

# A two-level, longitudinal investigation into the effects of employee social entrepreneurship orientation and top management team decisions on product innovation

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# Technological Forecasting & Social Change

## A two-level, longitudinal investigation into the effects of employee social entrepreneurship orientation and top management team decisions on product innovation

--Manuscript Draft--

<b>Manuscript Number:</b>	TFS-D-21-02585R2
<b>Article Type:</b>	Research Paper
<b>Keywords:</b>	Employee social entrepreneurship orientation; Top management team; Decision creativity; Decision speed; Product innovation
<b>Corresponding Author:</b>	Eric Shiu University of Birmingham Birmingham, UNITED KINGDOM
<b>First Author:</b>	Colin C.J. Cheng, PhD
<b>Order of Authors:</b>	Colin C.J. Cheng, PhD Eric Shiu
<b>Abstract:</b>	<p>While social entrepreneurship orientation (SEO) is a relatively new field of study, thanks to SEO researchers' efforts we have learned how SEO influences firm performance, notably innovation performance. However, there is still a clear lack of empirical work on how social entrepreneurial employees within an organization and specific decision characteristics of top management they work under may influence innovation performance. This study aims to contribute to the above issues by adopting a meso-to-micro approach to investigating how top management team (TMT) decision creativity and speed influence the effects of employee social entrepreneurship orientation (eSEO) on firms' product innovation performance. To reveal the dynamics of eSEO over-time, we adopted a longitudinal research design for collecting data, over a two-year period of time, from 2,567 employees, one TMT member, and one NPD manager from each of the 206 social enterprises, with a secondary proxy dataset to triangulate the primary data. Our results show that high TMT decision creativity helps social enterprises leverage eSEO to enhance product innovation performance, while high TMT decision speed fails to produce the same effect. When high TMT decision creativity is coupled with low TMT decision speed, the contribution of eSEO to product innovation is at its largest.</p>
<b>Response to Reviewers:</b>	We have responded to each comment in our latest revision. We have included two files each of which is a response to comments of each of the two reviewers in our submission.

**Manuscript Number: TFS-D-21-02585.R2**

**A two-level, longitudinal investigation into the effects of employee social entrepreneurship orientation and top management team decisions on product innovation**

Dear Editor,

Thank you for the “minor revision” decision letter sent on 19 April. We have finished this minor revision and are ready to submit this latest version of our manuscript.

We have found this submission journey which involved two rounds of review and revision very constructive and this certainly has enriched our research experience. We are grateful to Professor Matthias Fink and the two anonymous reviewers for their time to assist us in this journey to improve our paper to the extent that we hope it can match the high quality of your Journal.

Yours sincerely,

Eric Shiu (corresponding author)

26 April 2022

Manuscript ID: FS-D-21-02585.R2

A two-level, longitudinal investigation into the effects of employee social entrepreneurship orientation and top management team decisions on product innovation

**Reviewer #1**

I appreciate your revisions and detailed answers in response to my comments. Your paper's research gap, research question, definitions and analytical levels have become much clearer.
--

**Response:**

We really appreciate your taking the time to review the manuscript, and thank you for your encouragement.

Manuscript ID: FS-D-21-02585.R2

A two-level, longitudinal investigation into the effects of employee social entrepreneurship orientation and top management team decisions on product innovation

## Reviewer #2

Thank you to the authors for the opportunity to revise this new version of the manuscript and for all the work they have put in the revision. I liked the previous version, but think this is better. Only have seen a few minor typos to correct:

### **Response:**

We really appreciate your taking the time to review the manuscript and provide valuable comments, which have improved the manuscript. We have followed your suggestions to revise the manuscript as follows.

Comment #1.

Abstract: please define NPD the first time you use it.

### **Response:**

We are sorry for overlooking this and thank you for the reminder. We have written the full name “new product development” at the Abstract section. In addition, we have also checked to ensure we have provided the full name of abbreviations on the first use throughout the revision, such as “new product development (NPD)” on page 11.

Comment #2.

P.7 of your manuscript (section 2.3), middle paragraph, second sentence: rather than "...because SEO is strategic posture at...", you may consider "...because SEO represents the strategic posture at..."

