2014) rooted in the micro-foundations of activities and resources that are qualified to be at the VRIN-O level. Therefore, all five dimensions reinforce the relationship between attention (CEO EO) and resource (relative learning) in multiple ways suggesting that CE EO has a strong moderation effect on the relationship between relative exploration and performance.

We develop the other six arguments on the overall moderation effect. First, based on Fig. 1, the CEO's attention to enable EO alone is capable of generating dynamic capabilities, strategic assets, and long-term performance (Keil et al., 2017). Bundling of relative exploration and CEO EO also contribute to generating dynamic capabilities (Teece, 2007) and strategic assets with VRIN-O attributes (Barney, 1991). CEO as a mechanism to enable EO activity is building intangible assets while reinforcing relative exploration as shown in Fig. 1. Intangible, strategic assets have a long-life cycle and can be used in the global expansion (Morck and Yeung, 1998) which is predominantly a balance of exploration and exploitation focus. The relative exploration of intangible assets generated in the EO process must be deployed in a broad range of markets through internationalization and to multiple firms through licensing, joint ventures, or strategic alliances. Teece (1986) supports this notion that the long-term exploration orientation will only survive if we can exploit it through economies of scale and scope at the same time (Kotabe, Srinivasan, & Aulakh, 2002; Morck and Yeung, 1991).

Second, when CEO EO empowers organization it builds open-mindedness, commitment, and shared vision (Sinkula et al., 1997): key ingredients needed for learning orientation to develop. Also, we assert that this is a self-reinforcing loop as it is with exploration and exploitation (Gupta et al., 2006). Higher the CEO EO and relative exploration interact and bundle each other a higher impact on performance results; we call it 'attention effect'. However, a note of caution is that the firm needs to be alerted to avoid 'success trap' or 'failure trap' by avoiding too much interaction on either of them (March, 1991).

Third, the learning mechanism discussed here and in hypothesis 1, both complements to CEO EO as a failure in entrepreneurial approach is inevitable and learning from failure and success must be embedded in the organization (Madsen and Desai, 2010). Hence, as discussed in the second argument, it supports the self-sustaining loop of interactions. Higher the relative learning and CEO EO interact and bundle each other, a higher impact on performance results; we call it 'learning effect'. The standalone and amalgamation (interaction) of 'attention effect' and 'learning effect' affects firm performance significantly.

Fourth, though we started EO as attention and argued that it actually merges or bundles or interacts with relative exploration to be a 'resource' and that is also having VRIN-O attributes contributing to the firm performance and sustainable competitive advantage at the end, we conclude that our unit of analysis is 'resource' not firm or individuals. This approach helped us to combine both individual, firm, and market levels of analysis. In such unit of analysis as suggested by the following argument, we juxtaposition both learning and CEO EO: "In a Resource-based view, discerning appropriate inputs is ultimately a matter of entrepreneurial vision and intuition, the creative act underlying such vision is a subject that so far has not been a central focus of resource-based theory development" (Conner, 1991, p. 121).

When relative exploration is conceptualized as a process of seeking of costly-to-copy inputs for innovation, production, and distribution anchored in RBT, entrepreneurial vision and intuition nourish them to create a shared vision, commitment, and open-mindedness (Sinkula et al., 1997) which interacts positively with CEO entrepreneurial orientation (EO) (Ferreira, Marques, Bento, Ferreira, & Jalali, 2015; Keil et al., 2017) conceptualized as attention (Ocasio, 1997; Laamanen,

2019).

Fifth, before this study, EO has been conceptualized as a firm-level construct EO (Lumpkin and Dess, 1996). It is common wisdom that important decisions in a firm are centralized. The argument does not only rest on the centralization of decision-making, but it also argues for the empowerment of others through various mechanisms (Ferreira et al., 2015; Keil et al., 2017). Based on the Upper Echelon theory (Hambrick and Mason, 1984; Najmaei and Sadeghinejad, 2019), CEO's are the images of the organization. If they have both EO and learning embedded culture, the organization thrives. Absence of either one, they will falter.

Sixth, various studies (e.g. Rauch et al., 2009), suggest that there is a relationship between entrepreneurial orientation and firm performance. Blinded by the obvious over three decades, even after meta-analysis on the subject, the understanding is limited and contingent effects are important to understand (Wiklund & Shepherd, 2003, 2005). Cho and Hambrick (2006) posit that EO as attention influences CEOs' decisions regarding entrepreneurial drives and culture, and at the same time gives credibility to entrepreneurial drive throughout the organization which becomes pervasive, and entrepreneurial cultures of innovation, search, experimentation, and celebrating failure for ultimately succeeding become the norm rather than the exception.

In preceding discussions, we covered the conceptual clarity and the linkages between CEO EO as attention and relative exploration. Wang (2008) argued that when the organization gets the CEO's attention to each dimension of EO as described above, the old dictatorial and bureaucratic structures vanish which brings decentralized and delegated communications in the whole organization. Such abolishment of the old guard facilitates the development of a shared vision. Thus, CEO EO contributes a suitable environment inside the organization for organizational learning to happen to result in a perpetual loop of being more entrepreneurial firm breeds more learning-oriented culture with values to promote commitment to learning, open-mindedness, and shared vision (Sinkula et al., 1997). Based on the synchronism of learning orientation and CEO EO, a firm can give better insights on the creation of new heterogeneous resources enabling reconfiguration of resources which leads to heterogeneous resources (Alvarez and Busenitz, 2001). These distinct bundles of resources are potential to be qualified as VRIN-O resources such as tacit knowledge of market and customer alike generated through the balancing act of exploration and exploitation.

Therefore, the synergistic or complementing effect of CEO EO on the relationship between relative exploration and long-term performance can be called 'the entrepreneurship of resource-based theory' (Alvarez and Busenitz, 2001). This is a distinctive domain of entrepreneurship that differentiates a firm from its competitors (Alvarez and Busenitz, 2001). Barney (2001) recognized the need for this distinctive entrepreneurship linked with the RBT as the researchers have not given much attention in applying the RBT in entrepreneurship research. As extant RBT largely 'fails to integrate creativity and the entrepreneurial act' (Barney, 2001), by crossing the boundaries to integrate with the ABV and synching with relative exploration anchored in RBT, we have opened a new frontier of research by 'identifying resources such as entrepreneurial alertness, insight, entrepreneurial knowledge, and the ability to coordinate resources, as resources in their own right' (Alvarez and Busenitz, p. 772).

Our study deviates from tradition slightly and argues that rather than using it as an antecedent to sustainable performance, it is used as a moderating effect to the relative exploration/future financial performance relationship based on **six arguments** and even at the sub-dimension level, we developed in this section with novel contribution as to our knowledge, conceptualization, and operationalization at the individual (CEO) levels are non-existing nor 'resource' as a unit of analysis which helped us to go deeper in multiple levels.

Therefore, not only CEO EO as a construct but also all five dimensions of CEO EO as attention (Ocasio, 1997; Laamanen, 2019; Keil et al., 2017) enable organization-wide entrepreneurship drive and guide the

organization to be successful in nourishing or complementing the learning code for explorative and exploitative learning and balance thereof (March, 1991; Uotila et al., 2009) make a significant improvement in firm performance. Thus,

Hypothesis 2: CEOs' attention to entrepreneurial orientation positively moderates the relationship between relative exploration and future financial performance.

