The impact of exploration, exploitation and ambidexterity on systematic risk in public Euronext Growth SMEs

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Résumé :

The main objective of this paper is to contribute to the literature on ambidexterity in SMEs by providing, more specifically, a look at the relationship between ambidexterity and risk in these companies. Our main theoretical objective is to identify the role played by ambidexterity as well as its components, exploration and exploitation, on the systematic risk of SMEs listed on the Euronext Growth stock market. Our interest therefore is to understand the role played by ambidexterity in risk management within SMEs, in view of increasing their chance of survival at this particular development stage.

The results of our research show that, on a short-term systematic risk (one β to two years) of SMEs listed on Euronext Growth, exploration has an amplifying effect while exploitation has a reducing effect. Contrary to what was expected, ambidexterity also has an amplifying effect on systematic risk, which invites us to explore the explanatory elements of this result going against the widely accepted observation in the literature that ambidexterity plays a positive role in risk reduction.

Mots-clés : SME, exploration, exploitation, ambidexterity, systematic risk

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INTRODUCTION

From a financial perspective, the main focus of public firms should be achieving profit maximization to signal their long-term firm viability (Jain *et al.*, 2008) and its invariance. Therefore, when talking about returns, one must take into account the variance of this return, otherwise known as risk (Markowitz, 1952). As recalled by Josephson *et al.* (2016), risk implies turbulence and disruption in cash flow expectations, and strongly impacts the ability to generate sufficient future cash flows, firm survival and vitality, as well as firm attractiveness to investors. While shareholders would welcome a risky project that generates strong returns because the additional risk is compensated by a higher rate of return, increased risk may put the firm's survival at stake and thus negatively impact employees and other stakeholders (Grinblatt and Titman 1998; Hirshleifer and Suh, 1992; Montgomery and Singh, 1984; Sorescu and Spanjol, 2008).

The fact remains that not all stakeholders are sensitive to the same risk component. In particular, the research in portfolio theory (Lintner, 1965; Markovitz, 1952; Sharpe, 1964; Treynor, 1962) has decomposed financial total risk into systematic and idiosyncratic components, which have differing effects on various corporate stakeholders. Portfolio theory argues that investors are able to hold diversified portfolios, which partly eliminates total firm risk. The more securities held in a portfolio, the lower is the standard deviation of the portfolio's return (Bhattacharya *et al.*, 2019; Lintner, 1965; Markovitz, 1952; Sharpe, 1964; Treynor, 1962). However, even if investors had a perfectly diversified portfolio of all publicly traded stocks, a residual volatility would still remain, that represents the risk of the stock market as a whole. Systematic risk, or market risk, therefore measures the amount of risk that an individual stock contributes to the risk of the overall portfolio (Sorescu and Spanjol, 2008). This risk is exogenous, "inherent to the entire market" (Martin *et al.*, 2018, p. 92) and "reflects the portion of firm stock risk that moves in concert with market-wide shocks" (Bhattacharya *et al.*, 2019, p. 6). Specific risk, on the other hand, "involves stock return volatility that is specific to the firm" (Martin *et al.*, 2018, p. 92) and "unrelated to the market as a whole" (Bhattacharya *et al.*, 2019, p. 4). It is thus the

amount of risk left once systematic risk has been calculated and taken into account, and corresponds to the volatility that can be reduced to a minimum by fully diversifying one's portfolio (Bhattacharya *et al.*, 2019; Grinblatt and Titman, 1998; Sorescu and Spanjol, 2008). As shareholders can diversify their portfolios to compensate for specific risk, they mainly care about the systematic component of total risk (Amit and Wernerfelt, 1990, Haug *et al.*, 2018; Lintner, 1965; Markovitz, 1952; Montgomery and Singh, 1984; Sharpe, 1964; Treynor, 1962). To attract, retain and satisfy shareholders, public firms must therefore seek to reduce systematic or market risk. As this risk measures "firm sensitivity to general market factors such as changes in interest rates, the regulatory environment, and the activity level in the economy" (Haug *et al.*, 2018, p. 431-432), any organizational strategy that reduces this sensitivity is of crucial importance for firms. In fact, "the analysis of risk has always been assumed both explicitly and implicitly to be an important component of corporate strategy" (Bettis, 1982, p. 23). The strategy literature however remains quite silent on the impact that different organizational strategies may have on the systematic component of risk. This is conceivable because the strategy might affect the specific risk more than the systematic risk. In strategy research, to our knowledge, only the diversification strategy has been linked to systematic risk (*e.g.*, Barton, 1988; Haug *et al.*, 2018; Lee and Jang, 2007; Lubatkin and Rogers, 1989; Montgomery and Singh, 1982; Palich *et al.*, 2000). Strategy researchers have thus been intrigued by a possible connection between diversification strategy of public firms and systematic risk. The results that have been found are however mixed. For instance, Montgomery and Singh (1984) have found that related diversifiers managed to reduce their systematic risk, whereas unrelated diversifiers increased their systematic risk. On the other hand, Barton (1988) argues that if other possible causes are controlled, diversification has no impact on systematic risk, although he does agree that diversification may influence it through the modification of the firm's financial context.

Therefore, strategy literature has tackled the issue of systematic risk primarily through the angle of corporate diversification. One key element for diversification is precisely ambidexterity as "diversification has an important influence on the adoption of strategic ambidexterity approaches and vice versa" (Laplume and Dass, 2012, p. 29). In fact, firms are known to better adapt to diversification, but also to complex environments, thanks to ambidexterity (Laplume and Dass, 2012; Simsek, 2009). Strategy literature has indeed widely recognized that ambidextrous organizations, which are capable to both exploit their current capabilities in order to compete in mature markets and explore in order to develop new products and services for new markets, have a better chance "to survive in the face of changed market conditions"

(O'Reilly and Tushman, 2013, p. 330). More generally, Uotila (2018) shows that "ambidexterity emerges as the predominant mode of adaptation in environments that are either simple and stable or highly complex and highly turbulent". In sum, ambidexterity is "more likely when the firm's markets [are] unstable, changing" (O'Reilly and Tushman, 2007, p. 196). One may thus suggest that shareholders might expect value from ambidexterity. We consequently suggest that ambidexterity could be another way of analyzing systematic risk from a strategic perspective, by studying how the firm can reduce, through ambidexterity, its sensitivity to general market factors.