Section 3 (your p.10), second paragraph. First sentence: rather than "...we expect each dimension of eSEO to likely to be positively associated with...", you may consider "...we expect each dimension of eSEO to be positively associated with..."

(your) p.17, 10th line: rather than "...we used a meso-to-micro level approach to collect two levels' data...", you may consider "we used a meso-to-micro level approach to collect two-level data..."

### **Response:**

In the revision, we have followed your suggestions to revise these sentences.

Comment #3.

Apart from that, there is considerable repetition in the first two paragraphs of section 4.1. Please re-write both and/or merge them into one single paragraph.

### **Response:**

We thank you for the comment. We have followed your suggestion to re-write and merge the first two paragraphs of Section 4.1 into one single paragraph, as follows.

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“Social enterprises by their nature need to be innovative in order to be able to generate innovative solutions to social problems (Del Giudice et al., 2019; Doherty et al., 2014). In this regard, we follow Defourny and Nyssen’s (2017) four major social enterprise models and place the firms in our study in the social business model. More specifically, this study dealt with a subset of social enterprises that are labelled as social businesses by Defourny and Nyssens (2017). This particular social enterprise relies on all sorts of strategies and tactics commonly espoused by normal for-profit enterprises for meeting their dual purposes. It needs not only to fulfill its social purpose, as often carved in stone in their mission statement, but also to meet its economic purpose so as to survive, grow, and earn enough income to support its social purpose (Defourny and Nyssens, 2010). Both purposes are important but the social one should be more central because primacy of social mission is what is needed for them to be rightfully called social enterprises. We claim that our surveyed firms entirely meet this requirement because one of the key criteria in our choice of eligible firms is that more than 50% of their sales have to come from provision of products and services for fulfilling social needs, indicating their “primacy of social mission” (Nicholls, 2006).”

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- TMT with high decision creativity can leverage eSEO to further enhance product innovation performance.
- TMT with high decision speed fails to leverage eSEO to further enhance product innovation performance.
- TMT with high decision creativity and low decision speed can leverage eSEO to optimize product innovation performance.

# **A two-level, longitudinal investigation into the effects of employee social entrepreneurship orientation and top management team decisions on product innovation**

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Figures

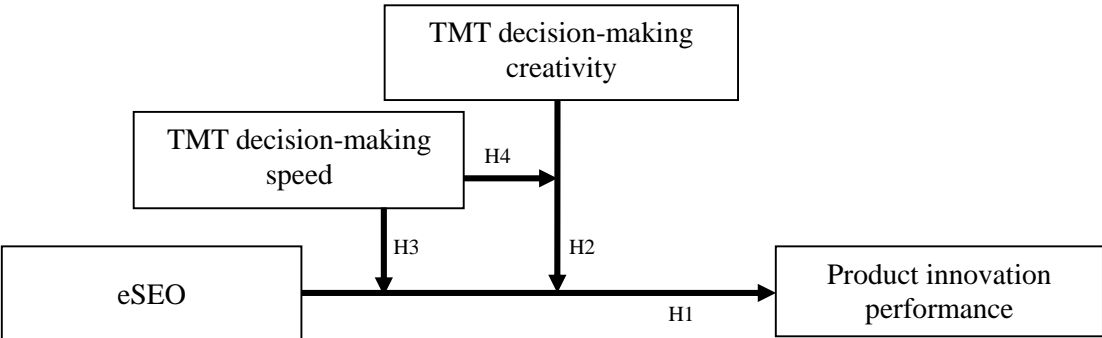
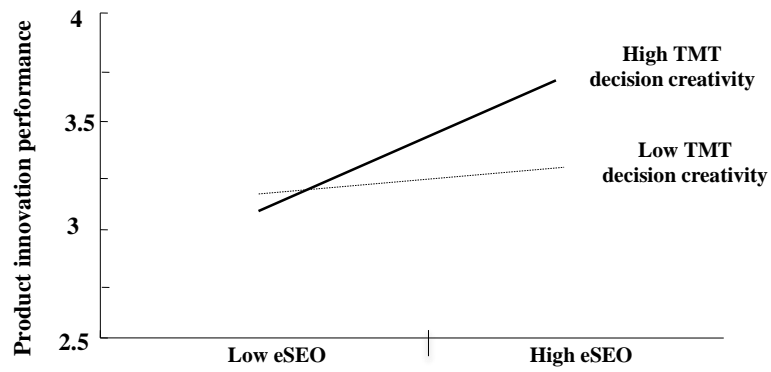
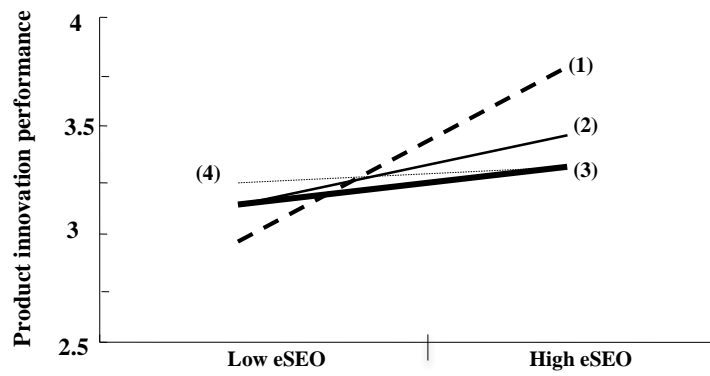


