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**A tale of two predictors: The impact of
regulatory focus and entrepreneurial
orientation on small and medium-sized
enterprises**

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A tale of two predictors: The impact of regulatory focus and entrepreneurial orientation on small and medium-sized enterprises

ABSTRACT

Small and medium-sized enterprises (SMEs) contribute significantly to economic growth and job creation. Given the importance of SMEs, this study examines the factors that may impact their outcomes (i.e., behaviours and performance). In particular, it examines the effects of chief executive officers' (CEOs') regulatory focus and firms' entrepreneurial orientation (EO) on SMEs. Regulatory focus theory suggests that people can pursue their goals via a promotion focus (associated with a concern for growth and a desire for gains) or a prevention focus (associated with a concern for safety and a desire to avoid losses). As an individual-level motivational characteristic, regulatory focus underlies the motives people are aiming to satisfy, the goals they pursue, and the strategic means they prefer to implement in striving for their goals. Since CEOs are the top decision makers, their decisions induced by regulatory focus should have an impact on firms they lead. Additionally, EO refers to a firm-level behavioural construct that involves three independent dimensions, namely, innovativeness, risk-taking, and proactiveness. Since organisations often rely on entrepreneurial activities to renew themselves, their levels of innovativeness, risk-taking, and proactiveness should have an impact on their performance.

This study expands research on regulatory focus theory and entrepreneurial orientation through examining (a) the effects of CEO regulatory focus on SME performance and how the effects differ between firms operating in different industry environments (i.e., high-tech and low-tech industries); (b) the independent effects of firms' levels of innovativeness, risk-taking, and proactiveness on SME performance and how the effects differ between firms operating in different industry environments; and (c) the influences of CEO regulatory focus on SMEs' levels of innovativeness, risk-taking, and proactiveness. In so doing, this study also contributes to entrepreneurship research in two ways. First, it provides insights about how the effects of regulatory focus and the dimensions of EO on SMEs are contingent on the industry environment in which firms operate. Second, it sheds light on how the individual-level characteristic and firm-level behaviours differ in explaining the variance in firm outcomes.

I collected online survey data from 110 SMEs in the UK. The empirical results demonstrate that CEO regulatory focus is associated with SME performance. Specifically, CEO promotion focus is positively, and CEO prevention focus is negatively associated with SME performance. Industry environment moderates the relationship between CEO promotion focus and SME performance. That is, CEO promotion focus has stronger effects on SMEs in high-tech industries than those in

low-tech ones. However, a moderating role of industry environment on the relationship between CEO prevention focus and SME performance is not observed. The findings also suggest that the three dimensions of EO have unique effects on SME performance. Specifically, there is an inverted U-shaped relationship between innovativeness and SME performance, a U-shaped relationship between risk-taking and SME performance, and a positive linear relationship between proactiveness and SME performance. Industry environment moderates the performance effects of innovativeness and proactiveness on SMEs except for risk-taking. In particular, innovativeness has stronger effects on SMEs in low-tech industries, whereas proactiveness has stronger effects on SMEs in high-tech industries. Moreover, the empirical results demonstrate that CEO promotion focus positively impact SMEs' levels of innovativeness and proactiveness except risk-taking, while CEO prevention focus negatively impact SMEs' levels of risk-taking and proactiveness except innovativeness.

The empirical results indicate that innovativeness, risk-taking, and proactiveness together account for 14% of the variance in SME performance, whereas CEO promotion and prevention focus account for 6% of the variance in SME performance. As such, firm-level entrepreneurial behaviours regarding innovativeness, risk-taking, and proactiveness are more robust predictors in explaining the variance in SME performance than individual-level CEO characteristic concerning promotion and prevention focus. Additionally, the results reveal that CEO promotion and prevention focus are the antecedents of SMEs' entrepreneurial behaviours. While regulatory focus and EO refer to different natures of phenomenon and represent constructs at different levels, this study shows that both factors have substantial impacts on organisations. Therefore, to understand the organisational outcomes of SMEs, it is paramount to consider CEO regulatory focus and EO.

Author Declaration

I confirm that this thesis is composed of my original work and has not been submitted in substantially the same form for the award of a higher degree elsewhere.

Shuangfa Huang

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Chapter 1: Introduction

1.1 Purpose of the study

Small and medium-sized enterprises (SMEs) play a central role in economic development and job creation. They represent 99% of all businesses and account for two-thirds of all employment in the private sector in the EU (Muller et al., 2017). Indeed, SMEs are the driving force behind economic growth in many OECD economies (OECD, 2017). Despite their significance, SMEs face challenges such as liability of smallness (Aldrich and Auster, 1986) and lack of resources including financial resources, knowledge, and networks (Radas and Božić, 2009; Maes and Sels, 2014). Compared to large firms, for example, SMEs have disadvantages in raising financial resources and attracting talent (Aldrich and Auster, 1986). As a result, SMEs tend to have less experience and lower capabilities in innovation (Van de Vrande et al., 2009; Nicholas et al., 2011). It should be noted that the smallness of SMEs might allow them to respond quickly to changing market environments and achieve greater flexibility (Hoffman et al., 1998), suggesting that it might serve as a potential source for SMEs to gain competitive advantages over large firms.

Given the importance of SMEs, this study aims to examine the factors that might influence the organisational outcomes (i.e., behaviours and performance) of SMEs. In particular, this study has three research objectives. *The first objective is to assess the impacts of CEO regulatory focus, a motivational characteristic, on SME performance and examine how the impacts differ between SMEs operating in high-tech industries and those in low-tech industries.* Regulatory focus theory is based on the premise that people are motivated to satisfy different types of needs (i.e., growth versus security). Specifically, it delineates how people regulate their behaviours to realise their goals through two distinct motivational systems: promotion focus and prevention focus (Higgins, 1997, 1998). A promotion focus is associated with a concern for growth and advancement, whereas a prevention focus is associated with a concern for safety and responsibility (Crowe and Higgins, 1997). Because promotion and prevention focused people are driven by different underlying needs, they differ in the strategic means they use for goal pursuit as well as the type of outcomes that are salient to them (Brockner et al., 2004). Researchers

have highlighted that regulatory focus is a motivation-based characteristic that underlies the motives people are trying to satisfy, the goals they pursue, and the strategic actions they prefer to implement in striving for their goals (Brockner et al., 2004; Molden et al., 2008).

To understand the organisational outcomes of SMEs, it is critical to consider the regulatory focus of CEOs. Regulatory focus induces people to pursue different types of goals using distinct strategic means (Higgins, 1997, 1998), suggesting that it has a profound impact on people's decision making. Indeed, research in regulatory focus theory has shown that people's regulatory focus shapes their decisions concerning risk-taking (Scholer et al., 2010; Hamstra et al., 2011) and pursuing changes (Lieberman et al., 1999; Fuglestad et al., 2008). As such, regulatory focus has a significant impact on the decisions made by CEOs. Since CEOs are the top decision maker in their firms (Finkelstein et al., 2009), the decisions that are induced by regulatory focus should have an impact on the firms they lead. Indeed, empirical evidence has shown that the regulatory focus of CEOs or entrepreneurs is related to small firm performance (Wallace et al., 2010) and new venture performance (Hmieleski and Baron 2008). The authors also suggest that the performance effects of regulatory focus are more pronounced for firms operating in a dynamic than a stable environment.

Although studies have shown that CEO regulatory focus influences small firm performance, it remains unclear how the influence of regulatory focus might differ between firms operating in different industry environments (i.e., high-tech versus low-tech industries). As Lomberg et al., (2016, p. 6) pointed out, "environmental factors such as dynamism, hostility, complexity, or munificence vary across industries", suggesting that firms operating in different industry environments should face distinct challenges. To illustrate, compared to the low-tech industries, the high-tech industries are more uncertain, more competitive, and more complex (Moriarty and Kosnik, 1989; Qian and Li, 2003; Wu, 2012). Given that firms operating in high-tech industries tend to face different challenges than those operating in low-tech industries, there are reasons to expect that the performance effects of CEO regulatory focus are likely to differ between them. Consistent with extant research (Bierly and Daly, 2007; Rauch et al., 2009; Sarooghi et al., 2015), this study distinguishes the industry environment in which firms operate into high-

tech and low-tech industries. Therefore, this study assesses how the performance effects of CEO regulatory focus differ between SMEs in high-tech industries and those in low-tech industries.

The second objective is to assess the effects of firms' entrepreneurial behaviours, including innovativeness, risk-taking, and proactiveness, on SME performance and examine how their performance effects differ between SMEs operating in high-tech industries and those in low-tech industries. Entrepreneurial orientation (EO) refers to the “strategy-making practices, management philosophies, and firm-level behaviors that are entrepreneurial in nature” (Anderson et al., 2009, p. 200). EO is an important factor to consider because theoretical work and empirical evidence have suggested that EO significantly impact the performance of organisations (Lumpkin and Dess, 1996; Rauch et al., 2009; Wales, 2016). There are two diverging views about the nature of EO: unidimensional or multidimensional. The unidimensional EO refers to the shared variance among innovativeness, risk-taking, and proactiveness (Miller, 1983; Covin and Slevin, 1989; Covin and Wales, 2012), whereas the multidimensional EO entails a set of independent dimensions (three or five dimensions depending on researchers' conceptualisation), each of which are expected to have independent effects on organisations (Lumpkin and Dess, 1996; Kreiser et al., 2002).

This study operationalises EO as a multidimensional construct and assesses the independent effects of innovativeness, risk-taking, and proactiveness on SME performance based on three reasons. Firstly, researchers have highlighted that the dimensions of EO are independent (Lumpkin and Dess, 1996; Kreiser et al., 2002), and that they are “more telling than the aggregate index” (Miller, 2011, p. 880). In other words, examining the dimensions of EO independently can help to reveal their unique effects on organisations. Secondly, recent research has shown that “aggregating the entrepreneurial orientation dimensions into one combined measure ... can result in their independent influences being distorted or canceled out altogether” (Dai et al., 2014, p. 519). As such, it is critical to examine the dimensions of EO independently rather than combining them into one factor. Thirdly, while a number of studies have explored the relationship between the dimensions of EO and firm performance, the nature of their link remains inconclusive because results from the empirical evidence are mixed. Some

researchers have found a linear relationship between the dimensions of EO and firm performance (Hughes and Morgan, 2007; Swierczek and Ha, 2003) while others found a curvilinear relationship (Kreiser et al., 2013). The inconsistent findings may be due to the fact that existing studies are focusing on different industries and/or firm contexts, such as small High-tech firms (Hughes and Morgan, 2007), medium and large sized High-tech firms (Morgan and Strong, 2003), and SMEs (Kreiser et al., 2013).

To contribute to EO literature, this study examines how the performance effect of innovativeness, risk-taking, and proactiveness differ between SMEs operating in different industry environments. Prior studies have revealed that external environmental factors such as dynamism and hostility moderate the relationship between EO and firm performance (Wiklund and Shepherd, 2005; Covin and Slevin, 1989). Additionally, researchers have suggested that these external environmental factors differ between the high-tech industries and the low-tech ones (Lomberg et al., 2016), implying that the industry environment in which firms operate is likely to influence the performance effects of EO dimensions on SMEs. As Rauch et al., (2009, p. 780) noted, “industry and task environment represent different conceptualizations of the firm’s environment, we believe both represent valuable moderators, and continued effort along these lines are valuable in order to gain a deeper understanding of the EO–performance relationship.” While researchers have suggested that firms operating in high-tech industries benefit more from EO than firms in nonhigh-tech industries (Rauch et al., 2009), it remains unclear whether such effects hold true when the dimensions of EO are examined independently. As such, examining the potential moderating effects of industry environment on the relationship between EO dimensions and SME performance could provide a more fine-grained understanding about the performance effects of EO dimensions on SMEs.

While regulatory focus represents an individual-level construct (Higgins, 1997, 1998) and EO represents a firm-level construct (Covin and Wales, 2012), existing studies have shown that both constructs are useful in predicting the outcomes of organisations (Johnson et al., 2015; Rauch et al., 2009; Wales, 2016). Through incorporating both constructs in this study, and separately assessing the performance effects of regulatory focus and the EO dimensions on SMEs, the results

generated from this study might shed light on how the two constructs differ in explaining variance in firm performance. For example, the results might provide insights as for whether the individual-level motivational characteristic, regarding regulatory focus, or the firm-level entrepreneurial behaviours regarding the three dimensions of EO are a more robust predictor of SME performance.

Another reason to integrate CEO regulatory focus and the EO dimensions in this study is that it allows for the examination of the potential relationships between them. There are theoretical reasons to suspect that CEO regulatory focus might shape firms' levels of innovativeness, risk-taking, and proactiveness. Research in upper echelons theory suggests that the characteristics of top executives (e.g., CEOs) have profound impacts on organisational outcomes (Hambrick, 2007; Hambrick and Mason, 1984). Specifically, characteristics such as personality, values, and experience affect CEOs' interpretation of the strategic situations they face that, in turn, shapes their decisions and actions. Since CEOs occupy the highest positions within organisations, their decisions and actions can thus significantly impact the behaviours of the organisations they lead. In line with this view, empirical evidence has demonstrated that a wide range of CEO characteristics are associated with the behaviours of organisations (Busenbark et al., 2016; Wales et al., 2013b; Simsek et al., 2010).

Additionally, there is empirical evidence suggesting that CEO regulatory focus impacts organisational behaviours such as firms' levels of business acquisition (Gamache et al., 2015), new product introduction (Greenbaum, 2015) and growth-related strategic actions (Chen et al., 2017). Because organisations are an extension of the people who are in charge (Hambrick and Mason, 1984), the decisions and goals of CEOs can become manifested through the behaviours undertaken by the organisations they lead. Indeed, researchers have highlighted that firms' strategic behaviour "is often determined by executives on the basis of their goals and temperament" (Miller and Friesen, 1982, p. 1). Given that regulatory focus determines the goals CEOs pursue, and the strategic means they prefer to use (Brockner et al., 2004; Molden et al., 2008), there are reasons to expect that CEO regulatory focus should have an impact on firm-level behaviours. Nevertheless, existing studies often focus on large firms (Gamache et al., 2015; Greenbaum, 2015; Chen et al., 2017) with limited attention devoted to the SME context

(Kammerlander et al., 2015). Consequently, we know little about the effects of CEO regulatory focus on the behaviours of SMEs. Given that CEOs have more managerial discretion in smaller firms (Finkelstein et al., 2009), the effects of CEO regulatory focus on organisational behaviours should be more salient in SMEs.

Accordingly, a final objective of this study is to examine the effects of CEO regulatory focus on SMEs' levels of innovativeness, risk-taking, and proactiveness. Researchers have highlighted that “we know little about the antecedents of EO” (Rosenbusch et al., 2013, p. 634), and that “the literature is still scarce regarding the role of leaders' characteristics in shaping the entrepreneurial posture of an organization” (Pittino et al., 2017, p. 224). The current study addresses this research gap by drawing insights from regulatory focus theory and examines how CEO regulatory focus shapes the different entrepreneurial behaviours of SMEs. It is worth noting that examining the effects of regulatory focus on firms' innovativeness, risk-taking, and proactiveness is consistent with the suggestion from Rauch et al., (2009, P.779) that “it may be more appropriate to study antecedences and consequences of EO at the level of the dimensions of EO”. Nevertheless, research on this area is largely unexplored as existing studies typically operationalise EO as a combined factor (Wales et al., 2013a). Since the dimensions of EO are distinct, examining the antecedents of EO at the level of individual dimensions should generate more nuanced insights that cannot be uncovered when they are combined as one factor.

This study focuses on the context of SMEs based on three considerations. Firstly, CEOs have higher managerial discretion within small firms (Finkelstein and Hambrick, 1990a). This implies that CEOs should have an even stronger influence on SMEs than large firms, which are more likely to be managed by top management teams. Thus, SMEs represents an ideal context to examine the effects of CEO regulatory focus on the behaviours and performance of SMEs. Secondly, the implications of innovativeness, risk-taking, and proactiveness are likely to differ between SMEs and large firms. For example, since SMEs are resource constrained (Rosenbusch et al., 2013), they may have less experience of and lower capabilities for innovation than large firms. Also, given that SMEs tend to lack resources in buffering losses, potential failures in their entrepreneurial activities might significantly impact their performance or even endanger their survival. By contrast,

similar failures should have limited impacts on large firms, which tend to have more resources to buffer such losses. Finally, because SMEs contribute significantly to economic development and job creation (OECD, 2017), it is imperative to better our understanding of the factors that might influence the behaviours or performance of SMEs. An enhanced understanding might help SMEs to calibrate their activities to achieve better performance.

In short, the purpose of this study is to investigate the factors that might impact the organisational outcomes of SMEs. This study examines two important factors: CEOs' regulatory focus (i.e., promotion and prevention focus) and firms' entrepreneurial behaviours (i.e., innovativeness, risk-taking, and proactiveness). It is paramount to consider these two factors because studies have shown that they have profound influences on organisations (Johnson et al., 2015; Rauch et al., 2009; Wales, 2016). In particular, this study aims to address three research questions (RQ):

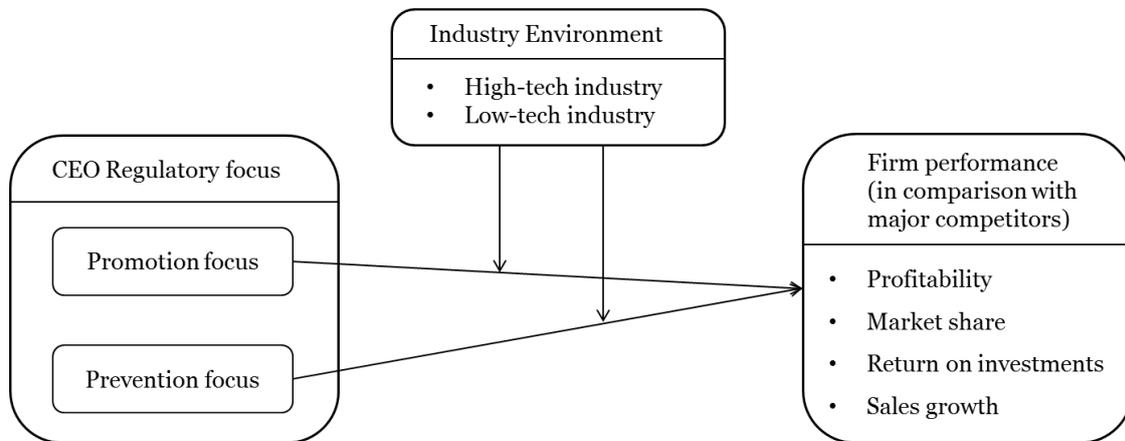
RQ 1. How does the CEO's regulatory focus affect the respective SME's performance; and how does the effect differ between SMEs operating in high-tech industries and those in low-tech industries?

RQ 2. How does an SME's level of innovativeness, risk-taking, and proactiveness impact its performance; and how does the effect differ between SMEs operating in high-tech industries and those in low-tech industries?

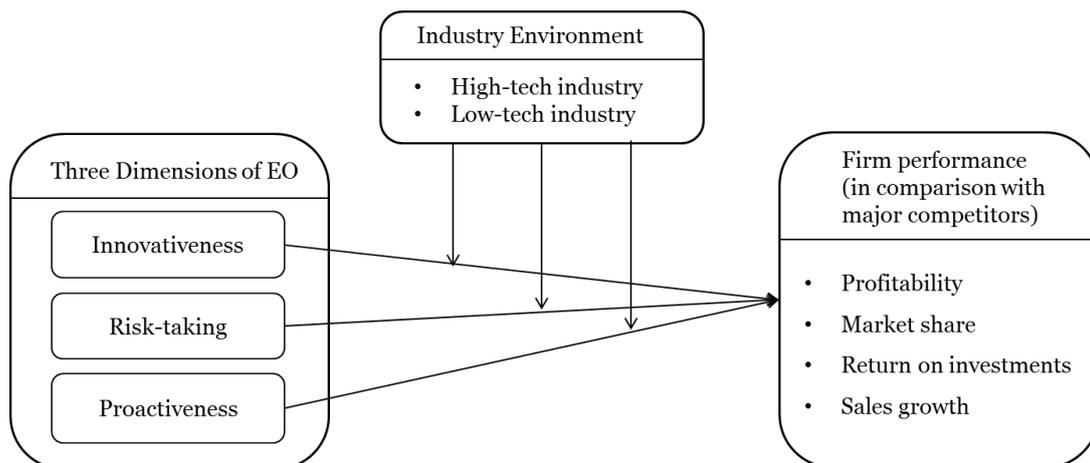
RQ 3. How does the CEO's regulatory focus influence the respective SME's levels of innovativeness, risk-taking, and proactiveness?

Figure 1-1 presents the theoretical models used in relation to the three research questions and illustrates the proposed relationships of the key theoretical constructs examined in this study. As shown in the figure, I posture that CEO promotion and prevention focus are associated with SME performance and that their relationship might vary between SMEs operating in high-tech industries and those in low-tech industries. Additionally, I hypothesise that SMEs' levels of innovativeness, risk-taking, and proactiveness are related to SME performance, and that their relationship might vary between SMEs operating in high-tech industries and those in low-tech ones. Finally, I posit that CEO promotion and prevention focus are associated with SMEs' levels of innovativeness, risk-taking, and proactiveness.

RQ 1. How does the CEO's regulatory focus affect the respective SME's performance and how does the effect differ between SMEs operating in high-tech industries and those in low-tech industries



RQ 2. How does an SME's level of innovativeness, risk-taking, and proactiveness impact its performance and how does the effect differ between SMEs operating in high-tech industries and those in low-tech industries



RQ 3. How does the CEO's regulatory focus influence the respective SME's levels of innovativeness, risk-taking, and proactiveness

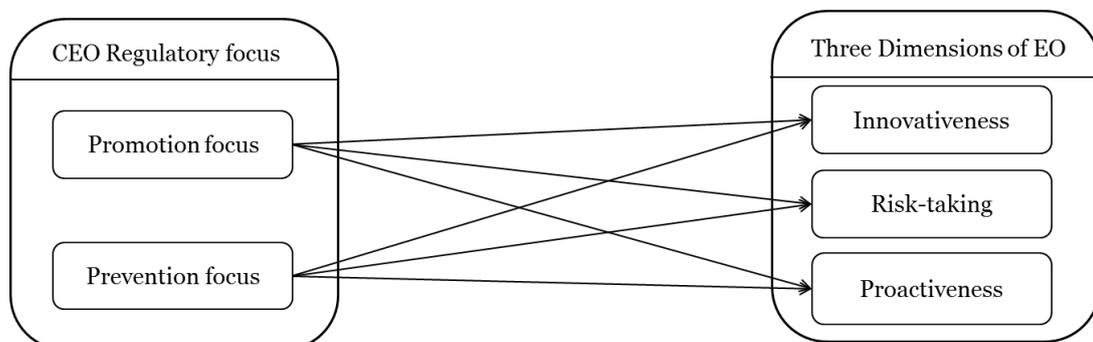


Figure 1-1: Theoretical framework of the study

1.2 Structure of the thesis

This introductory chapter presents the rationale for conducting this study and outlines the three key research questions it aims to address. The remainder of this thesis is organised as follows.

Chapter 2 presents a review of the literature on regulatory focus theory and entrepreneurial orientation in three sections. In the first section, I introduce the theoretical foundations of regulatory focus theory and outline the major differences between promotion and prevention focus as well as their distinct implications on people's decision making. After that, I discuss how people's regulatory focus is related to different organisational outcomes. This is followed by introducing the limitations of existing studies that examine the effect of regulatory focus within organisational contexts. In the second section, I introduce the historical roots and conceptual development of the EO concepts and outline the contributions of EO to entrepreneurship literature. I then introduce the shortcomings of existing EO studies on issues related to definitional inconsistency, dimensionality, and measurement. This is followed by a discussion of the performance implications of EO and its dimensions on organisations. This chapter concludes with section three discussing the major differences between regulatory focus and EO, as well as why there is a potential relationship between them.

Chapter 3, the hypothesis development chapter, outlines the hypothesised relationships proposed in this study. It is divided into three sections with each section corresponding to one of the research questions outlined in the introductory chapter. Specifically, drawing on existing theoretical and empirical evidence, I first introduce the potential effects of CEO regulatory focus on SME performance and how they are moderated by the industry environment in which SMEs operate. As such, Hypotheses 1 to 4 are used to address research question one. After that, I outline the potential links between the dimensions of EO and SME performance and how they are moderated by the industry environment in which SMEs operate. Hence, Hypotheses 5 to 10 are developed to address research question two. Finally, I introduce the potential effects of CEO regulatory focus on SMEs' levels of innovativeness, risk-taking, and proactiveness. Therefore, Hypotheses 11 to 16 are developed to address research question three.

Chapter 4 presents the methodology used in this research. I first discuss the rationale for adopting a quantitative research design and using an online questionnaire for data collection. The sampling frame and the data collection processes, including questionnaire design, pilot testing, and formal data collection are then introduced. After that, I discuss the procedures used to scrutinise the quality of data collected. This is followed by introducing the measurement for all key variables. This chapter concludes with a discussion of the different tests that are used to examine the reliability and validity of the constructs used in this study.

Chapter 5 presents the data analysis and results from this research. It includes five sections. In the first section, I discuss the descriptive statistics for all the key variables used in this study. In sections two to five, I first introduce the regression models used for hypothesis testing. This is followed by introducing the detailed results from regression analysis, as well as the different robustness or post-hoc tests used to scrutinise the results. All hypotheses and the results from hypothesis testing are summarised in section five.

Chapter 6, the final chapter, presents a discussion of the findings generated from this study. I discuss how the empirical results generated from the present study are related to and also extend research on regulatory focus and EO. Since several hypotheses are not supported in this study, potential explanations for the non-findings are introduced. Additionally, the theoretical contributions in relation to regulatory focus theory and EO, as well as their practical implications are highlighted. This chapter concludes with a discussion of the research limitations and the potential areas for future research.

Chapter 2: Literature Review

2.1 Regulatory Focus Theory

People's tendency to approach pleasure and avoid pain is recognised as the hedonic principle (Higgins, 1997). Psychologists often rely on this principle to explain people's motivation to move toward desired end-states (pleasure) and move away from undesired end-states (pain). While the hedonic principle has contributed to our understanding of people's motivation, it is not without limitations because it fails to account for how people approach desired end-states and avoid undesired ones. Indeed, as Higgins (1998, p. 2) pointed out, "*how* the hedonic principle operates might be as important in motivation as the fact that it does operate". To move beyond the hedonic principle, Higgins (1997, 1998) proposed regulatory focus theory that delineates how people approach desired end-states and avoid undesired end-states in different strategic ways.

2.1.1 Foundations of regulatory focus theory

Regulatory focus theory is based on the premises that people are concerned with different needs and that "the hedonic principle should operate differently when serving fundamentally different needs" (Higgins, 1997, p. 1281). For example, researchers have differentiated the needs concerned with advancement and growth from those concerned with security and protection. Indeed, the needs for advancement and security are two of the most fundamental needs that people are motivated to fulfil (Molden et al., 2008). Building on the differentiation between different needs, regulatory focus theory distinguishes self-regulation, which refers to the processes by which people set goals and then regulate their cognition and behaviour to realise their goals (Bryant, 2009; Tumasjan and Braun, 2012), into two independent regulatory systems: a promotion focus for achieving advancement and a prevention focus for ensuring security.

2.1.1.1 The difference between promotion and prevention focus

One fundamental distinction between promotion and prevention focus is the different needs underlying the two systems. Specifically, promotion focus concerns advancement needs and prevention focus concerns security needs. Because of the

different underlying needs, promotion and prevention focus orient people to fulfil their needs in distinct ways. In particular, the two systems differ on several aspects: a) the preferred strategic means for goal pursuit (approach versus avoidance); b) the strategic tendencies people exhibited in pursuing goals (eagerness versus vigilance); and c) the type of outcomes that are salient to them (gain versus loss). Table 2-1 summarises the key differences between promotion and prevention focus, which are elaborated below.

Table 2-1: The differences between promotion and prevention focus

	Promotion focus	Prevention focus
Primary concerns / underlying needs to satisfy	Concerned with advancement, growth, and accomplishment	Concerned with security, safety, and responsibility
Strategic preference for goal pursuit	Prefer approach strategies (approaching matches to advancement and approaching mismatches to non-fulfilment)	Prefer avoidance strategies (avoiding mismatches to security and avoiding matches to threat)
Strategic tendency	Inclined to insure hits and insure against errors of omission (Eagerness)	Inclined to insure correct rejections and insure against errors of commission (Vigilance)
Salient outcomes	Sensitive to the presence or absence of positive outcomes (gains)	Sensitive to presence or absence of negative outcomes (losses)

Sources: Adapted from Higgins (1997, 1998); Crowe and Higgins (1997); Molden et al., (2008).

Because promotion and prevention focus are concerned with distinct needs, both systems entail different strategic means for goal pursuit (Higgins, 1997). Before introducing how the strategic means differ, it is important to acknowledge that regulatory focus is orthogonal to approach/avoidance motivation. Specifically, both promotion and prevention focus include “both approaching desired end-states and avoiding undesired end-states” (Johnson et al., 2015, p. 1503). That is, a promotion focus includes striving for advancement and avoiding non-fulfilment and a prevention focus includes striving for security and avoiding threat, as illustrated in Figure 2-1.