This article therefore focuses on the relationship between ambidexterity and systematic risk. Indeed, while it has been suggested that ambidexterity does impact specific risk (Josephson *et al.*, 2016), little is known about the impact that ambidexterity may have on systematic risk. Focusing on risk from a shareholder perspective, this research thus aims at analyzing the effects of ambidexterity and its components (i.e., exploration and exploitation) on the variance of systematic risk of public firms. Concerning empirical scope, our research focuses on the specific context of SMEs. Although SMEs represent "a vital component of most nations' economies (Lubatkin *et al.*, 2006, p. 648), the issue of ambidexterity remains underexplored in these firms (Alcalde-Heras *et al.*, 2019). Yet SMEs face specific challenges when it comes to ambidexterity, as they have a less formalized and hierarchical structure and lack slack resources or capabilities (Alcalde-Heras *et al.*, 2019; Cenamor *et al.*, 2019; Lubatkin *et al.*, 2006; Voss and Voss, 2013), both being key elements for ambidexterity. In addition, SME are more sensitive to market-wide factors and external fluctuations as they struggle to obtain resources be it by finding foreign investors or by obtaining bank loans (Altman *et al.*, 2010).

The paper is structured as such: the following part will focus on the review of extant literature on systematic risk in the strategy field, followed by a set of research hypotheses that relate exploration, exploitation and ambidexterity to this risk. We then describe our empirical methods, discuss the results, and finally draw our conclusions.

1. THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES

This section discusses the systematic risk and the way it has been studied in the field of strategy, before putting forward hypotheses aimed to test the relationships between this type of risk and the constructs of exploration, exploitation and ambidexterity.

1.1. SYSTEMATIC RISK IN STRATEGY

Systematic or exogenous risk is a firm's sensibility to changes in the overall level of the stock market (Bhattacharya *et al.*, 2019; Dotzel *et al.*, 2013; McAlister *et al.*, 2007). It refers to the sensitivity of a firm's returns to macroeconomic tendencies expressed as the correlation between variations in the firm's returns and the returns of the overall stock market (Lubatkin and Chatterjee, 1994) and reflects the portion of firm stock risk that variates in tandem with market-wide fluctuations. Systematic risk is thus an important metric for publicly listed firms because it allows them to measure the vulnerability of their stock in comparison to the market's variations.

While researchers have paid considerable attention to the trade-off between risk and return when assessing corporate strategy (Amit and Wernerfelt, 1990; Bowman, 1980), most studies have made a connection between corporate strategy and specific risk (Beasely *et al.*, 2005; Gordon *et al.*, 2009; Islam *et al.*, 2006; Prevost *et al.*, 2000), but failed to deal with systematic risk. Yet, systematic risk plays a key role in the way shareholders view the firms that they have invested or wish to invest in. Beaver *et al.* (1970, in McAlister *et al.*, 2007, p. 37) suggested that an increase in systematic risk impacts (1) the survival of the firm through higher or even hyper growth because of reduced earnings opportunities which forces firms to either become bigger or disappear, as well as (2) lower dividend payout because firms with greater volatility have to pay out a lower percentage of earnings if they wish to provide steady dividend payment to their shareholders. Therefore, systematic risk plays a major role in firm survival on the one hand and in the steadiness of shareholders' income on the other. It is therefore crucial for firms to identify ways to reduce it.

One way in which strategy literature has addressed systematic risk reduction has been through the phenomenon of diversification. Montgomery and Singh (1984) were the first strategy researchers to take interest in the relationship between diversification and systematic risk. These authors have found that related diversifiers managed to reduce their systematic risk whereas unrelated diversifiers increased their systematic risk. More specifically, they have found that "the mean systematic risk associated with single businesses, dominant, related constrained and related linked diversifiers approximates the market portfolio, whereas the systematic risk of unrelated diversifiers is significantly higher than that of the market portfolio" (p. 189). In other words, firms that diversified their activities in the same sector, - thus focusing on distilling current skills and developing new ones in the same or related fields - , have brought their systematic risk to the same level as the systematic risk of the overall market, whereas firms that diversified in unrelated fields have increased their systematic risk. Later on, Barton (1988)

hypothesized that diversification has no impact on systematic risk if other possible causes are controlled, but does however agree that the diversification strategy chosen by the management team may directly or indirectly influence systematic risk. Later studies have also suggested that related diversifiers have lower systematic risk than their unrelated counterparts thanks to the potential of creating synergies between units (Lubatkin and Chaterjee, 1994; Haug *et al.*, 2018). In more recent years, research on diversification and systematic risk has taken an angle of sector-focused analyses, taking into consideration the specific attributes of each sector and industry. For instance, Lee and Jang (2007) stress the importance of sectoral approaches, arguing that "systematic risk can vary across industries since industries show various resistance patterns against the risk due to different business attributes" (p. 435). Others have concentrated on a particular type of diversification, such as geographical diversification (*e.g.* Sun and Govind, 2018). Nevertheless, Haug *et al.* (2018), – who talk about diversification as a way to manage risks –, put forward the need for an in-depth analysis of the relationship between diversification and risk, including the systematic risk component, on a common ground between strategy and finance. The authors claim that the few studies, which concentrated on the link between diversification and risk, have used discipline-specific definitions thus making difficult the comprehensive analysis of the two.

An important element that should be taken into account when analyzing diversification is dynamic capabilities. In particular, the role that they play in diversification strategies should be taken into account when the effects of geographic and product diversification are being analyzed (Sun and Govind, 2018). One such capability that has long been related to a firm's short-term and long-term performance is ambidexterity (Koryak *et al.*, 2018). Indeed, ambidexterity is a concept often related to dynamic capabilities (Jurksiene and Pundziene 2016; O'Reilly and Tushman, 2013) that allows the firm to diversify (Jurksiene and Pundziene 2016). Therefore, diversification and ambidexterity strongly influence each other (Laplume and Dass, 2012). Yet, while the relationship between diversification and systematic risk has been addressed, to our knowledge, no research in the field of strategy has focused on the relationship between ambidexterity and systematic risk. The remainder of this section is destined to fill this gap by focusing on the impact that ambidexterity and its components, i.e. exploration and exploitation, may have on systematic risk.