Fig. 1 Research model

**Note:** eSEO: employee social entrepreneurship orientation; TMT: top management team



**A(H2):** Interaction between eSEO and TMT decision creativity



- (1) High TMT decision creativity/Low TMT decision speed
- (2) High TMT decision creativity/High TMT decision speed
- (3) Low TMT decision creativity/High TMT decision speed
- (4) Low TMT decision creativity/Low TMT decision speed

**B(H4):** Interaction among eSEO, TMT decision creativity, and TMT decision speed

**Fig. 2.** Plotted Interactions for Product Innovation Performance.

Note: eSEO: employee social entrepreneurship orientation; TMT: top management team

## Tables

**Table 1**

Measures and items.

	Factor loading
<b>Employee social entrepreneurship orientation</b> (New scale; $\alpha = .92$ , CR = .94, AVE = .64)	
As the employee of this firm, please indicate the extent to which you agree or disagree with the following statements:	
I prefer to try my new ways of increasing social impact.	.75
I prefer to try my new ways of marketing our products.	.81
I prefer to try my new ways of working with external beneficiaries.	.84
I prefer to try my new ways of fundraising.	.79
I usually engage in forecasting to avoid surprises.	.77
I like to consider it important to be ready for future unexpected events.	.82
I tend to engage in financial plan to prepare for the future.	.80
I tend to actively monitor external forces affecting my firm.	.78
I usually engage in managing risks associated with my department's projects.	.76
I tend to undertake my department's projects with considering associated costs and benefits.	.83
I tend to use a cautious approach to making resource commitments.	.81
On high social impact department's projects, I tend to take steps so potential losses are affordable.	.80
In designing new products, I tend to see the value in cross-department coordination.	.72
I believe in undertaking pilot department's projects before fully implementing new programs.	.79
My firm philosophy guides everything I do in my department.	.83
I usually ask myself: How is this social activity achieving the purpose of my firm?	.86
Whatever surplus funds I generate are usually re-invested toward fulfillment of my firm's social mission.	.75
I usually seek to balance mission and financial viability in my firm.	.79
I prefer to seek sustainable sources of income to remain viable.	.77
<b>TMT decision creativity</b> (Menon et al., 1999; $\alpha = .84$ , CR = .82, AVE = .60)	
Top management team decisions create significant changes in procedure.	.77
Top management team develops new approaches that are different from prevailing industry practices.	.82
Top management team comes up with radical new ideas.	.73
<b>TMT decision speed</b> (Baum and Wally, 2003; $\alpha = .85$ , CR = .84, AVE = .64)	
Key questions are resolved quickly by top management team.	.79
There is time wasted in making decisions by top management team.	.86
Issues are identified rapidly by top management team.	.74
<b>Product innovation performance</b> (De Luca and Atuahene-Gima, 2007; $\alpha = .90$ , CR = .91, AVE = .68)	
Please rate the extent to which your firm has achieved the following product innovation performance objectives in the last two years,	
Market share in relation to the firm's stated objectives;	.81
Return on assets relative to stated objectives;	.80
Return on investments related to stated objectives;	.84
Profitability relative to stated objectives;	.79
Sales in relation to stated objectives.	.87
<b>Risk propensity</b> (Colquitt et al., 2006; $\alpha = .89$ ; CR = .91, AVE = .62)	
I enjoy being reckless.	.81
I take risks.	.85
I seek danger.	.72
I seek adventure.	.79
I would never go hang-gliding or bungee jumping.	.76
I would never make a high risk investment.	.78
<b>Self-enhancement motive</b> (Yun et al., 2007; $\alpha = .86$ ; CR = .89, AVE = .57)	
I intend to change my behaviors to make a good impression on others.	.79
I try to modify my behaviors to give good images to others.	.78
It is important to me to make a good impression on others.	.73
I like to present myself to others as being a friendly and polite person.	.71
I am sensitive to the impression others have about me.	.77
I try to create the impression with others that I am a good person.	.74
<b>Prior innovation performance</b> (Gao et al., 2015; $\alpha = .81$ ; CR = .82, AVE = .69)	
Relative to competitors, turnover of new products has a higher portion of contribution in our total sales.	.80
Relative to competitors, our firm introduces technologically new or technologically improved products to the market at a more rapid pace.	.86