#### 4. The interplay of CEO market orientation and relative exploration

Narver and Slater (1990) define market orientation as the organization culture that most effectively and efficiently creates the necessary behaviors for the creation of superior value for buyers and, thus, superior performance for the business. This research operationalizes market orientation as a five-dimensional construct similar to (Narver and Slater, 1990). The five dimensions are three core components (customer orientation, competitor orientation, inter-functional coordination) and two decision components (long-term focus and profitability). The positive outcomes of being market-oriented include firm consequences, customer consequences, innovation consequences, and employee consequences (Jaworski & Kohli, 1996). Over some time, due to modernization organizations have become more market oriented. Market-oriented CEOs may be in a better position to guide how to serve the market and create value for both the customer and the firm (Merlo and Auh, 2009). Thus, market orientation essentially provides the reinforcements for planning and executing strategies that aim to deliver customer satisfaction, and sustain competitive advantage (Day, 1999; Martin & Grbac, 2003).

The market orientation (MO) and its impact on performance are well-researched, as found in the meta-analysis researches on – 63 studies on performance outcomes of market orientation (Cano, Carrillat, & Jaramillo, 2004) and 355 studies on consequences of market orientation (Kirca, Jayachandran, & Bearden, 2005). To be successful in avoiding the exploitation trap due to too much focus on exploitation, and in that matter the failure trap due to too much focus on exploration, CEOs must be market-oriented and give attention to customers, competitors, inter-functional coordination, long-term focus, and profitability. According to Upper Echelon theory (Hambrick and Mason, 1984; Najmaei and Sadeghinejad, 2019), firms are the image of their CEOs and they mimic the attention and behaviors of the top management. Therefore, when CEOs are market-oriented, in general firms adopt a similar approach in their daily activities.

Scholars (Hult, Ketchen, & Slater, 2005; Li & Calantone, 1998) confirm that marketing resources are vital to the performance of firms. Most of the existing studies where MO has a positive impact on performance have used subjective measures of performance (Kirca et al., 2005; Wang, Chen, & Chen, 2012). Previous studies have answered different questions to strengthen the role of MO for an organization. For instance, how internal stakeholders closely involved in a market orientation process can impede or encourage the achievement of market-oriented objectives (Schlosser and McNaughton, 2007) and how to execute selling strategies with market-oriented culture to generate market-oriented behavior (Lai, 2016; Baber et al., 2018).

However, previous studies indicate both direct roles (Pelham, 1997; Sin et al., 2005; Li et al., 2008) as well as mediation and moderation roles (Hsieh, Chiu, & Hsu, 2008; Wei, Zhao, & Zhang, 2014) of MO with organizational performance. So far studies have coupled market orientation with technology, innovativeness, and product orientations (Augusto and Coelho, 2009; Noble, Sinha, & Kumar, 2002; Zhou, Yim, & Tse, 2005). Looking at the flow of relative exploration depicted in Fig. 1, it could be argued that beginning from the strategically unique assets and traveling through the core and dynamic capabilities the exploitation outcome depends on the CEO EO and CEO MO. A simple direct relationship may not capture the complete picture because these are two different focuses responsible for the sustainable performance of

an organization.

CEO EO represents strategical functions such as building capacities, innovativeness, pro-activeness and risk abilities, market orientation cast entrepreneurial orientation, and guides all aspects of the firm's activities to enhance performance. For example, new product performance (Wei & Atuahene-Gima, 2009), and salespersons' attitudes (Siguaw, Brown, & Widing, 1994); change in the composition of customers and their preferences (Jaworski and Kohli, 1993); competitor orientation and inter-functional coordination (Chung, 2011). Hsieh et al. (2008) believed that the three components make up a distinct strategic marketing resource and play a crucial role in firm performance.

Behavioral components and decision criteria both are two legs of market orientation (Narver and Slater, 1990). Looking at the behavioral components, customer orientation deals with the orientation of solving customer complaints, regularly evaluating ways of creating superior value and customer satisfaction (Gray, Matear, Boshoff, & Matheson, 1998; Pelham, 1997) this helps in positive image building of the firm. Competitor orientation comparative advantage to a firm over the rivals by monitoring and using information related to competitors' marketing activities (Gray et al., 1998; Hsieh et al., 2008). In tandem with this view, Hsieh et al. (2008) contend that competitor orientation is important since it enables organizations to align with their rivals in their quest to develop new products, manufacturing strategies, setting the competitive price, delivery time and other promotional activities.

Inter-functional orientation helps in aligning and coordinating all the organizational functions to achieve objectives of the organization (Tajeddini, Trueman, & Larsen, 2006). Long term focus and profitability are two decision criteria followed by the organizations to gain sustainable competitive advantage. Organizations are responsible to generate and disseminate values to their stakeholders. Hence, keeping the focus on long term sustainability and profitability enable organizations to deal with market dynamics and secure wealth of the organization (Jaworski and Kohli, 1993; Wang et al., 2012).

Therefore, studying this construct as CEOs' market orientation in conjunction with CEO's entrepreneurial orientation is important to understand and reveal performance outcomes that are yet to be addressed in the literature. Innovation and efficiency need not be a trade-off if proper attention to the market is given at the right time. Through the balancing act of the CEO, we argue that there is a positive moderating effect of CEO market orientation on the relationship between relative exploration and performance. Thus, hypothesis 3 is developed as follows:

Hypothesis 3: CEOs' attention towards the market positively moderates the relationship between relative exploration and performance.

Fig. 2 summarizes the relationships between OA (relative exploration) and performance (Tobin Q), and the moderating effects of CEO EO and MO, which are conceptualized using the ABV as outlined in the introduction section.

## 5. Methodology

This study is based on the Nordic NASDAQ sample over 10 years. Departing from the tradition of survey-based research with common-method variance, we followed the computer-aided text analysis (CATA) (Uotila et al., 2009) as a measurement method for both EO and MO. This research design enabled us to use System GMM (Generalized Methods of Moments) (Arellano and Bond, 1991) as an analysis method, which tackled endogeneity, unobserved heterogeneity, and common method variance at the same time in the specification itself.

### 5.1. Data and sample

This research has a cross-industry, cross-sector sample of large-cap and mid-cap Nordic companies. The sample, therefore, included a number of the most prominent companies from Sweden, Finland,

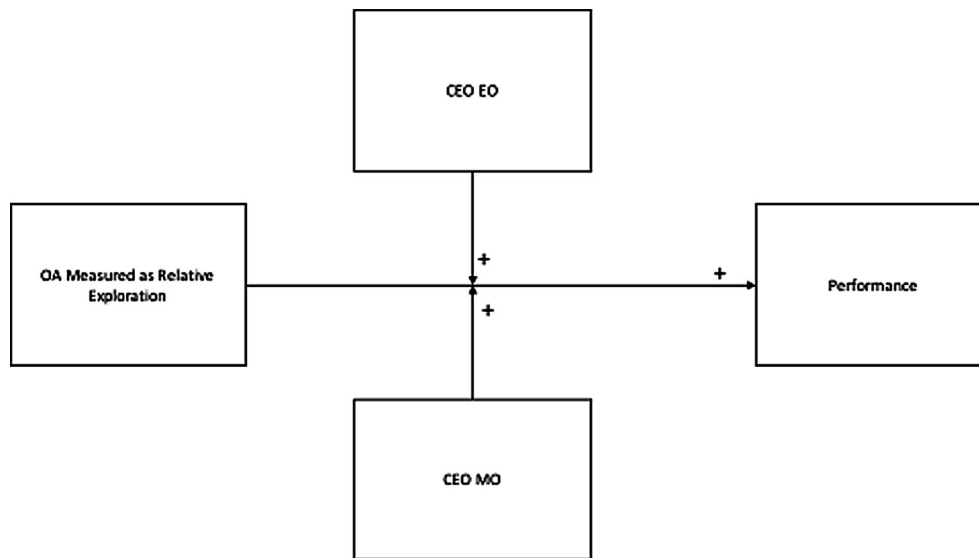


Fig. 2. Theoretical Framework.