1.2. RESEARCH HYPOTHESES

One cannot talk about ambidexterity without first stopping to look at the components that this construct encompasses. These components are exploration and exploitation, often seen as "paradoxical capabilities" (O'Reilly and Tushman, 2007:8) that "compete for scarce resources" (March, 1991, p. 71). Although our study focuses on the relationship between the overarching construct of ambidexterity and systematic risk, we thus also considered each of its two components to better understand this relationship. Indeed, these components being contradictory in nature (Koryak *et al.*, 2018), they "provide distinct strategic paths" (Osiyevskyy *et al.*, 2020, p. 228) that can lead to opposed effects.

1.2.1. Exploration and systematic risk

Exploration is about "search, discovery, autonomy, innovation and embracing variation" (Tushman and O'Reilly, 2007, p. 10). Exploration is required for a firm to ensure its future viability (March, 1991) and maintain advantage in the face of tough industry competition (Hauser *et al.*, 2007). Once exploration strategies start yielding benefits, they could arguably generate large future returns because of the lack of competition due to their avant-gardist new products. Indeed, exploration allows the firm to develop new knowledge different from the current knowledge base (Lavie *et al.*, 2010), and thus increase its adaptability (Andriopoulos and Lewis, 2009; March, 1991; Walrave *et al.*, 2017). Indeed, firms focusing on exploration will have the competencies allowing them to more effectively combat market variations, and therefore combat the increases in systematic risk, thanks to their elevated speed in understanding and seizing promising new opportunities (Zahra and George, 2002) and their better adaptation to environmental changes (Wiklund and Shepherd, 2005). Moreover, a market-wide shock will require a proactive and risky strategy in order for the firm to survive and stay relevant in an increased systematic risk situation (Rosenbusch *et al.*, 2013; Bhattacharya *et al.*, 2019), such as an exploration strategy.

However, "the distance in time and space between the locus of learning and the locus for the realization of returns is generally greater in the case of exploration than in the case of exploitation, as is the uncertainty" (March, 1991, p. 84). Therefore, returns from exploration have a higher degree of uncertainty and take longer to come to fruition (He and Wang, 2010; Osiyevskyy *et al.*, 2020), often times endangering the very existence of the firm. Moreover, exploration brings about increased total risk and greater costs for firms (Bierly and Daly, 2007) that may also result in occasional losses due to a first market feedback that can be negative (Osiyevskyy *et al.*, 2020). Although exploration is required for a firm to maintain advantage in

the face of tough industry competition (Hauser *et al.* 2007), radical innovations, that are often associated with exploration (Bierly and Daly 2007; Jurksiene and Pundziene 2016), can also lead to an increase in total firm risk. As it may potentially "drive out economies of scale and/or disciplined problem-solving" (Walrave *et al.*, 2017, p. 1147), exploration increases the variability of firm performance (Osiyevskyy *et al.*, 2020). For instance, Sorescu and Spanjol (2008) have shown that radical innovation is positively associated with increases in total firm risk, meaning both idiosyncratic and systematic risk alike. In addition, firms that pursue an explorative strategy may increase the fluctuation of their future returns, leading to a higher inconsistency in stock prices and thus exposing themselves to a higher systematic risk (Grinblatt and Titman, 1998; Sorescu and Spanjol, 2008). Indeed, while high variability may also lead to abnormally high returns, on a regular basis, high variability implies greater uncertainty (Osiyevskyy *et al.*, 2020). Thus, "pursuing the exploration strategy is likely to affect the level (mean) of firm performance negatively" (Osiyevskyy *et al.*, 2020, p. 230) which will, in turn, reduce the trust that the financial market has in the firm as performance variability augments its chances of defaulting on its commitments (Miller and Bromiley, 1990). We therefore posit that:

H1: Exploration increases systematic risk

1.2.2. Exploitation and systematic risk

Exploitation is about "efficiency, increasing productivity, control, certainty, and variance reduction" (Tushman and O'Reilly, 2007, p. 10). Returns from exploitation, although rapid, produce path dependence (Benner and Tushman, 2001; Gupta *et al.*, 2006; Levinthal and March, 1993, Tushman and O'Reilly, 2007) and lead to myopic management tendencies (Mizik, 2010), a false sense of security and a competency or success trap, making it an expert in a field that is rapidly becoming obsolete (Gupta *et al.*, 2006, Güttel and Konlecher, 2009; Levinthal and March, 1993) as well as undermining the firm's ability to adapt (Walrave *et al.*, 2017). While exploitation does not discourage risk-taking, it is a strategy that encourages focusing on existing business and customers, thus rendering the firm unwilling to take new risks such as radical product innovations or brand-new technologies (Bhattacharya *et al.*, 2019). Moreover, the more similar a firm's activity and way of doing business is to the other firms in the same sector, the "higher the susceptibility of the firm to any common shock to the market" (Bhattacharya *et al.*, 2019, p. 7) and therefore the systematic risk may be increased.

Nevertheless, organizational literature puts forward that firms may favor exploitation thanks to rapid positive returns (He and Wang, 2004; Josephson *et al.*, 2016; March, 1991). Exploitation thus becomes more essential in firms with few financial resources because it helps generate strongest positive initial returns (Mizik and Jacobson, 2003) through the refinement and optimization of competencies existing inside the firm (Josephson *et al.*, 2016). It thus allows the firm to make more appropriate decisions in a more uncertain or riskier environment, allowing it to have extensive knowledge of what is required in order to best fit in the market (Bhattacharya *et al.*, 2019). Furthermore, an exploitation strategy could allow the firm to do better than their rivals in terms of satisfying and retaining customers, reducing the chances of customers leaving in the face of difficult times for the firm (Bhattacharya *et al.*, 2019). Thus, on a marketplace that has a low competitive intensity, the harvest of current opportunities over the need to develop new capabilities and value opportunities is also reduced (Hauser *et al.* 2007; Josephson *et al.*, 2016), exploitation seeming to be a stable and profitable solution. Under high crisis severity, exploitation also seems beneficial, as the variability of the firm's performance in such context is reduced when firms deploy an exploitation strategy (Osiyevskyy *et al.*, 2020). Moreover, Josephson *et al.* (2016, p. 551) state that "shifts toward exploitation, and its ability to insulate the firm from immediate threats, reduce a firm's susceptibility to financial market changes". As exploitation can thus reduce the variability of performance and the susceptibility to market changes, we posit that:

H2: Exploitation reduces systematic risk

1.2.3. Ambidexterity and systematic risk

Tushman and O'Reilly (1996), following Duncan (1976), put forward the concept of ambidextrous organization, meaning organizations capable of achieving the appropriate balance between exploration and exploitation. Thus, ambidexterity refers to the building, modification and reconfiguration of resources and competences in order to integrate two distinctive processes inside a firm, such as exploration and exploitation (Josephson *et al.*, 2016). It is widely recognized that an ambidextrous organization has the capabilities to both compete in mature markets (where the focus is on cost, efficiency, and incremental innovation) as well as develop new products and services for new markets (focused more on experimentation, speed, and flexibility) (Tushman and O'Reilly, 1996). Therefore, being able to simultaneously pursue both exploration and exploitation would allow the firm to increase financial performance (Govindarajan and Trimble, 2005; Markides and Charitou, 2004; O'Reilly and Tushman, 2007)

and long-term success (Tushman and O'Reilly, 2007). Though the most suitable balance between exploration and exploitation may differ depending on each firm's targets and objectives, literature has thus proved that both are necessary for long-term survival (Güttel and Konlecher, 2009). In particular, to reduce exposure to systematic risk, a firm must differentiate itself and explore unknown products and technologies and address new client segments all while exploiting their existing competencies allowing them to distill and refine market intelligence in order to respond in an effective manner (Bhattacharya *et al.*, 2019). While some scholars such as March (1991) and those following in his steps believe that exploration and exploitation are in competition for firm resources and that achieving both is highly expensive for the firm, being ambidextrous allows the firms to mitigate the organizational effects of market changes and them far more flexibility in addressing challenges and reducing uncertainty (Alcalde-Heras *et al.*, 2019).

Moreover, the fact that ambidexterity supposes the reconfiguration of resources and competences to integrate two distinctive processes inside a firm brings it closer to a dynamic capability (O'Reilly and Tushman, 2007), which is defined as "a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness" (Zollo and Winter, 2002, p. 340). More specifically, dynamic capabilities mean "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece *et al.*, 1997, p. 516). Literature even puts forward that dynamic capabilities have a "risk-protection function (…) in response to exogenous shocks" (Newey and Zahra, 2009, p. S96). Therefore, we suggest that ambidexterity, as a dynamic capability, has a risk-protection function for firms in high systematic risk situations. We therefore posit that:

H3: Ambidexterity reduces systematic risk

2. RESEARCH METHODOLOGY

The details of the methodology used to empirically test our hypotheses is described in the following sections.

2.1. DATA SET

Our dataset consists of secondary data covering the years 2016–2018 for publicly traded SMEs on Euronext Growth, the particular market for small and medium-sized firms belonging to the eurozone. We focused on publicly owned firms because they are required by law to

publicly share documents such as annual reports (Uotila *et al.*, 2009; Walrave *et al.*, 2017). We first selected all 210 firms listed on the Euronext Growth market. We then built our own database on these SMEs in two steps.

First, data on the propensity of firms to explore and/or exploit were extracted from the annual reports of these 210 SMEs. We thus proceeded to collecting firm-level information by manually downloading the annual rapports for each firm over a period of three years. However, not all firms have published a consolidated annual report. When this annual report was missing, we downloaded both the consolidated accounts document and the management report designed for shareholders. Thus, our database has either three documents per firm (3-year annual reports) or six documents per firm (3-year consolidated accounts documents and 3-year management reports). We only kept the firms that published their reports in French, which brought us to 165 public SMEs. The inability of treatment of certain protected reports and the lack of essential information regarding these firms resulted in a final sample of 92 firms and 367 valid reports over three years. The sectors of these firms, which are Europe-based companies, are varied (see Appendix 1).

Second, data on systematic risk and related to control variables were extracted from the Capital IQ database for the 92 firms in our final sample.

2.2. MEASURES

Exploration, exploitation. The collected reports of the 92 public SMEs were processed using the textual research function of Nvivo 11, to obtain the word frequencies of a set of terms meaning exploration or exploitation. Following the study of Uotila *et al.* (2009) and Walrave *et al.* (2017), we used the terms that enabled March (1991), in his seminal paper, to distinguish exploration and exploitation. On the one hand, exploration is thus described as including "things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" (March, 1991, p. 71). On the other hand, exploitation includes "such things as refinement, choice, production, efficiency, selection, implementation, execution" (March, 1991, p. 71). We translated these terms into French, as the reports of our selected firms were in French.

To our knowledge, there is no French study using word frequency that has deployed the March's (1991) terms. We therefore validated our translations by submitting a form to four French-speaking researchers whom have published papers in the field of ambidexterity and are regarded

as "experts". [1]We asked them to attribute a level of accordance to each term related to exploration and exploitation, as well as required them to propose new words for those that they did not agree with. We then proceeded to quantify the answers and keep the words with the highest scores and removed the words with the lowest scores and replaced them, when possible, with suggestions given by the experts. In the end, out of the eight words for exploration, three were removed and two new words were added. As for exploitation, out of the eight words translated, two were removed and one new word was added. This gave us a total of seven key words for exploration and seven key words for exploitation. The details of this term ranking can be seen in Appendix 2. Once the words have been chosen, we then proceeded to a manual check of the context in which each word entry and lexical field was used in the collected reports, to make sure that no errors would occur. After this check, we operationalized exploration as the total number of matched keywords for exploration and then did the same thing for exploitation.

Ambidexterity. Following the study of Li *et al.* (2018), we operationalized ambidexterity as the balance between exploration and exploitation, and measured it through the following equation:

$$0 < 1 - \frac{|x - y|}{(x + y)} < 1$$

where *x* refers to the total number of words for exploration; *y* refers to the total number of words for exploitation; and the higher the value, the more ambidextrous the firm is.