<b>Technological turbulence</b> (Zhou and Wu, 2010; $\alpha = .90$ ; CR = .91, AVE = .71)	
The technology in this industry is changing rapidly.	.82
Technological changes provide substantial opportunities in this industry.	.85
A large number of new product ideas have been made possible through technological breakthroughs in this industry.	.84
It is very difficult to forecast where the technology in this area will be in the next few years.	.87
$\alpha$ : Cronbach's alpha; CR: composite reliability; AVE: average variance extracted	

**Table 2**

Basic descriptive statistics and correlation matrix.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. eSEO	<b>.80</b>											
2. TMT decision creativity	.06	<b>.77</b>										
3. TMT decision speed	.02	-.07	<b>.80</b>									
4. Product innovation performance	.25*	.30**	.02	<b>.82</b>								
5. Employee gender (1=female)	.02	.07	.04	.09	--							
6. Employee age	.06	.10	.09	.08	.04	--						
7. Risk propensity	.29*	.03	.02	.21*	-.11	-.08	<b>.79</b>					
8. Self-enhancement motive	.04	.09	.10	.07	.08	-.06	.08	<b>.75</b>				
9. Social enterprise age	-.03	-.07	-.02	.11	-.10	0.07	.09	.08	--			
10. Social enterprise size	.05	.01	-.06	.04	.02	.12	.07	.05	.21*	--		
11. Prior innovation performance	.07	.23*	.24*	.32**	.04	-.05	.27*	.09	-.11	-.09	<b>.83</b>	
12. Technological turbulence	.28*	.25*	.31**	-.20*	.04	.03	.23*	.09	-.11	-.10	.09	<b>.84</b>
Mean	5.12	5.23	5.08	4.95	0.41	35.05	3.89	4.09	10.8	352	5.21	5.19
Standard deviation	1.36	1.29	1.13	1.08	0.50	8.12	0.84	0.78	2.32	47	1.17	1.12

\*\*  $p < 0.01$ ; \*  $p < 0.05$ ; N = 206; Bold figures on the diagonal are the square root of the AVE; eSEO: employee social entrepreneurship orientation