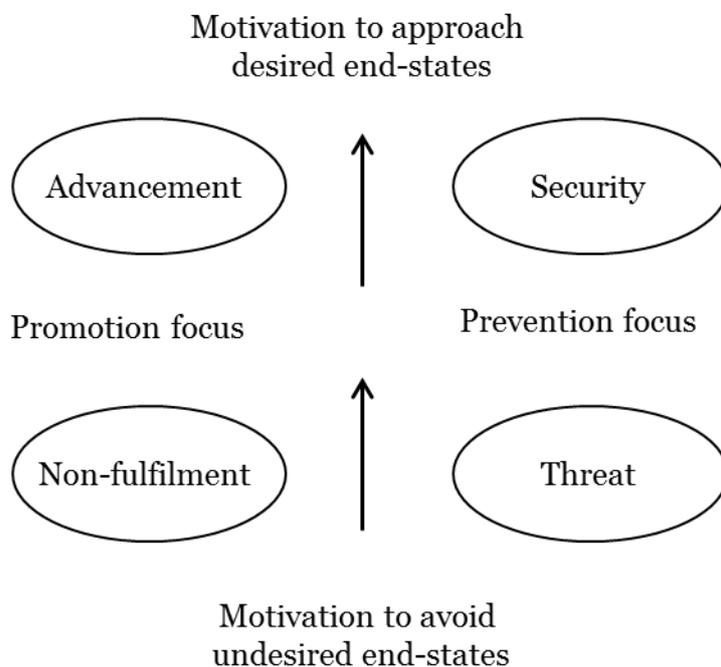


Figure 2-1: An illustration of the distinction between regulatory focus and the approach – avoidance motivations, adapted from Molden et al., (2008)

Regulatory focus theory suggests that promotion and prevention focus differ in the preferred strategic means people use for goal pursuit. In particular, promotion focused people prefer to approach matches to advancement and approach mismatches to non-fulfilment, whereas prevention focused people prefer to avoid mismatches to safety and to avoid matches to threat. Hence, whether attaining desired end-states or preventing undesired one, a promotion focus favours *approach means* whereas a prevention focus favours *avoidance means*. An initial demonstration of the different strategic means preferred by promotion and

prevention focus comes from a study by Higgins et al., (1994). In the third study of this paper, participants were presented with six strategies that they might use to experience desired friendships. Three of the strategies were concerned about approaching matches to desired friendship (e.g., to be emotionally supportive) and the other three strategies were concerned with avoiding mismatches to friendship (e.g., not neglecting friends). Higgins et al., (1994) found that participants with a promotion focus concern select more approach strategies and those with a prevention focus concern select more avoidance strategies.

Promotion and prevention focus also differ in the strategic tendencies people exhibited in pursuing goals. Specifically, regulatory focus theory proposes that promotion focused people are *eager* to attain advancement because they are inclined to approach matches to desired end-states; whereas prevention focused ones are *vigilant* to insure safety because they are inclined to avoid mismatches to desired end-states. As Higgins (1997, p. 1285) highlighted, “individuals in a state of eagerness from a promotion focus should want, especially, to accomplish *hits* and to avoid errors of omission or *misses* (i.e., a loss of accomplishment). In contrast, individuals in a state of vigilance from a prevention focus should want, especially, to attain *correct rejections* and to avoid errors of commission or *false alarms* (i.e., making a mistake).” Hence, promotion focused people should exhibit a tendency to “insure hits and insure against errors of omission” in pursuing goals, whereas prevention focused people should exhibit a tendency to “insure correct rejections and to insure against errors of commission” for goal pursuit.

For example, Crowe and Higgins (1997) examined people’s different strategic tendencies using a recognition memory task. Participants first viewed a series of nonsensical words and then were given a set of words that included words from the original list (i.e., targets) but also new words (i.e., distractors). During the test, participants were required to indicate either ‘yes’ or ‘no’ based on whether or not they had seen the word. The four possible outcomes are: 1) saying ‘yes’ when the word was presented – a hit; 2) saying ‘no’ when the word was presented – a miss; 3) saying ‘yes’ when the word was absent – an error of commission; and 4) saying ‘no’ when the word was absent – a correct rejection. Crowe and Higgins (1997) found that promotion focused people exhibited a risky response bias to saying ‘yes’ (i.e., a propensity to ensure hits), whereas prevention focused people have a conservative

response bias to saying 'no' (a tendency to ensure correct rejections). Similar results were observed in another study examining regulatory focus in a team setting. Specifically, promotion focused teams are biased towards saying 'yes', whereas prevention focused teams are biased towards saying 'no' (Levine et al., 2000).

Another major difference between promotion and prevention focus is their sensitivities to either gains or losses (Higgins, 1997, 1998). Because a promotion focus is concerned with the needs for advancement, promotion focused people are more sensitive to gain related outcomes. In other words, the presence or absence of positive outcomes is more salient to promotion focused people who are driven to strive for attaining gains. The presence of positive outcomes represents a success in their endeavour and the absence of such outcomes represents a failure (Collins, 2016). By contrast, as a prevention focus is concerned with the needs for security, prevention focused people are more sensitive to loss related outcomes. That is, the absence and presence of negative outcomes are more salient to prevention focused people who are driven to protect themselves from loss. The absence of negative outcomes represents a success in their endeavour and the presence of such outcomes represents a failure (Collins, 2016).

The difference in people's sensitivity to gain and loss is demonstrated in an experimental study from Markman et al., (2005). Participants were invited to complete a learning task and were given performance incentives framed either in terms of gain or loss. For example, the gain related framing would emphasise gaining points and not gaining points based on their response, whereas the loss related framing would emphasise not losing points or losing points based on their response. Markman et al., (2005) found that people who were primed with a promotion focus achieved better task performance when the incentives or task payoffs were framed in terms of gain. On the other hand, people who were primed with a prevention focus accomplished better task performance when the incentives or task payoffs were framed in terms of loss. Their findings demonstrate that gain related outcomes are more salient to promotion focused people while loss related outcomes are more salient to prevention focused people. Their results also indicate that aligning the incentives with people's regulatory focus have profound implications for task performance.

To illustrate how the different sensitivities shape people's decision making, imagine the situation of evaluating potential business opportunities and deciding which one or ones to undertake. People are likely to consider a wide range of criteria such as the resources required, the feasibility of the opportunities, potential loss due to failure, and potential gain, among others. A promotion focus would orient people to weight more heavily the perceived potential gains because their underlying concern is for preferring opportunities that provide significant potential for advancement. On the other hand, a prevention focus would induce people to attach more significance to the perceived potential loss because their underlying concern is for avoiding opportunities that entail significant risk, which can lead to loss and endanger their security. Indeed, researchers have suggested that the different sensitivities to gains or losses partly explains why firms that are led by promotion focused CEOs undertake higher number and value of business acquisition than firms that are led by prevention focused CEOs (Gamache et al., 2015).

It should be acknowledged that regulatory focus has been examined both as a chronic disposition and also as a response to situational cues (Lanaj et al., 2012). The chronic element of regulatory focus is a stable disposition developed through people's developmental and achievement experiences. People's childhood experiences of interacting with their primary caretakers shape their regulatory focus (Higgins and Silberman, 1998). For example, the caretaker-child interaction that emphasises attaining accomplishments can induce a promotion focus, while an interaction that emphasised insuring safety can induce a prevention focus. Additionally, people's success or failure experiences in promotion and prevention related self-regulation affect their tendencies toward using that strategy for goal attainment (Higgins et al., 2001). On the other hand, the situational element of regulatory focus is more malleable (Wu et al., 2008; Gorman et al., 2012) and can be influenced by different situational factors such as the framings of task payoffs in laboratory settings (Shah and Higgins, 1997) and the leadership style of supervisors (Kark and Van Dijk, 2007; Wallace et al., 2009). Following previous entrepreneurship research (Kammerlander et al., 2015; Bryant, 2009), this study focuses on chronic regulatory focus because it has more stable effects on people's behaviours.

2.1.1.2 Implications of promotion and prevention focus

Having discussed the key differences between promotion and prevention focus, I now introduce the psychological and behavioural implications of the two systems, including how they affect people's attitude toward change versus stability, relative emphasis on speed versus accuracy in decision making, and the propensity towards risk-taking versus risk aversion.

One distinction between promotion and prevention focus is the sensitivity to gain versus loss. Researchers suggest that this difference impacts people's attitude towards change versus stability. In general, attending to gain induces people more toward seeking change whereas attending to loss induces them more toward maintaining the status quo (Liberman et al., 1999; Molden et al., 2008; Collins, 2016). People often engage in behavioural regulation to bring themselves into alignment with their preferred goal states (Scholer and Higgins, 2011). That is, they compare their current circumstance with desired end-states and act to reduce the discrepancy when they experience discrepancy between the two. Moving toward improved circumstances and away from the status quo is more desirable for people with a promotion focus, whereas maintaining satisfactory or adequate circumstances and avoiding the presence of problems is more critical for people with a prevention focus. Consequently, promotion focused people prefer change while prevention focused people prefer stability.

The different attitudes toward change and status quo maintenance are illustrated within a study conducted by Liberman et al., (1999). In particular, the authors examined how promotion and prevention focus impacts people's willingness to substitute an interrupted activity for another activity and to exchange an acquired object for a different one. They found that promotion focused people are more likely to switch to a new task when their previous one is interrupted than prevention focused people, who will typically resume the old task. Additionally, promotion focused people are more likely than prevention focused people to exchange an object they already possess for a new object. The findings highlight the important role of promotion and prevention focus in shaping people's tendency towards change and stability.

Similar findings have been observed with respect to other situations. Compared with promotion focused people, prevention focused ones have a stronger preference to maintain the status quo options - staying with the original choice of investment funds they have chosen rather than switching to potentially better ones (Chernev, 2004). In another study examining consumers' decision about the adoption of new products, Herzstein et al., (2007) found that prevention focused consumers are less willing to try and use new products than promotion focused one. Additionally, in a longitudinal study, Fuglestad et al., (2008) found that a promotion focus is associated with a higher tendency to initiate behaviour changes (e.g., higher quit rates of smoking) whereas a prevention focus is related to a higher propensity to maintain behaviour change (e.g., remain smoke-free in the follow-up period).

While both theoretical and empirical evidence suggests that, compared with promotion focused people, prevention focused ones have a stronger preference for stability and are less willing to consider new possibilities and change, it is important to acknowledge that a preference for stability and the status quo does not imply prevention focused people would not practice change. In the situation of experiencing losses, for example, prevention focused people might activate changes that would allow them to regain adequate status quo (Collins, 2016).

In addition to influencing people's attitude toward change versus stability, promotion and prevention focus also have distinct impacts on people's relative emphasis on speed versus accuracy in decision making. The gain related concerns associated with promotion focus induce a preference for eager judgement strategies, whereas the loss related concerns associated with prevention focus induce a preference for vigilant judgment strategies (Molden et al., 2008). As a result, promotion focused people tend to emphasise speed during goal pursuit while prevention focused people are likely to emphasise accuracy. Förster et al., (2003) examined such differences using simple drawing tasks. Participants were required to connect numbered dots to form pictures. Speed was measured by the numbers of dots participants connected within a given time, and accuracy was measured by the numbers of dots that they failed to connect. Prioritising speed represents an eagerness strategy to maximise potential gains, whereas prioritising accuracy represents a vigilance strategy to minimise potential losses. Consistent with their expectations, Förster et al., (2003) found that promotion focused participants

produced faster (i.e., higher quantity) outputs, whereas prevention focused participants produced more accurate (i.e., fewer mistakes) outputs.

In another experimental study, Spanjol et al., (2011) examined how promotion and prevention focus affects teams' decisions on new product introduction. Using simulation tasks that involve decisions concerning the number, types, and timing of new product introduction, the authors found that promotion focused teams (i.e., both members are promotion focused) introduced higher numbers of new products than prevention focused teams. Additionally, the speed of new product introduction as well as the novelty of products was higher for promotion focused teams than prevention focused teams. Their findings also demonstrate that promotion and prevention focus have distinct influences on people's relative emphasis on decision making concerning speed versus accuracy with respect to introducing new products. These findings are consistent with the results from Förster et al., (2003) who suggested that promotion focused people emphasise speed (or quantity) while prevention focused people emphasise accuracy (or quality) during decision making.

Additionally, promotion and prevention focus have differential effects on people's tendency towards risk-taking. Research in regulatory focus theory suggests that promotion and prevention focus are related to people's risk-taking propensity (Bryant and Dunford, 2008). Because promotion focus is associated with an eagerness inclination to insure hits and insure against errors of omission, promotion focused people are likely to have a higher tendency to engage in risk-taking. By contrast, because prevention focus is associated with a vigilant inclination to insure correct rejections and insure against errors of commission, prevention focused people tend to exhibit higher tendencies toward risk aversion. Florack and Hartmann (2007) examined such differences in an experiment involving financial investment decisions. They found that prevention focused teams are more risk averse than promotion focused teams in their investment decisions – represented by allocating investment to funds that have lower levels of volatility, which indicates the level of risks involved. In another study examining how promotion and prevention focus impacts people's actual risky behaviour in the context of mobility, Hamstra et al., (2011) found that promotion focus was positively, and prevention focus was negatively associated with people's actual risky behaviour in speeding.

While a prevention focus is typically supported by cautious means that entails lower risk, in the situation of experiencing losses, prevention focused people can also become more risk tolerant. For example, using a stock investment scenario, Scholer et al., (2010) examined people's risk seeking behaviours under loss. Specifically, after participants had experienced a loss in a previous round of investment, they were then presented with two different investment options. One investment option entails higher risk with a payoff that may allow participants to recover their losses from the previous investment, whereas another investment option involved lower risk with a payoff that nevertheless could not eliminate their previous loss. Scholer et al., (2010) found that compared with promotion focused participants, the ones who are primed with a prevention focus exhibited higher risk seeking tendencies and were more willing to choose the risky option over the conservative option. As Collins (2016, p. 17) pointed out, "the concern with avoiding loss was so great that a prevention focus evoked a willingness to select the riskier option" that may allow prevention focused people to escape from the situation of loss.

2.1.2 Regulatory focus and firm outcomes

While regulatory focus was originally developed as an individual-level construct to explain the differences in people's behaviours and underlying motivations, researchers have applied it in the organisational context to understand how people's regulatory focus may affect the behaviours and performance of organisations. For example, recent studies have shown that the regulatory focus of CEOs or entrepreneurs has profound impacts on the behaviours and performance of firms they lead (Kammerlander et al., 2015; Gamache et al., 2015; Greenbaum, 2015; Wallace et al., 2010; Hmieleski and Baron, 2008). Such findings are not surprising given that CEOs or entrepreneurs are the primary decision makers within their organisations (Hambrick and Mason, 1984). As such, their regulatory focus induced decisions should impact firms they lead.

For example, Kammerlander et al., (2015) examined the effects of CEO regulatory focus on firms' level of engagement in exploration and exploitation activities within an SME context. Using survey responses from CEOs in Switzerland, the authors found that CEOs' level of promotion focus is positively related to firms' level of exploration and exploitation; and that these correlations are also enhanced under conditions of intense competition. They also found that CEOs' level of prevention focus negatively affects firms' exploration but that there is no correlation with exploitation. Additionally, Kammerlander et al., (2015) observed that promotion focus positively impacts organisational ambidexterity but prevention focus does not have similar effects. Although the authors did not directly test the performance implications of promotion and prevention focus, their empirical results implicitly suggest that under intensive competition, firms that are led by promotion focused CEOs may achieve better outcomes than firms that are led by prevention focused CEOs. This is because the former firms are better positioned to balance competing activities (exploration versus exploitation), which in turn should contribute to better performance (Lubatkin et al., 2006; O'Reilly and Tushman, 2011).

In addition to shaping firms' exploration and exploitation behaviours, researchers have found that CEO regulatory focus is also associated with other organisational behaviours such as business acquisition and new product introduction (Gamache et al., 2015; Greenbaum, 2015). For example, Gamache et al., (2015) examined the

impact of CEO regulatory focus on firms' acquisition behaviour measured by the number and value of acquisition. The authors captured CEO regulatory focus through a content analysis of letters to shareholders over a period of ten years. Consistent with their hypotheses, the authors found that CEO promotion focus positively, and CEO prevention focus negatively, impact firms' level of acquisition. In another study within the context of the U.S. automobile industry, Greenbaum (2015) found that CEO promotion focus positively, and CEO prevention focus negatively, influence the number of new products introduced by firms they lead. While these two studies are focusing on the context of large firms (Gamache et al., 2015; Greenbaum, 2015), it is likely that the findings should hold true within SMEs, and perhaps even more so, given that CEOs tend to play a more dominant role in such firms (Finkelstein et al., 2009).

Moreover, a number of studies have suggested that the regulatory focus of CEOs or entrepreneurs are related to small firm performance (Wallace et al., 2010) and new venture growth (Hmieleski and Baron, 2008). For example, Wallace et al., (2010) examined the direct relationships between CEO regulatory focus and small firm performance, suggesting that both promotion and prevention focus positively impact firm performance, and that environmental dynamism will moderate these impacts. Using survey data collected from both CEOs and one of their top managers, Wallace et al., (2010) found that promotion focus positively impacts firm performance, and that this finding is consistent when using either the self-reported performance data from CEOs or top managers. They also found that prevention focus negatively impacts firm performance. Nevertheless, such results are only observed on the performance data from the top manager but not the CEO-reported performance data. As such, the nature of the link between CEO prevention focus and firm performance remains inconclusive.

A related study from Hmieleski and Baron (2008) argues that regulatory focus can indirectly impact new venture growth through shaping firms' tendencies to deviate from their original business concepts. Specifically, the authors propose that the impact of regulatory focus on new venture growth is mediated by firms' deviation from original business concepts. As Hmieleski and Baron (2008, p. 287) noted, "entrepreneurs must deviate from their original business opportunity as the realities of an unpredictable future unfold" during the entrepreneurial process. They

found that, in dynamic environments, promotion focus relates positively, and prevention focus relates negatively, to new venture growth. Both relationships are fully mediated by firms' deviation from their original business concepts. However, no significant relationship between regulatory focus and venture performance was observed under stable environments. Together, the empirical results from Wallace et al., (2010) and Hmieleski and Baron (2008) demonstrate that the performance effects of regulatory focus on organisations are context dependent. That is, the impacts of regulatory focus are contingent upon the environmental context (i.e., environmental dynamism) in which firms operate.

2.1.3 The limitations of regulatory focus

As illustrated in the previous discussions, researchers have used the individual difference regarding regulatory focus to explain the variance in firms' behaviours or performance. While existing studies have generated useful insights about the effects of regulatory focus within organisational contexts, they are not without limitations. For example, existing studies have shown that CEO regulatory focus shapes the strategic behaviours of large firms (Gamache et al., 2015; Greenbaum, 2015). However, these studies only assessed the effects of CEO regulatory focus alone without considering the potential influence of other team members. This is problematic because large firms are likely to be managed by top management teams (Finkelstein et al., 2009), suggesting that other team members also play a significant role in shaping the behaviours of organisations. As such, there are reasons to expect that the variance in the behaviours of large firms is not only a function of individual CEOs alone but also shaped by other top management team members. Indeed, researchers have suggested that the regulatory focus of CEOs and CFOs are likely to interact and influence firms' growth related activities (Chen et al., 2017). Accordingly, it is possible that studies that examine CEO regulatory focus in large firm contexts may incorrectly attribute the variance in firms' behaviours to CEO regulatory focus while part of the variance may be due to the influences from other team members.

Additionally, existing studies on the relationship between CEO regulatory focus and firm behaviours mainly focus on the context of large firms with limited attention being devoted to SMEs (e.g., Kammerlander et al., 2015). The lack of studies on smaller firms may be because the use of regulatory focus theory within organisational contexts is still nascent (for a recent review see Johnson et al., 2015). Because the organisational structure and managerial systems often differ between large firms and SMEs (Aldrich and Auster, 1986), the results generated from large firms may not hold true within SMEs. For example, researchers have highlighted that the CEOs of small firms have higher levels of managerial discretion (Finkelstein and Hambrick, 1990b; Finkelstein et al., 2009; Wangrow et al., 2015), suggesting that their influence on such firms should be more salient. Accordingly, while the findings generated from large firm contexts can shed light on the influence of CEO regulatory focus on organisations, more research is still needed to uncover the

nature and extent of the influence of CEO regulatory focus on the behaviours of SMEs.

A third limitation of existing studies of regulatory focus within organisational contexts is that the potential interplays between promotion and prevention focus are largely ignored. Regulatory focus theory suggests that promotion and prevention focus represent two independent systems rather than opposite ends of a single continuum (Higgins, 1997, 1998). In support of this view, results from a meta-analysis of studies on regulatory focus and work-related outcomes have shown that there is a relatively weak association between promotion and prevention focus (Lanaj et al., 2012), suggesting that people may have varying combinations of promotion and prevention focus. For example, people may be high or low in both promotion and prevention focus or they may be high in one attribute and low in another (Markovits, 2012). Nevertheless, the majority of existing studies that examine regulatory focus within organisational contexts did not consider the potential interplay between promotion and prevention focus, except one recent study from Kammerlander et al., (2015). Thus, in addition to assess the direct influence of promotion and prevention focus on the behaviours or performance of organisations, it would be paramount to consider how the varying combinations of promotion and prevention may influence the outcomes of organisations.

2.2 Entrepreneurial Orientation

Research on entrepreneurial orientation (EO) has attracted substantial attention in the past three decades. Indeed, EO has been considered as a central concept within entrepreneurship literature (Covin and Lumpkin, 2011). Nevertheless, debates remain on the nature of the EO construct, its dimensionality, and the measurement of the construct (Covin and Lumpkin, 2011; George and Marino, 2011; Covin and Wales, 2012). Additionally, the performance implications of EO remain inconclusive because the empirical evidence on the relationship between EO and firm performance has been mixed (Rauch et al., 2009; Tang et al., 2008; Su et al., 2011; Wales et al., 2013c). Before discussing the limitations of existing EO studies, I first introduce the development of the EO concept and how it contributes to the field of entrepreneurship research.

2.2.1 The historical roots and conceptual development of EO

The historical root of the EO concept can be traced to the strategy-making process literature (e.g., Mintzberg 1973). In particular, Mintzberg (1973) conceived three modes of strategy-making with one of them being the entrepreneurial mode. The author proposed that the entrepreneurial mode of strategy-making is characterised by the active search for new opportunities and undertaking bold decisions under conditions of uncertainty through which organisations may make dramatic gains. In a similar vein, Khandwalla (1976/77, p. 22) extended the concept of management style, which refers to the “operating set of beliefs and norms about management held by the organization’s key decision makers”. The author suggested that an entrepreneurial management style is characterised by “bold, risky, aggressive decision making” (Khandwalla, 1976/77, p. 25).

Building on the work of Mintzberg (1973) and others, Miller and Friesen (1982) distinguished entrepreneurial firms from conservative firms based on the innovation strategies firms undertake. Specifically, entrepreneurial firms are “firms that innovate boldly and regularly while taking considerable risks in their product-market strategies” (Miller and Friesen, 1982, p. 5), whereas conservative firms are firms that undertake innovation mainly in response to the challenges they face. Hence, entrepreneurial firms tend to aggressively pursue innovation unless there is

evidence that resources are being exhausted by too much innovation. Conversely, conservative firms are likely to innovate in response to competitive attacks or changing customer needs in the market environment. As such, innovation in conservative firms tends to be reactive as it takes place only when necessary.

In a subsequent seminal work, Miller (1983, p. 771) proposed that “[a]n entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch.” While Miller never employed the term EO in this initial work (Miller, 2011), researchers often credit him with introducing the EO concept because this seminal work laid the foundation of EO, which was later adopted and extended by other researchers (e.g., Covin and Slevin, 1989; Lumpkin and Dess, 1996). In particular, Miller’s early work on EO is important in two ways. Firstly, Miller conceived the characteristics that are essential for a firm to be labelled as entrepreneurial. The characteristics have been widely used as the three core dimensions of the EO construct (i.e., innovativeness, risk-taking, and proactiveness). Secondly, Miller’s work contributes to the changing focus of entrepreneurship from individual actors to the firm-level process. As Miller (1983, p. 770) noted, rather than focusing on the entrepreneurs who make the strategic decisions, “this paper shifts the emphasis somewhat, looking at the entrepreneurial activity of the *firm*.”

Nevertheless, Miller’s work is not without limitations. While Miller (1983) suggested that a firm can be characterised as entrepreneurial when it exhibits innovativeness, risk-taking, and proactiveness concurrently, whether such entrepreneurial behaviours should be sustained to some degree over time is unknown. In other words, the temporal element of EO is largely ignored in the early conceptualisation of the construct. To illustrate, it is possible that a firm may only exhibit singular entrepreneurial behaviour, or it may exhibit entrepreneurial behaviours occasionally or on a sustained basis. The temporal issue of EO was then addressed by subsequent scholars (e.g., Covin and Slevin 1991).

Covin and Slevin (1991, p. 7) extended the EO concept by suggesting that “organizations with entrepreneurial postures, are those in which particular behavioral [*sic*] patterns are recurring”. The term entrepreneurial posture is

synonymous with the concept of EO because it represents firm-level behaviours concerning innovativeness, risk-taking, and proactiveness. Based on this extension, a firm can be classified as entrepreneurial only when it exhibited sustained entrepreneurial behaviours. Additionally, the authors are explicit in pointing out that the existence of EO requires the concurrent exhibition of all three dimensions that are expected to co-vary. It is worth noting that Covin and Slevin (1991) conceived EO as an independent variable that could be used to explain variation in firm performance. Their work differs from Miller's original work that examines the factors and processes that lead to EO, which is operationalised as a dependent variable.

A major shift in the conceptual development of EO comes from the work by Lumpkin and Dess (1996, p. 137), who conceived EO as "the processes, practices, and decision-making activities that lead to new entry". The authors suggested that new entry is the result of launching new or existing products into new or established markets. Drawing on the difference between process and result, the authors proposed that EO refers to the process and entrepreneurship refers to the outcome of the process. More specifically, EO represents how the new entry is achieved through a range of entrepreneurial activities, whereas entrepreneurship represents the result of those activities. Lumpkin and Dess's (1996) conceptualisation of EO differs from previous works in two important aspects. First, EO is viewed as a multidimensional construct comprised of dimensions that can vary independently. This differs from previous views (i.e., unidimensional) that the dimensions of EO should co-vary (Covin and Slevin, 1989). Second, the number of EO dimensions is increased from the original three dimensions (i.e., innovativeness, risk-taking, and proactiveness) to five dimensions with the inclusion of autonomy and competitive aggressiveness. The dimensions of EO are elaborated later in this chapter (see section 2.2.2.2).

In a subsequent development of EO, Kreiser et al., (2002) used a cross-cultural sample to validate the EO measure developed by Covin and Slevin (1989). The authors assessed the model fits when EO is operationalised as a one, two, or three dimensional constructs. They found that EO is best operationalised as a three dimensional construct. As Kreiser et al., (2002) highlighted, when the three dimensions are aggregated into one, the potential independent influence of each

dimension on firm performance will be ignored. Additionally, their empirical results demonstrated that the three dimensions of EO can vary independently. While the authors' primary purpose was to validate the EO measure, their work leads to a unique variation in the development of EO. Specifically, EO is best operationalised as a multidimensional construct that consists of three independently varying dimensions: innovativeness, risk-taking, and proactiveness. This conceptualisation represents an integration of the multidimensional view of EO (Lumpkin and Dess, 1996) with the three dimensions proposed by Miller (1983) and Covin and Slevin's (1989).

The conceptual development of EO has contributed to our understanding of firm-level entrepreneurship in three ways. Firstly, the early works of EO were among the pioneers to shift the focus of entrepreneurship research from the actor (i.e., entrepreneur) to the entrepreneurial activity of the firm (Zahra et al., 2013). As Miller (1983, p. 770) pointed out, "what is most important is not who is the critical actor, but the *process* of entrepreneurship itself and the organizational factors which foster and impede it". As such, EO serves as one of the foundations for the development of entrepreneurship as a firm-level behavioural phenomenon (Covin and Slevin, 1991). The conceptualisation of EO also paves the way for researchers to investigate the antecedents and consequences of firm-level entrepreneurial behaviours. For example, theoretical and empirical works have explored the determinants of EO and how EO impacts the outcomes of organisations (Covin and Slevin, 1991; Zahra, 1993; Lumpkin and Dess, 1996; Wales et al., 2013a).

Secondly, the EO construct allows researchers to make a distinction between the process (EO) and the results from the process (entrepreneurship). It delineates the essential factors that are required (Miller, 1983) or pertinent (Lumpkin and Dess, 1996) for firms to be classified as entrepreneurial. Specifically, it outlines the entrepreneurial behaviours (e.g., innovativeness, risk-taking, and proactiveness) that firms can undertake to renew themselves. In an increasingly competitive market, it is imperative for firms to sustain their competitiveness through pursuing entrepreneurial activities. As Covin and Lumpkin (2011, p. 862) noted, the EO construct offers useful insights to understanding "why and how some firms are able to regularly renew themselves via new growth trajectories while others are not".

Thirdly, since EO is conceived as a firm-level attribute, all firms can be plotted based on their EO (Covin and Slevin, 1989). As such, it allows researchers to make meaningful comparisons on firms' extent of entrepreneurial activities. Indeed, the EO scale offers a useful common metric that has been widely used by researchers to assess the entrepreneurial level of firms (Rauch et al., 2009; George and Marino, 2011). This, in turn, has contributed to entrepreneurship literature as studies can thus assess how the different levels of entrepreneurial activities might result in variation in firm performance.