Denmark, and Iceland. Norway, while being a member of the Nordic countries, is an outsider to the EU and not included in Nasdaq Nordic index calculations. Sweden, Finland, Denmark, and Iceland are very similar to each other in terms of the business environments that the companies are facing (Benito et al., 2003).

In the Nordic stock exchange, companies with a market capitalization of EUR 1 billion or more are considered to be large-cap companies, while those with a market capitalization of EUR 150 million or more are considered to be mid-cap companies. We constructed a panel dataset of all the firms across the different sectors in the Nordic large-cap and mid-cap indices from 2005 to 2014. Data was collected from annual reports and FactSet. As of 2015, there were 296 firms listed under the categories large-cap (> = 1 billion EUR) or mid-cap (> = 150 million EUR) in the Nasdaq Nordic stock exchange index. During data collection, we found 27 firms that we had no access to annual reports for or which contained missing data. These firms were not included in this study. Therefore, the final sample consisted of 269 companies in the Nasdaq Nordic large- and mid-cap indices.

Country distributions are tabulated in Table 1, and the distribution of large-cap and mid-cap companies is tabulated in Table 2 with the percentile distribution of the sample companies. The results of the country of origin and size distributions indicate that Swedish firms and mid-cap companies dominate the sample (57% and 60% respectively).

### 5.2. Variables

The dependent variable of the study is Tobin's Q, which is set to measure a firm's long-term sustainable performance. Because of the different, variable, and often uncertain time lags with which exploration and exploitation have been argued to influence a firm's sustainable performance, the research uses a market-based sustainable performance measure to examine the effects of exploration and exploitation, on not only the firm's current sustainable performance but also on the market's expectations of its future sustainable performance. Tobin's Q is

therefore used as the measure of sustainable performance, which captures both short-term and long-term sustainable performance (Lubatkin and Shrieves, 1986; Uotila et al., 2009). Various authors have defined this measure as the market value divided by the book value of assets (Brown and Caylor, 2006), and this is the approach utilized in this study to operationalize Tobin's Q (Lubatkin and Shrieves, 1986).

Independent and moderating variables, which are exploration and exploitation, can be operationalized as either two separate constructs, or as a single continuous variable denoting the relative degree of exploration relative to exploitation (Gupta et al., 2006). The latter approach conceptualizes a firm's exploration–exploitation strategy as a variable ranging from zero to one, with a value of zero indicating that the firm only focuses on the exploitation, and a value of one indicating a total focus on exploration. This approach has frequently been used to study the antecedents and consequences of a firm's exploration–exploitation strategy (Lavie and Rosenkopf, 2006; Uotila et al., 2009), and will be adopted in this study to examine how the effects of such a strategy are moderated by the firm's competitive orientation.

Our main independent variable, relative exploration, was measured using the content analysis approach (Uotila et al., 2009), and the detailed word list is listed in Table 3. Content analysis of annual reports is an alternative to self-informant based cross-sectional survey methodology on three fronts. First, survey methodology-based research is prone to the bias of a single key informant in each firm. Content analysis of annual reports facilitates the collection of data issued on behalf of the management board, including the CEO, in contrast to a single informant. Second, key informants are typically not easily reachable in survey-based research, whereas annual reports as data sources are readily accessible for publicly listed companies. Third, annual reports are normally available from the previous year without a retrospective bias to construct a panel of data. Textual data extracted from annual reports has a further advantage over more specialized measures, such as patent data, in that it is substantively similar in format across different industries, thus facilitating an easier cross-industry study such as in this research spanning a large number of industries.

In addition to communicating their strategies to stakeholders, firms may have alternative concerns such as legitimacy and image management, which influence the language used in annual reports (Stanton and Stanton, 2002). Still, we consider the threat of such concerns biasing our results to be at low levels due to legislative and bookkeeping reasons. First, we are not taking the firms' claims at face value, but rather using a relatively neutral list of keywords as discussed below to identify

Table 1  
Country distributions.

Country	Number of firms	Observations	Percentages
Denmark	48	480	18%
Finland	64	640	25%
Sweden	148	1480	57%
Total	260	2600	100%

**Table 2**  
Large cap and mid cap companies, observations in each country.

Country	Number of Large Cap Firms	Percentages	Large Cap Observations	Number of Mid Cap Firms	Percentages	Mid Cap Observations
DK	20	20%	200	28	18%	280
FI	28	28%	280	36	23%	360
SE	53	52%	530	95	60%	950
Total	101	100%	1010	159	100%	1590

the relative emphasis the firms put on exploration versus exploitation. We have no reason to believe that a firm trying to spin their image in a particular way would lead to a disproportionate use, or lack of use, of these particular words. Secondly, because we are measuring exploration and exploitation as relative to one another, emphasizing one in their communications means a firm would automatically de-emphasize the other. Thus, even if the firms were to be strategic in their communications and for example play up their successes, our measure would still reflect the balance between exploration and exploitation in their activities.

The traditional approach to content analysis is based on human coders. However, various studies have utilized computer-aided text analysis and human coding and found the results are comparable (Laver, Benoit, & Garry, 2003). Consequently, we adopted the computer-aided text analysis (CATA) method (Uotila et al., 2009). These annual reports are analyzed, with the keywords identifying exploratory and exploitative actions validated (Uotila et al., 2009) and anchored in our original definition of exploration and exploitation (March, 1991). The total sums of the counts of exploratory and exploitative words in a particular annual report, representing the corresponding company-year, are used as the measures for exploration and exploitation. Relative explorations are calculated as exploration / (exploration + exploitation) and therefore can take values ranging from zero (no exploration, only exploitation) to one (only exploration, no exploitation).

We use the CEOs' EO as attention as operationalized (Uotila et al., 2009) and detailed keywords used in that paper and ours also are from (Short, Broberg, Coglisier, & Brigham, 2010), and all keywords are listed in Table 3. Their argumentation and operationalization methods are based on the CATA procedure, which enables longitudinal research when compared to traditional survey-based research due to the retrospective bias and non-availability of informants for the whole study period. Second, CATA protects the privacy and confidential information, it is easier to replicate, and it is also more reliable.

CEO Market Orientation is also set as attention. The market orientation (Kohli & Jaworski, 1990) can be defined as the norms and behaviors that support the firm-level development and sharing of market information. In this notion, strategic responses to market information are included. We use the market orientation measure (Zachary, McKenny, Short, & Payne, 2011) using content analysis of CEO letters from the S&P 500, and the detailed keyword list is shown in Table 3.

The current research setting is similar to (Zachary et al.'s 2011) approach, and annual reports will be used as data sources. We will follow the original five-dimensions (Kumar, Subramanian, & Yauger, 1998): customer orientation, competitor orientation, inter-functional coordination, long-term focus, and profitability. In most of the survey studies, only the first three dimensions were used. Therefore, going for the original definition is possible with this research design. Most of the survey-based studies have dropped the latter two dimensions, as they did not correlate to performance.

Firm size as a control variable was measured as the logarithm of the number of employees. We also included year controls, as well as industry controls operationalized as dummy variables at the 2-digit SIC code level. We included the lagged values of the dependent sustainable performance variable in the models, as a control for unobserved heterogeneity. Table 4 summarizes the constructs, measures, and sources

used in this study. We used one percent Winsorization for all continuous variables except relative exploration, which was naturally bounded between zero and one.