**Table 3**  
Regression model.

	Model 1	Model 2	Model 3	Model 4
Constant	4.89(0.24)	4.68(0.22)	4.64(0.21)	4.67(0.21)
Employee gender	-0.11(0.08)	-0.10(0.07)	-0.10(0.07)	-0.09(0.07)
Employee age	0.12(0.14)	0.12(0.14)	0.12(0.14)	0.13(0.14)
Employee education degree (High school and below)	-0.01(0.12)	-0.03(0.10)	-0.03(0.10)	-0.04(0.10)
Employee education degree (Bachelor)	-0.02(0.13)	-0.02(0.14)	-0.02(0.14)	-0.01(0.14)
Employee education degree (Master)	-0.07(0.11)	-0.07(0.12)	-0.07(0.12)	-0.06(0.12)
Employee education degree (PhD)	-0.05(0.15)	-0.04(0.16)	-0.04(0.16)	-0.04(0.15)
Risk propensity	0.19*(0.11)	0.18*(0.11)	0.17*(0.11)	0.17*(0.10)
Self-enhancement motive	0.14(0.12)	0.13(0.12)	0.13(0.12)	0.13(0.12)
Social enterprise age	0.04(0.10)	0.07(0.08)	0.07(0.08)	0.07(0.08)
Social enterprise size	-0.01(0.12)	0.03(0.10)	0.03(0.10)	0.02(0.10)
Prior innovation performance	0.22**(0.08)	0.23**(0.08)	0.23**(0.08)	0.24**(0.08)
Technological turbulence	-0.18*(0.03)	-0.19*(0.03)	-0.19*(0.03)	-0.19*(0.03)
Industry (Chemicals)	0.02(0.20)	0.05(0.16)	0.06(0.17)	0.04(0.17)
Industry (Energy)	0.01(0.16)	0.05(0.14)	0.07(0.14)	0.07(0.14)
Industry (Health)	0.03(0.16)	0.05(0.14)	0.05(0.14)	0.03(0.14)
Industry (Agriculture)	-0.10(0.32)	-0.08(0.36)	-0.07(0.37)	-0.06(0.37)
Industry (Information technology)	0.02(0.20)	0.04(0.17)	0.04(0.17)	0.01(0.17)
Industry (Others)	0.02(0.22)	0.01(0.20)	0.01(0.19)	0.01(0.19)
Employee social entrepreneurship orientation (eSEO)		0.31*** (0.04)	0.33*** (0.04)	0.36*** (0.04)
TMT decision creativity		0.21** (0.03)	0.22** (0.03)	0.26** (0.03)
TMT decision speed		-0.09(0.02)	-0.10(0.02)	-0.10(0.01)
eSEO × TMT decision creativity			0.28** (0.04)	0.31*** (0.04)
eSEO × TMT decision speed			-0.14(0.02)	-0.13(0.02)
eSEO × TMT decision creativity × TMT decision speed				-0.24** (0.03)
Adjusted R <sup>2</sup>	0.08	0.22	0.32	0.43
R <sup>2</sup> change		0.14**	0.10**	0.11**

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ; N = 206; Standard errors are reported in the parentheses.