In short, there are several different conceptualisations of EO (for a recent review see Randerson, 2016). Miller's seminal work serves as the foundation of the EO concept. Building upon this, researchers have conceptualised EO in different ways. Some researchers conceive EO as a unidimensional construct comprised of three dimensions that should co-vary (Covin and Slevin, 1989), while others conceptualise EO as a multidimensional construct comprised of three or five dimensions that can vary independently (Lumpkin and Dess, 1996; Kreiser et al., 2002). As a prominent theoretical construct in the entrepreneurship literature, EO has offered important contributions to the field of entrepreneurship research. Nevertheless, the different conceptualisations of EO have also resulted in several limitations and debates on this area, which are explored below.

2.2.2 The limitations of EO

Despite the popularity of EO, there are several limitations associated with EO research. In particular, debates remain on whether EO is a dispositional or behavioural phenomenon, a unidimensional or multidimensional construct, and how to operationalise the measurement of EO. Given these issues related to EO, Covin and Lumpkin (2011, p. 859) assert that EO is an “annoying construct” and “for every scholar who employs the construct of EO in his or her research, there is another scholar who simply wishes it would exit the scholarly conversation”. The issues in relation to the definitional inconsistencies, the dimensionality of EO, and the measurement of the construct are discussed in turn.

2.2.2.1 Definitional inconsistency

Since there is a lack of consensus on whether EO represents a dispositional or a behavioural phenomenon (Miller, 2011; Covin and Lumpkin, 2011), researchers have defined EO in different manners (George and Marino, 2011). For example, some researchers define EO as “a firm-level disposition to engage in behaviors [sic] that lead to change in the organization or marketplace” (Voss et al., 2005, p. 1134). Dispositions refer to the “tendencies to respond to situations, or classes of situations in a particular, predetermined manner” (House et al., 1996, p. 205). Accordingly, when EO is conceived as a dispositional phenomenon, it represents a firm’s tendency to act in an entrepreneurial manner. Conversely, other researchers conceptualise EO as “a set of distinct but related behaviors [sic]” that are entrepreneurial in nature (Pearce et al., 2010, p. 219). Researchers have highlighted that the definitional inconsistencies of EO have undermined the credibility of EO research and hindered the accumulation of knowledge in this area (George and Marino, 2011; Randerson, 2016).

This study adopts the view that EO is better examined as a behavioural phenomenon rather than as a firm-level disposition based on three reasons. Firstly, it is a firm’s actions that make it entrepreneurial rather than its dispositions, which may or may not be manifested into entrepreneurial behaviours (Covin and Lumpkin, 2011). For instance, the presence of a disposition to pursue entrepreneurial endeavours may not translate into such behaviours. Hence, while the disposition toward entrepreneurial behaviours can be associated with EO, it is not a sufficient defining

factor of the concept. Indeed, researchers have highlighted that we know entrepreneurs through their actions (Gartner, 1989), and that “behaviour [sic] is the central and essential element in the entrepreneurial process” (Covin and Slevin, 1991, p. 8). Following the same line, the exhibition or absence of entrepreneurial behaviours should be a better indicator of whether a firm is entrepreneurial or not.

Secondly, examining EO as a behavioural construct can offer benefits in relation to measuring and managing EO. As a behavioural construct, a firm’s level of EO can be better gauged because behaviours tend to be demonstrable (Covin and Slevin, 1991). We can thus reliably distinguish entrepreneurial firms from conservative firms through measuring their demonstrable behaviours. Conceiving EO as a behavioural construct also allows potential intervention. That is, a firm may manage EO to stimulate or decrease its entrepreneurial activities. For example, a firm may cultivate an organisational environment (Fayolle et al., 2010) and strategies (Miller, 1983) to foster or alleviate its level of EO. Finally, if EO is conceived as a dispositional construct, it becomes problematic to distinguish the concept of EO from related entrepreneurial attributes (e.g., entrepreneurial culture), that are also intangible in nature (Blumentritt et al., 2005).

2.2.2.2 The dimensionality issue

There are two predominant views about the dimensionality of EO: unidimensional and multidimensional. The unidimensional view is associated with the work of Miller (1983) and Covin and Slevin (1989) who suggested that EO is comprised of three dimensions, namely, innovativeness, risk-taking, and proactiveness. In particular, EO represents “the common or shared variance among risk-taking, innovativeness, and proactiveness” (Covin and Lumpkin, 2011, p. 862). Hence, the existence of EO requires the concurrent exhibition of all three dimensions. This implies that a firm cannot be classified as entrepreneurial if it exhibits only one or two of the dimensions (Miller, 1983). Innovativeness represents firms’ propensities to engage in and support new ideas and experimentation that may lead to new products, services and processes (Lumpkin and Dess, 1996; Wiklund and Shepherd, 2005). Risk-taking refers to the willingness to make substantial resource commitments that have uncertain outcomes (Miller and Friesen, 1978; Rauch et al., 2009). Proactiveness refers to the “forward-looking, first mover advantage-seeking

efforts to shape the environment by introducing new products or processes ahead of the competition” (Lyon et al., 2000, p. 1056).

The multidimensional view of EO is associated with the work of Lumpkin and Dess (1996) who suggested that EO consists of five dimensions that can vary independently. Lumpkin and Dess (1996, p. 137) explicitly assert that all of the dimensions “may be present when a firm engages in new entry. In contrast, successful new entry also may be achieved when only some of these factors are operating”. To illustrate, an entrepreneurial firm may exhibit high levels on all dimensions, or it may have high levels on some of the dimensions but low on others. In addition to the original three dimensions conceived by Miller (1983), Lumpkin and Dess (1996) proposed to include competitive aggressiveness and autonomy as two additional dimensions of EO. Competitive aggressiveness represents a firm's tendency to directly challenge its competitors to outperform them in the marketplace. As such, it differs to the proactiveness dimension that is more client-oriented rather than competitor-focused (Miller, 2011). 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, 1996, p. 140).

Many studies have deviated from the original three or five-dimensions of EO and have used different dimensional combinations (Wales et al., 2013a). For example, some researchers operationalise EO as a construct comprising of only two dimensions: proactiveness and innovativeness (Merz and Sauber, 1995; Knight, 1997) or proactiveness and risk-taking (Avlonitis and Salavou, 2007). Other researchers used three dimensions of EO by combining the work from Miller (1983) and Lumpkin and Dess (1996) (e.g., combining proactiveness, risk-taking, and competitive aggressiveness) (Wales et al., 2013a). The proliferation of EO through various dimensional combinations is likely to hinder the rigor of EO research (Basso et al., 2009; Wales, 2016). As George and Marino (2011) noted, defining the EO concept with only two dimensions will decrease the intension - the collection of encompassed properties - of EO and reduce the precision of the concept. For example, one firm may exhibit high levels of EO based on one study, but this not be the case according to another. Also, the lack of consistency in employing these EO dimensions makes it problematic to make meaningful comparisons of the results from differing studies.

This study examines EO as a multidimensional construct that involves three core dimensions including innovativeness, risk-taking, and proactiveness. Competitive aggressiveness is not included in this study because it may overlap with proactiveness (Basso et al., 2009). To illustrate, competitive aggressiveness entails a tendency to outperform competitors in the marketplace (Lumpkin and Dess, 1996), while proactiveness also involves a goal to beat “competitors to the punch” (Miller, 1983, p. 771). As Basso et al., (2009, p. 318) pointed out, “trying to outrun or outperform one’s competitors is indeed a sign of proactiveness”. This implies that there may not be a clear-cut distinction between competitive aggressiveness and proactiveness. Also, autonomy, which is represented by the independent action of individuals or teams to conceive and realise new ideas, is not included in this study as it may not be accomplished and maintained at the firm level (Edmond and Wiklund, 2010). Examining the original three dimensions of EO is also consistent with the majority of existing EO studies (Rauch et al., 2009; Wales, 2016).

While this study adopts the multidimensional view of EO, it is important to acknowledge that the unidimensional and multidimensional view are distinct, that neither view is necessarily superior to the other, and that both views have contributed significantly to the EO literature. Indeed, researchers have highlighted that “the two predominant conceptualizations can co-exist in the literature with each approach providing unique insights” (Wales, 2016). Nevertheless, recent studies have suggested that it is imperative to consider the differences between the dimensions of EO (Miller, 2011) because “aggregating the entrepreneurial orientation dimensions into one combined measure ... can result in their independent influences being distorted or canceled [*sic*] out altogether” (Dai et al., 2014, p. 519). As such, when the dimensions of EO are combined into one factor, the uniqueness of each dimension is ignored. Accordingly, this study operationalises EO as a multidimensional construct and examines the performance implications of innovativeness, risk-taking, and proactiveness independently.

2.2.2.3 Measurement issues

EO can be operationalised as a reflective or formative construct (Covin and Wales, 2012). A major difference between reflective and formative constructs is the relationship between the latent construct and its measures (Covin and Wales, 2012;

George and Marino, 2011). As shown in Figure 2-2 (a), when EO is operationalised as a reflective second-order construct, the latent construct EO lead to changes in its measures. In other words, EO is manifested through innovativeness, risk-taking, and proactiveness, suggesting that “an increase in EO would be expected to increase the level of each of these dimensions” (George and Marino, 2011, p. 999). As such, the EO construct is measured by using the arithmetic average of the scores of its three dimensions. Conversely, as shown in Figure 2-2 (b), when EO is operationalised as a formative construct, it is formed by innovativeness, risk-taking, and proactiveness. In other words, “EO is created by its dimensions, rather than the dimensions being manifestations of EO” (George and Marino, 2011, p. 1000). The majority of existing studies operationalise EO as a reflective construct. Indeed, a recent review has revealed that 54 out of the 61 EO studies aggregated the dimensions of EO into one factor (George and Marino, 2011).

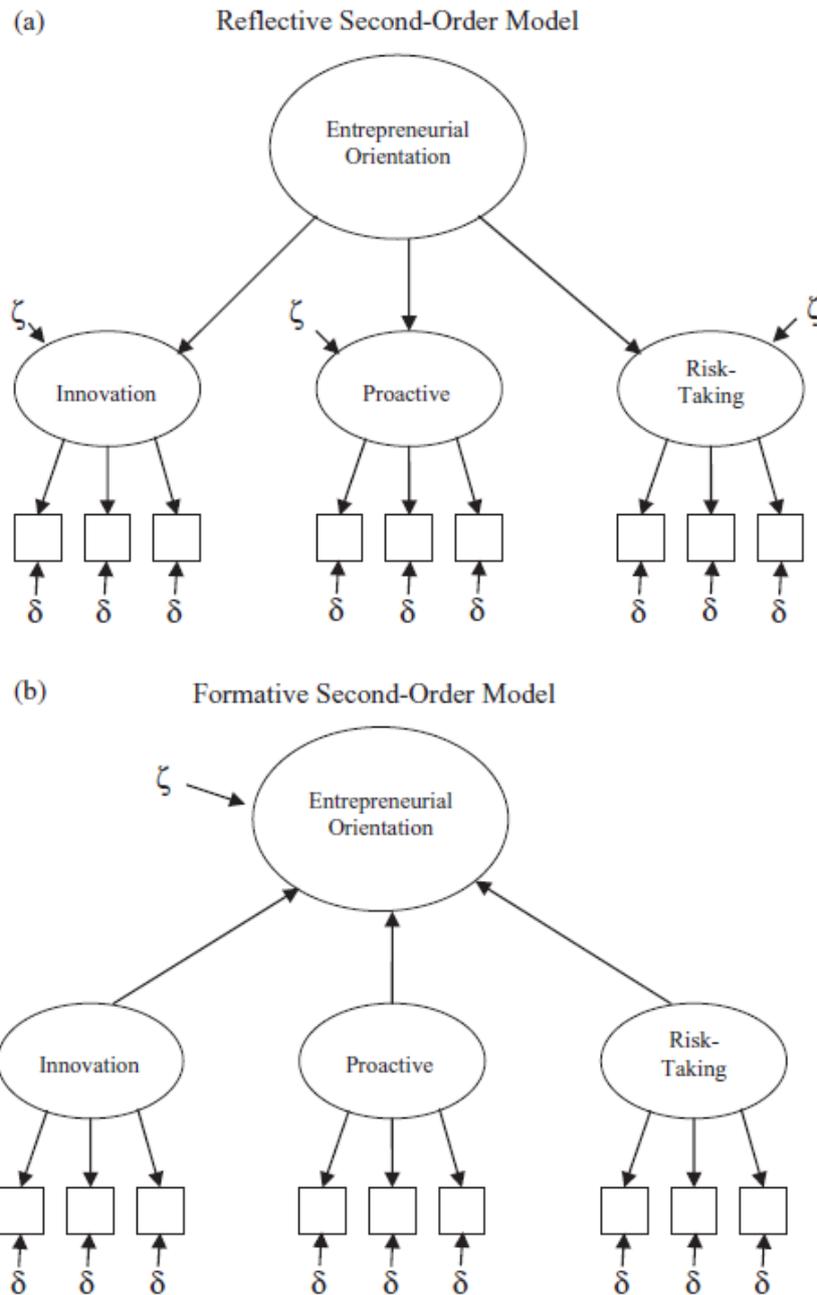


Figure 2-2: (a) Reflective second-order model. (b) Formative second-order model (George, 2011)

EO has been measured using different scale items (Covin and Wales, 2012; Randerson, 2016), which make the comparison of EO research problematic. In a recent review of empirical studies on EO, for example, Rauch et al., (2009) found that the number of items used to measure innovativeness, risk-taking, and proactiveness varied from six to eleven items. While the nine-item scale developed by Covin and Slevin (1989) is the most widely used measure in existing EO research

(Rauch et al., 2009; George and Marino, 2011; Wales et al., 2013a), researchers have noted that it also has limitations because the scale includes both dispositional and behavioural items (Anderson et al., 2015). To illustrate, one of the items for innovativeness assesses the extent to which firms favour innovation related activities (disposition), and another measures firms' actual innovation activities, represented by changes in their product line (behaviour). However, other researchers have argued that the presence of disposition-related items should not undermine the quality of the scale because "the inclusion of such [disposition-focused] items helps assure that the behaviors [sic] assessed are likely being driven by stable response tendencies (as opposed to chance or other nonsystematic stimuli)" (Covin and Lumpkin, 2011, p. 859).

This study operationalises innovativeness, risk-taking, and proactiveness as unique variables rather than combining them as a single factor. This is consistent with the suggestion from Rauch et al., (2009, p. 779) that "it may be more appropriate to study antecedences and consequences of EO at the level of the dimensions of EO". As Miller (2011, p. 880) concurs, "the components of EO are more telling than the aggregate index". That is, combining innovativeness, risk-taking, and proactiveness together will prevent us from gaining an understanding of the distinctiveness of the three EO dimensions. For example, it is possible that the effects of a low score in one of the dimensions may go unnoticed (Basso et al., 2009). Researchers have also suggested that studies following the combined approach might "hide or inaccurately attribute effects resulting from variations in only a single dimension of EO" (Lomberg et al., 2016, p. 2). Assessing the dimensions of EO as unique variables is also consistent with Covin and Wales's (2012, p. 696) suggestion that "separately assessing EO's sub-dimensions using individual reflective-type scales is a reasonable measurement approach". This approach has been adopted in recent EO studies (Kreiser et al., 2013; Dai et al., 2014). Following the majority of EO research (Rauch et al., 2009; George and Marino, 2011; Wales et al., 2013a), this study uses the nine-item measurement scale developed by Covin and Slevin (1989) to measure the three dimensions of EO.

2.2.3 EO and firm performance

The performance implications of EO has been a central focus in EO research (Rauch et al., 2009; Gupta and Wales, 2017). In general, there are two streams of research that examine the relationship between EO and firm performance. The first stream examines EO as a unidimensional construct and assesses how EO can have an impact on firm performance. Theoretical arguments suggest that EO contributes to better firm performance (Lumpkin and Dess, 1996). In a fast changing business environment with shortened product lifecycles, the future profit streams from existing products are uncertain. For example, the sales of existing products and services may stagnate due to changes in consumer demands and the market environment. As such, firms should constantly seek out new product and market opportunities to renew themselves.

Firms may benefit from adopting an EO because, through engagement in innovation and risk-taking efforts, and acting in anticipation of future market demand, they can capitalise on new product and market entry opportunities (Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003). The wider pool of new opportunities serves as a potential source for firms to develop competitive advantage (Ireland et al., 2009), thereby contribute to better performance. As such, entrepreneurial firms are likely to outperform their conservative counterparts. Consistent with this view, a wide range of empirical studies have proposed and demonstrated that the unidimensional EO is positively associated with firm performance (Zahra and Covin, 1995; Wiklund, 1999; Lee and Tsang, 2001; Wiklund and Shepherd, 2003, 2005). Indeed, a meta-analysis of the EO – firm performance relationship also revealed a positive link between them (Rauch et al., 2009).

Nevertheless, researchers have suggested that the potential negative effects of EO should not be ignored (Wiklund and Shepherd, 2011). From a theoretical perspective, there are reasons to expect that high levels of EO might also have detrimental effects on firm performance. For example, EO entails risk-taking and innovativeness. Increasing levels of risk-taking have been associated with higher probabilities of failure (Alvarez, 2007). Similarly, high levels of innovativeness require firms to deviate from existing practice and venture into areas that are beyond their current expertise (Lumpkin and Dess, 1996). As such, increasing levels

of innovativeness are associated with higher uncertainty of outcomes. Indeed, research suggests that the range of possible performance outcomes tends to increase within EO firms because not all entrepreneurial activities will turn out successfully and lead to positive returns (Wiklund and Shepherd, 2011). Firms that engage in high levels of entrepreneurial activities are likely to produce a distribution of outcomes ranging from success (e.g., making profits) to failure (e.g., making losses) in their endeavours. As a result, a high level of EO should result in a greater extent of variation in firm performance. In line with this notion, recent empirical evidence has shown that EO is related to greater firm performance variance (Wales et al., 2013b).

Additionally, a number of empirical studies have revealed a curvilinear relationship between EO and firm performance, providing further evidence that increasing levels of EO may not lead to universally positive outcomes. Tang et al., (2008) found an inverted U-shaped relationship between EO and firm performance among Chinese firms. Su et al., (2011) observed an inverted U-shaped relationship between EO and firm performance among Chinese new ventures, and a positive relationship in established firms. Similarly, Wales et al., (2013c) found that, after a certain point, increasing levels of EO have diminishing effects on firm performance. The authors suggested that, on average, “a relatively low to moderate level of EO produces the highest growth in small firms” (Wales et al., 2013c, p. 112). Together, these findings suggest that increasing levels of EO provide benefits for organisations, but that when levels of EO are too high, it could have detrimental effects on organisations.

The second stream of research disaggregates EO into its sub-dimensions and assesses the independent effects of each dimension of EO on firm performance. While this approach has the advantage of uncovering the unique effects of each EO dimension on firm performance, it has received less attention in existing studies (Rauch et al., 2009; George, 2011; Wales et al., 2013a). For studies that have explored the differential effects of individual EO dimensions on firm performance, the empirical results have been mixed. Some researchers have found that the relationship between the different EO dimensions (i.e., proactiveness, risk-taking, innovativeness) and firm performance is linear (Hughes and Morgan, 2007) while others have reported a curvilinear relationship (Kreiser et al., 2013). For example, some researchers found a positive linear relationship between risk-taking and firm

performance (Swierczek and Ha, 2003), while others found a negative linear link (Hughes and Morgan, 2007), and a third group yet has suggested a curvilinear relationship (Kreiser et al., 2013). Similarly, empirical evidence on the relationship between proactiveness / innovativeness and firm performance has been inconsistent. Hence, the performance implications of innovativeness, risk-taking, and proactiveness on organisations remain inconclusive.

2.3 Regulatory focus versus entrepreneurial orientation

The preceding discussions suggest that while both regulatory focus and EO represent promising predictors in explaining the variance in firm performance, the two factors differ significantly on two aspects. Firstly, regulatory focus and EO represent constructs at different levels. In particular, regulatory focus is an individual-level construct that was originally conceived to explain why individuals differ in their decision making and behaviours (Higgins, 1997, 1998; Brockner et al., 2004). With the development of regulatory focus theory, researchers have extended it to organisational contexts and explored how individual differences in regulatory focus impacts the behaviours and performance of organisations (Johnson et al., 2015). By contrast, EO is a firm-level construct that was conceptualised to delineate the types of behaviours that are typically associated with entrepreneurial firms (Miller, 1983, 2011). While the nature of the relationship between EO and firm performance remains inconclusive, it is generally recognised that there is a link between them, because the entrepreneurial activities firms pursue may allow them to develop new products for the market, capitalise on potential new opportunities, or establish first-mover advantage.

Secondly, regulatory focus and EO refer to different natures of phenomenon. Regulatory focus represents a motivational characteristic associated with individuals (Molden et al., 2008; Gamache et al., 2015). As individual-level characteristic, the potential effects of people's regulatory focus on organisations may or may not be materialised. To illustrate, firms that are led by CEOs with high levels of promotion focus may be more risk-tolerant. However, it is possible that the lack of resources within such firms might hinder its capability to translate the risk-taking tendencies into action. In other words, the behavioural tendency induced by regulatory focus may not always translate into action. Additionally, there should be some underlying mechanisms through which the performance effect of regulatory focus can occur. For example, through influencing people's decision making, regulatory focus might influence the behaviours or capabilities of firms, which in turn results in the variance in firm performance. On the other hand, EO represents a set of entrepreneurial behaviours, including innovativeness, risk-taking, and proactiveness that firms pursue (Lumpkin and Dess, 1996; Wales, 2016). It is fair to

argue that the entrepreneurial activities firms undertake should have an impact, which may be positive, neutral or negative, on the performance of organisation. Taken together, one may suspect that the performance effects of firm-level EO are likely to be more salient than the performance effects of individual-level regulatory focus.

Despite the significant difference between regulatory focus and EO, it is important to note that a potential link may exist between these two constructs. Theoretical arguments suggest that organisational behaviours are often a function of the people who are in charge (Hambrick and Mason, 1984; Hambrick, 2007), implying that CEOs should determine the activities firms undertake. In support of this view, a wide range of empirical evidence has demonstrated that CEOs' characteristics significantly impact the behaviours of organisations (Busenbark et al., 2016). As Miller and Friesen (1982) pointed out, the "goals and temperament" of CEOs determines the strategic behaviours of firms they lead. Because regulatory focus underlies the goals people aim to achieve as well as the strategic means they prefer to use (Brockner et al., 2004), CEOs' goals and strategic preferences might be manifested through the behaviours of organisations they lead. Indeed, a number of empirical studies have revealed that CEO regulatory focus shapes firm-level behaviours (Gamache et al., 2015; Kammerlander et al., 2015). This empirical evidence demonstrates that CEO regulatory focus is likely to have an impact on the entrepreneurial behaviours of organisations.

Chapter 3 Hypothesis Development

The literature review chapter has illustrated that both CEO regulatory focus and the dimensions of EO are likely to have an impact on organisations. This hypothesis development chapter outlines the potential relationships among the focal variables, including CEO regulatory focus, and the three dimensions of EO and firm performance examined in this study. It is divided into three sections with each section corresponding to one research question outlined in the introduction chapter. Specifically, the first section presents the potential effects of CEO regulatory focus on firm performance and how these effects vary between SMEs operating in high-tech industries and those in low-tech industries, addressing research question one. In response to research question two, the second section outlines the potential links between the three dimensions of EO and firm performance as well as how their relationships differ between SMEs operating in high-tech industries and those in low-tech ones. The final section covers the potential relationships between CEO regulatory focus and the three EO dimensions, addressing research question three.

3.1 Regulatory focus and firm performance

3.1.1 Promotion focus and firm performance

I posit that CEO promotion focus will be associated with firm performance because it is likely to impact firms' capabilities to (a) adapt quickly to fast changing environment; (b) perform and balance differing and competing activities (exploration and exploitation); and (c) identify and capitalise on new opportunities. First, promotion focus can enhance firms' strategic flexibility (Aaker and Mascarenhas, 1984), which refers to the ability to adapt quickly to changes in the environment. Research in regulatory focus theory suggests that people with high levels of promotion focus are more open to change and new possibilities (Lieberman et al., 1999), implying that promotion focused CEOs should have more positive attitudes towards change. As such, firms that are led by CEOs with high levels of promotion focus will likely have higher tendencies to adjust their activities in response to the changing environment. Consistent with this view, it has been found that firms that are led by promotion focused entrepreneurs are more likely to adapt their original business concept in a dynamic environment (Hmieleski and Baron, 2008). This finding demonstrates that CEO promotion focus tends to enhance firms' ability to respond quickly to environmental changes. As firms' success depends on their ability to adapt quickly in the competitive environment (Hitt et al., 1998; Nadkarni and Herrmann, 2010), it is thus expected that promotion focus should contribute to better performance.

Second, promotion focus can influence firms' capability to "perform differing and often competing, strategic acts at the same time", which refers to organisational ambidexterity (Simsek et al., 2009, p. 865). Recent empirical evidence has shown that CEO promotion focus positively affects organisational ambidexterity. In particular, Kammerlander et al., (2015) found that firms that are led by promotion focused CEOs engage in high levels of exploration and exploitation activities. Exploration concerns activities such as "search[ing], experimentation and variation", whereas exploitation entails activities involving "choice, implementation and variance reduction" (Lavie et al., 2010, p. 110). Theoretical arguments suggest that a balance between exploration and exploitation (organisational ambidexterity) is essential for firm success (March, 1991). Empirical studies have demonstrated

that firms that can balance exploration and exploitation activities are more likely to achieve better performance (He and Wong, 2004; Atuahene-Gima and Murray, 2007; Cao et al., 2009). As promotion focus can help to induce organisational ambidexterity, firms that are led by promotion focused CEOs should achieve increased performance.

Finally, promotion focus might also impact firms' capability to identify and capitalise on new opportunities. People with high levels of promotion focus are more opportunity oriented as they are motivated to satisfy their needs for growth (Higgins, 1997; Tumasjan and Braun, 2012). As a result, promotion focused CEOs should be more motivated to proactively seek new opportunities. As Johnson et al., (2015, p. 1512) noted, "[i]ndividuals with a promotion focus would be more likely to search for and identify new opportunities than those with a prevention focus." Indeed, it has been found that promotion focused entrepreneurs engage with a higher number of business contacts for new information (Pollack et al., 2015) and are more likely to identify higher quantity and quality of new opportunities (e.g., innovativeness) (Tumasjan and Braun, 2012). Furthermore, firms that are led by promotion focused CEOs introduce more new products (Greenbaum, 2015) and pursue higher levels of business acquisition (Gamache et al., 2015). As promotion focus may stimulate firms to proactively seek and pursue new opportunities, which is a critical factor for business success (Hughes and Morgan, 2007), firms that are led by promotion focused CEOs should have the advantage to capitalise on new opportunities which may lead to better performance. In short, the above theoretical and empirical arguments suggest that promotion focus will likely enhance firm-level capabilities which, in turn, contribute to better firm performance. Therefore, it is hypothesised that:

Hypothesis 1: CEO promotion focus will be positively associated with firm performance.

3.1.2 Prevention focus and firm performance

Similarly, there are reasons to expect that CEO prevention focus will be associated with firm performance. However, the effect of prevention focus on firm performance should be negative based on three reasons. Prevention focus can

undermine firms' strategic flexibility, which in turn negatively affects firm performance. People with high levels of prevention focus prefer stability over change (Lieberman et al., 1999). As prevention focused CEOs are prone to remain at status quo, firms that are led by such people should be less willing to change. Indeed, it has been found that firms that are led by prevention focused entrepreneurs are less likely to deviate from their original business concepts in dynamic environments (Hmieleski and Baron, 2008). This finding demonstrates that prevention focused CEOs will likely hinder firms' ability to adapt quickly in a changing environment. Since firms' strategic flexibility is a critical factor for firm success (Hitt et al., 1998; Nadkarni and Herrmann, 2010), it is thus expected that prevention focus will be negatively associated with firm performance.

Additionally, prevention focus can affect firm-level strategic activities that, in turn, impact firm performance. As firms' exploration process involve experimenting with new alternatives that are beyond their existing areas of expertise, its returns are less certain and more remote in time (March, 1991; Lavie et al., 2010). In other words, the exploration process involves significant changes and uncertainties. Because prevention focused people are more likely to avoid change (Lieberman et al., 1999), CEOs with high levels of promotion focus are less willing to pursue exploration activities. In support of this view, empirical evidence has shown that prevention focused CEOs induce firms to engage in low levels of exploration activities (Kammerlander et al., 2015). While the exploration process entails uncertainty, it is essential for firm success because it allows firms to avoid the trap of suboptimal stability (March, 1991). For example, stability may lock firm resources and activities into products and processes that are outdated, negatively affecting firm performance (Nerkar and Roberts, 2004).