After running the newey2 command in Stata, for the panel data we used neweyvif command to check if the variance inflation factor could be used. In this test, we received the following table where neither CEO EO nor CEO MO had a value higher than 10. Hence, there is no risk of multicollinearity as shown in Table 5 below.

Also, in system GMM we report two levels of autocorrelations AR1 and AR2. In both cases, there is no sign of autocorrelation avoiding multicollinearity. In the case of multicollinearity, nowadays Stata drops variables itself, which did not occur at all in our case. Therefore, we rule out that multicollinearity in modeling is a problem.

### 5.3. Model

System GMM is used as the analysis method to account for the endogeneity problem inherent in panel data. We used the Arellano-Bond System GMM estimator (Arellano and Bond, 1991; Blundell and Bond, 1998) due to the presence of the highly persistent dependent sustainable performance variables. We test each hypothesis by following the latest specification and argumentation to use system GMM (Keil et al., 2017). There are five key reasons for the system GMM estimator to be the most robust estimator for our research. First, the type of data demands this method, as our data is panel data with few periods and many companies. Second, the dependent variable is driven by previous levels of sustainable performance. This required us to use the lagged dependent variable as a control. Third, the panel data is inherent with heteroscedasticity and autocorrelation, which needs to be controlled. Fourth, perhaps our explanatory variables are correlated with past and current realizations of the error term. Fifth, this specification has the most prevalent control for unobserved heterogeneity.

At this point, it is interesting to explore the benefits of using the lagged dependent variable as control and the associated benefits and risks. Lagged dependent variables can be used with time series and panel data where many observations at multiple times are used. Lags refer to time-related and to other variables. In our data when we lag data by one year, let's say if all variables are measured in 2014, we use the value from 2013 in the analysis. In arguing for causality, the second condition, called temporal precedence, could be handled through a lagged variable.

Another issue discussed in the context of panel data is a serial correlation, or autocorrelation, which occurs when a variable correlates with itself over time. It is important to note that the regression techniques make no assumptions about the autocorrelation of independent variables, but there should be no autocorrelation of the error term. The effects of the serial correlation of the error term are similar to the effects of heteroscedasticity. Two-step system GMM not only handles first-order serial correlation but also goes one step further to handle second-order serial correlation. Following prior research (Uotila et al., 2009), industry and year controls were treated as exogenous variables and all the other variables were treated as predetermined. Due to a large number of variables and years in our data, we limited the number of instruments to the first available lagged levels to avoid overfitting bias. The System GMM estimation was run using the xtabond2 Stata module (Roodman, 2009).



**Table 3**  
Words used in CATA.

Authors	Construct(s)	CATA Keywords
Uotila et al. (2009)	Relative exploration (Exploration divided by the total of exploration & exploitation)	The wildcard ‘*’ can represent any characters. Exploratory action: explor*, search*, variation*, risk*, experiment*, play*, flexib*, discover*, innovat * Exploitative action: exploit*, refine*, choice*, production*, efficien*, select*, implement*, execut*
Short et. al (2010)	CEO EO (Autonomy, Innovativeness, Proactiveness, Competitive aggressiveness, Risk-taking, additional inductively derived words)	At-liberty, authority, authorization, autonomic, autonomous, autonomy, decontrol, deregulation, distinct, do-it-yourself, emancipation, free, freedom, free-thinking, independence, independent, liberty, license, on-one's-own, prerogative, self-directed, self-directing, self-direction, self-rule, self-ruling, separate, sovereign, sovereignty, unaffiliated, unattached, unconfined, unconnected, unfettered, unforced, ungoverned, unregulated Ad-lib, adroit, adroitness, bright-idea, change, clever, cleverness, conceive, concoct, concoction, concoctive, conjure-up, create, creation, creative, creativity, creator, discover, discoverer, discovery, dream, dream-up, envisage, envision, expert, form, formulation, frame, framer, freethinker, genesis, genius, gifted, hit-upon, imagination, imaginative, imagine, improvise, ingenious, ingenuity, initiative, initiator, innovate, innovation, inspiration, inspired, invent, invented, invention, inventive, inventiveness, inventor, make-up, mastermind, master-stroke, metamorphose, metamorphosis, neoteric, neoterism, neoterize, new, new-wrinkle, innovation, novel, novelty, original, originality, originate, origination, originative, originator, patent, radical, recast, recasting, resourceful, resourcefulness, restyle, restyling, revolutionize, see- things, think-up, trademark, vision, visionary, visualize Anticipate, envision, expect, exploration, exploratory, explore, forecast, fore- a glimpse, foreknow, foresee, foretell, forward-looking, inquire, inquiry, investigate, investigation, look-into, opportunity-seeking, proactive, probe, prospect, research, scrutinization, scrutiny, search, study, survey Achievement, aggressive, ambitious, antagonist, antagonistic, aspirant, battle, battler, capitalize, challenge, challenger, combat, combative, compete, comp- enter, competing, competition, competitive, competitor, competitor, conflicting, contend, contender, contentious, contest, contestant, cutthroat, defend, dog-eat-dog, enemy, engage, entrant, exploit, fierce, fight, fighter, foe, intense, intensified, intensive, jockey-for-position, joust, joust, lock-horns, opponent, oppose, opposing, opposition, play-against, ready-to-fight, rival, spar, strive, striving, struggle, tussle, vying, wrestle Adventurous, adventurous, audacious, bet, bold, bold-spirited, brash, brave, chance, chancy, courageous, danger, dangerous, dare, daredevil, daring, dauntless, dicey, enterprising, fearless, gamble, gutsy, headlong, incautious, intrepid, plunge, precarious, rash, reckless, risk, risky, stake, temerity, uncertain, venture, venturesome, wager Advanced, advantage, commercialization, customer-centric, customized, develop, developed, developing, development, developments, emerging, enterprise, enterprises, entrepreneurial, exposure, exposures, feature, features, founding, high-value, initiated, initiatives, innovations, innovative, introductions, launch, launched, leading, opportunities, opportunity, originated, outdoing, outthinking, patents, proprietary, prospects, prototyping, pursuing, risks, unique, ventures Attendee, buyer, buying, client, clientele, consume, consumer, customer, empor, habitu�, market, marketer, patron, patronage, patronize, patronized, purchase, purchased, purchaser, purchasing, shopper, spectator, subscribe, subscribed, subscriber, subscribing, user, vend, vended, vendee, visitor Adversary, adverse, aggression, aggressions, aggressive, ambition, ambitions, ambitious, antagonist, antagonize, antagonized, aspirant, aspire, aspired, aspires, assail, assailant, assailants, assailed, barricade, barricaded, battle, battled, battler, battles, beat, beaten, beating, bid, bid, bidder, block, blockade, blockaded, blocked, blocks, challenge, challenged, challenger, challenges, challenging, clash, clashed, clashes, clashing, collide, collided, collides, colliding, combat, combated, combating, combative, combats, compete, competed, competer, competes, competing, competition, competitive, competitor, competitors, conflict, conflicted, conflicting, conflicts, confront, confrontation, confrontational, confrontations, conquer, conquered, conquering, conquers, contend, contender, contending, contentious, contest, contestant, contestants, counteraction, counteractions, counteractive, cutthroat, cutthroats, disputant, dispute, disputed, disputes, disputing, enemies, enemy, engage, engaged, engagement, engagements, engages, engaging, entrant, fight, fighting, fights, foe, foes, formidable, fought, grappled, grapple, grapples, grappling, jockey, jockeys, jockied, match, matched, matches, matching, opponent, oppose, opposed, opposers, opposing, opposition, oppositionist, oppositionists, oppositions, outbid, outclass, outclassed, outclassing, outmatch, outmatched, outmatches, outmatching, outrank, outranked, outranking, outranks, outrate, outrated, outrates, outrating, participant, participants, participate, participated, resist, resistance, resistant, resistants, resisted, resisting, rival, rivals, spar, sparing, sparred, spars, strive, strived, strives, striving, struggle, struggled, struggles, struggling, superior, surpass, surpassed, surpasses, surpassing, vied, vying, war, warring, aggressor, combatant, imitator, advantage, advantages Accordant, accordants, amalgam, amalgamate, amalgamation, associate, associated, associates, associating, coactive, coadjuvant, coalesce, coalescence, collaborate, collaborated, collaborates, collaborating, collaboration, collaborative, combination, combinations, combine, combined, combines, combining, complement, complementary, complementary, complemented, complementing, complements, concerted, concerting,
Zachary et al. (2011)	CEO MO (Customer orientation, competitor orientation, inter-functional coordination)	Attendee, buyer, buying, client, clientele, consume, consumer, customer, empor, habitu�, market, marketer, patron, patronage, patronize, patronized, purchase, purchased, purchaser, purchasing, shopper, spectator, subscribe, subscribed, subscriber, subscribing, user, vend, vended, vendee, visitor Adversary, adverse, aggression, aggressions, aggressive, ambition, ambitions, ambitious, antagonist, antagonize, antagonized, aspirant, aspire, aspired, aspires, assail, assailant, assailants, assailed, barricade, barricaded, battle, battled, battler, battles, beat, beaten, beating, bid, bid, bidder, block, blockade, blockaded, blocked, blocks, challenge, challenged, challenger, challenges, challenging, clash, clashed, clashes, clashing, collide, collided, collides, colliding, combat, combated, combating, combative, combats, compete, competed, competer, competes, competing, competition, competitive, competitor, competitors, conflict, conflicted, conflicting, conflicts, confront, confrontation, confrontational, confrontations, conquer, conquered, conquering, conquers, contend, contender, contending, contentious, contest, contestant, contestants, counteraction, counteractions, counteractive, cutthroat, cutthroats, disputant, dispute, disputed, disputes, disputing, enemies, enemy, engage, engaged, engagement, engagements, engages, engaging, entrant, fight, fighting, fights, foe, foes, formidable, fought, grappled, grapple, grapples, grappling, jockey, jockeys, jockied, match, matched, matches, matching, opponent, oppose, opposed, opposers, opposing, opposition, oppositionist, oppositionists, oppositions, outbid, outclass, outclassed, outclassing, outmatch, outmatched, outmatches, outmatching, outrank, outranked, outranking, outranks, outrate, outrated, outrates, outrating, participant, participants, participate, participated, resist, resistance, resistant, resistants, resisted, resisting, rival, rivals, spar, sparing, sparred, spars, strive, strived, strives, striving, struggle, struggled, struggles, struggling, superior, surpass, surpassed, surpasses, surpassing, vied, vying, war, warring, aggressor, combatant, imitator, advantage, advantages Accordant, accordants, amalgam, amalgamate, amalgamation, associate, associated, associates, associating, coactive, coadjuvant, coalesce, coalescence, collaborate, collaborated, collaborates, collaborating, collaboration, collaborative, combination, combinations, combine, combined, combines, combining, complement, complementary, complementary, complemented, complementing, complements, concerted, concerting,