Systematic risk. Research on systematic risk is almost unanimously based on the Capital Assets Pricing Model (CAPM) developed by Sharpe (1964) and Lintner (1965). The main idea is that the expected rate of return on an asset is obtained by adding the risk-free rate to the risk premium of the asset. The risk premium is the product of the market spread with the asset's beta (β). β represents "the slope in the regression of a security's return on the market's return" (Fama and French, 1992, p. 427); in other words, how sensitive the firm's stock is to the overall market fluctuations. Montgomery and Singh (1984) have used this same measure for systematic risk arguing that "as shareholders combine individual securities in portfolios, they can average out the effect of non-market-related risk in the return. Therefore, it is the risk portion of the return which remains (β) which is of concern at the portfolio level" (p. 182). β has also been used by numerous other studies in strategy (*e.g.* Amit and Wernerfelt, 1990; Lubatkin and Rogers, 1988; Lee and Jang, 2007; Bhattacharya *et al.*, 2019). In our study, the β has been

[1] We would like to thank the experts for their time and expertise in providing us with their suggestions and their validation for the best French terminology for our study.

extracted from the Capital IQ database in the beginning of 2020 for the past 102 weeks. It is therefore the β for the better part of 2018, 2019 and January and February 2020. This β has been extracted at the beginning of March 2020, therefore the covid-19 crisis is not reflected by the values in our database.

Control variables: We controlled for variables that may influence systematic risk. The information regarding these variables has been extracted from the Capital IQ database for 2018. First, the literature puts forward the importance of taking into account the *sector* or industry in which the studied firms operate, as "systematic risk can vary across industries since industries show various resistance patterns against the risk due to different business attributes" (Lee and Jang, 2007, p. 435). We thus calculated the average β for each sector for the past 102 weeks (the same procedure as for the dependent variable β). The idea behind this calculation is to obtain an average score that is common to all firms belonging to the same sector and which reflects their common sensitivity to market shifts. To obtain this variable, we have extracted the two-year β for 150 random companies for each sector and we then proceeded to the calculation of an average using the excel function with the same name. The number of firms considered is random, we considered 150 firms to be enough for an unbiased representation of each sector. Second, *debt leverage* is also known to have a significant link with systematic risk (Hamada, 1972; Lee and Jang, 2007; Logue and Merville, 1972). To calculate this ratio, we have extracted the information regarding total debt and total equity for 2018 regarding our firms then proceeded to calculating the debt leverage by dividing total debt by total equity.

Finally, *firm size* was also taken into account, as numerous studies in finance have associated firm size with a determinant of systematic risk (Ben-Zion and Shalit, 1975; Logue and Merville, 1972). To calculate this variable, we have extracted the information for 2018 regarding the total number of employees for each firm.

The measures of all our variables and the papers that detail them are summarized in the table 11 below.

Table 1: Measures of main variables

Construct	Measure	References	Data source
Exploration	Word frequency score	March (1991), Uotila *et al.* (2009), Walrave *et al.* (2017)	Annual reports
Exploitation	Word frequency score	March (1991), Uotila *et al.* (2009), Walrave *et al.* (2017)	Annual reports
Ambidexterity	Calculated score following Li *et al.* (2018)	Li *et al.* (2018)	Annual reports

Systematic risk	β	Amit and Wernerfelt (1990), Bhattacharya *et al.* (2019), Fama and French (1993), Lintner (1965), Montgomery and Singh (1984), Sharpe (1964)	Capital IQ database
Activity sector	Average β for 150 random firms of the same sector	Lee & Jang, 2007	Capital IQ database
Debt leverage	Total debt/ Total equity	Hamada, 1972; Lee and Jang, 2007; Logue and Merville, 1972	Capital IQ database
Firm size	Total revenue or Total employees	Ben-Zion and Shalit, 1975; Logue and Merville, 1972	Capital IQ database

2.3. ANALYSIS METHOD

To test our research hypotheses, we proceeded to a series of linear regressions using the SPSS software. Due to normal law discrepancies, exploration and exploitation variables had to be computed into natural logarithms in order to correct firm distribution. This computation has allowed for a normal distribution of our firms that can be seen in the figures in Appendix 3. The same computation has been deployed for the control variables *TxEndettement* which represent debt leverage and *TotalEmployés* which represents firm size.

3. RESULTS

Table 2 presents results of the three models tested. Model 1 includes only the control variables. It indicates that control variables have no significant impact on our dependent variable, therefore neither the sector nor the debt level or firm size have an actual influence on the systematic risk of our firms.

Table 2: Linear regression analysis

	Model 1	**Model 2**	**Model 3**
Average 2 year beta	0.070	-0.059	-0.060
Log Debt ratio	0.023	0.104	0.111
Log Total employees	0.039	0.194	0.189
Log exploration		0.623***	
Log exploitation		-0.612***	
Ambidexterity			0.511***
r^2	0.008	0.214	0.206
Durbin-Watson	1.910	1.909	1.920

Notes : *** P<0.001, ** P<0.01, * P<0.05

In Model 2, independent variables related to exploration and exploitation were introduced, in addition to control variables. The results show that exploration significantly increases systematic risk (p=0.001), while exploitation significantly reduces systematic risk (p=0.001). These results thus confirm both H1 and H2.

Model 3 includes both ambidexterity, as independent variable, and control variables. The results show, unequivocally, that ambidexterity increases systematic risk (p<0.001), leading to reject H3.

4. DISCUSSION AND CONCLUSION

This section provides a discussion of our findings and puts forth the research implications and limitations of this study.

4.1. DISCUSSION

This study is interested in the relationship between ambidexterity and systematic risk. It focused on risk from a shareholder perspective and aimed at analyzing the effects of ambidexterity and its components (i.e., exploration and exploitation) on the variance of systematic risk of public firms.