Finally, prevention focus can undermine firms' ability to capitalise on new opportunities and hinder firm performance. As innovation requires firms to deviate from existing practices (Musteen et al., 2010), it represents change. Firms that are led by CEOs with favourable attitudes toward change are more likely to foster innovation through exploring new products and market opportunities (Musteen et al., 2010). Because prevention focused people have higher preferences for stability over change, it can be expected that firms that are led by such people are less likely to foster innovation and pursue new opportunities. Indeed, recent empirical studies

have found that firms that are led by prevention focused CEOs introduce lower numbers of new products (Greenbaum, 2015) and undertake lower numbers and values of business acquisition (Gamache et al., 2015). Researchers have highlighted that firms with a lower tendency to undertake new opportunities and support innovation are less likely to capitalise on emerging opportunities that can result in lower performance (Hughes and Morgan, 2007). Given that prevention focus can hinder firms' tendency to support innovation and undertake new opportunities, it should have negative effects on firm performance. Accordingly, it is hypothesised that:

Hypothesis 2: CEO prevention focus will be negatively associated with firm performance.

3.1.3 The moderating role of industry environment

Researchers often categorise the industry environment in which firms operate into high-tech and low-tech industries (Bierly and Daly, 2007; Rauch et al., 2009; Sarooghi et al., 2015). Compared to the low-tech industries, high-tech industries entail higher levels of market and technological uncertainty (Moriarty and Kosnik, 1989). Market uncertainty arises due to rapid changes in consumer preferences and the unpredictability of competitors' behaviours (Khandwalla, 1972). Technological uncertainty occurs because of the rapid changes in technology (Rosenbusch et al., 2013). Because of the high rate and magnitude of changes associated with high-tech industries (Wang et al., 2015; Fainshmidt et al., 2016), the span of product life cycles is shorter in high-tech than low-tech industries (Qian and Li, 2003). Given that high-tech industries are more uncertain and competitive than low-tech industries, it is expected that the performance implications of promotion and prevention focus will likely differ between firms that operate within these different industry environments.

I propose that the positive relationship between promotion focus and firm performance will be more pronounced for firms in high-tech industries than those in low-tech industries. As pointed out earlier, promotion focus can enhance firms' ability to adapt quickly in a rapid changing environment. As such, firms that are led by CEOs with high levels of promotion focus should be more flexible in adapting

their activities (Hmieleski and Baron, 2008). While firms in any industry environment may benefit from flexibility, its advantages should be more pronounced for firms in high-tech industries because the extent of changes is higher in such industries (Moriarty and Kosnik, 1989). Indeed, researchers have highlighted that high levels of flexibility are required for firms to respond quickly to changes in uncertain environments (Aaker and Mascarenhas, 1984), which is often associated with the high-tech industries. As Halvorson and Higgins (2013, p. 4) noted, “[p]romotion-focused leaders tend to be most effective in dynamic industries, where it’s important to respond rapidly and innovatively to stay ahead”. In support of this notion, researchers have found that firms that are led by promotion focused entrepreneurs can achieve higher growth in dynamic environments (Hmieleski and Baron, 2008).

Additionally, promotion focus is related to firms’ ability to perform and balance exploration and exploitation activities (Kammerlander et al., 2015). Such a capability is particularly important for firms that operate in the high-tech industries because the rapid technological changes can erode the value of firms’ existing capabilities and advantages (Collis, 1994). As noted by Wu (2012, p. 492), “high-tech industries are characterized by [a] rapid rate of technological change, which makes existing technological advantage quickly obsolete.” As a result, firms that operate in the high-tech industries are required to “exploit existing competences for short-term commercial benefits and simultaneously explore new competences for long-term success” (Wang et al., 2015, p. 26). Furthermore, a shorter product life cycle associated with the high-tech environment implies that firms’ existing products are likely to become obsolete quickly in the marketplace (Qian and Li, 2003). That is, firms’ competitive advantages are more likely to be short-lived in high-tech industries. Hence, the capability to identify and capitalise on new market opportunities, which can be stimulated by promotion focus, should be more critical for firms that operate in the high-tech industries. Therefore, it is hypothesised that:

Hypothesis 3: The positive relationship between promotion focus and firm performance will be stronger for firms in high-tech industries than those in low-tech industries.

Similarly, I posit that the negative relationship between prevention focus and firm performance will be stronger for firms in high-tech industries than those in low-tech ones. As prevention focus is likely to undermine firms' ability to adapt quickly to environmental changes (Hmieleski and Baron, 2008), firms that are led by prevention focused CEOs should have a higher tendency towards rigidity rather than flexibility. Researchers have highlighted that rigidities have substantial detrimental effects on firms operating in an uncertain environment (Leonard-Barton, 1992). Compared to the low-tech industries, the high-tech industries are less stable. As such, the potential negative impacts that may arise due to rigidities should be stronger for firms that operate within the high-tech industries. As Hmieleski and Baron (2008, p. 295) pointed out, "a focus on preventing losses and being rigid toward change (prevention focus) significantly reduces performance".

Additionally, prevention focus undermines firms' tendencies to engage in exploration activities (Kammerlander et al., 2015). As the development of new capabilities and knowledge requires exploration (March, 1991; McGrath, 2001), firms that are led by CEOs with high levels of prevention focus will have less opportunity to develop and extend new competences. Because the low-tech industries are less competitive than the high-tech industries (Bierly and Daly, 2007; Wang et al., 2015), firms that operate within the low-tech industry environment should have lower needs to enhance their capabilities. Conversely, developing new competences are more important for firms that operate in high-tech environments as the value of their existing capabilities declines quickly due to environmental changes (Collis, 1994). Furthermore, prevention focus is likely to hinder firms' tendency to pursue new opportunities. Due to the different spans of product life-cycles, firms that operate in low-tech industries face lower pressures to introduce new products or services through exploiting new opportunities, whereas the opposite is true for firms that operate in a high-tech environment. Because the products in high-tech industries become obsolete more quickly, the absence of new product offerings should make firms in the high-tech industries more vulnerable (Leonard-Barton, 1992). Hence, it is hypothesised that:

Hypothesis 4: The negative relationship between prevention focus and firm performance will be stronger for firms in high-tech industries than those in low-tech industries.

3.2 Entrepreneurial orientation and firm performance

3.2.1 The independent effects of innovativeness on firm performance

Innovation is a critical factor for firms to survive and thrive in a dynamic business environment (Cheng et al., 2013). For example, innovation allows firms to adapt and respond to changing customer demands, shrinking product life cycles and growing market competition (Howell et al., 2005). It also provides firms with the opportunity to foster business growth and generate higher profits (Wiklund et al., 2009). Researchers have highlighted that facilitating firms' levels of innovativeness may lead to the development of new products that address customers' changing needs (Lumpkin and Dess, 1996). As such, innovative firms can differentiate themselves from competitors through new product offerings and generate better profits (Qian and Li, 2003). Indeed, innovation underlies firms' differentiation strategy that allows them to develop competitive advantage and achieve better performance (Gatignon and Xuereb, 1997; Linton and Kask, 2017). Additionally, innovative firms are more R&D-oriented (Gatignon and Xuereb, 1997) and are more supportive of new ideas and experimentations (Lumpkin and Dess, 1996). The R&D and experimenting activities represent a major source for firms to generate and sustain innovative outputs. As a result, innovative firms are more likely to continuously introduce new and/or refined products to meet the changing market conditions and achieve better performance. Consistent with this view, prior research has shown a positive relationship between innovativeness and firm performance (Lumpkin and Dess, 2001; Hughes and Morgan, 2007).

Nevertheless, innovation is associated with substantial costs and uncertain outcomes, which should also have an impact on firm performance. First, substantial resources are required for firms to invest in innovation projects, undertake research and development (R&D), and develop capabilities required for innovation (van de Ven, 1986; Kreiser et al., 2013). Researchers have highlighted that high levels of innovativeness requires firms to commit considerable resources and has the potential to "compromise the ability of SMEs to meet short-term financial obligations"(Kreiser et al., 2013, p. 276). In other words, high levels of innovativeness may drain resources from other value-creating activities that are critical for SMEs (Rosenbusch et al., 2011), which tend to be resource constrained.

Second, the outcomes of firms' innovative efforts tend to be uncertain because innovation requires firms to depart from established practices and experiment with new alternatives (Lumpkin and Dess, 1996). This implies that while engaging in experimentation might generate innovative outcomes, some of these efforts might not yield positive results (March, 1991; Lavie et al., 2010). Accordingly, high levels of innovativeness might have detrimental effects on SME performance because SMEs tend to lack slack resources to buffer potential loss in the innovation process.

The preceding discussions suggest that innovativeness allows firms to address changing customer demands with new products. At low levels of innovativeness, firms are less likely to support new ideas and engage in experimentation (Lumpkin and Dess, 1996), which in turn might hinder the development of new products. As a result, firms with low levels of innovativeness are less likely to reap the benefits of differentiation through offering new or refined products to the market place (Linton and Kask, 2017). With the increase of innovativeness from low to moderate, firms' performance should increase because firms are likely to generate better profits from their innovative new products. Nevertheless, at high levels of innovativeness, the potential costs and uncertain outcomes associated with innovative efforts might outweigh the potential benefits. Together, these arguments imply that moderate levels of innovativeness will likely allow SMEs to register better performance. As such, the relationship between innovativeness and SME performance should be curvilinear. In particular, up to a point, increasing innovativeness should lead to enhanced firm performance, but beyond that point, further increases in innovativeness will be associated with diminishing or even negative returns in firm performance. Thus, it is hypothesised that:

Hypothesis 5: The relationship between innovativeness and firm performance is an inverted U-shaped.

3.2.2 The independent effects of risk-taking on firm performance

Risk-taking is an essential element in the entrepreneurial process (Covin and Slevin, 1989; Miller, 1983). As Frishammar and Hörte (2007, p. 769) noted, "if no risks are taken, no new products will ever be produced and launched". Hence, for firms to compete in a fast changing market environment, they are required to engage in risk-

taking. Indeed, researchers have highlighted that firms that are risk tolerant are more likely to capitalise on emerging market opportunities that, in turn, contribute to better firm performance (Hughes and Morgan, 2007). Theoretical arguments underlying entrepreneurial learning also implicitly suggest that firms can benefit from risk-taking (McGrath, 2001; Dess et al., 2003). For example, the willingness to engage in initiatives with uncertain outcomes can foster the development of new knowledge, routines, and capabilities that are distinctive to organisations (McGrath, 2001; Matusik, 2002). Given that firm-specific knowledge and capabilities are valuable and difficult to imitate (Dess et al., 2003; Barney, 1991), they may serve as a source of competitive advantage, thereby contributing to better firm performance.

While risk-taking is necessary for firms to capitalise on new opportunities and compete in the market place, it also has potential negative effects on organisations. For example, risk-taking is associated with a chance of failure (Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003), suggesting that the resources committed to risk-taking activities might not bear fruit. As the levels of risk increases, the probability of failure should also increase (Alvarez, 2007). Hence, at high levels of risk-taking, firms should face significant chances of failure. In other words, it is possible that the investments may fail to generate desirable outcomes. Because SMEs are resource constrained (Muller et al., 2017), the potential failure in their risk-taking activities may result in considerable business disruptions or even threaten firms' survival in a competitive market place. Accordingly, high levels of risk-taking may negatively impact firm performance. Additionally, prior research has found that people who are risk tolerant tend to focus on the opportunities for potential positive outcomes, while people who are risk averse tend to emphasise the threats from potential failure (Schneider and Lopes, 1986). In the same vein, firms with high levels of risk-taking tendencies might be over optimistic with the opportunity presented, which can lead them to over-commit resources to projects that are unpromising (Dai et al., 2014).

Firms with low levels of risk-taking tendencies are less willing to pursue opportunities that involve high risks with potential high returns (Lumpkin and Dess, 1996). While the risk-averse tendency allows firms to prevent potential loss, it can also limit firms' chance to benefit from projects that have high returns. On the other hand, high levels of risk-taking also have its limitations because it might endanger

the performance of organisations due to the higher chance of failure involved. Accordingly, it is expected that moderate levels of risk-taking should allow firms to achieve better firm performance. In line with this notion, prior research has found that the relationship between risk-taking and firms' return on assets (ROA) is curvilinear in entrepreneurial firms. Specifically, Begley and Boyd (1987, p. 89) found that "risk-taking has a positive effect on ROA up to a point. Beyond that point, increases in risk-taking begin to exert a negative effect on ROA." This empirical evidence supports the view that moderate risk-taking should contribute to better firm performance. Thus, it is hypothesised that:

Hypothesis 6: The relationship between risk-taking and firm performance is an inverted U-shaped.

3.2.3 The independent effects of proactiveness on firm performance

Proactiveness represents a tendency to introduce new products or services ahead of competitors (Lumpkin and Dess, 1996; Keh et al., 2007). Researchers have highlighted that proactive firms are more likely to engage in external environmental scanning to acquire information about the changing market environment and customer needs (Wang, 2008; Kreiser, 2011). The enhanced understanding of the market and customer needs, in turn, allows proactive firms to satisfy unmet market demands (Smith and Cao, 2007; Hughes and Morgan, 2007). Through developing and launching new products ahead of the competition, proactive firms can thus establish first-mover advantages (Wiklund and Shepherd, 2003; Zahra and Covin, 1995) and extract higher profits (Lumpkin and Dess, 1996). As a result, proactiveness provides opportunities for firms to establish a leadership position within their industry (Lumpkin and Dess, 2001), which subsequently contributes to better firm performance.

Nevertheless, time and resources are required for firms to be proactive in acquiring new market insights (Dai et al., 2014). Also, potential up-front costs may be necessary for firms to develop the requisite capabilities for new market entry (Kreiser et al., 2013). Because proactive firms act in anticipation of future market demands (Keh et al., 2007), it is possible that their proactive efforts might not always lead to positive outcomes. For example, firms' assumptions about the future

market demands might prove to be incorrect. Additionally, while proactive firms might introduce new products ahead of their competitors, the new products are not guaranteed to be a success in a competitive market place. Given the potential costs involved for firms to be proactive, high levels of proactiveness might have negative effects on organisations in the situation that firms' proactive efforts failed to generate desirable outcomes.

Proactive firms are better placed to establish themselves as leaders rather than followers (Venkatraman, 1989; Lumpkin and Dess, 1996) because they can establish first-mover advantages through offering new products in the market place before their competitors. Firms with low levels of proactiveness might have to catch up in the market competition and continuously respond to the actions of proactive firms. This implies that increasing levels of proactiveness should contribute to better performance. As Dess et al., (2003, p. 370) noted, "proactively seeking new opportunities may make a more lasting contribution to value creation than an occasional attempt to innovate, introduce or adopt entrepreneurial ideas." Nevertheless, resources and efforts are required for firms to be proactive. It can thus be expected that some of the firms' proactive endeavours might not yield positive results, suggesting that high levels of proactiveness might have potentially negative effects on organisations. Therefore, it is hypothesised that:

Hypothesis 7: The relationship between proactiveness and firm performance is an inverted U-shaped.

3.2.4 The moderating effects of industry environment

I posit that the relationship between the three dimensions of EO and firm performance will be contingent on the industry environment (i.e., high-tech and low-tech industries) in which firms operate. Prior studies have revealed that environmental factors such as dynamism and hostility moderate the EO - firm performance relationship (Wiklund and Shepherd, 2003; Covin and Slevin, 1989), suggesting that the performance effects of EO are more pronounced in an environment with higher levels of change and competition. Because environmental factors such as dynamism, hostility, and complexity differ between the high-tech and low-tech industries (Lomberg et al., 2016), it is likely that the industry

environment in which firms operate can also moderate the effects of the dimensions of EO on firm performance. Empirical evidence has shown that industry environment moderates the effects of EO on firm performance (Rauch et al., 2009). Accordingly, there are reasons to expect that the performance effect of innovativeness, risk-taking, and proactiveness may also differ between SMEs operate in high-tech industries and those in low-tech industries.

I propose that the effects of innovativeness on firm performance should be stronger in low-tech than high-tech industries for two reasons. First, new products tend to emerge less frequently in low-tech industries than in high-tech ones (Qian and Li, 2003; Szymanski et al., 2007), suggesting that innovation is less common in low-tech industries. As such, firms in low-tech industries may derive more benefits from innovation than firms in high-tech industries. For example, the new products offered by firms in low-tech industries can be better differentiated from existing market offerings. In other words, such firms are more likely to establish the positional advantage through differentiating their products from competitors (Porter, 1980; Linton and Kask, 2017). Secondly, the new products developed through innovative effects should become obsolete more slowly within low-tech industries because such industries are associated with longer product life cycles than high-tech ones (Qian and Li, 2003; Szymanski et al., 2007). Conversely, the fast changing market environment associated with high-tech industries should make existing products become obsolete quickly. This implies that the products resulting from innovation efforts may generate more benefits for firms in low-tech industries than those in high-tech ones. Therefore, the benefits from innovativeness are perhaps more prominent for firms in low-tech industries than low-tech industries.

Additionally, I expect that the potential detrimental effects of innovativeness on firm performance will be stronger in low-tech than high-tech industries. Firms in low-tech industries face lower pressure in modifying their products because consumers' preferences are less likely to change substantially (Moriarty and Kosnik, 1989; Qian and Li, 2003), suggesting that such firms should have less experience in innovation. Because learning is best achieved through repeated efforts (March et al., 1991), the limited experience in innovation may thus hinder firms' development of innovation capabilities. By contrast, researchers have highlighted that "high-tech

firms seem to devote greater attention to the innovativeness of their products” (Kirner et al., 2009). Accordingly, such firms should have more experience in innovation than firms that operate in low-tech industries. The accumulated experience should enhance their innovation capabilities, which is critical for firms to achieve better performance. Innovation requires firms to deviate from their established practice (Musteen et al., 2010). As such, firms with high levels of innovativeness will likely venture into areas that are beyond their existing areas of expertise. As firms operating within low-tech industries have lower levels of innovation capabilities than the high-tech firms, it is thus expected that the low-tech firms are more likely to face setbacks when their levels of innovativeness are high. Therefore, it is hypothesised that:

Hypothesis 8: The inverted U-shaped relationship between innovativeness and firm performance will be stronger for firms in low-tech industries than those in high-tech industries.

With regards to risk-taking, I posit that the relationship between risk-taking and firm performance will be stronger in high-tech industries than in low-tech industries. Firms in high-tech industries face higher uncertainties and competition due to rapid changes in technology and market demand (Moriarty and Kosnik, 1989; Qian and Li, 2003). For example, changes in technology might posit new challenges for firms that operate in high-tech industries because they need to experiment with new technologies. Similarly, changes in market demand imply that firms’ advantages obtained through their market offerings can be short-lived. Accordingly, firms in high-tech industries should experience considerable risks. Conversely, firms that operate in low-tech industries face an environment that is more certain and less competitive because the technology and market demand are more stable. Hence, such firms should experience a lower level of risks than those in high-tech industries.

Firms that operate in either high-tech or low-tech industries should engage in risk-taking to avoid missing potentially valuable opportunities (Frishammar and Hörte, 2007). Nevertheless, high levels of risk-taking activities might have negative effects on organisations because the resources committed to risky initiatives may fail to bear fruit due to an increased level of uncertainty involved (Alvarez, 2007).

Compared to the low-tech industries, the high-tech industries entail greater risks (Szymanski et al., 2007). For example, high-tech industries are more uncertain and more competitive than the low-tech one (Moriarty and Kosnik, 1989). Accordingly, it is likely that firms' risk-taking efforts are less likely to yield positive outcomes in the competitive industry environment (i.e., high-tech industries). Conversely, the opposite may be true for firms in low-tech industries because the industry environment is more stable and less competitive. Therefore, risk-taking should have higher impacts for firms operate in high-tech than low-tech industries. It is thus hypothesised that:

Hypothesis 9: The inverted U-shaped relationship between risk-taking and firm performance will be stronger for firms in high-tech industries than those in low-tech industries.

I also hypothesise that the relationship between proactiveness and firm performance will be stronger in high-tech industries than in low-tech industries. Proactiveness allows firms to establish first-mover advantage (Lyon et al., 2000; Keh et al., 2007), which should be beneficial for firms that operate in either high-tech or low-tech industries. Consistent with this notion, researchers have highlighted that “the ability to frequently challenge the status quo with new, breakthrough ideas is critical for firm success” (Bierly and Daly, 2007, p. 499). Nevertheless, the significance of proactiveness should differ between high-tech and low-tech industries due to the different levels of changes involved. High-tech industries have been characterised as highly competitive and uncertain (Moriarty and Kosnik, 1989). High competition and uncertainty imply that firms operating in such an environment should experience significant changes. By contrast, low-tech industries are less competitive and more stable (Szymanski et al., 2007). As such, the extent of changes in low-tech environments is likely to be low.

Indeed, compared to the low-tech industries, the rate and magnitude of changes are greater within high-tech industries (Wang et al., 2015). Firms operating in fast changing environment (i.e., high-tech industries) should have a greater need to be proactive to develop their competitive advantage. For example, firms' existing competitive advantages are likely to be short-lived as their existing products will turn obsolete quickly in a marketplace where product life cycles are short (Wu,

2012). While proactiveness is also beneficial for firms operating in low-tech industries, its importance should be less prominent given that the market environment is more stable and the product life cycles are longer. As such, fostering high levels of proactiveness should be more critical for firms in high-tech industries than those in low-tech ones. In other words, the potential performance effects of proactiveness should be more salient in high-tech industries than those in low-tech industries. Hence, it is hypothesised that:

Hypothesis 10: The inverted U-shaped relationship between proactiveness and firm performance will be stronger for firms in high-tech industries than those in low-tech industries.

3.3 Regulatory focus and entrepreneurial orientation

3.3.1 The effects of promotion focus on the three dimensions of EO

I posit that CEO promotion focus will be associated with firms' levels of innovativeness, risk-taking, and proactiveness. In particular, I propose that CEO promotion focus will be positively related to firms' engagement in innovativeness because promotion focused CEOs tend to favour innovation and are more likely to foster innovative efforts within firms they lead. A promotion focus is known to be associated with a preference for change (Lieberman et al., 1999; Chernev, 2004). Promotion focused people are motivated to seek changes because the changes they initiate might allow them to move toward growth and advancement. In other words, changes represent an opportunity for promotion focused people to attain potential gains that are salient to them. Indeed, researchers have found that promotion focused people are more likely to initiate behaviour changes (Fuglestad et al., 2008). Similarly, empirical evidence has shown that promotion focused managers are more willing to "experiment with a wide range of alternatives and to deviate from existing best practices" (Ahmadi et al., 2017, p. 209). Researchers have highlighted that experimenting with alternatives and deviating from existing practices are the essences of innovation (Musteen et al., 2010). Accordingly, CEOs with high levels of promotion focus should have more positive attitudes toward innovation.

Researchers have found that top managers' favourable attitudes toward innovation positively impact the initiation, adoption decision and implementation of innovation within their firms (Damanpour and Schneider, 2006). Given that promotion focused CEOs tend to favour innovation, firms that are led by such people should have a higher tendency to pursue innovation, which in turn might generate potential gains to satisfy their needs for growth (Brockner et al., 2004). In support of this notion, recent empirical evidence has shown that firms led by CEOs with high levels of promotion focus engage in higher levels of exploration activities (Kammerlander et al., 2015). The exploration process entails experimenting with new alternatives that may lead to new products or services (March, 1991), suggesting that it might result in innovation related outcomes. Taken together, the theoretical and empirical evidence suggest that promotion focused CEOs should have a favourable attitude toward innovation. As a result, they are more likely to

foster such activities within firms they lead because the potential gains that may be generated from innovation can satisfy their needs for growth. Accordingly, firms that are led by CEOs with high levels of promotion focus should exhibit higher levels of innovativeness. Hence, it is hypothesised that:

Hypothesis 11: CEO promotion focus will be positively associated with firms' levels of innovativeness.

I also posit that promotion focus will be positively related to firms' pursuit of risk-taking. Promotion focused CEOs are more risk tolerant as they tend to prefer eagerness means in striving for gains (Crowe and Higgins, 1997). Specifically, promotion focused people are eager to achieve advancement through maximising the chance for gains (hits) and minimising the chance for non-gains (misses). The eagerness inclination in striving for potential gains often induces promotion focused people towards risk-taking. Indeed, researchers have highlighted that the motivation to attain gains "generally translates into a more eager form of exploration and greater risk taking" (Zhou and Pham, 2004, p. 127). Consistent with this notion, empirical evidence has shown that promotion focused people exhibited a risky response bias in completing different tasks (Crowe and Higgins, 1997). Additionally, researchers have suggested that a promotion focus leads to people's risk-seeking behaviours, indicated by that such people have higher tendency to overstate their task performance (Gino and Margolis, 2011). Together, these empirical findings support the idea that promotion focused people have a higher risk-taking propensity (Bryant and Dunford, 2008).

Given that promotion focused CEOs tend to be risk tolerant, firms that are led by CEOs with high levels of promotion focus should have a higher tendency to engage in risk-taking. Prior researchers have suggested that promotion focused leaders are more likely to develop an organisational culture that encourages risk-taking and tolerates mistakes (Kark and Van Dijk, 2007). Recent empirical evidence has revealed that firms that are led by CEOs with high levels of promotion focus engage in higher levels of risky activities (Kammerlander et al., 2015). Additionally, empirical evidence has shown that promotion focused teams (i.e., both members are promotion focused individuals) make investment decisions that involve higher risks (Florack and Hartmann, 2007). These empirical findings provide support that

promotion focused CEOs are more likely to induce risk-taking within their firms to maximise potential gains. Taken together, firms that are led by CEOs with high levels of promotion focus should exhibit higher levels of risk-taking. Therefore, it is hypothesised that:

Hypothesis 12: CEO promotion focus will be positively associated with firms' levels of risk-taking.

Additionally, I propose that promotion focus will be positively related to firms' pursuit of proactiveness. This is because promotion focused CEOs are more opportunity oriented and are more likely to induce firms they lead to be proactive in seeking and undertaking new product opportunities. Promotion focused people are driven to approach matches to advancement and approach mismatches to non-fulfilment (Higgins et al., 1994). Advancement represents gains, whereas non-fulfilment represents non-gains. To attain potential gains, promotion focused people are more likely to deviate from their status quo to approach their desired end-states. In other words, they are more proactive to initiate or engage in activities that may lead to gains. As Johnson et al., (2015, p. 1512) pointed out, people with a promotion focus "would be more likely to search for and identify new opportunities". Indeed, empirical evidence has shown that promotion focused people have a higher tendency to pursue new courses of actions (Lieberman et al., 1999). Promotion focused entrepreneurs are also more proactive in networking, indicated by a higher number of business contacts they interact with for information (Pollack et al., 2015). Also, prior research has suggested that promotion focus positively influences people's frequency to engage in proactive behaviour (Waterwall, 2017), which "involves challenging the status quo rather than passively adapting to present conditions" (Crant, 2000, p. 436).

Promotion focused people's tendency to approach gains through proactively seeking new opportunities is likely to significantly impact the firms they lead. For example, empirical evidence has shown that firms that are led by promotion focused CEOs are more proactive in business acquisitions as indicated by higher numbers and values of business acquisition firms undertake (Gamache et al., 2015). Researchers have also found that promotion focused teams are more proactive in new product introduction captured by higher number and faster speed of new products

introduced under experimental settings (Spanjol et al., 2011). Additionally, a recent empirical study has revealed that firms that are led by promotion focused CEOs are more proactive in new product introduction (Greenbaum, 2015). Together, these theoretical and empirical findings suggest that promotion focused CEOs' opportunity seeking tendencies should orient firms they lead to pursue proactive efforts for potential gains, which can satisfy their needs for advancement. As such, firms that are led by CEOs with high levels of promotion focus should exhibit higher levels of proactiveness. Thus, it is hypothesised that:

Hypothesis 13: CEO promotion focus will be positively associated with firms' levels of proactiveness.

3.3.2 The effects of prevention focus on the three dimensions of EO

Similarly, there are reasons to expect that CEO prevention focus will be associated with firms' levels of innovativeness, risk-taking, and proactiveness. I posit that CEO prevention focus will be negatively related to firms' pursue of innovativeness because prevention focused CEOs tend to prefer maintaining status quo. A prevention focus entails a preference for stability (Lieberman et al., 1999). Prevention focused people are driven by stability because maintaining satisfactory status quo allows them to ensure safety. Indeed, researchers have found that prevention focused people are less likely to activate behaviour changes (Fuglestad et al., 2008). Prevention focused managers have a lower tendency to explore new alternatives (Ahmadi et al., 2017). However, it should be acknowledged that a preference for stability does not imply that prevention focused people will not seek changes. In the situation of experiencing losses, for example, prevention focused people may initiate changes to restore adequate status quo (Collins, 2016).

Because innovation requires firms to experiment with new alternatives and deviate from their existing practices (March, 1991; Lumpkin and Dess, 1996), the innovation process should involve substantial changes and uncertain outcomes. Given that prevention focused CEOs are driven to ensure their safety needs through maintaining satisfactory status quo, CEOs with high levels of prevention focus should have lower motivation to foster innovation within firms they lead. In line with this view, researchers have found that prevention focused teams introduced

new products that are less novel than those introduced by promotion focused teams (Spanjol et al., 2011). Recent empirical evidence has also shown that firms that are led by CEOs with high levels of prevention focused are less likely to engage in exploration activities (Kammerlander et al., 2015), which may lead to innovation. Together, this theoretical and empirical evidence supports the idea that firms that are led by CEOs with high levels of prevention focus should exhibit lower levels of innovativeness. Accordingly, it is hypothesised that:

Hypothesis 14: CEO prevention focus will be negatively associated with firms' levels of innovativeness.