**Table 4**  
Regression model (secondary proxy data).

	Model 1	Model 2	Model 3	Model 4
Constant	4.91(0.20)	4.82(0.21)	4.86(0.20)	4.87(0.20)
Employee gender	-0.12(0.06)	-0.11(0.05)	-0.11(0.07)	-0.11(0.07)
Employee age	0.10(0.12)	0.11(0.12)	0.11(0.12)	0.11(0.13)
Employee education degree (High school and below)	-0.03(0.09)	-0.05(0.10)	-0.05(0.09)	-0.04(0.09)
Employee education degree (Bachelor)	-0.04(0.12)	-0.04(0.12)	-0.04(0.12)	-0.03(0.13)
Employee education degree (Master)	-0.06(0.10)	-0.06(0.09)	-0.07(0.09)	-0.06(0.09)
Employee education degree (PhD)	-0.07(0.13)	-0.05(0.13)	-0.05(0.12)	-0.06(0.13)
Risk propensity	0.20*(0.10)	0.21*(0.10)	0.21*(0.10)	0.20*(0.09)
Self-enhancement motive	0.12(0.12)	0.11(0.13)	0.11(0.13)	0.11(0.13)
Social enterprise age	0.05(0.10)	0.07(0.09)	0.07(0.09)	0.06(0.11)
Social enterprise size	-0.03(0.11)	0.04(0.08)	0.04(0.08)	0.05(0.09)
Prior innovation performance	0.24**(0.08)	0.25**(0.06)	0.26**(0.06)	0.26**(0.05)
Technological turbulence	-0.19*(0.04)	-0.20*(0.05)	-0.21*(0.05)	-0.21*(0.05)
Industry (Chemicals)	0.04(0.12)	0.06(0.14)	0.07(0.15)	0.07(0.15)
Industry (Energy)	0.03(0.14)	0.04(0.12)	0.06(0.12)	0.05(0.12)
Industry (Health)	0.02(0.13)	0.03(0.14)	0.04(0.14)	0.03(0.14)
Industry (Agriculture)	-0.09(0.21)	-0.08(0.22)	-0.08(0.22)	-0.07(0.23)
Industry (Information technology)	0.03(0.18)	0.05(0.17)	0.05(0.17)	0.04(0.17)
Industry (Others)	0.04(0.14)	0.03(0.15)	0.03(0.15)	0.03(0.15)
Employee social entrepreneurship orientation (eSEO)		0.32***(0.03)	0.35***(0.03)	0.37***(0.03)
TMT decision creativity		0.23**(0.02)	0.24**(0.03)	0.27**(0.02)
TMT decision speed		-0.10(0.01)	-0.12(0.02)	-0.12(0.01)
eSEO × TMT decision creativity			0.29**(0.03)	0.33***(0.03)
eSEO × TMT decision speed			-0.15(0.02)	-0.14(0.03)
eSEO × TMT decision creativity × TMT decision speed				-0.27**(0.04)
Adjusted R <sup>2</sup>	0.10	0.23	0.34	0.44
R <sup>2</sup> change		0.13**	0.11**	0.10**

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ; N = 206; Standard deviations are reported in the parentheses.

## **Author biography**

Colin C.J. Cheng is affiliated with National Taipei University, Taiwan. His main research area is in innovation. In recent years a lot of his innovation research is linked to sustainability and social justice. He has published widely in highly ranked journals such as Journal of Product Innovation Management, Journal of Business Ethics, Journal of Cleaner Production, and Technovation, to name just a few.

Eric C. Shiu is affiliated with University of Birmingham, United Kingdom. His research is mainly in the innovation field though his publications also extend to the marketing and management fields. He has published widely in respectable journals such as Journal of Business Research, Transportation Research, Psychology and Marketing, and International Small Business Journal, among others.



We declare that this paper has been all started and completed by the authors. This paper has not been submitted to or presented in any other papers or conferences. The authors would like to thank the editor and the two anonymous reviewers for their very constructive comments.

# **A two-level, longitudinal investigation into the effects of employee social entrepreneurship orientation and top management team decisions on product innovation**

## **ABSTRACT**

While social entrepreneurship orientation (SEO) is a relatively new field of study, thanks to SEO researchers' efforts we have learned how SEO influences firm performance, notably innovation performance. However, there is still a clear lack of empirical work on how social entrepreneurial employees within an organization and specific decision characteristics of top management they work under may influence innovation performance. This study aims to contribute to the above issues by adopting a meso-to-micro approach to investigating how top management team (TMT) decision creativity and speed influence the effects of employee social entrepreneurship orientation (eSEO) on firms' product innovation performance. To reveal the dynamics of eSEO over-time, we adopted a longitudinal research design to collect data from 2,567 employees, one TMT member, and one new product development manager from each of the 206 social enterprises, with a secondary proxy dataset to triangulate the primary data. Our results show that high TMT decision creativity helps social enterprises leverage eSEO to enhance product innovation performance, while high TMT decision speed fails to produce the same effect. When high TMT decision creativity is coupled with low TMT decision speed, the contribution of eSEO to product innovation is at its largest.