First of all, our results show that exploration and exploitation do influence systematic risk. On the one hand, exploration increases the systematic risk of the studied firms, as expected. It is consistent with literature that claims, at least on short term, exploration increases firm risk (March, 1991). It suggests that exploration strategies, which take longer to come to fruition (He and Wang, 2010; Osiyevskyy *et al.*, 2020), may not be recognized or evaluated to their rightful added value, as the market is unable to "recognize and evaluate the long-term consequences of managerial actions" (Mizik, 2010, p. 597). It however runs counter to studies on entrepreneurial orientation – an orientation generally adopted by exploration-oriented firms (Menguc and Auh, 2008) –, that have suggested that entrepreneurial orientation decreases systematic risk (Bhattacharya *et al.*, 2019). On the other hand, our results confirm that exploitation decreases systematic risk. The rapid or short-term positive returns of exploitation (He and Wang, 2004; Josephson *et al.*, 2016; March, 1991) are thus seen as desirable, especially for SMEs that lack resources. Therefore, shareholders, future investors and other market members may perceive exploitation strategies as more reliable since they are considered to be "more immediate and thus higher in the short run" (March, 1991, p. 84), especially regarding SMEs. More

surprisingly, and contrary to what was expected, our results show that ambidexterity increases systematic risk. Ambidextrous firms may be thus more exposed to increased exogenous risk. One possible explanation for this unexpected finding may lie in the assumption that exploring and exploiting at the same time means a high consumption of resources (He and Wang, 2004; March, 1991), whereas SMEs are seen as resource-constrained and therefore, more sensitive to exogenous threats (Osiyevskyy *et al.*, 2020). Moreover, financial markets and research in finance in general is based on precedent and on "the *ex post* calibration of risk-adjusted returns among firms" (Rufeli *et al.*, 1999, p. 168) while the strategic vision is "fundamentally concerned with managers' *ex ante* decision processes as well as their efforts to create and maintain above-average returns for their firms" (Rufeli *et al.*, 1999, p. 168). Therefore, one may assume that from a strategic point of view, ambidexterity can be seen as beneficial because it has a long-term perspective on the way a firm should be managed; however, from a financial point of view, where the impact of long-term decisions is usually not evaluated, these strategies may seem riskier and less profitable, since the main interest of investors is usually on return maximization (Montgomery and Singh, 1984) and variance reduction. This logic is better illustrated by Mizik (2010) who studies the stock market's inability to properly value firms engaged in innovation and firms that are myopically managed. The author presents evidence that "the financial markets do not differentiate well between firms that engage in myopic management and firms that do not" (p. 608), while agreeing that firms myopically managed may reap short-term benefits but will suffer long-term damage in financial performance. Therefore, the idea put forward by Haug *et al.* (2018) regarding a common language to discuss risk between both finance and strategy is all the more necessary in this context as, depending on the time span and the temporality of the firm goal, ambidexterity can have an ambivalent character: on the one hand, it acts as a risk enhancer because it may strain the firm, forcing it to burn through resources and thus send negative signals to the market and its potential investors while ; on the other hand, it is a means to insulate the firm from exogenous risk by helping it develop strong dynamic capabilities allowing it to combine et reconfigure internal resources (O'Reilly and Tushman, 2007) in order to better face exogenous shocks or major external changes.

As a general overview, our results show that exploitation as an independent strategy reduces systematic risk, whereas exploration and ambidexterity, independently, increase systematic risk. Investors may feel more at ease placing their money in a firm focused on productivity and profit generation because the benefits are easily identifiable and quantifiable. This is not the

case for exploration because, as previously stated, the yield that exploration may generate is long-term or maybe even inexistent. Due to its volatile nature, this strategy seems risky to investors and the returns, while probably higher than those of exploitation, are perhaps not worth the effort. Moreover, investors may feel that SME lack the necessary absorption capabilities to integrate both exploration and exploitation. Should this be the case, ambidexterity may not be viewed as a way to reduce risk, but rather as a conflictual paradigm opposing a strategy requiring stiffness of processes and a focus on efficiency (exploitation) to a strategy requesting that the firm be flexible, adaptable and open to change (exploration). This seems all the more dangerous for SME who, due to their less formalized structure and a lesser separation of processes addressing these two strategies, will struggle to meet the requirements for achieving ambidexterity and thus staying afloat. Thus, investors and other market agents (such as investment banks or normal banks) are dissuaded from investing in these firms.

4.2. LIMITS AND FUTURE RESEARCH

First, we have identified limitations regarding our firm sample. Our sample is composed of Euronext Growth listed firms. This stock market is designed for small and medium sized firms that allows for a simpler procedure for firms to list and thus raise funds on the capital market (*cf.* https://www.euronext.com/fr/statut-marche-croissance-pme). However, since it focuses only on SMEs, our sample may present by nature, a higher degree of risk as they seem more prone to exogenous risks due to the previously mentioned "liability of smallness" (Osiyevskyy *et al.*, 2020, p. 229). Therefore, future research should focus on a larger sample of firms that includes firms listed on other stock markets and not exclusively restricted to SMEs in order to evacuate the bias of size. Moreover, our sample focuses uniquely on Euronext Growth firms that have published their annual reports in French, since the main purpose of this paper was to test the applicability of an analysis of exploration and exploitation that employs March's keywords, following Uotila *et al.* (2009) and Walrave *et al.* (2017), but executed in French. Future research should focus on firms pertaining to other firms publishing reports in other languages in order to amass more variety in firm ambidexterity analysis.

Second, our analysis focuses on only three years of official documents and their impact on the two-year β following this period. Therefore, we may only observe the short-term effects of exploration, exploitation and ambidexterity on systematic risk. However, research on the temporal effects of these strategies have highlighted that exploitation is rewarding on the short term whereas exploration brings long term benefits to the firm (Levinthal and March, 1993;

March, 1991; Uotila, 2017). Therefore, future research should focus on understanding the long-term impact that these strategies have on systematic risk.

Third, our sample does not have a control variable based on the age of the studied firm, though research has showed that age plays an important role among determinants of systematic risk (Saravia e*t al.*, 2020). This was a deliberate choice in order to obtain as many results from our sample as possible. The next stage for this research should focus on refining the sample and perhaps executing an in-depth analysis while taking age into account.