(continued on next page)

Table 3 (continued)

Authors	Construct(s)	CATA Keywords
		concurrent, congenial, congeniality, congenially, connect, connected, connecting, connects, consolidate, consolidates, consolidating, consolidation, consolidative, cooperate, cooperates, cooperating, cooperation, cooperative, coordinate, coordinated, coordinates, coordinating, correlated, correlation, correlational, correlative, fuse, fused, fusing, fusion, fusions, harmonious, harmony, in-concert, incorporate, incorporated, incorporating, incorporation, integral, integrate, integrates, integrating, integration, interact, interaction, interactional, interactive, interacts, joint, joint task, jointly, mutual, mutually, mutually beneficial, reciprocal, reciprocity, share, shared, shares, sharing, simpatico, symbiosis, symbiotic, symbiotically, syncretism, synergetic, synergistic, synergize, synergy, synthesis, synthesize, synthesized, synthesizes, synthesizing, team, team up, teaming, teams, teamwork, together, unification, unified, unite, united, unitedly, unites, unitize, unity, coaction, integrated, cross functional, interfunctional, company-wide, cross brand, mobilize, utilize, leverage, allocate, employ

6. Results

Descriptive statistics and correlation tables are reported in Table 6. Tobin’s Q has a mean value of 6.30, while CEO EO has 316.27. Similarly, CEO MO has a value of 1420.35 and relative exploration has a value of 0.55. R&D intensity is reported to be in the range of 0.49, and the number of employees (log) is 7.48. Correlations between variables are in a good range, and there is no multicollinearity. Also, system GMM drops variables in case of multicollinearity, but in our analysis, the dropping of the variables did not occur. Findings are reported in Table 6.

Model 1 reports the control model with a lagged dependent variable, R&D intensity, and company size. Model 2 reports the testing of hypothesis 1, which supports that there is a curvilinear relationship between relative exploration and performance. Model 3 reports the testing of hypothesis 2, which supports the theory that there is a positive moderating effect of CEO EO on the relationship between relative exploration and performance. Similarly, Model 4 reports the testing of hypothesis 3, which supports that there is a positive moderating effect of CEO MO on the relationship between relative exploration and performance. Fig. 3 plots the findings of hypothesis 1, clearly showing an inverted, U-shaped relationship between relative exploration and performance. However, the shape does not exactly resemble the earlier findings by *Votila et al. (2009)*.

The three scenarios in Fig. 4 depict how relative exploration (balancing of exploration and exploitation) has a differential impact on Tobin’s Q (sustainable performance) when CEO EO moderates the relationship either at high, medium or low levels.

In scenario one when CEO EO is at a high level, it has a U-shaped, positive influence on the relationship between relative exploration activities and Tobin’s Q. First, it has a negative slope, but then that becomes positive after a certain level of relative exploration has been achieved. High CEO EO influence reaches a turning point at 0.4 level of relative exploration when it has a turning impact on the relationship between relative exploration activities and Tobin’s Q. After or before this point, the impact on the relationship between relative exploration activities and Tobin’s Q wanes and reaches no effect level at both ends zero and one. At 0.6 and above the level of relative exploration, the

Table 4  
Descriptive statistics and correlations.

Variable	Mean	SD	Min	Max	1	2	3	4	5	6
1 Tobin’s Q <sup>a</sup>	6.30	9.74	0.39	67.35	1					
2 CEO EO	316.27	225.82	0	2286	-0.09	1				
3 CEO MO	1420.35	844.93	0	7101	-0.06	0.83	1			
4 Relative exploration	0.55	0.16	0	1	-0.05	0.05	0.04	1		
5 R&D intensity (log) <sup>a</sup>	0.49	1.02	0	6.16	0.19	-0.09	-0.02	-0.09	1	
6 Number of employees (log) <sup>a</sup>	7.48	2.17	1.61	11.72	-0.18	-0.07	-0.13	-0.18	-0.08	1

<sup>a</sup> Winsorized at the 1% level

Table 5  
VIF test.

variable	VIF	1/VIF
eosum	3.03	0.330517
mosum	3.03	0.330517
Mean VIF	3.03	3.03

impact of CEO EO as attention to enable, for example, corporate entrepreneurship becomes critical.