I also propose that CEO prevention focus will be negatively related to firms' engagement in risk-taking because prevention focused CEOs tend to be risk-averse. Researchers suggest that prevention focused people are more sensitive to the presence or absence of negative outcomes (Brockner et al., 2004). The sensitivity to potential losses has implications on prevention focused people's risk-taking tendencies because, when evaluating new information or opportunities, they tend to weight more heavily on the potential losses involved (Markman et al., 2005; Molden et al., 2008). Indeed, prevention focused people's motivation to protect against mistakes "generally translates into a more vigilant form of exploration and greater risk aversion" (Zhou and Pham, 2004). As a result, prevention focused people are more risk-averse. Indeed, empirical evidence has shown that prevention focused people exhibited a conservative response bias in completing different tasks (Crowe and Higgins, 1997). Also, they are prone to engage in risk avoidance behaviours (Gino and Margolis, 2011; Hamstra et al., 2011).

Given that a prevention focus is associated with a risk avoidance tendency, CEOs with high levels of prevention focus should orient their firms to pursue activities that involve outcomes that are more certain. In other words, they are less likely to encourage risk-taking because such activities entail outcomes that are uncertain. Indeed, researchers have found that the investments made by prevention focused teams are less risky than those made by promotion focused teams (Florack and Hartmann, 2007). Additionally, recent empirical evidence has demonstrated that prevention focused CEOs negatively impact firms' tendencies to engage in exploration activities that are risky (Kammerlander et al., 2015). Taken together,

prevention focused CEOs are more risk-averse because they are driven to ensure their need for safety. As a result, firms that are led by CEOs with high levels of prevention focus should exhibit lower extent of risk-taking. Thus, it is hypothesised that:

Hypothesis 15: CEO prevention focus will be negatively associated with firms' levels of risk-taking.

I also hypothesise that CEO prevention focus will be negatively related to firms' pursue of proactiveness because prevention focused CEOs tend to be reactive in their endeavours. Prevention focused people are driven to avoid mismatches to safety and avoid matches to threat (Higgins et al., 1994). Maintaining safety represents non-loss while falling into threat represents a loss. Because prevention focused people are motivated to ensure safety and avoid losses, they are oriented to maintain satisfactory status quo rather than deviate from current states. Indeed, researchers have found that prevention focused people are more likely to engage in behaviours that are intended to sustain the status quo (Shin et al., 2017). In other words, prevention focused people are less proactive to engage in behaviours that lead to changes. As Crant (2000, p. 439) pointed out, “[l]ess proactive individuals are passive and reactive, preferring to adapt to circumstances rather than change them”, suggesting that prevention focused people tend to be more passive as they prefer stability over change (Lieberman et al., 1999).

Proactiveness requires firms to act in anticipation of future demand and introduce new products or services ahead of their competitors (Lumpkin and Dess, 1996). Given that a prevention focus is associated with a propensity to ensure safety through maintaining status quo, firms that are led by CEOs with high levels of prevention focus should have a lower tendency to be proactive and act in anticipation of market demands. In other words, such firms are less likely to develop new products or services ahead of the competition, implying lower extents of proactiveness. Indeed, researchers have found that prevention focused teams introduced a lower number of new products than those introduced by promotion focused teams (Spanjol et al., 2011). Additionally, firms that are led by prevention focused CEOs engage in lower numbers and values of business acquisitions (Gamache et al., 2015), and introduce a lower number of new products (Greenbaum,

2015). Together, these findings suggest that firms that are led by CEOs with high levels of prevention focus should exhibit lower levels of proactiveness. Accordingly, it is hypothesised that:

Hypothesis 16: CEO prevention focus will be negatively associated with firms' levels of proactiveness.

Chapter 4 Research Methodology

4.1 Research design

Research design should be guided by the type of questions the researcher intends to answer (Bono and McNamara, 2011). As outlined in the introduction chapter, this study aims to address three research questions. Firstly, to examine how the CEO's regulatory focus affects the respective SME's performance, and how this effect differs between SMEs in high-tech industries and those in low-tech industries. Secondly, to assess how an SME's levels of innovativeness, risk-taking, and proactiveness impact its performance and how does the effect differ between SMEs in high-tech industries and those in low-tech industries. Thirdly, to evaluate how the CEO's regulatory focus influences the respective SME's levels of innovativeness, risk-taking, and proactiveness.

Since the primary purpose of this study is to assess the potential relationships between different variables, a quantitative approach is considered more appropriate for this study (Creswell, 2009; Antonakis et al., 2010). A quantitative research design allows researchers to collect quantifiable and measurable data. Such data, in turn, can be used in statistical analysis to test the hypotheses proposed in the preceding hypothesis development chapter. Accordingly, quantitative research design is adopted for this study because it fits the purpose of this research. Researchers have highlighted that, with representative samples, the generalisability of research findings may be achieved from a quantitative study (Easterby-Smith et al., 2012). However, it should be acknowledged that a quantitative approach is not without limitations. For example, an in-depth and rich understanding of the research phenomenon is unlikely to be achieved through the quantitative approach (Jack, 2010).

Additionally, this study employed an online survey for data collection. Compared with a paper-based survey, the online questionnaire has advantages in both cost and flexibility (Brace, 2004). The cost involved in an online survey is relatively lower than surveys administrated using the post, the telephone, or in person. Also, the turnaround time of an online approach tends to be quick (Ilieva et al., 2002). Such an approach also saves the time and effort required for respondents to return the

completed survey. Accordingly, it might help to encourage participation from potential respondents. The questionnaire was operationalised through the online platform Qualtrics. I incorporated two features of the online survey to make it more convenient for respondents to fill in. Firstly, respondents were allowed to save the unfinished questionnaire and then continue it later. This is based on the consideration that CEOs tend to have a tight business schedule. Secondly, a progression bar showing the percentage of the survey that has been filled was featured at the end of each screen to minimise potential drop out issues due to a lack of awareness of the progress made thus far, or a misconception that the survey is too long to complete.

4.2 Sampling

To test the hypotheses developed in Chapter 3, I chose to examine SMEs operating in England, UK. SMEs contribute significantly to the job creation and economic development in the UK. In all private sectors in the UK, for example, 99.3% of firms are SMEs, which account for 60% of all employment (Department for Business, Energy & Industrial Strategy, 2016). I used the Financial Analysis Made Easy (FAME) database, a widely used source of information on UK firms (e.g., Dada and Fogg, 2016), as the sampling frame. FAME contains information (e.g., names, addresses, and employee numbers) of firms operating in the UK, as well as the contact details of these firms' top managements such as Chief Executive Officer, Managing Director, Business Owner, or Company Director. I employed three criteria in selecting firms from the database: 1) firms with a primary trading address in England, UK; 2) active firms that are not in receivership or dormant; 3) firms with less than 250 employees in the last trading year. Based on the three criteria, 52,568 firms were identified of which 5,000 SMEs were randomly selected for this study. However, a close examination of the data extracted from the FAME database revealed that a significant number of firms lack contact details for CEOs. The firms which lacked contacts details for their CEOs were then removed from the dataset. This resulted in a sample size of 1542 firms for data collection.

4.3 Data collection

In the following, I present the processes involved in data collection. In particular, the processes of questionnaire design, pilot testing, and data collection are introduced in turn. The ethical issues about data collection are also highlighted.

QUESTIONNAIRE DESIGN In designing the survey instrument, I conducted an extensive literature review to identify established measures for constructs used in this study (Churchill and Iacobucci, 2006). Using existing measures can help to ensure the construct reliability and validity (Bono and McNamara, 2011). I also invited two CEOs and three academics to comment upon the drafts of the questionnaire. One CEO was from the service industry, and the other was from the manufacturing industry. They were selected because both of them have extensive experience in their industry, 18 and 38 years respectively. Their different backgrounds can also help to ensure that the questionnaire is examined from different perspectives. The three academics were invited to give feedback on the survey design, as they all have experience in conducting quantitative research.

Based on the feedback from the CEOs and academic staff, I further refined the questionnaire with regards to the sequence of questions and survey instruction. For example, the section about the background information of participants and organisations was originally placed at the end of the questionnaire. Following the suggestion of one academic, the background information section was moved to the beginning of the survey, based on the idea that starting the survey with easy questions might help to encourage participation. One CEO pointed out that the third question about regulatory focus was not very clear (i.e., How often have you accomplished things that got you "psyched" to work even harder?). The CEO indicated that the wording "psyched" seems unfamiliar. But based on the context of the question, he suggested that the question was still understandable. As the regulatory focus questionnaire has been employed in several others studies, I decided to keep the wording.

PILOT TESTING I pre-tested the survey with a convenience sample of 12 CEOs to avoid any potential issues that were not identified during the initial stage of the questionnaire design process. I established connections with those CEOs through

the Lancaster University's programmes, such as Entrepreneurs in Residences, and Masterclasses. I introduced the purpose of the research project to the CEOs first and then invited them to complete the survey and comment on any issues with regards to the clarity of instructions, the wording of questions, the sequence of questions and the overall survey design (Malhotra, 2006). The pilot testing revealed that on average it took around 10 to 15 minutes to complete the online survey, except one CEO who took around 25 minutes. During a conversation with the CEO afterwards, he explained that he wanted to think about the survey questions carefully before providing feedback. One sample response from the questionnaire pilot testing is provided in Appendix 1.

The profile of CEOs who participated in the pilot testing is summarised in Table 4-1. The CEOs were from different industry backgrounds including manufacturing, service, and others (e.g., retailing, wholesaling, construction, and agriculture, among others). The majority of them had served more than five years in their organisations, with a minimum tenure of 3 years and a maximum of 35. Both male and female CEOs were used in the pilot testing. Although the sample size was small, the respondents and their organisation's size were quite diverse. Hence, the sample size used for pilot testing was considered sufficient (Grichnik et al., 2014). Since only one minor issue was identified from the pilot testing, I then employed the refined questionnaire for subsequent data collection. The final questionnaire is included in Appendix 2.

Table 4-1: Profile of participants for pilot testing

Number	Gender	Age	Tenure	Industry	Number of employees
1	Female	57	20	Manufacturing	< 50
2	Male	49	12	Others	< 50
3	Male	66	18	Others	< 250
4	Male	31	6	Service	< 10
5	Male	59	35	Manufacturing	< 50
6	Male	45	7	Manufacturing	< 250
7	Male	41	14	Service	< 250
8	Male	45	3	Service	< 10
9	Male	53	4	Service	< 10
10	Male	61	8	Service	< 250
11	Female	43	15	Service	< 50
12	Male	53	8	Service	< 250

COLLECTING DATA I invited CEOs to participate in the study through an invitation email, which is included in Appendix 3. The research purpose was introduced in the email and CEOs were invited to follow the embedded link to complete the online survey. I contacted 1542 firms, but a significant number of emails bounced back to the researcher due to reasons such as invalid email addresses, and executive has retired or moved to another company. Some automated responses indicated that some CEOs were out of office or on annual leave. Several respondents replied to the invitation email and indicated that they were unable to participate in the study because their firms were not SMEs or not located in England, UK. In total, 1,388 emails reached the target while the remaining 154 emails failed to deliver.

To encourage participation, CEOs were assured that their answers would remain confidential and be used for academic purposes only. Also, they were informed that

an Executive Summary of the research findings would be provided at the end of this study. After the initial invitation email, three rounds of follow up emails were used to encourage participation. The emails were scheduled for two weeks, four weeks, and five weeks after the initial invitation email. In total, 157 responses, of the initial 1,388 e-mailed, were collected within the period. The response rate is 11.3 percent, which is comparable to similar studies using senior executives as a primary data source (Brettel and Rottenberger, 2013; Xu, 2011). Through examining the data set, it was found that some cases were not valid due to missing data on key variables. These were then removed. Additionally, one response was removed due to being an outlier. The procedures in examining outliers are discussed in the next section. In total, 110 valid responses were used in statistical analysis for hypothesis testing.

The characteristics of all respondents were as follows. The average age of CEOs was 50.67 years, and the average tenure was 14.41 years. The sample was dominated by male CEOs who accounted for 81.2% of all respondents. This is in line with the findings from Global Entrepreneurship Monitor (GEM) that male business ownership is significantly higher than female business ownership in the UK (Hart et al., 2014). Results from the UK 2014 Small Business Survey indicate that only 18% of SMEs are led by women (BIS, 2015). Thus, the gender ratio of this study is representative of the intended population. The average firm age was 30.4 years. The firms varied in size with 20% of the firms having fewer than ten employees. The percentage of firms with 11-50 employees and 51-250 employees are 32.7% and 47.3% respectively. The firms were from different industries: 28.2% were in manufacturing, 48.2% were in service, and 23.6% were from other sectors. The characteristics of the samples are summarised in Table 4-2. A more detailed, statistical description of the sample's characteristics is included in Appendix 4.

Table 4-2: Sample characteristics

Age	50.67 years
Tenure	14.41 years
Gender	
Male (%)	81.2%
Female (%)	18.8%
Firm age	30.4 years
Firm size	
1–10 employees	20%
11–50 employees	32.7%
51–250 employees	47.3%
Industry	
Manufacturing (%)	28.2%
Services (%)	48.2%
Others (%)	23.6%

ETHICAL CONSIDERATIONS Ethical issues concerning informed consent and confidentiality were taken into consideration during the data collection process. First, informed consent was achieved through two steps. Respondents were invited to click the link embedded within the invitation email to complete the online survey. Given that the research purpose was introduced within the email, following the link indicated that respondents were interested and were agreeing to participate in the study. Furthermore, following the suggestion from a member of the University Research Ethics Committee, a statement “Completion and return of the questionnaire will be taken as informed consent and the questionnaires cannot then be withdrawn” was included on the first page of the online survey. This approach was adopted because the survey was operationalised online, and so it may be unrealistic to require respondents to sign and return a physical consent form. It was anticipated that such a process might heavily discourage potential respondents from participation in the study.

Second, participants were assured the confidentiality of their response to the online survey, which collects data in relation to the personal information of CEOs as well as the strategic behaviours and performance of organisations. Specifically, participants were assured that the information they provided would remain

confidential and that neither they and/nor their organisations would be named in any work arising from the research. Through ensuring confidentiality in the data collected, this might enhance respondent's interest and participation in the study. The contact details of the researcher and two supervisors were provided at the beginning of the online questionnaire. This allowed potential respondents to raise any potential issues that they might have about the project.

Finally, it is worth noting that as the contact details of CEOs were obtained from the FAME database, some CEOs might not be interested in participating in this research due to their tight business schedule or lack of interest. During the data collection process, nine respondents contacted the researcher and indicated that they would like to be removed from the emailing list. Their contact details were then removed from the list and they were excluded from all follow up emails.

4.4 Data screening

MISSING DATA I used SPSS, the statistical analysis software, to examine missing data before data analysis. The data concerning the risk-taking dimension of EO was missing in two cases. Given that only two data points were missing, it was considered appropriate to keep the two cases. I replaced the missing values by using the mean value of the variable from all other valid responses. Although the mean substitution method may reduce the variance of the variable, it is unlikely to be a problem for this study as the level of missing data is relatively low in this study (Hair et al., 2014).

OUTLIER The key independent and dependent variables were measured using five-point Likert-scale. This implies that outliers are not an issue for these variables. To illustrate, answering the survey questions at the extreme values of 1 or 5 is not representative of an outlier. I examined the standardised scores for CEO age and tenure to identify potential outliers. It was observed that the highest standardised score was 2.13 for CEO age and 2.90 for CEO tenure. This implies that there were no outliers in the two variables because their standardised scores were lower than the threshold value of 3.29 (Tabachnick and Fidell, 2013). In addition to examining the standardised scores, I also visually inspected the boxplots for CEO age and tenure. The boxplots also demonstrated that there was no outlier, measured by visibly far distance from the box. This further confirmed that outliers were not an issue with respect to CEO age and tenure.

I also examined the standardised score for firm age. The results revealed that the highest standardised score was 8.30, which is much higher than the second value of 3.01. The extreme value of 8.30 indicated that this case was an outlier as the value is much higher than the threshold value of 3.29. Through examining the dataset, it was found that the firm age for this case was 472 years. This case was then removed from further data analysis to avoid potential distortion of the results. This leads to a final sample size of 110 cases for further data analysis.

NORMALITY I then assessed the data normality of all variables based on the skewness and kurtosis z- values, which are calculated by dividing the statistical values of skewness and kurtosis by their respective standard errors. The z-values for

most variables were within the recommended range of ± 1.96 (Hair et al., 2014) except for firm performance, CEO tenure, and firm age. In other words, the data for firm performance, CEO tenure, and firm age was not normally distributed. Given that the z-value of firm performance is -2.07, which is close to the recommended threshold value, this variable remained unchanged. Following the suggestion from Hair et al., (2014), I then transformed the data of CEO tenure and firm age by taking the square root of each variable. The transformed data for CEO tenure became normally distributed, but the transformed data on firm age still deviated from a normal distribution. A logarithmic transformation was then applied to firm age to overcome strong skewness (Tabachnick and Fidell, 2013). The skewness and kurtosis z-values for CEO tenure and firm age after data transformation were within the recommended range of ± 1.96 , suggesting that the data would be acceptable for further analysis. The detailed statistic values, standard errors, as well as z-values for the normality test, are provided in Appendix 5.

4.5 Measurement

REGULATORY FOCUS While various measures have been developed to assess people's regulatory focus (Scholer and Higgins, 2011), the Regulatory Focus Questionnaire (RFQ) and the General Regulatory Focus Measure (GRFM) are the measures that have been commonly used in extant studies. Specifically, RFQ captures people's histories of success in achieving promotion and prevention related goals (Higgins et al., 2001). It consists of 11 items, with six items for promotion focus and five items for prevention focus. The GRFM captures people's regulatory focus by measuring the extent to which they concern promotion and prevention related goals (Lockwood et al., 2002). It consists of 18 questions to measure promotion and prevention focus. Consistent with prior empirical studies within the entrepreneurship context (e.g. Bryant 2009; Kammerlander et al., 2015), I used the RFQ to measure promotion and prevention focus as the RFQ is considered as the "most widely appropriate of the existing measures" to capture people's regulatory focus (Haws et al., 2010, p. 980). CEOs were asked to provide their responses to each item using a five-point Likert scale ranging from 1 to 5. Specific items of the RFQ are provided in section 2 of Appendix 2. It is worth noting that several items were reverse coded and the scores for these items were first adjusted before creating the measures for promotion and prevention focus (i.e., taking the average of respective items).

I assessed the measure of promotion and prevention focus using principal component analysis (PCA) with varimax rotation technique. The results revealed an inconsistent loading of one item on promotion focus (Item 1: "Compared to most people, are you typically unable to get what you want out of life?"). This item was then removed from further analysis. Removing the item was considered appropriate because similar issues were also observed in another study which examined the impact of CEO regulatory focus on the behaviours of organisations (i.e., Kammerlander et al., 2015). I then re-conducted PCA on the remaining ten items. It was found that one item which was originally designed to measure promotion focus was loaded on a separate factor (Item 11: "I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them."). Because a single item is insufficient to represent one factor (Tabachnick and Fidell, 2013), this item was excluded from analysis. Further PCA analysis on the remaining

items revealed that one item on prevention focus (Item 8: “Not being careful enough has gotten you into trouble at times”) had to be removed because the communalities value of 0.46 was lower than the recommended value 0.5.

The final PCA results indicated that two factors had eigenvalues over Kaiser’s criterion of 1 and 59.5% of the variance can be explained by the two factors derived from PCA. The factor loadings for all items range from 0.66 to 0.86, which are all sufficient (Hair et al., 2014). The detailed results from PCA are presented in Appendix 6. The four items for promotion focus and four items for prevention focus were all loaded on the respective factors. The Cronbach’s Alpha was 0.64 for promotion focus and 0.83 for prevention focus, indicating acceptable internal reliability of the measures (Bryant, 2009; Hair et al., 2014). The results were consistent with the study from Kammerlander et al., (2015) which also found that promotion focus ($\alpha = 0.77$) has higher internal reliability than prevention focus ($\alpha = 0.60$).

INNOVATIVENESS, RISK-TAKING, AND PROACTIVENESS Following prior studies (Covin and Slevin, 1989; Covin and Wales, 2012; Dada and Fogg, 2016), I employed the widely adopted nine-item scale to measure the three dimensions of EO. In particular, each dimension of EO was measured by three items using a five-point Likert scale. Sample items include: ‘We favour a strong emphasis on R&D, technological leadership, and innovations’ (innovativeness); ‘When there is uncertainty, we typically adopt a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities’ (risk-taking); and ‘We are very often the first business to introduce new products, administrative techniques, operating technologies, etc.’ (proactiveness). The Cronbach’s alpha is 0.77 for innovativeness, 0.79 for risk-taking, and 0.84 for proactiveness, all well above the recommended value of 0.7, indicating good scale reliability.

FIRM PERFORMANCE I employed four items to measure firm performance. CEOs were required to evaluate their firms’ performance in comparison with major competitors over the past three years on profitability, market share, return on investments, and sales growth. This approach is considered appropriate because prior empirical evidence has demonstrated that the performance relative to competitors measured shows good relevance, internal consistency, and external

validity (Chandler and Hanks, 1993). The performance measure captures both financial (profitability and return on investments) and non-financial performance (market share and sales growth) (Richard et al., 2009). This is also consistent with existing EO studies that use perceived financial and non-financial performance as the performance indicator (Rauch et al., 2009). The items were measured by using a five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree). The average of these four items was used as the performance measure. The Cronbach's alpha was 0.77, indicating high scale reliability.

INDUSTRY ENVIRONMENT Following prior research, industry environment was measured by assessing CEOs' perceptions of the industry in which their firms operate. For example, Bierly and Daly (2007) asked respondents to indicate whether their industry would be characterised as a high-tech industry. I extended Bierly and Daly's (2007) one-item measure and used a two-item measure by asking respondents to indicate: 1) the extent to which their primary product is high-tech or low-tech; and 2) the extent to which their primary product is high knowledge intensive or low knowledge intensive, based on a scale of one to five. Including one more item to capture knowledge intensity is based on the consideration that high-tech industries are generally more knowledge intensive than the low-tech ones (Thornhill, 2006; Bolland and Hofer, 1998). Also, the item can better capture the nature of the product, which refers to both goods and services, offered by firms from the service sector. The average of the two items was used to represent the industry environment in which firms operate. While the Cronbach's alpha 0.55 is slightly lower than the recommended value of 0.6, it was considered acceptable because researchers have highlighted that a lower alpha is expected for scales that are measured with few items (Dai et al., 2014; Morris and Pavett, 1992).

CONTROLS Several control variables were used in this study: CEO age, CEO tenure, firm age, firm size, industry, and environmental turbulence. CEO age and tenure are controlled because they allow CEOs to accumulate more experience, which may influence the behaviours of firms they lead. For example, it is possible that CEOs with more experience in innovation may have higher a tendency to foster such activities within their firms. Also, one could argue that older CEOs might be less motivated to pursue new opportunities because researchers have highlighted that age is negatively associated with entrepreneurs' focus on new opportunities (Gielnik

et al., 2012). Additionally, it is possible that CEOs with more experience, which result from higher age and/or longer tenure, are more likely to have the skills in managing their respective firms, which could have an impact on the outcome of firms they lead. For example, researchers have highlighted that entrepreneurs' experience is positively related to venture growth (Lee and Tsang, 2001), suggesting that it is important to control the age and tenure of CEOs.

Firm age was calculated by the number of years the business was established (Lubatkin et al., 2006). Older firms should have more experience in entrepreneurial activities than younger firms. As such, firm age may influence the outcomes of firms' different entrepreneurial activities. Firm size was measured by using the range of full-time employees working within the business. It was controlled because firms' capability to engage in entrepreneurial activities depends on their resources and competencies (Covin and Slevin, 1991), which are associated with the size of organisations. Firm size was included as dummy variables with three categories: less than 10 employees, which served as the reference group in the model, 11-50 employees, and 51-250 employees. Consistent with previous research (Lubatkin et al., 2006; Kammerlander et al., 2015), industry was controlled to account for potential influences from the industry. Industry dummies include manufacturing, service, and other businesses, which served as the reference group in the model.

Finally, environmental turbulence was controlled because changes in the environment provides new opportunities but also entails risks (Su et al., 2011). As such, environmental turbulence may have an impact on firm behaviours or performance. Environmental turbulence was measured by using a six-item, five-point scale adapted from Jaworski and Kohli (1993). The scale contained items measuring the market and technological changes within the environment in which firms operate. Sample items include: "Customers' product preferences change quite a bit over time" and "The technology in our industry is changing rapidly". The Cronbach's alpha was 0.76, indicating high scale reliability.

4.6 Reliability and validity test

NON-RESPONSE BIAS I tested non-response bias for early and late responses (Armstrong and Overton, 1977) on CEO age, tenure, and firm age. The underlying assumption is that late responses might be similar to non-responses (Kanuk and Berenson, 1975). I categorised the data into two groups based on the time of response. The early response group has 56 cases, while the late response group has 54 cases. The results from T-test showed that all p-value > 0.10 (see Appendix 7), suggesting that there is no significant differences between the two groups. Thus, non-response bias was not a problem to this study.

COMMON METHOD BIAS As the survey data was self-reported by individual CEOs, several approaches were employed to minimise the potential issue of common method bias (Podsakoff and Organ, 1986; Podsakoff et al., 2003). Firstly, participants were assured the anonymity and confidentiality of their responses to reduce the effect of social desirability in answering the survey (Podsakoff et al., 2003). Specifically, they were assured that the information they provided would remain confidential in that their answers would not be shared with anybody and they would not be named in any work arising from the research. Secondly, the questions concerning the different constructs were placed in different sections of the survey. This separation of constructs with different sets of section instructions can help to minimise participants' perception of any direct relationship between the constructs in the study (Podsakoff et al., 2003).

Finally, I employed Harman's one-factor test to examine common method bias. According to Podsakoff and Organ (1986, p. 536), when a substantial amount of common method variance is present, "either (a) a single factor will emerge from the factor analysis, or (b) one 'general' factor will account for the majority of the covariance" among the measured variables. The results from factor analysis indicated that six factors account for 70 per cent of the variance extracted (eigenvalue > 1), with the first factor accounting for only 25.42 per cent of the variance (see Appendix 8). Hence, no single factor was dominant from the factor analysis, and no single factor represented the majority of the variance. Accordingly, the risk of common method bias is low in this study.

CONSTRUCT VALIDITY I examined the construct validity of the three dimensions of EO as well as promotion and prevention focus through conducting confirmatory factor analysis (CFA) and calculating the square root of the average variance extracted (AVE) for each variable (Baron and Tang, 2011; Chen et al., 2014). I first examined a two-factor CFA model that includes promotion and prevention focus. The chi-square for the two-factor model was non-significant ($\chi^2 = 26.03$, $p > 0.10$). The fit indices demonstrate that the model provided a good fit to the data: $\chi^2/\text{d.f.} = 1.37$, CFI = 0.97, TLI = 0.95, RMSEA = 0.06. I then compared the two-factor model with an alternative one-factor model, which combines all items into one factor. As shown in Table 4-3, the two-factor model provided a much better fit to the data than the one-factor model. Accordingly, the promotion and prevention focus scales are measuring distinct constructs.

Table 4-3: Confirmatory factor analysis for regulatory focus

Model	χ^2	d.f.	$\Delta\chi^2$	CFI	TLI	RMSEA
Recommended values	$\chi^2 / \text{d.f.} \leq 3$			≥ 0.90	≥ 0.90	≤ 0.08
Two-factor model	26.03	19		0.97	0.95	0.06
One-factor model	69.19	20	43.16	0.78	0.69	0.15

CFI = comparative fit index; TLI = Tucker–Lewis Index;
RMSEA = root-mean-square error of approximation.

I also examined a three-factor CFA model that includes innovativeness, risk-taking, and proactiveness. Although the chi-square for the three-factor model was significant ($\chi^2 = 42.17$, $p < 0.05$), the fit indices indicate that the three-factor model provided a good fit to the data. Specifically, the ratio of $\chi^2/\text{d.f.}$ (1.76) was below the threshold value of 3. The comparative fit index (CFI = 0.96) and Tucker Lewis index (TLI = 0.95) were above the acceptable criterion level of 0.9. The root-mean-square error of approximation (RMSEA = 0.08) was not higher than the threshold value of 0.08. Additionally, all individual items significantly loaded on their respective latent variables. I then compared the three-factor model with an alternative one-factor model, which combines all items into one factor. As shown in Table 4-4, the three-

factor model provided a much better fit to the data than the one-factor model. Together, the results suggest that the innovativeness, risk-taking, and proactiveness scales are measuring distinct constructs.

Table 4-4: Confirmatory factor analysis for the three dimensions of EO

Model	χ^2	d.f.	$\Delta\chi^2$	CFI	TLI	RMSEA
Recommended values	$\chi^2 / \text{d.f.} \leq 3$			≥ 0.90	≥ 0.90	≤ 0.08
Three-factor model	42.17	24		0.96	0.95	0.08
One-factor model	183.22	27	141.05	0.68	0.58	0.23

CFI = comparative fit index; TLI = Tucker–Lewis Index;
 RMSEA = root-mean-square error of approximation.

Additionally, I calculated the square root of the average variance extracted for promotion focus, prevention focus, innovativeness, risk-taking, and proactiveness. Results indicated that the square root of the AVE values were adequate (see Appendix 9 for a summary). The AVE 0.483 for promotion focus is considered acceptable although it is slightly lower than the recommended value of 0.5 (Tabachnick and Fidell, 2013). Taken together, the CFA and AVE results provide support for discriminant and convergent validity of the key variables used in this study.