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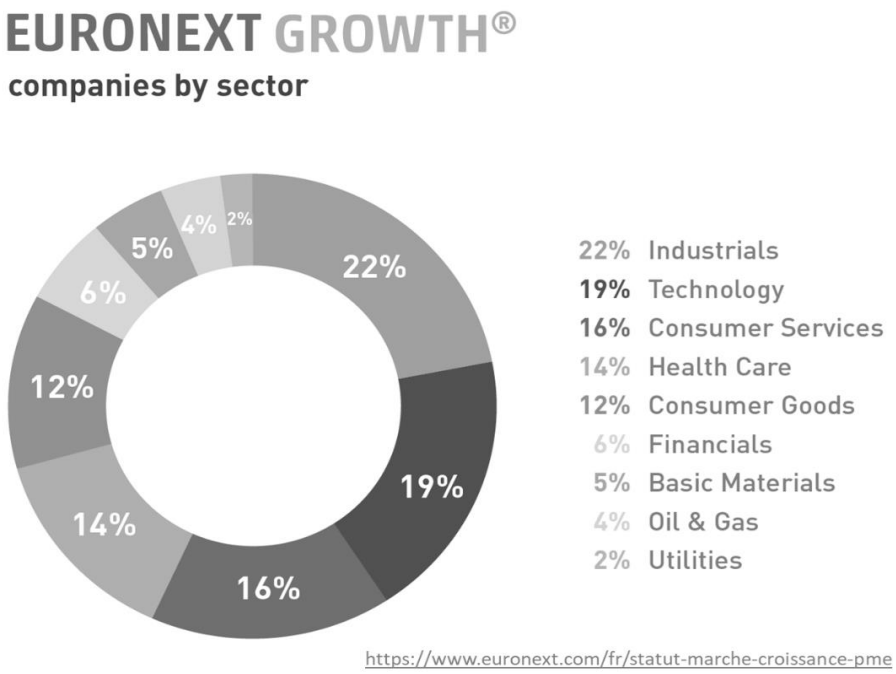
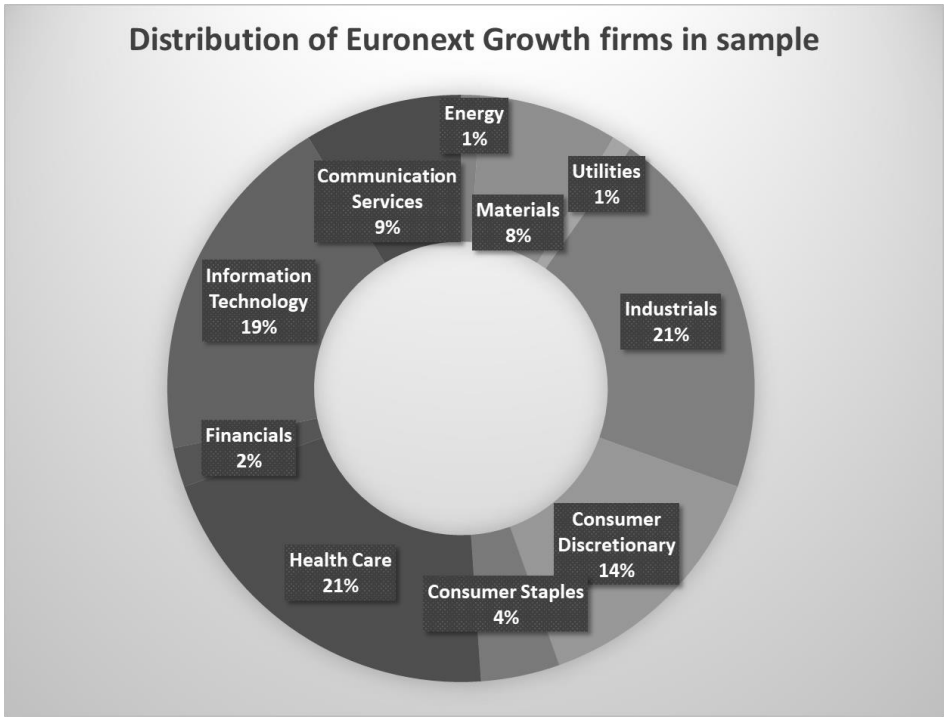
6. APPENDIX

APPENDIX 1 : SECTOR DISTRIBUTION OF EURONEXT GROWTH FIRMS (1) AND SAMPLE FIRMS (2)

1



2



APPENDIX 2 : TERM RANKING FOR EXPLORATION AND EXPLOITATION

Word	Experts opinion BS	CB	MF	RB	Final score	
Recherche	2	2	2	2	**8**	
~~**Variation**~~	~~1~~	~~0~~	~~1~~	~~2~~	~~**4**~~	evacuated
(Prise de) Risque	2	2	1	2	**7**	
Expérimentation	2	2	2	1	**7**	
~~**Jeu**~~	~~1~~	~~1~~	~~0~~	~~1~~	~~**3**~~	evacuated
~~**Fléxibilité**~~	~~0~~	~~2~~	~~1~~	~~1~~	~~**4**~~	evacuated
Découverte	2	2	2	2	**8**	
Innovation	1	1	2	1	**5**	
Créativité		2		2	**4**	
(Innovation) radicale		2		2	**4**	
Raffinement	2	2	1	0	**5**	
~~**Choix**~~	~~0~~	~~0~~	~~0~~	~~0~~	~~**0**~~	evacuated
Production	2	0	2	0	**4**	
Efficience	2	2	2	2	**8**	
Efficacité	1	2	2	2	**7**	
Sélection	1	0	1	2	**4**	
~~**Implémentation**~~	~~2~~	~~0~~	~~0~~	~~0~~	~~**2**~~	evacuated
Exécution	1	0	1	2	**4**	
(Innovation) incrémentale	2	2		2	**6**	

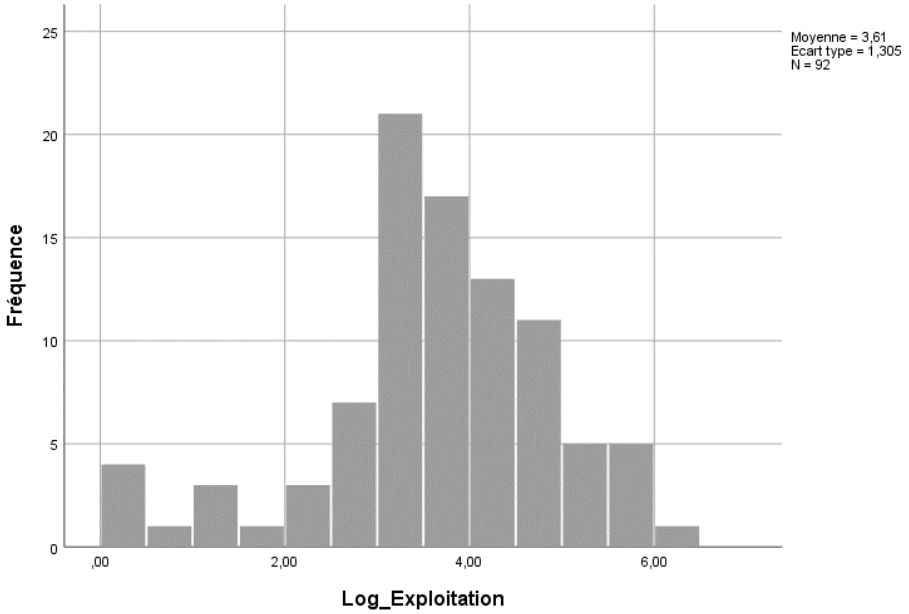
LEGEND :