In scenario two when CEO EO is at the minimum level, it has a just curve flipping phenomenon, showing first a slightly positive curve, which then dries down and then takes a negative slope after 0.6 level of relative exploration values as shown in Fig. 4. In scenario three when CEOs’ EO is at a low level, it has a U-shaped, negative influence on the relationship between relative exploration activities and Tobin’s Q. Low CEO EO influence reaches a turning point at 0.6 level of relative exploration when it has the most negative impact on the relationship between relative exploration activities and Tobin’s Q. After or before this point, a negative impact on the relationship between relative exploration activities and Tobin’s Q wanes and reaches no effect level at both ends zero and one.

The two scenarios in Fig. 5 similarly show that the degree of relative exploration (OA-balancing of exploration and exploitation) has a differential impact on Tobin’s Q (long term performance) when CEO MO moderates the relationship.

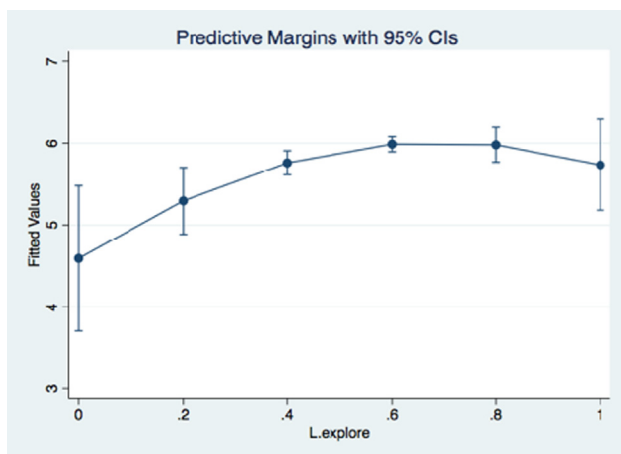
In scenario one when CEO MO is at a high level, it has a U-shaped, positive influence on the relationship between relative exploration activities and Tobin’s Q. High CEO MO influence reaches a turning point at 0.6, when it has the minimum impact on the relationship between relative exploration activities and Tobin’s Q, as it clearly shows that initial investments in developing EO do not result in performance. After or before this point, impact on the relationship between relative exploration activities and Tobin’s Q wanes and reaches no effect level at both ends zero and one. However, after 0.6 level of relative exploration, the performance slope is positive, and with a steep rise in performance.

In scenario two when CEO MO is at a low level, it has an inverted,

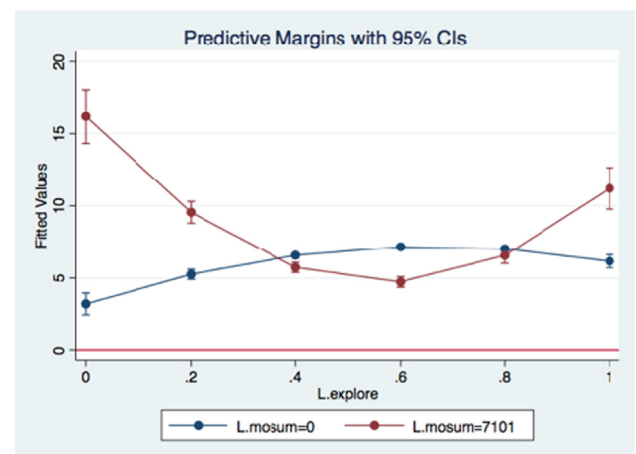
**Table 6**  
System GMM Regression of Tobin's Q (JbrR&REOMO.log).

Variable	Model 1	Model 2	Model 3	Model 4
<i>Explanatory variables</i>				
Relative exploration		4.1 (1.54)**	17.32 (1.43)***	11.95 (1.33)***
(Relative exploration X Relative Exploration)		-2.96 (1.33)*	-14.81 (1.26)***	-9.02 (1.16)***
(Relative exploration) × (CEO EO)			-0.04 (0.00)***	
(Relative exploration) × (Relative exploration) × CEO EO)			0.03 (0.00)***	
(Relative exploration) × (CEO MO)				-0.01(0.00)***
(Relative exploration) × (Relative exploration) × CEO MO)				0.01(0.00)***
<i>Control variables</i>				
Tobin's Q <sub>(t-1)</sub>	0.21 (0.01)***	0.79 (0.06)***	0.75 (0.16)***	0.05 (0.01)***
Number of employees, ln	-0.96 (0.23)***	0.13 (0.05)*	0.33 (0.11)***	0.43 (0.13)***
R&D intensity, ln	-0.66 (0.19)***	0.29 (0.05)***	0.066 (0.14)***	0.79 (0.14)***
N	1995	1380	833	833
Wald $\chi^2$	76***	95299.05***	133059.85***	123501.17***
Hansen (p-value)	0.50	0.42	0.65	0.44
z <sub>1</sub> (p-value)	-1.56 (0.12)	-2.07 (0.04)	-1.86 (0.06)	-1.90 (0.06)
z <sub>2</sub> (p-value)	-0.61 (0.54)	-0.94 (0.35)	-0.92 (0.36)	-0.93 (0.36)
Number of groups	254	208	158	158
Number of instruments	76	108	108	108

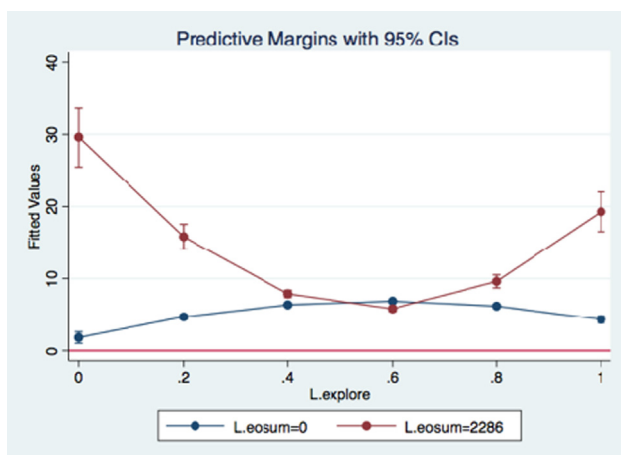
+ p < 0.1 level, \* p < 0.05 level, \*\* p < 0.01 level, \*\*\* p < 0.001 level. Parameters for moderation are small as the number of counts of words for CEO EO and CEO MO are very large.



**Fig. 3.** Curvilinear relationship between Relative Exploration and Firm Performance (Hypothesis: 1).



**Fig. 5.** Moderating effect of CEO MO on the Relationship between Relative Exploration and Performance (Hypothesis 3).



**Fig. 4.** Moderating Effect of CEO EO and CEO MO on the Relationship between OA and Performance (Hypothesis 2).

U-shaped, negative influence on the relationship between relative exploration activities and Tobin's Q. Low CEO MO influence reaches a turning point at 0.6 when it has the most positive impact on the

relationship between relative exploration activities and Tobin's Q. After or before this point, a negative impact on the relationship between relative exploration activities and Tobin's Q wanes and reaches no effect level at both ends zero and one.

To summarize, we followed the procedure by Haans, Pieters, and He (2016) to study the inverted U-shape. First, we tested the relative exploration with a sustainable performance relationship. Then we introduced CEO EO (Fig. 4) and CEO MO (Fig. 5) as moderators. Firms showed a higher performance at the higher level of CEO EO and CEO MO, with the result showing the curve flipping at the lower level of CEO EO and CEO MO. Both Figs. 4 and 5 demonstrate the idea suggested by Haans et al. (2016, p. 27) about the curve flipping at the lower level of EO and MO.

### 7. Discussion

Our study using ABV complements RBT in explaining sustainable competitive advantage, especially in a fast-changing environment. The findings of the study validate that relative exploration has an inverted U-shaped relationship with the long-term performance which is positively moderated by both CEO's EO and MO. The result of this work should advance to the development of a more theoretical and a managerially apt description of the relationship between ABV and RBT.