*Keywords:* Employee social entrepreneurship orientation; Top management team; Decision creativity; Decision speed; Product innovation

# 1. Introduction

While the emergence of social entrepreneurship research has enriched literature from the last decade, many scholars have argued that organizations with a strong social entrepreneurship spirit can tackle social problems through entrepreneurial actions (Gupta et al., 2020; Rawhouser et al., 2019; Hockerts, 2017). However, so far, the inclusion of entrepreneurship orientation (EO) in the study of social entrepreneurship has received scant attention (e.g., Gupta et al., 2020; Dwivedi and Weerawardena, 2018; Kraus et al., 2017). This new field of research is referred to as social entrepreneurship orientation (SEO).

Based on previous studies (Gali et al., 2020; Kraus et al., 2017; Madison et al., 2014; Steven and Jarillo; 1990), which regard EO as a strategic posture, this study defines SEO, an extended construct of EO, as a strategic posture taken at a meso-level<sup>1</sup> or a firm-level that corresponds with the firm's social entrepreneurship orientation. While research on SEO is still in a nascent stage (Gupta et al., 2020; Saebi et al., 2019), more recent studies have generated valuable insights into the topic of SEO scale development (e.g., Dwivedi and Weerawardena, 2018; Kraus et al., 2017) and its impact on firm performance (e.g., Gali et al., 2020; Halberstadt et al., 2020). However, a particular concern is that those studies examine SEO only as a meso-level construct and neglect that fact that SEO can also manifest at a micro-level of analysis (e.g., Covin et al., 2020; Forcadell and Úbeda, 2020; Gawke et al., 2019; Santos et al., 2020; Wales et al., 2020). In fact, several studies in strategy research have found that a strategic orientation can be represented as a micro-level phenomenon which, in turn, is linked to innovation performance. The specific fields of strategy research where a strategic orientation at a micro-level and its impact on innovation performance have been proven include service

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<sup>1</sup> In this study, meso-level refers to the firm level, while micro-level refers to the individual employee level. Although employees can include anyone apart from the owner of the firm, employees in this study are referred to as individual employees without management responsibilities and so top management team members and other senior and middle management staff are excluded from our definition of employees for this study. We contacted top management team members for questions related to TMT decision making, individual employees for questions related to the different dimensions of eSEO, and innovation managers for questions related to product innovation performance. We did not contact other types of staff, such as other middle management staff.

orientation (Popli and Rizvi, 2015), environmental orientation (Spanjol et al., 2015), customer orientation (Gazzoli et al., 2013), and EO (Kollmann et al., 2017; Gupta et al., 2016; Ferreira et al., 2015).

The lack of micro-level data in previous studies on SEO is a serious limitation, since the contributions of employees are critical for the generation of superior organizational performance, notably product innovation (Rawhouser et al., 2019; Soda et al., 2019). As such, we follow the notion of Wales et al. (2020), Covin et al. (2020), and Gawke et al. (2019) that SEO should be conceptualized not only at the meso-level but also across to the micro-level of an organization. Accordingly, the micro-level view of SEO (termed eSEO) is needed to understand its effects on innovation performance.

In this study, we define eSEO as a strategic posture taken at a micro-level or an individual non-management employee level that collectively corresponds with their social entrepreneurship orientation based on the original conceptualization of SEO by Dwivedi and Weerawardena (2018), Kraus et al. (2017), and George and Marino (2011), as well as those of researchers who focus on individual EO (e.g., Covin et al., 2020; Santos et al., 2020; Kraus et al., 2019; Gawke et al., 2019; Mustafa et al., 2016). Although individual employees without management responsibilities do not make strategy in name, their collective posture on the six dimensions of SEO can affect firm performance such as product innovation performance in this study and therefore we still use the term “strategic posture” for what they posturized. These six dimensions are innovativeness, proactivity, risk-taking, social mission, sustainability, and effectual behaviors. We then use this definition and conceptualization as a start to properly develop dimensions and scale items for eSEO construct so that we can use these items in our empirical investigation.