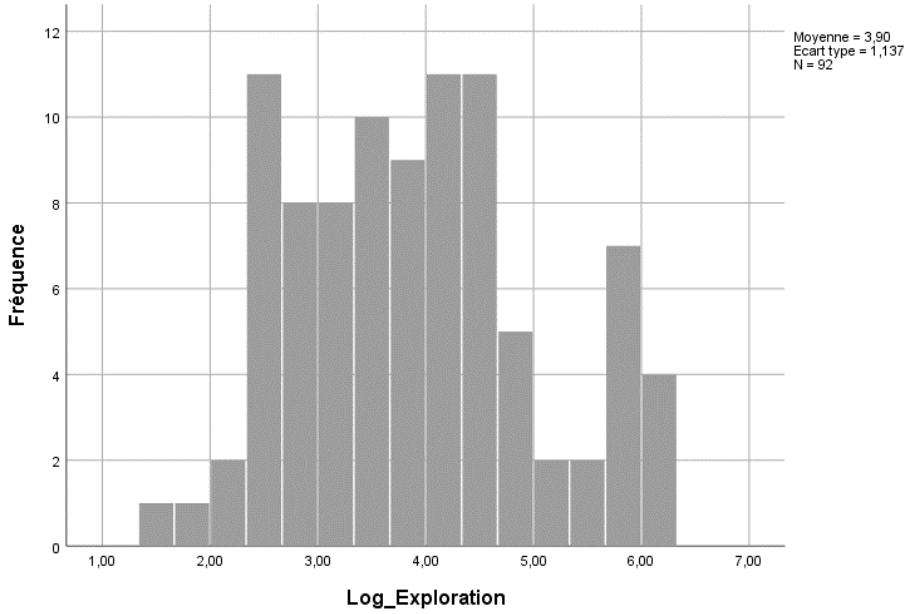
Not at all	0
Rather yes	1
Definitely yes	2

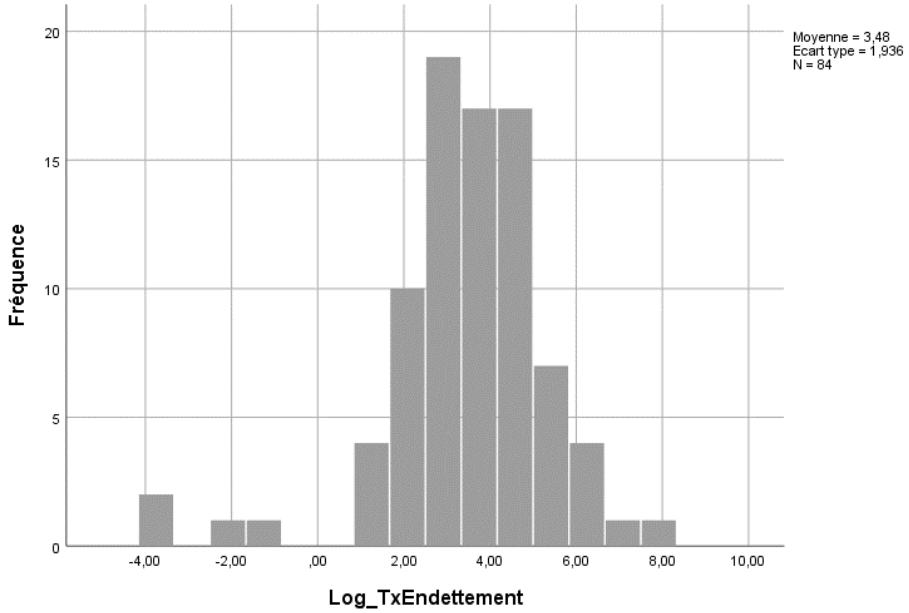
March

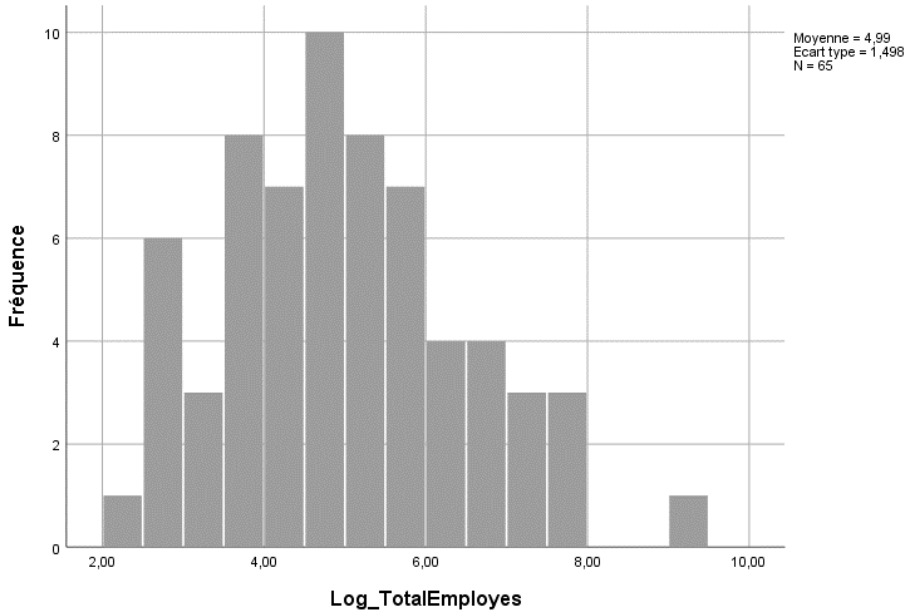
Experts

APPENDIX 3 : FIRM DISTRIBUTION FOLLOWING LOGARITHME CONVERSION






Moyenne = 3,48
Ecart type = 1,936
N = 84
Fréquence
Log_TxEndettement


Moyenne = 4,99
Ecart type = 1,498
N = 65
Fréquence
Log_TotalEmployes