### 7.1. Theoretical implications

We initiated our study to conceptualize: (1) Why are VRIN-O resources on their own are not the only necessary and sufficient conditions for sustainable performance; also, why to introduce decision-makers' attention as a key moderator in achieving sustainable performance? (2) Whether the CEO's attention as an enabling mechanism of entrepreneurial drive or market focus matters for the organizations when pursuing relative exploration operationalized as a manifestation of VRIN-O advantage in the firm?

Conceptually, RBT (Barney, 1991; Barney, Wright, and Ketchen, 2001; Barney, Ketchen, and Wright, 2011; Lavie, 2006) explains the direct link between relative exploration (Uotila et al., 2009; Jancenelle, 2019) and performance. ABV argues that the performance and behavior of a firm is the result of how firms channelize and distribute the attention of their decision-makers. The present study used the conceptualization of ABV as a combination with entrepreneurial orientation (EO) because EO affects the performance of the firm (Keil et al., 2017). Similarly, the market orientation (MO) of decision-makers in a firm (Narver and Slater, 1990; Zachary et al., 2011) also affects the firm's performance.

The need for the integration of RBT and ABV has been accomplished empirically (Ocasio, 1997; Laamanen, 2019) to capitalize on sustainable performance where attention is considered as a rare and valuable resource itself. RBT focuses on VRIN-O resources to create a sustainable competitive advantage, and ABV brings forward how CEOs' attention is important while allocating and reconfiguring resources for survival and growth. Therefore, in achieving the objectives of firms, both views contribute significantly. Thus, our contributions center on four out of five themes as demanded by Barney, Ketchen, and Wright (2011): interlinkages with other perspectives moving beyond RBT, processes of resource acquisition and development explained through the relative exploration and moderation of CEO EO and CEO MO, and method through system GMM and measurement issues through CATA.

Also, another aspect we have claimed in the introduction is as per Ocasio (1997), his assertion that the attention-based view alone cannot explain what the sources of a firm's competitive advantage are. Therefore, it is important to understand how and why the CEO's attention towards enabling firm-level entrepreneurial drive and market focus is important for the long-run performance anchored in the focus of relative exploration. Understanding firm heterogeneity is possible for a *particular point in time*, but it has no explanatory power about why firm heterogeneity lasts under intra-industry rivalry.

Therefore, our study significantly contributes to building knowledge on sustainable performance and firm heterogeneity by integrating the resource-based theory with the attention-based view. The objective of this integration is to develop a more compelling understanding of the business strategy and value creation. In attempting this arduous task, we modeled CEO EO and CEO MO as moderators, as a novel contribution to the literature.

The findings suggested that the construct of OA, when conceptualized based on the RBT, becomes stronger in the presence of the moderating effects of CEO EO and CEO MO as suggested by the ABV (Ocasio, 1997; Laamanen, 2019). Though the valuable, rare, inimitable, and non-substitutable resources are the cornerstones of sustainable competitive advantage, the call for integrating attention as a rare and valuable resource (Ocasio, 1997; Laamanen, 2019) has not been tested empirically so far to our knowledge. Normally, CEOs' attention span is a challenge in many firms that are operating under high uncertainty. The current research builds a strong link between these two paradigms and concludes that to realize the benefits of the RBT, one needs to take good care of the CEOs' attention in entrepreneurial and market-related activities.

Our findings suggest that though both of these seemingly similar constructs which do not have a multicollinearity effect when they are studied or applied together in the organization, CEOs' EO and MO both

have a multiplying effect on performance when relative exploration becomes the focus of the organization. These constructs, when looked from the theoretical lenses of resource-based theory and attention-based view, validate the important research gap demanded by Ocasio (1997).

Going beyond Cho and Hambrick (2006), we extended and linked the EO as attention construct with the resource-based theory, while CEOs' MO link shows to be a positive contribution in research that may drive further, extended research into untangling the mechanism in which Upper Echelon theory's suggestion that organizations are the images of the CEO. This claim, which we also mentioned in the introduction section, goes beyond Cho and Hambrick (2006), also how and through which mechanism CEOs and top management teams' (TMT) attention matters in developing entrepreneurship and customer-first philosophies.

Along with RBT and ABV, the industry-based view is denoted as the third leg of the strategy tripod, which is outlined in the future research section. Hence, the present study is an addition to the knowledge of firm strategy and behavior from the selective attention of decision-makers which either supports or blocks perception and action. However, the notion is not to replace the resource-based theory or industry-based view as such but to complement it.

Our research advanced literature on firm strategy and behavior when subject to the selective attention of decision-makers, which either supports or blocks perception and action. While this study has touched upon the entrepreneurial perspective to the market and customer focus as a first strategy, it is not supposed to replace the resource-based theory of the firm or competitive perspectives on corporate strategy (an issue of further research); rather complements it.

### 7.2. Methodological implications

In answering the research call for longitudinal studies with novel measurement techniques such as CATA that can handle common method variance, endogeneity, and unobserved heterogeneity in regression specification itself enabled by system GMM, our study also made some interesting empirical contributions. First, these features are in-built in system GMM (Allerano and Bond, 1991) which enabled us to move closer to validating causal links of the constructs and moderators with the sustainable performance of the firm over a specified time.

Second, our arguments and results also contribute to the research on both mid-cap and large-cap Nordic firms, a unique context of institutions. Reeb, Sakakibara, and Mahmood (2012) argued that future submissions in the *Journal of International Business Studies* and other high-level journals needed to consider endogeneity concerns seriously. System GMM handles it through the use of instruments in the GMM specification itself by using instruments and lagged variables in modeling to avoid endogeneity and common method variance respectively and lagged dependent variables as a control to control for unobserved firm heterogeneity.

Third, in addition to the contributions to the literature, CEO EO and MO become complementors in the core of entrepreneurship research. To the best of our knowledge, we are amongst one of the first studies on the interaction of CEOs' EO and CEO MO with relative exploration on a causal mechanism, using the help of panel data and the latest measurements of CEO EO (Short et al., 2010) and CEO MO (Zachary et al., 2011).

Organizations need to be aligned and efficient in their management of ongoing business demands, while simultaneously being adaptive to changes in both the internal and external environments (Raisch and Birkinshaw, 2008). The broader organizational ambidexterity (OA) literature walked through different approaches such as addition, subtraction, and multiplication of exploration and exploitation, which have reported mixed findings in the literature. Our assertion is in line with (Uotila et al., 2009) which shows that rather than using addition, subtraction or multiplication measures of exploration and exploitation

to understand OA, it is better to focus on the relative exploration (which is the exploration divided by the total of exploration and exploitation).

### 7.3. Practical implications

Our arguments and results contribute to existing research on Nordic firms that are also focused on mid-cap and large-cap companies. While focusing on exploration orientation, CEOs may emphasize entrepreneurially and market penetrating customer-first behaviors which may create high value, or they may instead focus on organizational benefits rather than personal benefits, such as implementing entrepreneurial drive and customer-first philosophy and changing the culture of command and control to learning and empowerment satisfying VRIN-O criteria.

CEOs, while capitalizing on the short-term capital market and share price, must develop inherent characteristics to invest in the long-term solutions, where experimentation and exploration are allowed and failure leading to learning is an option. In balancing the short-term and long-term goals, their attention to entrepreneurial activities and market orientation must be the main agenda. If they miss this due to information overload or low attention span, an organization fails. Literature reported that Nokia failed due to shared emotions at the top, and was blinded by the obvious and CEOs' attention, as EO and MO were not on the radar. However, the turn-around initiated by Chairman Risto Siilasmaa turned the company around and started them sailing in the right direction. Perhaps the 'paranoid optimism' stated by the Chairman of Nokia will save the company at the end.