Chapter 5 Data Analysis and Results

5.1 Descriptive statistics

Table 5-1 presents the means, standard deviation, and correlations for the variables used in this study. The correlation between promotion and prevention focus is low in magnitude ($\rho = 0.168$, $p > 0.1$), which is consistent with previous studies (Kammerlander et al., 2015; Higgins et al., 2001). The correlations between innovativeness, risk-taking, and proactiveness range from 0.47 to 0.52, suggesting that while there is shared variance among the three dimensions of EO, substantial independent variance also exist for each dimension. The existence of independent variance provide further support that examining the three dimensions of EO independently may generate useful insights that cannot be revealed when the three dimensions are combined into one factor. The magnitudes of their correlations are comparable to those reported by Lomberg et al., (2016) ranging from 0.44 to 0.49 and by Kreiser et al., (2013) ranging from 0.36 to 0.47. I then assessed multicollinearity using the variance inflation factor (VIF) statistics. The lowest value was 1.19 and the highest value was 3.01. All VIFs were substantially below the critical value of 10 (Neter et al., 1985), suggesting that multicollinearity is not a concern for the current study.

Table 5-1: Means, Standard Deviations (SD), and Correlations of Variables

	M	SD	1	2	3	4	5	6	7	8	9	10
1. CEO age	50.67	10.49										
2. CEO tenure	14.41	9.57	.406**									
3. Firm age	30.40	32.11	0.172	.344**								
4. Environmental turbulence	3.71	.64	0.002	-0.165	-.189*							
5. Industry environment	3.57	.99	0.071	-0.124	-0.099	.327**						
6. Promotion focus	3.93	.49	-0.065	-0.011	-0.017	0.177	0.150					
7. Prevention focus	3.35	.89	0.156	.219*	.200*	-0.097	0.082	0.168				
8. Innovativeness	3.33	.85	0.183	0.059	0.007	.446**	.238*	.251**	-0.087			
9. Risk-taking	2.86	.97	0.000	-0.036	-0.109	.321**	.194*	0.069	-.238*	.492**		
10. Proactiveness	3.21	.92	0.028	-0.065	-0.100	.265**	0.099	.295**	-.223*	.515**	.468**	
11. Firm performance	3.53	.80	0.042	0.088	0.105	-0.059	0.146	0.180	-0.065	0.098	0.056	.297**

N=110 firms; *p < .05; ** < .01 (two-tailed).

5.2 Regulatory focus and firm performance

5.2.1 Regression Models

The results for testing Hypotheses 1 to 4 are provided in Table 5-2. The regression analysis used three models. Model 1 contains only the control variables and the moderating variable. In Model 2, I added the independent variables: promotion and prevention focus. The interaction terms were included in Model 3. Consistent with prior research (Kammerlander et al., 2015; Aiken et al., 1991), all independent variables were mean centred before creating the interaction terms to prevent potential multicollinearity.

Table 5-2: Regressing promotion and prevention focus onto firm performance

	Model 1:	Model 2:	Model 3:
Constant	3.06***	2.82***	2.73***
<i>Controls</i>			
CEO age	-0.01	0.00	0.00
CEO tenure	0.04	0.03	0.01
Firm age	0.07	0.16	0.18
Firm size (11-50)	0.02	0.00	-0.02
Firm size (51-250)	0.16	0.11	0.09
Manufacturing	0.29	0.30	0.24
Service	-0.04	0.08	0.03
Environmental turbulence	-0.12	-0.16	-0.18
Industry environment (High/Low-tech industry)	0.19*	0.18*	0.20*
<i>Direct effects</i>			
Promotion focus		0.33*	0.25
Prevention focus		-0.18*	-0.18 ⁺
<i>Interactions</i>			
Promotion focus x Industry environment (High/Low-tech industry)			0.42*
Prevention focus x Industry environment (High/Low-tech industry)			0.01
<i>R</i> ²	0.11	0.16	0.22
<i>Adjusted R</i> ²	0.03	0.07	0.12
ΔR^2		0.06	0.06
<i>F</i>	1.36	1.75 ⁺	2.12*
ΔF		3.23*	3.63*

†p < 0.10; *p < 0.05; ** < 0.01; *** < 0.001; unstandardized regression coefficients (two-tailed tests)

5.2.2 Regression Results

Hypotheses 1 and 2 tested the relationship between regulatory focus and firm performance. Hypothesis 1 predicted that promotion focus would be positively associated with firm performance. As shown in Model 2, promotion focus was positively and significantly ($\beta = 0.33, p < 0.05$) related to firm performance, providing support for Hypothesis 1. Hypothesis 2 posited that prevention focus would be negatively related to firm performance. As also shown in Model 2, prevention focus was negatively and significantly ($\beta = -0.18, p < 0.05$) related to firm performance. Hence, Hypothesis 2 was supported. Compared with Model 1, Model 2, which includes promotion and prevention focus as predictors, explained an additional 6% of the variance in firm performance.

Hypotheses 3 and 4 assessed the moderating effect of industry environment on the relationship between regulatory focus and firm performance. Hypothesis 3 predicted that industry environment would moderate the positive relationship between promotion focus and firm performance. As shown in Model 3, the interaction term of promotion focus was positive and significant ($\beta = 0.42, p < 0.05$), providing support for Hypothesis 3. The interaction term explained an additional 6% of the variance in firm performance beyond that explained by controls, promotion and prevention focus. Hypothesis 4 posited that the industry environment would moderate the negative relationship between prevention focus and firm performance. As shown in Model 3, the interaction term of prevention focus was non-significant ($\beta = 0.01, n.s.$). As such, Hypothesis 4 was not supported.

The moderating effect of industry environment is illustrated in Figure 5-1. As shown in the figure, the relationship between promotion focus and firm performance is stronger for firms in high-tech industries than those in low-tech industries. The figure also revealed a downward trend on the promotion focus – firm performance relationship for firms in low-tech industries, implying that promotion focus might not have a universally positive effect on firm performance. Specifically, the positive performance effects of promotion focus might hold true only in high-tech industries rather than in low-tech industries. The performance effects of prevention focus is similar for firms in high-tech industries and those in low-tech industries.

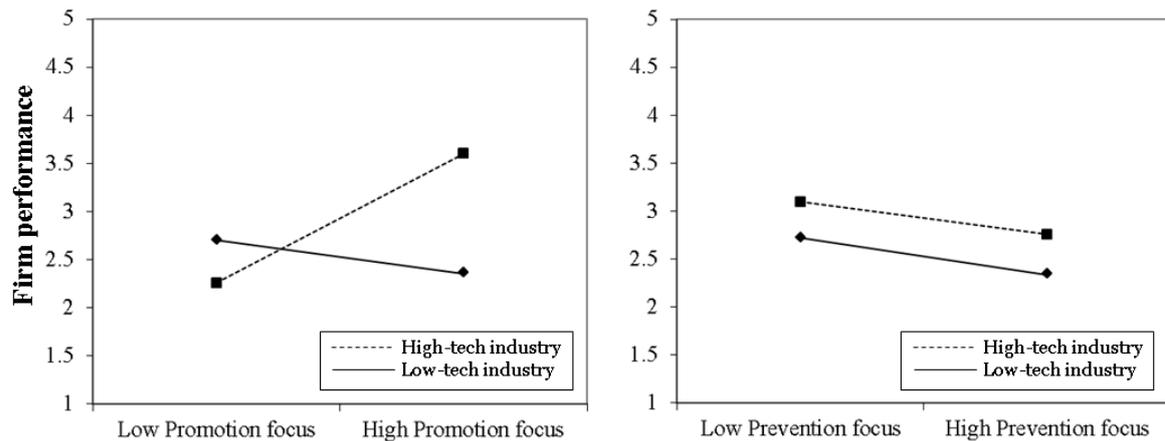


Figure 5-1: Plot of industry environment as moderator

5.2.3 Robustness checks

As robustness checks, I ran additional regression models to scrutinise the results from the current study. I split the sample into high-tech and low-tech group based on the median of the industry environment variable and then re-ran the analyses separately for each group. The high-tech group includes 56 firms, while the low-tech group includes 54 firms. As expected, the magnitude of the relationship between regulatory focus and firm performance varies between firms in the high-tech group and those in the low-tech groups. The results from sub-group analyses demonstrated that the promotion focus – firm performance relationship was significant in high-tech group ($\beta = 0.52, p < 0.05$) but non-significant in low-tech group ($\beta = -0.06, n.s.$). These results support the assumption that promotion focus has stronger effects for firms in high-tech industries than those in low-tech ones. The negative sign of the regression coefficient between promotion focus and the performance of firms in low-tech industries suggest that high levels of promotion focus might have detrimental effects for firms in low-tech industries. Additionally, the sub-group analysis indicated that the prevention focus – firm performance relationship was non-significant for firms in either the high-tech group ($\beta = -0.06, n.s.$) or in the low-tech group ($\beta = -0.18, n.s.$). This is in line with the non-findings that lead to the rejection of H4. The negative sign of the regression coefficient is consistent with the assumption that CEO prevention focus negatively impact firm performance.

5.2.4 Post-hoc test

Because promotion and prevention focus represent two independent systems rather than opposite ends of a single continuum (Higgins, 1997, 1998), researchers have highlighted that people might have varying combinations of promotion and prevention focus (Lanaj et al., 2012). Accordingly, I conducted post-hoc tests to examine how firm performance might differ when firms are led by CEOs with varying combinations of promotion and prevention focus. Consistent with prior studies (Kammerlander et al., 2015; Markovits, 2012; Idson et al., 2000), I used the median value of promotion and prevention focus to split the sample into four groups: (a) high promotion focus and high prevention focus; (b) high promotion focus and low prevention focus; (c) low promotion focus and high prevention focus; and (d) low promotion focus and low prevention focus. Following the taxonomy provided by Markovits (2012), I labelled the four groups as rationalists (34 cases), achievers (23 cases), conservatives (29 cases), and indifferents (24 cases), as shown in Table 5-3.

Table 5-3: CEOs with varying combinations of promotion and prevention focus

		Promotion focus	
		High	Low
Prevention focus	High	(a) Rationalists	(c) Conservatives
	Low	(b) Achievers	(d) Indifferents

I calculated the mean values of firm performance for each of the four groups. As illustrated in Figure 5-2, the rationalists group achieved the highest levels of firm performance (3.65), whereas the conservatives group achieved the lowest levels of firm performance (3.34). The indifferents group (3.63) achieved higher performance than the group of achievers (3.48). While the four groups differ in the mean value of firm performance, results from ANOVA analysis suggested that the between groups difference is not-significant. The Partial eta squared is 0.03, suggesting that 3% of the variance in firm performance is accounted for by the

membership of different groups with varying combinations of promotion and prevention focus.

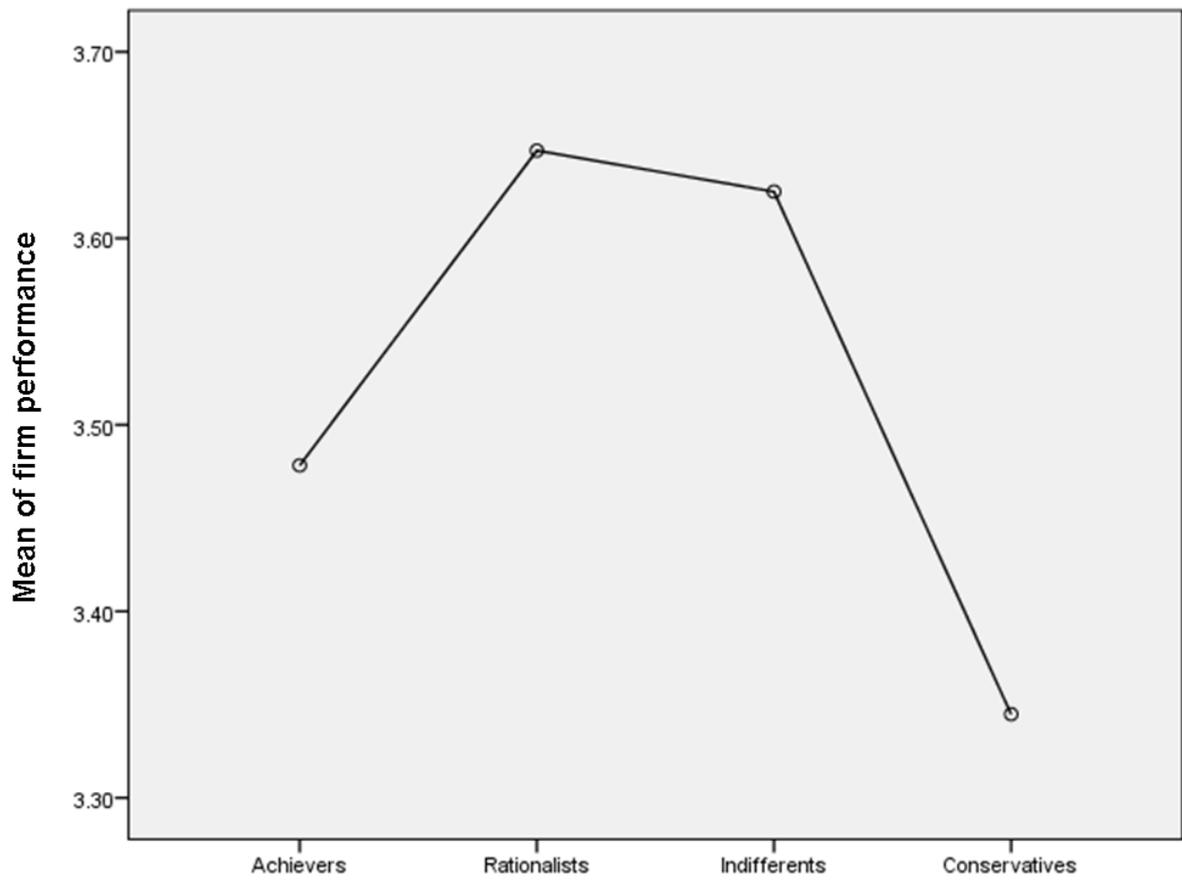


Figure 5-2: Comparing the mean value of firm performance

5.3 Entrepreneurial orientation and firm performance

5.3.1 Regression Models

The results for testing Hypotheses 5 to 10 are provided in Table 5-4. The regression analysis used six models. Model 1 contains the control variables and the moderating variable. For the dummy variable of firm size and industry, I used the group of fewer than 10 employees and ‘other industry’ as the reference group. In Model 2, I added the linear terms for innovativeness, risk-taking, and proactiveness. A positive relationship is observed when the coefficient of the linear term is positive and significant, whereas a negative relationship is observed when it is negative and significant (Aiken et al., 1991). In Model 3, I included the squared terms for innovativeness, risk-taking, and proactiveness to test for their nonlinear effects on firm performance. A U-shaped relationship is concluded when the coefficient of the squared term is positive and significant, whereas an inverted U-shaped relationship is concluded when the coefficient of the squared term is negative and significant (Aiken et al., 1991). I then included three separate models to test for the hypothesised moderating impact of industry environment. The linear and quadratic interaction terms for innovativeness, risk-taking, and proactiveness were included in Model 4 to Model 6. In line with prior research (Kreiser et al., 2013; Aiken et al., 1991), all independent variables were mean-centred before creating the interaction terms to prevent potential multicollinearity.

Table 5-4: Regressing innovativeness, risk-taking, and proactiveness onto firm performance

	Model 1:	Model 2:	Model 3:	Model 4:	Model 5:	Model 6:
Constant	3.54***	3.38***	3.51***	3.68***	3.48***	3.71***
<i>Controls</i>						
Firm age	0.10	0.21*	0.20*	0.18+	0.21*	0.18+
Firm size (11-50)	0.02	-0.10	-0.02	0.07	-0.02	0.04
Firm size (51-250)	0.13	-0.10	-0.07	-0.04	-0.07	-0.08
Manufacturing	0.31	0.22	0.21	0.20	0.22	0.31
Service	-0.01	0.19	0.22	0.19	0.23	0.26
Environmental turbulence	-0.12	-0.15	-0.20	-0.23	-0.20	-0.26+
Industry environment (High/Low-tech industry)	0.18*	0.16+	0.14	-0.02	0.12	0.07
<i>Direct effects</i>						
Innovativeness		-0.08	-0.04	-0.10	-0.05	-0.01
Risk-taking		-0.03	-0.02	-0.03	-0.02	-0.03
Proactiveness		0.35**	0.32**	0.31**	0.32**	0.22+
<i>Nonlinear effects</i>						
(Innovativeness) ²			-0.19+	-0.27**	-0.19+	-0.20*
(Risk-taking) ²			0.14+	0.10	0.13	0.13+
(Proactiveness) ²			0.05	0.07	0.05	0.01
<i>Interactions</i>						
Innovativeness x Industry environment (High/Low-tech industry)				0.13		
(Innovativeness) ² x Industry environment (High/Low-tech industry)				0.27*		
Risk-taking x Industry environment (High/Low-tech industry)					0.02	
(Risk-taking) ² x Industry environment (High/Low-tech industry)					0.02	
Proactiveness x Industry environment (High/Low-tech industry)						0.25*
(Proactiveness) ² x Industry environment (High/Low-tech industry)						0.05
<i>R</i> ²	0.10	0.19	0.24	0.29	0.25	0.28
<i>Adjusted R</i> ²	0.04	0.11	0.14	0.18	0.12	0.17
ΔR^2		0.09	0.05	0.05	0.00	0.04
<i>F</i>	1.70	2.39*	2.39**	2.62**	2.04*	2.48**
ΔF		3.69*	2.12	3.34*	0.05	2.58+

†p < 0.10; *p < 0.05; ** < 0.01; *** < 0.001; unstandardized regression coefficients (two-tailed tests)

5.3.2 Regression Results

Hypotheses 5 to 7 examined the independent effects of innovativeness, risk-taking, and proactiveness on firm performance. Hypothesis 5 predicted an inverted U-shaped relationship between innovativeness and firm performance. As shown in Model 3, while the linear term of innovativeness was non-significant ($\beta = -0.04$, n.s.), its squared term was negatively and marginally significant ($\beta = -0.19$, $p < 0.10$) related to firm performance, providing support for Hypothesis 5. As illustrated in Figure 5-3a, innovativeness was initially positively associated with firm performance, but the benefits start to diminish when the levels of innovativeness shift from moderate to high levels.

Hypothesis 6 posited an inverted U-shaped relationship between risk-taking and firm performance. As also shown in Model 3, while the linear term of risk-taking was non-significant ($\beta = -0.02$, n.s.), its squared term was positively and marginally significant ($\beta = 0.14$, $p < 0.10$) related to firm performance. The results suggest that the relationship between risk-taking and firm performance was in the opposite direction. Hence, Hypothesis 6 was not supported. As Figure 5-3b shows, firm performance decreases slightly for firms with increasing levels of risk-taking, before increasing again when the levels of risk-taking shift from moderate to high levels.

Hypothesis 7 predicted an inverted U-shaped relationship between proactiveness and firm performance. As shown in Model 3, the linear term of proactiveness was positive and significant ($\beta = 0.32$, $p < 0.01$), while its squared term was non-significant ($\beta = 0.05$, n.s.), suggesting that the relationship between proactiveness and firm performance is linear rather than the proposed inverted-U shaped. As such, Hypothesis 7 was not supported. Figure 5-3c illustrates that increasing levels of proactiveness lead to better performance. The linear term of proactiveness explained an additional 9% (Model 2) of the variance in firm performance beyond that explained by controls (Model 1). The curvilinear terms of innovativeness and risk-taking together explained an additional 5% of the variance in firm performance (Model 3). Together, the three dimensions of EO account for 14% of the total variance in the performance of SMEs.

Hypotheses 8 to 10 tested the moderating effect of industry environment on the relationship between the individual dimensions of EO and firm performance. Hypothesis 8 proposed that the independent effects of innovativeness will be stronger for firms in low-tech industries than those in high-tech ones. As shown in Model 4, the linear innovativeness - industry environment interaction term was non-significant ($\beta = 0.13$, n.s.), while the squared interaction term was significant ($\beta = 0.27$, $p < 0.05$), providing support for Hypothesis 8. Figure 5-4a illustrated the moderating effect of industry environment on the innovativeness - firm performance relationship between high-tech and low-tech industries. As shown in the figure, the effect of innovativeness on firm performance is more pronounced within low-tech industries.

Hypothesis 9 hypothesised that the independent effects of risk-taking will be stronger for firms in high-tech industries than those in low-tech ones. As shown in Model 5, neither the linear ($\beta = 0.02$, n.s.) innovativeness and industry environment interaction term nor the squared ($\beta = 0.02$, n.s.) interaction term was non-significant. As such, Hypothesis 9 was not supported. As shown in Figure 5-4b, risk-taking has similar effects for SMEs in high-tech industries and those in low-tech industries.

Hypothesis 10 posited that the independent effects of proactiveness will be stronger for firms in high-tech than those in low-tech industries. As shown in Model 6, the linear proactiveness - industry environment interaction term was significant ($\beta = 0.25$, $p < 0.05$), while the squared interaction was non-significant ($\beta = 0.05$, n.s.). This result implies that industry environment only moderates the linear relationship between proactiveness and firm performance without playing a moderating role on the proposed inverted U-shaped relationship. Accordingly, Hypothesis 10 was not supported. As Figure 5-4c shows, the relationship between proactiveness and firm performance is stronger for firms in high-tech industries than those in low-tech industries. Together, the results demonstrate that the explanatory power of innovativeness and proactiveness, with the exception of risk-taking, was enhanced when industry environment was included as the moderator. In particular, compared to Model 3, the moderation model of innovativeness (i.e., Model 4) and proactiveness (i.e., Model 6) explained an extra 5% and 4% of the variance in firm performance respectively.

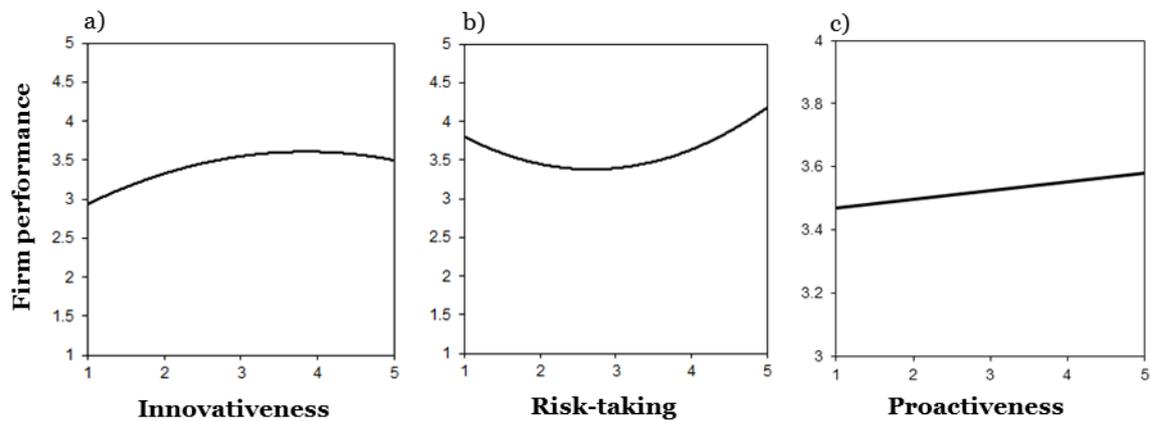


Figure 5-3a-c: Plot of the effects of the dimensions of EO on firm performance

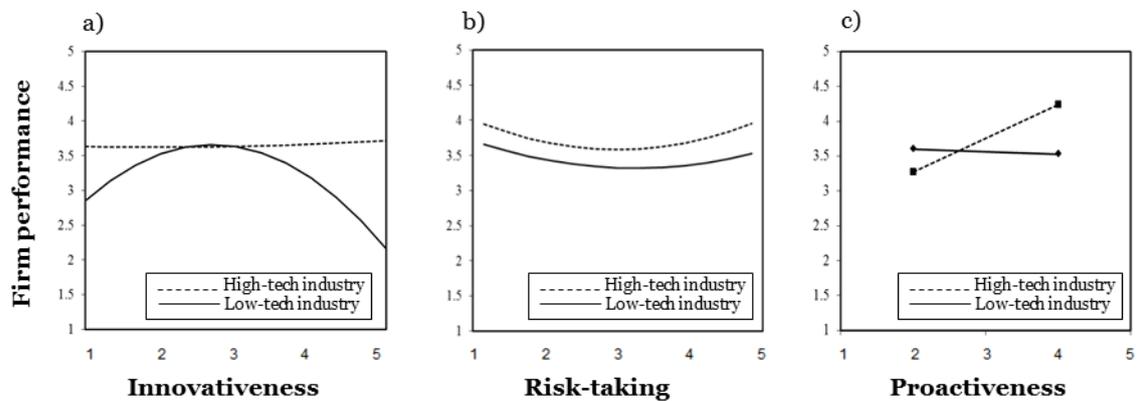


Figure 5-4a-c: Plot of industry environment as moderator

5.2.3 Robustness checks

I ran additional regression models as robustness checks to scrutinise the results from the current study. The regression results demonstrated that the relationship between risk-taking and firm performance was U-shaped rather than the proposed inverted U-shaped relationship. Because researchers have highlighted that there is a “potential for an S-shape or a series of inverse-U relationships between EO and performance” (Tang et al., 2008, p. 232), I suspect that the risk-taking and firm performance relationship may be more complex than originally anticipated. To further probe the performance effects of risk-taking and to identify potential causes for the non-findings, I first created a cubed risk-taking term. I then entered the cubed term into a new regression model after the inclusion of the linear and squared

terms to test for a potential S-shaped relationship between risk-taking and firm performance. The regression results for the cubed risk-taking term was non-significant ($\beta = 0.01$, n.s.), suggesting the risk-taking and firm performance relationship is quadratic rather than cubic.

I then split the sample into high-tech and low-tech groups based on the median of the industry environment variable and then re-ran the analyses separately for each group. The high-tech group includes 56 firms, while the low-tech group includes 54 firms. As expected, the magnitude of the relationship between the individual EO dimensions and firm performance vary between high-tech and low-tech group. Firstly, the results from sub-group analysis reveal that the relationship between the squared innovativeness term and firm performance was insignificant within high-tech group ($\beta = -0.09$, n.s.) but significant within low-tech group ($\beta = -0.48$, $p < 0.05$). This finding provides further support that innovativeness has more pronounced effects on firms in low-tech than those in high-tech industries.

Secondly, the relationship between the squared risk-taking term and firm performance was marginally significant within the high-tech group ($\beta = 0.22$, $p < 0.1$) but insignificant within the low-tech group ($\beta = 0.10$, n.s.). While this result from the sub-group analysis suggests that risk-taking has more pronounced effects on firms in high-tech than low-tech industries, a significant result was not observed from the full sample. Accordingly, the moderating effect of industry environment on the relationship between risk-taking and firm performance remains inconclusive.

Thirdly, the linear relationship between proactiveness and firm performance was significant within the high-tech group ($\beta = 0.39$, $p < 0.05$) but insignificant within the low-tech group ($\beta = 0.29$, n.s.). The relationship between the squared proactiveness term and firm performance was neither significant in the high-tech ($\beta = 0.02$, n.s.) nor in the low-tech groups ($\beta = 0.01$, n.s.). Together, these results suggest that the proactiveness - firm performance relationship is linear rather than the proposed inverted U-shaped. Also, the performance effect of proactiveness is greater on firms in high-tech than those in low-tech industries.

Given the debate about whether EO represents a unidimensional or multidimensional construct, I performed an ad-hoc analysis to assess the effect of

the unidimensional EO on firm performance. The EO construct was measured by taking the average of its three dimensions. It was then mean centred before creating the squared term of EO and the interaction term with industry environment. I then ran three additional models. The first model includes the controls (same as in Model 1 in Table 5-2) and the linear EO term. The squared EO term was added in the second model, while the linear and squared interaction terms of EO and industry environment were included in the third model.

The results demonstrate that the overall effect of EO on firm performance was positive and marginally significant ($\beta = 0.23$, $p < 0.10$). In the second model that includes both the linear and squared EO term. While the linear term was positive and marginally significant ($\beta = 0.24$, $p < 0.10$), the squared term was not significant ($\beta = 0.05$, n.s.), suggesting that the EO – firm performance relationship is linear rather than curvilinear. In the final model that includes both the linear and squared interaction terms, the linear interaction term was marginally significant ($\beta = 0.24$, $p < 0.10$), while the squared term was not significant ($\beta = 0.17$, n.s.), suggesting that EO has stronger performance effects on firms in high-tech than those in low-tech industries. Together, these results demonstrated that the performance implications of EO differ substantially, depending upon whether EO is conceptualised as a unidimensional or multidimensional construct.

5.4 Regulatory focus and entrepreneurial orientation

5.4.1 Regression models

The results for testing Hypotheses 11 to 16 are provided in Table 5-5. The regression analysis used six models. In Models 1-2, the dependent variable is innovativeness, whereas in Models 3-4, the dependent variable is risk-taking. In Models 5-6, the dependent variable is proactiveness. Models 1, 3, and 5 contain only the control variables. The predicting variables promotion and prevention focus were added in Models 2, 4, and 6.

Table 5-5: Regressing innovativeness, risk-taking, and proactiveness onto promotion and prevention focus

	Innovativeness		Risk-taking		Proactiveness	
	Model 1:	Model 2:	Model 3:	Model 4:	Model 5:	Model 6:
Constant	0.49	-0.59	2.55**	2.94**	3.12***	1.96*
<i>Controls</i>						
CEO age	0.01	0.01	-0.01	0.00	-0.01	0.00
CEO tenure	0.05	0.04	0.14 ⁺	0.14 ⁺	0.07	0.05
Firm age (log)	-0.06	0.01	-0.38**	-0.33*	-0.38**	-0.28*
Firm size (11-50)	0.26	0.24	-0.11	-0.13	0.42 ⁺	0.39
Firm size (51-250)	0.49*	0.44 ⁺	0.35	0.34	0.83**	0.77**
Manufacturing	0.04	0.04	-0.23	-0.20	0.25	0.26
Service	-0.14	-0.04	-0.53*	-0.46 ⁺	-0.62**	-0.49*
Environmental turbulence	0.61*	0.57*	0.38**	0.38**	0.27*	0.22 ⁺
<i>Direct effects</i>						
Promotion focus		0.34*		-0.01		0.40*
Prevention focus		-0.14		-0.18 ⁺		-0.22*
<i>R</i> ²	0.29	0.33	0.21	0.23	0.33	0.39
<i>Adjusted R</i> ²	0.23	0.26	0.15	0.16	0.27	0.33
ΔR^2		0.04		0.03		0.06
<i>F</i>	5.12***	4.88***	3.32**	3.01**	6.16***	6.29***
ΔF		3.07 ⁺		1.62		4.91**

†p < 0.10; *p < 0.05; ** < 0.01; *** < 0.001; unstandardized regression coefficients (two-tailed tests)

5.4.2 Regression results

Hypotheses 11 to 13 examined the effects of promotion focus on firms' levels of innovativeness, risk-taking, and proactiveness. Hypothesis 11 stated that promotion focus would be positively associated with innovativeness. As shown in Model 2, there is a significant positive relationship between promotion focus and innovativeness ($\beta = 0.34$, $p < 0.05$). Therefore, Hypothesis 11 is supported. Hypothesis 12 proposed that promotion focus would be positively associated with risk-taking. However, results do not provide support for Hypothesis 12. As shown in Model 4, the relationship between promotion focus and risk-taking is non-significant ($\beta = -0.01$, n.s.). Hypothesis 13 predicted that promotion focus would be positively associated with proactiveness. Results in Model 6 indicate a significant positive relationship between promotion focus and proactiveness ($\beta = 0.40$, $p < 0.05$), providing support for Hypothesis 13.

Hypotheses 14 to 16 assessed the influences of prevention focus on firms' levels of innovativeness, risk-taking, and proactiveness. Hypothesis 14 stated that prevention focus would be negatively associated with innovativeness. Results in Model 2 demonstrate that while there is a negative relationship between prevention focus and innovativeness as predicted, the relationship is non-significant ($\beta = -0.14$, n.s.). Hence, Hypothesis 14 is not supported. Hypothesis 15 proposed that prevention focus would be negatively associated with risk-taking. Results in Model 4 demonstrate a marginally significant negative relationship between prevention focus and risk-taking ($\beta = -0.18$, $p < 0.10$), providing support for Hypothesis 15. Hypothesis 16 predicted that prevention focus would be negatively associated with proactiveness. Results in Model 6 revealed a significant negative relationship between prevention focus and proactiveness ($\beta = -0.22$, $p < 0.05$), providing support for Hypothesis 16.

Compared to the baseline models (i.e., Models 1, 3, and 5), which contain only the control variables, the models that include promotion and prevention focus as predictors (i.e., 2, 4, and 6) have a higher explanatory power in elucidating the variance in firms' levels of innovativeness, risk-taking, and proactiveness. In

particular, promotion focus explained an additional 4% of the variance in firms' levels of innovativeness (Model 2) while prevention focus explained an additional 3% of the variance in firms' levels of risk-taking (Model 4). Additionally, promotion and prevention together explained an additional 6% of the variance in firms' levels of proactiveness (Model 6).

5.4.3 Post-hoc test

Similar to the regulatory focus – firm performance relationship, I also conducted post-hoc test to examine how firms' level of innovativeness, risk-taking, and proactiveness might differ when they are led by CEOs with varying combinations of promotion and prevention focus. I first calculated the mean values of innovativeness, risk-taking, and proactiveness for each of the four groups. The results are shown in Table 5-6.

Table 5-6: Comparing the means of innovativeness, risk-taking, and proactiveness

Group	Innovativeness	Risk-taking	Proactiveness
Rationalists (High promotion focus / high prevention focus)	3.51	2.78	3.39
Achievers (High promotion focus / low prevention focus)	3.65	3.30	3.57
Conservatives (Low promotion focus / high prevention focus)	3.11	2.56	2.71
Indifferents (Low promotion focus / low prevention focus)	3.03	2.90	3.19
Group total mean	3.33	2.86	3.21

To examine whether groups with high promotion focus will exhibit higher levels of innovativeness, risk-taking, and proactiveness than groups with low

promotion focus, I compared the groups between rationalists and conservatives, as well as the groups between achievers and indifferents. As shown in Table 5-6 and illustrated in Figure 5-5, the rationalists group exhibited higher levels of innovativeness, risk-taking and proactiveness than the conservatives group. Similar results are also observed when comparing the achievers group with the indifferents group. Together, these results are consistent with the assumption that CEOs with high levels of promotion focus should positively affect firms' levels of innovativeness, risk-taking and proactiveness (Hypothesis 11 to 13). While H12 was non-significant, based on the regression results reported in section 5.4.2, the results from mean comparisons provide some support that promotion focus should have a positive impact on firms' levels of risk-taking.

To examine whether groups with high prevention focus would exhibit lower levels of innovativeness, risk-taking, and proactiveness than groups with low prevention focus, I compare the groups between rationalists and achievers, as well as the groups between conservatives and indifferents. As illustrated in Figure 5-5, the rationalists group exhibited lower levels of risk-taking and proactiveness than the achievers group. Similar findings were also observed when comparing the conservatives group with the indifferents group. Together, these results are in line with the assumption that CEOs with high levels of prevention focus should negatively impacts firms' levels of risk-taking and proactiveness (Hypothesis 15 and 16). The innovativeness of rationalists group (3.51) is lower than the achievers group (3.65), which is consistent with arguments leading to Hypothesis 14. Nevertheless, the opposite result is observed when comparing the innovativeness between the conservatives group (3.11) and the indifferents group (3.03). This inconsistent result might underlie the non-significant findings that led to the rejection of H14, as reported in section 5.4.2.

Results from ANOVA analysis suggest the between groups difference for innovativeness ($p < 0.05$), risk-taking ($p < 0.10$), and proactiveness ($p < 0.05$) are all significant, suggesting that firms that are led by CEOs with varying combinations of promotion and prevention focus differ significantly in their levels of innovativeness, risk-taking, and proactiveness. The Partial eta squared

is 0.09 for innovativeness, 0.07 for risk-taking, and 0.12 for proactiveness. In other words, 9% of the variance in innovativeness, 7% of the variance in risk-taking, and 12% of the variance in proactiveness is accounted for by the membership of different groups with varying combinations of promotion and prevention focus.

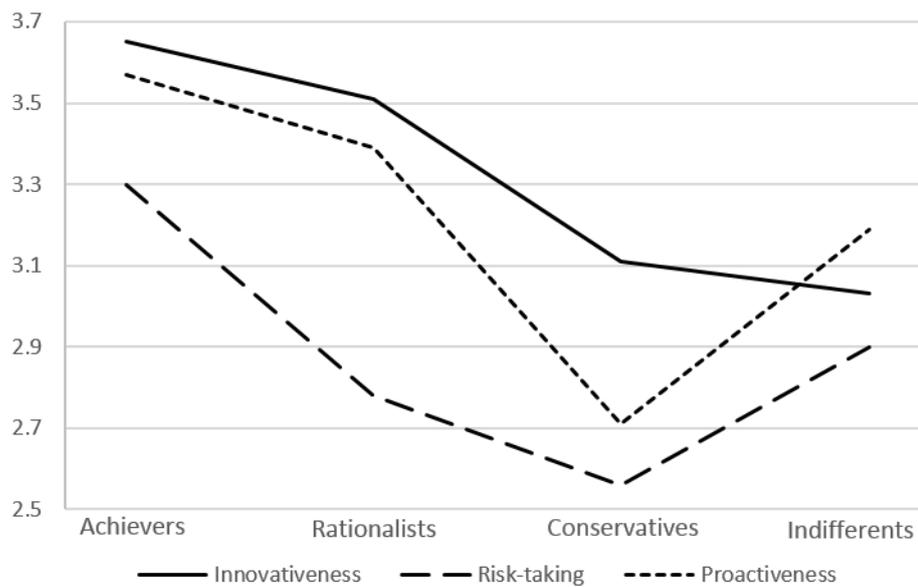


Figure 5-5: Comparing the mean value of the EO dimensions

5.5 Summary

The results from hypothesis testing are summarised in Table 5-7. Hypotheses 1-4 examined the performance effects of promotion and prevention focus and tested how they differ between firms in high-tech industries and those in low-tech industries. The empirical results provide some support for the effects of promotion and prevention focus on firm performance. Whilst industry environment moderates the promotion focus – firm performance relationship, a similar moderation effect was not observed for the prevention focus – firm performance relationship.

Hypotheses 5 to 10 examined the performance effects of innovativeness, risk-taking, and proactiveness on firm performance and tested how they differ between firms in high-tech industries and those in low-tech industries. While the empirical results provide some support for the hypothesised relationships, the nature of the performance effects of risk-taking and proactiveness differs from the predictions offered in the current study. Also, the proposed moderating effects of industry environment on the relationships between risk-taking and firm performance as well as the relationship between proactiveness and firm performance are not supported by this study.

Hypotheses 11 to 16 assessed the effects of promotion and prevention focus on firms' levels of innovativeness, risk-taking, and proactiveness. Promotion focus positively impacts firms' levels of innovativeness and proactiveness, excepting risk-taking. By contrast, prevention focus negatively impacts firms' levels of risk-taking and proactiveness, excepting innovativeness. In the next chapter, I discuss the implications of these results, the potential explanations for the non-findings, and how these results are related to and also contribute to existing literature in regulatory focus and EO.

Table 5-7: Summary of results from hypothesis testing

Hypotheses	Predictor	Dependent variable	Predicted relationship	Support
<i>Regulatory focus → Firm performance</i>				
Hypothesis 1	Promotion focus	Firm performance	+	Yes
Hypothesis 2	Prevention focus	Firm performance	-	Yes
Hypothesis 3	Promotion focus x Industry environment	Firm performance	Moderation	Yes
Hypothesis 4	Prevention focus x Industry environment	Firm performance	Moderation	No
<i>Innovativeness, risk-taking, and proactiveness → Firm performance</i>				
Hypothesis 5	Innovativeness	Firm performance	Inverted U-shaped	Yes
Hypothesis 6	Risk-taking	Firm performance	Inverted U-shaped	No (U-shaped)
Hypothesis 7	Proactiveness	Firm performance	Inverted U-shaped	No (+ Linear)
Hypothesis 8	Innovativeness x Industry environment	Firm performance	Moderation	Yes
Hypothesis 9	Risk-taking x Industry environment	Firm performance	Moderation	No
Hypothesis 10	Proactiveness x Industry environment	Firm performance	Moderation	No
<i>Regulatory focus → Innovativeness, risk-taking, and proactiveness</i>				
Hypothesis 11	Promotion focus	Innovativeness	+	Yes
Hypothesis 12	Promotion focus	Risk-taking	+	No
Hypothesis 13	Promotion focus	Proactiveness	+	Yes
Hypothesis 14	Prevention focus	Innovativeness	-	No
Hypothesis 15	Prevention focus	Risk-taking	-	Yes
Hypothesis 16	Prevention focus	Proactiveness	-	Yes

Chapter 6 Discussions and Conclusions

This study aimed to enhance our understanding of how CEO regulatory focus and firms' entrepreneurial orientation (i.e., innovativeness, risk-taking, and proactiveness) impacts SMEs. To understand the organisational outcomes of SMEs, the regulatory focus of CEOs is an important factor to consider. This is because regulatory focus impacts people's decision making (Higgins 1997, 1998). As firms' top decision makers, CEOs' decisions, induced by regulatory focus, should have an impact on firms they lead. While studies have suggested that the regulatory focus of CEOs or entrepreneurs is associated with the performance of small firms (Hmieleski and Baron, 2008; Wallace et al., 2010), how their links differ between firms operating in different industry environments (i.e., high-tech versus low-tech industries) remained unclear. Additionally, although empirical evidence has shown that CEO regulatory focus impacts the behaviours of large firms (Gamache et al., 2015; Greenbaum, 2015; Chen et al., 2017), little is known about the influences of regulatory focus on the entrepreneurial behaviours of SMEs. Therefore, the current study examined the performance effects of CEO regulatory focus on SMEs that operate in different industry environments as well as how CEO regulatory focus shapes the entrepreneurial behaviours of SMEs.

This study also examined EO because it has been found that EO has profound impacts on firm performance (Rauch et al., 2009). Although a number of studies have revealed that the individual dimensions of EO are associated with firm performance (Hughes and Morgan, 2007; Kreiser et al., 2013), the nature of their links remain unclear because the empirical evidence has been mixed. Additionally, while researchers have suggested that EO is more beneficial for firms in high-tech industries (Rauch et al., 2009), it is less clear whether the three dimensions of EO will share similar effects when they are examined independently. Hence, the current study examined the performance effects of the three dimensions of EO on SMEs that operate in different industry environments.

6.1 Discussions and contributions

6.1.1 Regulatory focus and firm performance

The first research question was about how CEO regulatory focus impacts the performance of SMEs and how the effects vary between SMEs in high-tech industries and those in low-tech industries (Hypotheses 1 to 4). This study found that CEO regulatory focus is associated with the performance of SMEs. In particular, the empirical results indicate that CEO promotion focus positively (Hypothesis 1) and CEO prevention focus negatively (Hypothesis 2) impact SME performance. These results are in line with the findings of Wallace et al., (2010), who showed that CEO promotion focus is positively, and CEO prevention focus negatively associated with small firm performance.

Additionally, the results demonstrate that the performance effect of CEO promotion focus differs between SMEs operating in different industry environments. Specifically, the performance effect of CEO promotion focus is stronger for SMEs in high-tech industries than those in low-tech industries (Hypothesis 3). CEOs with high levels of promotion focus should induce their firms to embrace changes and seek new opportunities (Lieberman et al., 1999; Chernev, 2004; Fuglestad et al., 2008), implying that such firms have higher levels of flexibility. Because the high-tech industries are associated with high rates and magnitudes of changes (Wang et al., 2015; Fainshmidt et al., 2016), the flexibility induced by promotion focus is thus more beneficial for firms that operate in the high-tech industries. The results from the present study are consistent with previous empirical evidence from Hmieleski and Baron (2008), who showed that within a dynamic environment, promotion focus has positive effects on new venture performance, whereas in a stable environment, promotion focus has no significant effects on new venture performance.

However, the performance effects of CEO prevention focus do not differ between SMEs in high-tech and those in low-tech industries (Hypothesis 4). CEOs with high levels of prevention focus should orient their firms to maintain status quo (Lieberman et al., 1999; Chernev, 2004; Fuglestad et al., 2008), which may lead

to rigidity and hinder firm performance. Indeed, researchers have highlighted that “being rigid toward change (prevention focus) significantly reduces performance” (Hmieleski and Baron 2008, p. 295). Because the high-tech industries are more dynamic than the low-tech ones, the suggestion is that being rigid to change might be more harmful to firms that operate in the high-tech industries. As such, I suspected that the effects of CEO prevention focus would be stronger for firms in high-tech industries than those in low-tech ones. The non-findings might be partly because people can have varying combinations of promotion and prevention focus (Lanaj et al., 2012; Markovits, 2012; Kammerlander et al., 2015), implying that the effect of prevention focus might be attenuated by respective CEOs’ levels of promotion focus.

While results from the full sample suggested an overall positive impact of CEO promotion focus and overall negative impact of CEO prevention focus on SME performance, the supplement sub-group analysis (i.e., separating firms in high-tech and those in low-tech industries into two groups) revealed a slightly different picture. In particular, the results suggest that for SMEs in high-tech industries, high levels of CEO promotion focus positively impact firm performance. This is consistent with the prediction offered in the current study. While the relationship between CEO prevention focus and SME performance is not significant in the sub-group analysis, the negative sign of the coefficient is also consistent with the hypothesis, which suggests that high levels of CEO prevention focus should negatively impact firm performance.

On the other hand, for SMEs in low-tech industries, the negative sign of the coefficient between CEO promotion focus and firm performance is quite surprising because it implies that high levels of CEO promotion focus may have detrimental effects on SMEs, although their relationship is not significant. The negative performance effect of CEO promotion focus is in contrast to prior research findings suggesting that CEO promotion focus positively impacts small firm performance (Wallace et al., 2010). Moreover, although the CEO prevention focus - SME performance is not significant, the negative sign of the coefficient is in line with the hypothesis, which suggests a negative effect of CEO prevention

focus on SME performance. Taken together, the results from the sub-group analysis have two important implications. Firstly, the performance effect of CEO promotion focus differs between firms that operate in different industry environments. Secondly, increasing levels of promotion focus might not generate universally positive effects on organisations, as suggested by prior studies (e.g., Wallace et al., 2010). As such, further research is still needed to probe the performance effects of CEO regulatory focus on organisations.

This study also assessed how CEOs with varying combinations of promotion focus and prevention focus impact firm performance (see the post-hoc test). Following previous studies (Markovits, 2012; Kammerlander et al., 2015), CEOs were categorised into four groups: high promotion and high prevention focus (rationalists), high promotion and low prevention focus (achievers), low promotion and high prevention focus (conservatives), and low promotion and low prevention focus (indifferents). The results from the post-hoc test revealed that firms that are led by CEOs with high levels of both promotion and prevention focus achieved the best performance (rationalists group: 3.65). This is followed by the group with low levels of both promotion and prevention focus (indifferents group: 3.63), and then the group with high promotion and low prevention (achievers group: 3.48). Firms that are led by CEOs with low promotion focus and high prevention focus achieved the lowest performance (conservatives group: 3.34). Since the rationalists group achieved better performance than the remaining three groups, such results implicitly suggest that both promotion and prevention focus might be necessary for the success of organisations. This is because high promotion focus might induce firms to explore new opportunities, whereas high prevention focus might orient firms to conduct the due diligence that can enhance their chance of success in exploiting identified opportunities (Brockner et al., 2004).

Together, the above results generated from this study have several important contributions to research on regulatory focus theory. Firstly, in contrast to previous research suggesting that high levels of promotion focus have universally positive impact on firm performance (Wallace et al., 2010), the current study

reveals that the positive performance effect of promotion focus is contingent on the industry environment in which firms operate. Specifically, the results from sub-group analysis demonstrate that the positive effects of promotion focus might hold true only for SMEs in high-tech industries. As such, this study extends previous works by showing that, in addition to environmental dynamism (Hmieleski and Baron, 2008; Wallace et al., 2010), the industry environment (e.g., high-tech versus low-tech industries) in which firms operate also interacted with promotion focus in affecting SME performance. For example, firms in high-tech industries might achieve better performance when they are aligned with CEOs with high levels of promotion focus.

Secondly, in contrast to previous held views that high levels of prevention focus only have negative impacts on firm performance (Hmieleski and Baron, 2008; Wallace et al., 2010), the results from post-hoc tests suggest that the negative effects of prevention focus might only occur when the respective CEOs' levels of promotion focus are low. In other words, high levels of prevention focus might be beneficial for organisations when it is accompanied by high levels of promotion focus. This also implies that to realise the positive potential of high promotion focus, it is paramount that the respective CEOs' prevention focus is high. The current study represents one of the first works to provide empirical evidence supporting the suggestion that "both promotion and prevention foci are necessary for entrepreneurial success" (Brockner et al., 2004, p. 204).

Thirdly, through examining how SME performance differs between firms that are led by CEOs with varying combinations of promotion and prevention, the current study addressed the call from Lanaj et al., (2012) to consider the potential interplay between promotion and prevention focus. Indeed, the results from the current study demonstrated that examining the performance effects of promotion and prevention focus separately might not reveal their real impacts on SMEs. For example, the regression results suggested that promotion focus positively and prevention focus negatively influences firm performance. Nevertheless, the post-hoc test uncovered that firms that are led by CEOs with high levels of promotion and prevention focus achieved the best performance.

Accordingly, future studies that examine the effects of regulatory focus are encouraged to consider how promotion and prevention focus interplay in affecting firm outcomes rather than examining them separately.

6.1.2 Entrepreneurial orientation and firm performance

The second research question was about how SMEs' levels of innovativeness, risk-taking, and proactiveness affect firm performance and how the effects differ between SMEs in high-tech industries and those in low-tech ones (Hypotheses 5 to 10). A number of empirical studies have shown an inverted U-shaped relationship between the unidimensional EO and firm performance (Tang et al., 2008; Su et al., 2011; Wales et al., 2013c), suggesting that moderate levels of EO will lead to better performance. Because the unidimensional EO represents the shared variance among innovativeness, risk-taking, and proactiveness, I thus suspected that when the three dimensions of EO are examined separately, they may share a similar inverted U-shaped relationship with SME performance. The results of this study, however, demonstrate that each EO dimension has unique effects on SME performance.

As predicted (Hypothesis 5), the empirical results indicate that there is an inverted U-shaped relationship between innovativeness and firm performance. That is, that up to a certain point increasing levels of innovativeness can enhance firm performance, but that beyond that point further increases in innovativeness are associated with diminishing returns. This result suggests that SMEs are more likely to obtain better performance when their innovativeness is at moderate levels than at either high or low levels. In contrast to the hypothesised inverted U-shaped relationship between risk-taking and firm performance (Hypothesis 6), the findings revealed a U-shaped relationship. It appears that when shifting from low to moderate levels of risk-taking, firm performance decreases slightly; and that it starts to increase again when shifting from moderate to high levels of risk-taking. Additionally, the empirical results displayed a positive linear relationship between proactiveness and firm performance rather than the proposed inverted U-shaped relationship (Hypothesis 7). Together, the results indicate that the three dimensions of EO have non-uniform relationships with firm performance.

Without assessing innovativeness, risk-taking, and proactiveness independently, their unique effects are unlikely to be uncovered.

While the proposed inverted U-shaped relationship between risk-taking and firm performance is not supported in this study, similar non-findings have been observed in prior research. Specifically, Kreiser et al., (2013) proposed an inverted U-shaped relationship between risk-taking and SMEs' perceived sales growth. However, their results revealed that risk-taking exhibited a negative U-shaped relationship with the perceived sales growth. As Kreiser et al., (2013, p. 287) pointed out, "risk-taking behaviors frequently do not represent a worthwhile endeavour for smaller firms; rather, SMEs exhibiting very low levels of risk-taking may be able to enjoy high levels of performance". Likewise, while the proposed inverted U-shaped relationship between proactiveness and SME performance is not supported, the linear result is consistent with those found in Hughes and Morgan (2007), who showed that within young High-tech firms, proactiveness displayed a positive linear relationship with firm performance. I proposed an inverted U-shaped relationship between proactiveness and SME performance because although being highly proactive allows firms to capitalise on new product opportunities, potential costs are associated with such efforts. The positive linear relationship identified in this study implies that the potential benefits and advantages that might be generated through being proactive should outweigh the potential costs involved.

Furthermore, the empirical results demonstrated that the performance effects of innovativeness, risk-taking, and proactiveness differ between SMEs in high-tech industries and those in low-tech industries. This finding is consistent with Lumpkin and Dess's (1996, p. 140) assertion that the importance of EO dimensions "may vary independently in a given context". In particular, this study found that, as expected, innovativeness has stronger performance effects on SMEs in low-tech than those in high-tech industries (Hypothesis 8). Prior research has shown that the levels of EO are higher in small firms in high-tech industries than those in low-tech ones (Covin et al., 1990), implicitly suggesting that innovativeness, one dimension of EO, should also be higher for firms in

high-tech industries. As such, innovativeness is less of a differentiator for SMEs in high-tech industries (Linton and Kask, 2017) because such firms are already associated with high levels of innovativeness. In other words, SMEs in high-tech industries are less likely to reap significant benefits from increasing levels of innovativeness. By contrast, the opposite is true for firms in low-tech industries, which is often associated with low level of innovativeness. Accordingly, increasing levels of innovativeness will have more pronounced performance effects on such high-tech firms.

While industry environment does not moderate the risk-taking and SME performance relationship in the full sample (Hypothesis 9), the results from subgroup analysis revealed that, as predicted, risk-taking has stronger performance effects for firms within high-tech industries than those in low-tech industries. Hence, further study is still required to examine whether the performance effects of risk-taking vary between firms in different industry environments. Furthermore, the results suggest that proactiveness has stronger performance effects on SMEs in high-tech industries than those in low-tech ones (Hypothesis 10). Since the high-tech industries are associated with high rates of market and technological changes (Moriarty and Kosnik, 1989; Qian and Li, 2003; Szymanski et al., 2007), firms' existing products should become obsolete more quickly in such industries. The opposite is true for firms in low-tech industries, which are more stable. Accordingly, being highly proactive is more important for SMEs in high-tech industries than those in low-tech ones. As a result, increasing levels of proactiveness have more pronounced effects for SMEs in high-tech than those in low-tech industries.

Together, the empirical findings generated from this study above have three important contributions to EO research. Firstly, this study extends prior work by demonstrating that innovativeness (inverted U-shaped), risk-taking (U-shaped), and proactiveness (positive linear) have unique performance effects on SMEs. As such, the empirical results demonstrate a non-uniform relationship between the dimensions of EO and SME performance. These findings are in contrast with those found in prior studies which suggest a uniform linear relationship between

EO dimensions and firm performance (Swierczek and Ha, 2003; Hughes and Morgan, 2007) or a uniform curvilinear relationship between them (Kreiser et al., 2013).

Secondly, this study uncovers that the performance effects of innovativeness, risk-taking, and proactiveness differ between SMEs in high-tech and those in low-tech industries. While researchers have suggested that EO “pays off more” in high-tech than nonhigh-tech industries (Rauch et al., 2009), this study provides empirical evidence showing that this might not hold true when innovativeness, risk-taking, and proactiveness are examined independently. Specifically, this study revealed that innovativeness has stronger performance effects for SMEs in low-tech industries. By contrast, proactiveness has stronger performance effects for SMEs in high-tech industries. The results from subgroup analysis also provide some support that the performance effects of risk-taking are more salient for SMEs in high-tech industries, although significant findings were not observed in the full sample. By examining the moderating effect of industry environment on the relationships between EO dimensions and SME performance, this study addresses the call by Rauch et al. (2009) to investigate how the performance effects of EO are contingent on the industry environment in which firms operate.

Thirdly, this study contributes to EO research by demonstrating that the performance implications of EO vary significantly depending on whether EO is conceptualised as a unidimensional or a multidimensional construct. This study examined EO as a multidimensional construct and found that each dimension of EO has unique effects on SME performance. Also, the significance of each dimension is dependent on the industry environment in which firms operate. Results from the post-hoc analyses revealed that the unidimensional EO is positively related to SME performance. Also, it is more beneficial for SMEs in high-tech industries. Accordingly, without examining innovativeness, risk-taking, and proactiveness independently, insights about their unique performance effects and how they differ between firms in different industry environments cannot be uncovered. As Dai et al., (2014) noted, when the

individual dimensions of EO are combined, their independent influences are likely to be distorted or concealed.

6.1.3 Regulatory focus and entrepreneurial orientation

The final research question was about how CEO regulatory focus affects SMEs' levels of innovativeness, risk-taking, and proactiveness. This study found that CEO regulatory focus has substantial effects on the three dimensions of EO. The empirical results are largely in line with the upper echelons theory, which suggests that CEO characteristics significantly influence the outcomes of organisations (Hambrick, 2007; Hambrick and Mason, 1984). Such findings are not surprising given that CEOs are the primary decision makers within their organisations, and that CEOs' decisions induced by regulatory focus should have an impact on organisations they lead (Finkelstein et al., 2009). For example, CEOs' decisions and motivations might manifest themselves through the entrepreneurial activities undertaken by the firms they lead.

This study revealed that CEO promotion focus positively impacts firms' levels of innovativeness (Hypothesis 11) and proactiveness (Hypothesis 13). The findings are largely in line with the regulatory focus theory that suggests that promotion focused people are more willing to consider alternatives and initiate changes (Brockner et al., 2004; Liberman et al., 1999), which tend to be the prerequisite for firms to innovate and be proactive (Musteen et al., 2010). These findings extend previous studies that have shown that promotion focus is positively associated with the innovativeness of opportunities identified by entrepreneurs (Tumasjan and Braun, 2012). In particular, the results uncover that high levels of CEO promotion focus induce firms to support new ideas and experimentation that are the essence of innovation. Additionally, the findings go beyond prior research by demonstrating that for firms that are led by CEOs with high levels of promotion focus, in addition to introducing more new products (Greenbaum, 2015), such firms also have higher tendencies to introduce products ahead of the competition as indicated by higher levels of proactiveness.