Although sample firms can have both positive and negative results depending on the situation, our results suggested that the relentless drive for a customer-first philosophy combined with entrepreneurial pursuits is key to their success. The absence of one or the other will make the strategy falter.

## 8. Conclusion

Thus, this study contributed on three fronts: theoretical front with the integration of resource-based theory and attention-based view, development of CEOs' or TMTs' attention as a mechanism that drives entrepreneurial orientation and market orientation in the firm, (before this research, these assumptions were implicit nor tested empirically), empirical front by using the Nordic settings which are called small open economies (SMOPEC), and the methodological front by answering the research call for longitudinal research that can handle endogeneity, common method variance, and unobserved heterogeneity.

The discussion above provides insights that the integration of resource-based theory and attention-based view, and the testing of this empirically in a longitudinal setting, is a novel contribution of this research to the current field. Against the backdrop of survey-based design in social science research, a new school of thought to use CATA is emerging and the paper has utilized all three constructs through the same method, though the dependent variable is used from the annual reports and FactSet database.

Due to this method only, researchers can utilize longitudinal design. Otherwise, doing longitudinal research is next to impossible through surveys or interviews, as retrospective bias and recall bias would undermine the accuracy of the research. Though practitioners have been familiar with attention as the key factor in making the next move for firms, our findings suggest that the academic rigor supports that attention is a rare resource that needs to be managed well.

The resource-based theory states that having valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities including dynamic capabilities (Teece et al., 1997; Teece, 2007; Teece, 2014) gives a firm a sustainable performance. However, anchored into the attention-based view, we raised the valid question as to why VRIN resources are not the only conditions necessary for sustainable performance and introduced decision-makers' attention as a key moderator in

achieving sustainable performance.

To test this relationship, we examined how the need of firms to balance their exploration and exploitation efforts, called relative exploration anchored in resource-based theory, is influenced by the attention-based view as a moderator and operationalized as CEOs' entrepreneurial orientation and market orientation. Using a panel data set of 269 firms listed on the Nordic NASDAQ stock exchange, we found a general, inverted, U-shaped relationship between relative exploration and long-term performance, while the attentions have a positive moderation effect. Implications for theory and practice were discussed.

## 9. Limitations and future research

This paper suffers from some limitations, as does all research. First, as we are aiming to connect two strong streams of literature, we may be blamed for sacrificing rigor against relevance. However, the belief is that the attention-based view has been sidelined in the literature since 1997 and that it is very important to re-introduce this fact as practitioner-oriented literature has been very popular, as shown by the latest book by the chairman of Nokia. As mentioned, a few times earlier, building a grand strategy tripod and testing on an empirical front, and bringing industry or competitive strategy perspective together with resources and attention would be a plausible research direction as well.

Second, many scholars in survey-based design may argue against using the CATA based method, which has its limitations and is still under development to reach the level of accuracy we aim to achieve. Third, additional research in refining the keywords and developing the discourse further would be highly recommended. Fourth, due to the space limitations and focus on the few variables, cross-industry analysis of the data is further due. Fifth, other less-developed countries might have different impacts on CEO EO and MO due to their cultures, and research could be extended to less-developed countries to empirically test these relationships.

While we positioned attention as a moderator, many studies may think of revising RBT where attention becomes a unique resource in itself which could be conceptualized as well. On the method of analysis, fixed effect, random effect or 2SLS approaches could be used to handle endogeneity also. However, getting the right instrument in testing 2SLS would be a daunting task. While opting for survey-based design, avoiding common method variance is highly recommended.

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\*Dr. Bhandari is post-doctoral researcher at the University of Helsinki, Finland while he received his D.Sc. (Econ. & Bus. Adm.) from the University of Vaasa, Finland. His research interests are focused on the interface of internalization theory, institution-based view, resource-based view, and competitive strategies; bridging the modern

computation technologies such as machine learning and text-mining into the social science by applying such techniques in understanding balance of exploration and exploitation, competitive strategies (pure vs hybrid), and internationalization. Also, building understanding on CEO's entrepreneurial orientation and market orientation as attention has been his central focus. He has published in top journals such as *Journal of Business Research*. He has previously worked for Nokia at the headquarters as a strategist; witnessing the corporate success, failure, and renewal at the extreme.

Dr. Sudhir Rana is Associate Professor and FPM (PhD) Chairperson at Fortune Institute of International Business, India. He holds an MBA and Ph.D. with MHRD Scholarship from the Government of India and Post Doctorate from Putra Business School, Universiti of Putra Malaysia. His research profile is followed by publications into ABDC/ABS/Scopus/Web of Sciences ranked and indexed journals published by Emerald, InderScience, Sage, Taylor and Francis and Neilson Journal Publishing, etc. His editorships with FIIB Business Review, Advances in Emerging Markets and Business Operations and South Asian Journal of Marketing motivate him to ensure that quality research get their best home.

Dr Justin Paul, is a full Professor in the Ph.D & MBA programs at the University of Puerto Rico, San Juan, PR, USA and holds a title- 'Distinguished Scholar' with India's premier business school- IIM (IIM-K). He serves as Editor-in-Chief, International Journal of Consumer Studies (An A ranked global academic journal with over 1000 submissions a year). He is well known as an author/co-author of best-selling textbooks – Business Environment (4th edition), International Marketing, (2nd edition) Management of Banking & Financial Services (2nd edition) and Export-Import Management (2nd edition) by McGraw-Hill, Pearson & Oxford University Press respectively. He served as a full-time faculty member with the Rollins College-Florida, University of Washington and Nagoya University of Commerce & Business- Japan, accredited by AACSB & AMBA in the past. He has been conferred with an honorary title- Distinguished Professor- by Symbiosis University, Pune, India in 2020. Dr. Paul serves/has served as Senior/Guest/Associate Editor with the International Business Review, Journal of Business research, Services Industries Journal, European Bus Review, Journal of Retailing & Consumer Services, Small Bus Economics, European Journal of International Management, Journal of Promotion Management, Business Ethics: A European Review & International Journal of Emerging Markets. Over 100,000 copies of his books have been sold and his articles have been downloaded over 700,000 times, which rank him among the most downloaded academicians in the field of business and economics. He is an author of over 75 articles in SSCI listed journals, out of which 40+ are in journals ranked as A & A star by Australian Business Deans Council. He has also authored/co-authored two more books namely International Business and Services Marketing. He started his career as Officer – Corporation Bank and moved to academics later. He served as Department Chairperson at Indian Institute of Management (IIM), the premier business school in South Asia at age 30. He has taught full courses at Aarhus University- Denmark, Grenoble Eco le de Management-France, University of Washington Foster School of Business-Seattle, Universite De Versailles -France, ISM University-Lithuania, SP Jain-Dubai, Warsaw University-Poland and has been a visiting professor/ an invited speaker and trainer at Vienna University of Economics and Business, Deakin University- Australia, University of Queensland, University of Chicago, University of Puget Sound, St.Martyn's University-USA, VSE- University of Prague, Fudan University-Shanghai, University of Turku-Finland and UIBE- Beijing.

Jari Salo holds D.Sc. (Econ. & Bus. Adm.) from the University of Oulu, Oulu Business School (AACSB), Finland. He is Professor of Marketing at the University of Helsinki, Finland. He has over 190 scientific publications including books. Research topics include among others digital marketing, industrial marketing, branding, consumer behaviour, innovation and commercialization of innovation.