Contrary to expectations, CEO promotion focus did not significantly impact firms' levels of risk-taking (Hypothesis 12). This is surprising given that prior studies have shown that promotion focused people are more risk tolerant in their financial investment decisions under experimental settings (Florack and Hartmann, 2007); and that firms that are led by CEOs with high levels of promotion focus engage in more exploration activities that involve higher risks (Kammerlander et al., 2015). One potential explanation for the non-finding might be due to the resource constraints faced by SMEs. Specifically, risk-taking requires firms to venture into the unknown and commit significant resources to initiatives with uncertain outcomes (Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003; Rauch et al., 2009).

Indeed, researchers have highlighted that firms that have high levels of excess resources can afford to engage in projects that involve more risk as the slack resources can buffer potential failure in their risk-taking efforts (Wiseman and Bromiley, 1996). Rosenbusch et al., (2013, p. 649) concur that "firms are more likely to take risks if they possess the resources to absorb potential losses". Empirical evidence has shown that firms' level of excess resources is positively associated with firms' risk-taking (Singh, 1986). Among SMEs, however, it is likely that few of them will have excess resources because they tend to be resource short. Prior research has highlighted that "resource constraints often lead to SMEs to be more risk-averse and less willing to invest in new technologies than larger firms" (OECD, 2017, p. 8). As a result, although SMEs that are led by CEOs with high levels of promotion focus are more risk tolerant, it is possible that resource constraints can hinder their capabilities to commit resources to risk-taking. In other words, the lack of resources might attenuate the effect of CEO promotion focus on SMEs' levels of risk-taking.

This study also revealed that CEO prevention focus negatively impacts firms' levels of risk-taking (Hypothesis 15) and proactiveness (Hypothesis 16). The empirical findings are consistent with regulatory focus theory that suggests that a prevention focus is associated with risk-aversion and a tendency to retain stability (Lieberman et al., 1999; Florack and Hartmann, 2007; Hamstra et al.,

2011), because the underlying need for prevention focused people is to ensure safety (Higgins, 1997, 1998). The findings demonstrate that firms that are led by CEOs with high levels of prevention focus are less likely to engage in risk-taking. As such, the results extend those by Kammerlander et al., (2015), who has shown that CEO prevention focus negatively influences exploration activities which imply risk-taking, because the exploration process entails uncertain outcomes (March, 1991). Moreover, the results complement prior studies that have found that CEO prevention focus negatively influences firms' numbers of new product introduction (Greenbaum, 2015). In particular, the findings show that high levels of CEOs' prevention focus induce firms to be less proactive in introducing new products ahead of the competition. Taken together, the findings are not surprising given that committing resources to risky initiatives and acting in anticipation of future market demands all entail significant uncertainties, as such efforts may fail to yield positive outcomes that, in turn, threaten prevention focused people's needs for safety.

The non-significance of the hypothesised relationship between CEO prevention focus and firms' levels of innovativeness (Hypothesis 14) is also interesting. I proposed that CEO prevention focus would negatively impact firms' levels of innovativeness based on the consideration that prevention focused people prefer maintaining status quo (Brockner et al., 2004; Liberman et al., 1999). This is likely to hinder innovation because innovation requires change and experimenting with new alternatives (Rosenbusch et al., 2011). While this study did not find a significant effect on innovativeness, the negative sign in the regression result is consistent with the hypothesis. The non-finding might be explained as follows. Researchers have highlighted that in the situation of experiencing loss, prevention focused people might deviate from their preferred practice to regain adequate status (Scholer et al., 2010; Collins, 2016). Following the same line, it is also possible that changes in the market environment (e.g., threats from competitors) might trigger prevention focused CEOs to deviate from their preferred stability and facilitate innovation. For example, in response to competitors' new market offerings, firms that are led by CEOs with high levels of prevention focus might shift their focus from maintaining status quo to

supporting innovation related activities to remain competitive in the marketplace.

This study also examined how CEOs with different combinations of promotion and prevention focus impact firms' entrepreneurial activities (see the post-hoc tests). In line with the assumptions, this study found that among CEOs with strong promotion focus, firms that are led by achievers (low prevention focus) exhibit higher levels of innovativeness, risk-taking, and proactiveness than firms led by rationalists (high prevention focus). This might be because the rationalists tend to face the dilemma of balancing their activities to ensure that both advancement and safety needs are satisfied. To illustrate, CEOs with high levels of promotion focus should induce firms to pursue entrepreneurial activities as the potential gains can help to satisfy their needs for advancement. At the same time, the accompanying high levels of prevention focus should orient their firms to be cautious in their entrepreneurial activities to ensure that CEOs' needs for safety are not endangered (Brockner et al., 2004). As a result, the vigilant tendency associated with high levels of prevention focus might safeguard firms from pursuing excessive entrepreneurial activities induced by high levels of promotion focus. This explains why firms that are led by rationalists pursue lower levels of entrepreneurial activities than firms led by achievers.

Together, the above findings offer important contributions to research on regulatory focus and EO. Firstly, this study extends research on regulatory focus theory by showing that, in addition to influencing SMEs' exploration and exploitation activities (Kammerlander et al., 2015), CEO regulatory focus also impacts SMEs' entrepreneurial behaviours. This extension is important because while studies have shown that CEO regulatory focus impacts the behaviours of large firms (Gamache et al., 2015; Greenbaum, 2015), limited attention has been devoted to the SME context. This study reveals that CEO regulatory focus shapes SMEs' levels of innovativeness, risk-taking, and proactiveness. As such, it provides empirical evidence demonstrating the significance of regulatory focus for understanding the entrepreneurial behaviours of SMEs. Hence, this study

answers calls for more research to explore how CEO regulatory focus impacts different types of firm strategic behaviours (Gamache et al., 2015).

Secondly, this study contributes to research on EO by uncovering the links between CEO regulatory focus and the three dimensions of EO. Researchers have noted that “the EO phenomenon and linkages that exist between this phenomenon and its antecedents and consequences are often poorly explained using ‘off-the-shelf’ theories” (Covin and Lumpkin, 2011, p. 859). Additionally, Rauch et al., (2009, p. 779) assert that “it may be more appropriate to study antecedences and consequences of EO at the level of the dimensions of EO”. By drawing insights from regulatory focus theory and examining the impact of CEO regulatory focus on firms’ levels of innovativeness, risk-taking, and proactiveness, this study addresses calls to better understand how CEO factors influence EO (Mousa and Wales, 2012; Pittino et al., 2017). Because the different entrepreneurial behaviours are associated with firm performance (Rauch et al., 2009; Gupta and Wales, 2017), it is imperative to understand the potential antecedents that might shape firms’ entrepreneurial behaviours. Nevertheless, further study is still needed to understand the link between promotion focus and firms’ levels of risk-taking as well as the link between prevention focus and firms’ levels of innovativeness.

Additionally, this study contributes to research in entrepreneurship by showing that the effects of CEO regulatory focus and the dimensions of EO are context dependent. That is, their performance effects are dependent on the industry context in which firms operate. For example, firms that operate in high-tech industries tend to face different types of challenges than firms that operate in the low-tech industries, implying that firms operating in different industry contexts should have distinct needs. As a result, the significance of CEO regulatory focus and the dimensions of EO should vary between firms that operate in different industry contexts. Prior studies have highlighted the importance of contexts (e.g., including business, social, spatial, and institutional context) for our understanding of entrepreneurship phenomenon (Welter, 2011; McKeever et al., 2015).

As Welter (2011, p. 165) noted, the contexts “provide individuals with opportunities and set boundaries for their actions. Context can be an asset and a liability for the nature and extent of entrepreneurship, but entrepreneurship can also impact contexts”. This study provides empirical evidence demonstrating that both the performance effects of CEO regulatory focus and EO dimensions are contingent on the industry context (i.e., high-tech industries versus low-tech industries) in which firms operate. The results indicate that the nature and/or magnitude of the performance effects of CEO regulatory focus and EO dimensions differ significantly between firms operating in high-tech industries and those in low-tech one.

Finally, by assessing the performance effects of CEO regulatory focus and the EO dimensions, as well as the potential links between them, this study also offers contributions to the entrepreneurship literature. While CEO regulatory focus and the three dimensions of EO represent constructs at different levels, both of them might result in variance in SME performance. The results indicated that innovativeness, risk-taking, and proactiveness together account for 14% of the variance in SME performance, whereas promotion and prevention focus account for 6% of the variance in similar outcomes. As such, this study provides empirical evidence showing that firm-level entrepreneurial behaviours in terms of innovativeness, risk-taking, and proactiveness are more robust predictors in explaining the variance in SME performance than individual-level CEO characteristic in terms of promotion and prevention focus.

The lower explanatory power associated with regulatory focus might be because individual characteristics often influence organisational outcomes through influencing people’s interpretations of the situations they face (Hambrick, 2007; Hambrick and Mason, 1984). For example, through influencing people’s decision making, regulatory focus can thus impact activities at firm-level. As such, the performance effects of regulatory focus are realised through other underlying mechanisms that are induced by regulatory focus. The empirical results also revealed that CEO regulatory focus is related to the three EO dimensions. Hence, this study provides empirical evidence showing how individual difference in CEO

characteristics might be useful in explaining the variance in firms' levels of entrepreneurial behaviours.

6.2 Managerial implications

The findings from this study have several practical implications for the top managers of SMEs. Firstly, this study reveals that the positive performance effects of promotion focus are context dependent (e.g., whether firms are in high-tech or low-tech industries). To improve firm-level outcomes, it is imperative for firms to align CEO promotion focus with the situations firms face. For example, high-levels of promotion focus positively influence the performance of SMEs in high-tech industries, but might have negative impacts on the performance of SMEs in low-tech industries. As such, promotion focus is beneficial only when it fits with the industry environment firms operate within (i.e., high promotion focus in high-tech industries). The finding echoes Hmieleski and Baron's (2008, p. 285) suggestion that "a promotion focus will be the most effective self-regulatory mode for entrepreneurs leading their firms within dynamic industry environments, which are characterized by uncertainty". Also, it is important for executives to recognise that promotion focus might have detrimental effects on organisations when it misfits with the industry environment (i.e., having overly high promotion focus in low-tech industries).

Secondly, this study uncovers the fact that firms that are led by CEOs with high levels of both promotion and prevention focus achieved the best performance, suggesting the importance of balancing promotion and prevention focus. Because people's regulatory focus is relatively stable (Higgins et al., 2001; Hmieleski and Baron, 2008), it might be unrealistic to ask people to alter such characteristics. However, promotion focused CEOs might intentionally involve prevention focused people in decision making processes to provide a balance for their tendencies to explore and engage in new opportunities that might be risky. As Brockner et al., (2004) highlighted, prevention focus might serve as "due diligence" in the entrepreneurial process. Similarly, prevention focused CEOs might surround themselves with promotion focused people to provide a balance for their tendencies to maintain a status quo that might undermine a firm's chances to capitalise on new opportunities. For example, the results indicated that firms that are led by prevention focused CEOs exhibited lower levels of

proactiveness. Involving promotion focused people in the decision making process might help to counter such issue because promotion focus is positively associated with firms' levels of proactiveness.

Thirdly, the results suggest that it is not necessary or beneficial for SMEs to exhibit high levels in all three dimensions of EO to achieve better performance. For example, the results suggest that up to a certain point, increasing levels of innovativeness will generate benefits for SMEs but beyond the point, further increases will likely have detrimental effects on SME performance. It appears that SMEs that are moderate in innovativeness will register better performance. By contrast, the results suggest that SMEs with moderate levels of risk-taking will experience low levels of performance. As Kreiser et al., (2013) pointed out, low levels of risk-taking are more desirable for SMEs to achieve better performance. Furthermore, the results suggest that proactiveness has predominated positive effects on SME performance, suggesting that being proactive to introduce products ahead of the competition might provide firms with competitive advantages and contribute to better performance.

Finally, the significance of innovativeness and proactiveness differ between SMEs in high-tech and those in low-tech industries. To enhance firm performance, SMEs are suggested to manage their levels of entrepreneurial activities to fit the industry environment in which they are operating. For example, innovativeness has stronger effects for SMEs operating in low-tech industries, suggesting that such firms can reap more benefits from increasing levels of innovativeness. However, when the levels of innovativeness are high, the potential detrimental effects will also be stronger for them. On the other hand, proactiveness has a stronger effect on SMEs operating in high-tech areas. As such, firms that operate in high-tech industries, which are often associated with high rates and magnitudes of changes, are encouraged to be proactive in seeking and undertaking new product opportunities. Results from sub-group analysis also provide some evidence showing that risk-taking has a higher impact on SMEs in high-tech industries. However, this link remains inconclusive as significant results were not observed in the full sample.

6.3 Limitations and directions for future research

This study comes along with limitations which present opportunities for future research. This study examined the impacts of CEO regulatory focus on SMEs. The results found here might not hold true in large firms because they are often managed by management teams (Finkelstein et al., 2009). For example, firms' decisions to engage in entrepreneurial activities might be influenced by other people within the top management team rather than by CEOs alone. Accordingly, it is unclear whether CEO regulatory focus will have a similar influence on the innovativeness, risk-taking, and proactiveness of large firms. Future investigations targeting large firms could examine the influence of top management teams rather than focusing on a single CEO. For example, a recent study has shown that the regulatory focus of CEOs and CFOs can interact and influence firms' growth-oriented initiatives (Chen et al., 2017). In the same vein, it would be interesting to examine how the composition of top management teams that consist of both promotion and prevention focused people might influence firms' strategic behaviours.

Since this study uses cross-sectional data, the relationships identified do not necessarily establish causality. In other words, the potential issue of reverse causality cannot be ruled out. For example, one may argue that it is the good performance that drives the three dimensions of EO rather than the opposite. That is, good firm performance might provide resources for firms to be proactive and to undertake innovative and risky initiatives. As such, future research exploring the consequences of the three dimensions of EO are encouraged to adopt a longitudinal design to better gauge the implications of the three dimensions of EO on firm performance. While the subjective performance data reported from CEOs might be prone to reporting bias, it is unlikely to undermine the results from this study because prior research has shown that subjective performance is highly correlated with the objective measure (Dess and Robinson, 1984). As Gupta and Wales (2017, p. 59) pointed out, "the majority of EO-performance findings are based on subjective measurement relative to competitors" (Gupta and Wales, 2017, p. 59).

Additionally, this study employed the Regulatory Focus Questionnaire (RFQ) scale to measure CEO regulatory focus. Similar to previous empirical work (e.g., Kammerlander et al., 2015), I found low internal reliability on the measure of promotion focus. In particular, two out of the six items (i.e., Items 1 and 11) were removed to achieve satisfactory construct reliability. While the Cronbach's Alpha value of 0.64 is acceptable, it is still lower than the recommended value of 0.7 (Hair et al., 2014). This issue might merit further examination. Researchers are encouraged to further assess and enhance the original RFQ scale to develop higher levels of reliability from it.

Finally, while research in regulatory focus theory suggests that promotion focus is associated with a risk-taking tendency, this study did not find a significant impact of CEO promotion focus on firms' levels of risk-taking. Similarly, although prevention focus is known to be associated with a tendency to maintain status quo, the proposed negative effects of CEO prevention focus on firms' level of innovativeness was not supported. These non-findings raise an important question about whether the effects of CEOs' characteristics on firm-level outcomes are dependent on other organisational or environmental factors. For example, it is possible that the absence of slack resources might hinder firms' risk-taking, suggesting that the risk-taking tendencies associated with promotion focus might not be materialised. Similarly, changes in the market environment or threats from competitors might trigger prevention focused people to deviate from their preferred status quo and support innovative effects. Accordingly, further studies are required to investigate the potential boundary conditions in which CEOs characteristics can shape firms' strategic behaviours.

6.4 Conclusion

To conclude, this study demonstrates that while regulatory focus and EO refer to different natures of phenomenon and represent constructs at different levels (i.e., individual-level motivational characteristic versus firm-level entrepreneurial behaviour), both factors have profound impacts on SMEs. In particular, this study found that CEO regulatory focus is related to the performance of SMEs. Additionally, CEO regulatory focus has a substantial influence on SMEs' levels of innovativeness, risk-taking, and proactiveness. As such, this study provides empirical evidence demonstrating the importance of regulatory focus in understanding the organisational outcomes of SMEs. Furthermore, this study reveals that each dimension of EO has unique performance effects on SMEs and that their effects, except risk-taking, vary between SMEs in high-tech industries and those in low-tech industries. Since the EO dimensions do not generate universally positive impacts, and since their salience depends on the industry environment in which firms operate, to enhance firm-level outcomes, it is paramount for SMEs to match their entrepreneurial behaviours with the industry environment they operate within. Together, this study found that individual differences in regulatory focus and firms' entrepreneurial behaviours are useful predictors in explaining the variance of organisational outcomes. Researchers are encouraged to explore the effects of regulatory focus and EO on other strategic behaviours or outcomes of SMEs.

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Appendix 1: Sample response from pilot testing

From: *** [name removed for anonymity]

Sent: 26 March 2015 10:52

To: Huang, Shuangfa

Subject: RE: Survey

Hi,

I have completed the survey.

The design of the survey appears fine. I have one or two comments.

In the heading I suggest you consider using the word Organisation or Company rather than Firm. This is a personal preference and I think you should ask other people.

In Section 1 Question 6, I like the separation of High Tech and Knowledge. This difference is often missed.

In section 2 Question 3, you ask about working harder. What about working cleverer? Are they the same thing? I believe they are different.

I looked up the book "Thinking, Fast and Slow". It looks interesting and I will get a copy. Thanks for the suggestion.

Best regards,

*** [name removed for anonymity]

Appendix 2: Questionnaire design

A SURVEY ASSESSING THE IMPACT OF CEO ON THE PRODUCT INNOVATION OF SMES

Guidelines to the questionnaire:

1. The term product refers to both goods and services.
2. Questions can be answered by simply ticking a number or providing a simple one word answer.
3. Questions are grouped in eight sections and can be completed in 15 minutes.
4. When you arrive at the final 'thank you' page, you will know that your responses have been recorded on our database.

SECTION 1: COMPANY BACKGROUND & RESPONDENT PROFILE

1. When was this business founded?

2. What is your industry?

Manufacturing

Service

Others

3. Number of employees?

1- 10

11-50

51-250

More than 250

4. Sales revenue?

Less than £1.5 million

Less than £7.5 million

Less than £37.5 million

More than £37.5 million

5. Percentage change in sales revenues in the past 3 years?
(fill one)

Growth _____%

OR Decrease _____%

6. Your primary product is:

(Please tick one number on each row)

High Tech 1 2 3 4 5 Low Tech

Customised 1 2 3 4 5 Standardised

High knowledge intensive 1 2 3 4 5 Low knowledge intensive

7. What is your current age:

8. What is your gender:

Male

Female

9. Level of education:

Postgraduate degree

Degree or higher degree

A level

GCSE

Other

No formal qualifications

10. What is your main role in the business?

Chairman

Managing Director

Executive Director

Non-executive Director

Owner-Manager

Partner

Other (Please specify)

11. Number of years with this company?

12. Number of years working in current industry?

SECTION 2: YOUR ATTITUDE TOWARD EXPLORATION & LEARNING

This set of questions asks you about specific events in your life. Please indicate your answer to each question by ticking the appropriate number below it.

1. Compared to most people, are you typically unable to get what you want out of life?	7. Do you often do well at different things that you try?
1 2 3 4 5 never sometimes very or seldom often	1 2 3 4 5 never sometimes very or seldom often
2. Growing up, would you ever "cross the line" by doing things that your parents would not tolerate?	8. Not being careful enough has gotten you into trouble at times.
1 2 3 4 5 never sometimes very or seldom often	1 2 3 4 5 never sometimes very or seldom often
3. How often have you accomplished things that got you "psyched" to work even harder?	9. When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do.
1 2 3 4 5 never sometimes very or seldom often	1 2 3 4 5 never sometimes very true true often true
4. Did you get on your parents' nerves often when you were growing up?	10. I feel like I have made progress toward being successful in my life.
1 2 3 4 5 never sometimes very or seldom often	1 2 3 4 5 certainly certainly false true
5. How often did you obey rules and regulations that were established by your parents?	11. I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them.
1 2 3 4 5 never sometimes very or seldom often	1 2 3 4 5 certainly certainly false true
6. Growing up, did you ever act in ways that your parents thought were objectionable?	
1 2 3 4 5 never sometimes very or seldom often	

SECTION 3: STRATEGIC PREFERENCE OF YOUR FIRM

To what extent do you agree with the following statements in relation to your firm's strategic preference?	Strongly disagree		← →	Strongly agree	
We favour a strong emphasis on R&D, technological leadership, and innovations	1	2	3	4	5
My firm has many new lines of products marketed in the past 3 years	1	2	3	4	5
Changes in our product lines have usually been quite dramatic	1	2	3	4	5
We have a strong propensity for high-risk projects (with chances of very high returns)	1	2	3	4	5
We believe, owing to the nature of the environment, that bold, wide-ranging acts are necessary to achieve the firm's objectives	1	2	3	4	5
When there is uncertainty, we typically adopt a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities	1	2	3	4	5
We initiate actions to which competitors then respond	1	2	3	4	5
We are very often the first business to introduce new products, administrative techniques, operating technologies, etc.	1	2	3	4	5
We typically adopt a very competitive, "undo-the-competitors" posture	1	2	3	4	5

SECTION 4: BUSINESS ENVIRONMENT

To what extent do you agree with the following statements in relation to your business environment ?	Strongly disagree ← → Strongly agree				
	1	2	3	4	5
The technology in our industry is changing rapidly	1	2	3	4	5
Technological changes provide big opportunities in our industry	1	2	3	4	5
A large number of new product ideas have been made possible through technological breakthroughs in our industry	1	2	3	4	5
Customers' product preferences change quite a bit over time	1	2	3	4	5
Our customers tend to look for new products all the time	1	2	3	4	5
We are witnessing demand for our products from customers who never bought them before	1	2	3	4	5

SECTION 5: FIRM PERFORMANCE

To what extent do you agree that in comparison with your major competitors over the past three years:	Strongly disagree ← → Strongly agree				
	1	2	3	4	5
Your company has higher profitability	1	2	3	4	5
Your company has higher market share	1	2	3	4	5
Your company has higher return on investments	1	2	3	4	5
Your company has higher sales growth	1	2	3	4	5

Appendix 3: Letter of invitation

Dear xxx (name of respondent),

You are invited to participate in a study from **Lancaster University**. The study aims to assess the impact of individual and firm learning on SMEs' innovation. The findings can help to inform you the influence of different learning behaviours on your organisation.

We recognise the value of your time and shall update you with an **Executive Report** on the findings of the study. Information you provide will remain confidential and individual firms will not be identified in any of the study findings. Questions can be completed in **15 minutes**.

Please follow **this link** to complete the survey.

Thank you for your participation.

Best Regards,

Shuangfa Huang

Institute for Entrepreneurship and Enterprise Development

Lancaster University Management School

Lancaster University

Lancaster, UK

LA1 4YX

Appendix 4: Descriptive statistics

Variable	Number of cases	Minimum	Maximum	Mean	Std. Deviation
CEO age	110	25.0	73.0	50.67	10.49
CEO tenure	110	1.0	42.0	14.41	9.57
Firm age	110	1.0	193.0	30.400	32.1051

Variable	Group	Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	90	81.8	81.8	81.8
	Female	20	18.2	18.2	100.0
	Total	110	100.0	100.0	
Firm size	1-10	22	20.0	20.0	20.0
	11-50	36	32.7	32.7	52.7
	51-250	52	47.3	47.3	100.0
	Total	110	100.0	100.0	
Industry	Manufacturing	31	28.2	28.2	28.2
	Service	53	48.2	48.2	76.4
	Others	26	23.6	23.6	100.0
	Total	110	100.0	100.0	

Appendix 5: Results from normality test

Construct	N	Skewness			Kurtosis		
	Statistic	Statistic	Std. Error	z-value (recommended value: +/-1.96)	Statistic	Std. Error	z-value (recommended value: +/-1.96)
Innovativeness	110	-.107	.230	-.462	-.486	.457	-1.064
Risk-taking	110	-.053	.230	-.231	-.772	.457	-1.689
Proactiveness	110	-.069	.230	-.301	-.314	.457	-.688
Firm performance	110	-.477	.230	-2.069	.223	.457	.488
Promotion focus	110	-.052	.230	-.227	-.260	.457	-.569
Prevention focus	110	-.144	.230	-.624	-.422	.457	-.923
CEO age	110	-.412	.230	-1.786	-.103	.457	-.225
CEO tenure (square root transformation)	110	-.216	.230	-.939	-.699	.457	-1.528
Firm age(logarithmic transformation)	110	-.433	.230	-1.880	.711	.457	1.556
Valid N (listwise)	110						

Appendix 6: Results from principal component analysis

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.939	36.735	36.735	2.939	36.735	36.735	2.769	34.616	34.616
2	1.821	22.767	59.503	1.821	22.767	59.503	1.991	24.887	59.503
3	.826	10.323	69.825						
4	.605	7.564	77.390						
5	.567	7.087	84.477						
6	.531	6.634	91.111						
7	.384	4.804	95.915						
8	.327	4.085	100.000						

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component	
	1	2
PRO3	.010	.730
PRO7	.344	.664
PRO9	.484	.510
PRO10	.477	.554
PRE2	.755	-.409
PRE4	.820	-.226
PRE5	.697	-.104
PRE6	.793	-.227

Extraction Method: Principal Component Analysis. 2 components extracted.

Rotated Component Matrix^a

	Component	
	1	2
PRO3	-.275	.676
PRO7	.058	.746
PRO9	.247	.658
PRO10	.223	.696
PRE2	.855	-.082
PRE4	.843	.111
PRE5	.683	.176
PRE6	.819	.100

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

Appendix 7: Results from non-response bias test

Group Statistics		N	Mean	Std. Deviation	Std. Error Mean
CEO Age	Early	56	50.018	9.977	1.333
	Late	54	51.352	11.053	1.504
Tenure	Early	56	13.027	9.465	1.265
	Late	54	15.852	9.547	1.299
Firm age	Early	56	30.375	31.682	4.234
	Late	54	30.426	32.836	4.468

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CEO Age	Equal variances assumed	2.530	.115	-0.665	108	.507	-1.334	2.006	-5.311	2.643
	Equal variances not assumed			-0.664	105.968	.508	-1.334	2.010	-5.319	2.651
Tenure	Equal variances assumed	.005	.945	-1.558	108	.122	-2.825	1.813	-6.419	.768
	Equal variances not assumed			-1.558	107.779	.122	-2.825	1.813	-6.419	.769
Firm age	Equal variances assumed	.008	.927	-0.008	108	.993	-0.051	6.152	-	12.142
	Equal variances not assumed			-0.008	107.436	.993	-0.051	6.156	12.244	-

Appendix 8: Results from common method bias test

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.339	25.423	25.423	5.339	25.423	25.423	2.913	13.872	13.872
2	3.042	14.484	39.907	3.042	14.484	39.907	2.808	13.373	27.245
3	2.326	11.078	50.984	2.326	11.078	50.984	2.585	12.310	39.555
4	1.513	7.206	58.190	1.513	7.206	58.190	2.300	10.953	50.509
5	1.362	6.486	64.676	1.362	6.486	64.676	2.074	9.877	60.385
6	1.117	5.319	69.996	1.117	5.319	69.996	2.018	9.610	69.996
7	.950	4.524	74.520						
8	.703	3.346	77.865						
9	.632	3.010	80.875						
10	.605	2.882	83.757						
11	.499	2.376	86.133						
12	.454	2.163	88.297						
13	.425	2.024	90.320						
14	.401	1.910	92.230						
15	.319	1.517	93.747						
16	.281	1.340	95.087						
17	.270	1.287	96.374						
18	.249	1.185	97.558						
19	.203	.968	98.526						
20	.163	.777	99.302						
21	.146	.698	100.000						

Extraction Method: Principal Component Analysis.

Appendix 9: Results from reliability and validity test

<i>Constructs and items</i>	<i>Factor loading</i>	<i>Cronbach's alpha</i>	<i>Average variance extracted (AVE)</i>
Promotion focus		0.644	0.483
How often have you accomplished things that got you "psyched" to work even harder?	0.676		
Do you often do well at different things that you try?	0.746		
When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do.	0.658		
I feel like I have made progress toward being successful in my life.	0.696		
Prevention focus		0.829	0.580
Growing up, would you ever "cross the line" by doing things that your parents would not tolerate?	0.855		
Did you get on your parents' nerves often when you were growing up?	0.843		
How often did you obey rules and regulations that were established by your parents?	0.683		
Growing up, did you ever act in ways that your parents thought were objectionable?	0.819		

Entrepreneurial Orientation

EO – Innovativeness

We favour a strong emphasis on R&D, technological leadership, and innovations.	0.738	0.770	0.598
My firm has many new lines of products marketed in the past 3 years.	0.811		
Changes in our product lines have usually been quite dramatic.	0.770		

EO – Proactiveness

We initiate actions to which competitors then respond	0.781	0.790	0.619
We are very often the first business to introduce new products, administrative techniques, operating technologies, etc.	0.820		
We typically adopt a very competitive, "undo-the-competitors" posture	0.758		

EO – Risk taking

We have a strong propensity for high-risk projects (with chances of very high returns)	0.807	0.840	0.672
We believe, owing to the nature of the environment, that bold, wide-ranging acts are necessary to achieve the firm's objectives	0.805		
When there is uncertainty, we typically adopt a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities	0.846		

Firm performance (in comparison with your major competitors over the past three years):

Your company has higher profitability	0.841	0.768	0.598
Your company has higher market share	0.622		
Your company has higher return on investments	0.850		
Your company has higher sales growth	0.759		