Most studies find that social entrepreneurship-related activities often enhance firm performance with innovation as an important driver of this performance and, crucially, they

also highlight the important role of boundary conditions (Saebi et al., 2019; Zahra and Wright, 2016), such as social capital (Estrin et al., 2013), firm structure (Terjesen et al., 2016), and firm culture (Bacq and Eddleston, 2018). It is surprising that so little attention has been given to top management team (TMT) decision-making process that directs the activities of the firm (Raes et al., 2013). Previous researchers suggest that the TMT decision-making process strongly influences employees' engagement in firm activities (Vandekerckhof et al., 2018; Shepherd and Rudd, 2014; Kownatzki et al., 2013), but unfortunately they did not elaborate further as to how cognitive information reflecting the decisions made at a meso-level reaches employees and influences their social entrepreneurship behaviors. Accordingly, by addressing the two important gaps above in the social entrepreneurship and strategy-making literature, this study focuses on the following research question: How does the TMT decision-making process influence the effects of eSEO on firms' product innovation performance?

Drawing on the resource-based view (RBV) and contagion theory, this study aims to open the way to a more fruitful discussion on the role of eSEO in product innovation under the influence of the TMT decision-making process. This is because RBV (Barney, 2001; Meyskens et al., 2010) and contagion theory (Su et al., 2020; Balogun and Johnson, 2004; Waldman and Yammarino, 1999) are the two theories collectively explaining why a strategic orientation at the micro-level and the TMT decision-making process can contribute to innovation performance. Figure 1 presents the research model.

Based mainly on the empirical evidence obtained from a longitudinal study on 206 social enterprises, which is checked by a designated secondary proxy dataset and explained by RBV and contagion theory, this study makes two main contributions. First, this study pioneers an empirical examination of the relationships between eSEO and product innovation performance, thereby contributing to the social entrepreneurship literature by providing a deeper understanding of the mechanism by which eSEO is linked to innovation (Gupta et al., 2020;

Saebi et al., 2019). Second, this study extends the strategy-making literature (Bromiley and Rau, 2016; Shepherd and Rudd, 2014) to social entrepreneurship research by investigating the role of the TMT decision-making process and its potentially varying impacts on the relationship between eSEO and product innovation performance.

---Insert Figure 1 about here---

## **2. Theoretical foundations**

### *2.1. Resource-based view*

This study relies on two theories to support its theoretical build-up. The first theory is RBV. According to RBV (Barney, 2001), strategic orientations such as EO and SEO are important resources that can produce positive outcomes for the firm (Meyskens et al., 2010).

Not only are these strategic orientations an important resource, they are essentially non-imitative. Scholars such as Kollmann et al. (2017), Gupta et al. (2016), Wales (2016), Ferreira et al. (2015), and Covin and Slevin (1989) all explicitly or implicitly claimed that EO, as one of the most popularly studied strategic orientations recently, is rooted within the culture and practice of the organization that other competing firms cannot copy directly. The claims are tantamount to approving the non-imitative status of EO and other strategic orientations and rightly so (Wales, 2016; Wiklund and Shepherd, 2011; Covin and Slevin, 1989). As Barney (2001) succinctly noted, these strategic orientations are non-imitable simply because they are ingrained in the host firm's culture. This non-imitable nature contributes to the effects these strategic orientations produce being longer lasting. Overall, eSEO, as a strategic orientation at the micro-level, can be treated as a key non-imitable resource contributing to positive outcomes for the firm.

### *2.2. Contagion theory*

The second theory applied in this study is contagion theory (Su et al., 2020; Balogun and Johnson, 2004; Waldman and Yammarino, 1999) which explains how SEO and TMT decision-making process at the meso-level are transmitted throughout the whole firm, down to the micro-level. SEO, TMT decision-making process and the like are information in the broadest sense. This information, metaphorically described as a stone thrown into a pond, can be cognitive (Cannon-Bowers, 2001) or emotional (Barsade, 2002). Scholars (e.g., Barsade, 2002; Cannon-Bowers, 2001; Moreland et al., 1996) in this field often used “contagion theory” instead of “leadership ripple effect”, often coined by practitioners to describe information from a group (e.g., TMT) being spread to every corner of the firm, which is essentially the ripple effect exhibited in a pond. We therefore treat a leadership ripple effect as the same in substance as contagion theory.

Apart from the aforesaid scholars such as Su et al. (2020), Balogun and Johnson (2004) and Waldman and Yammarino (1999) who espoused contagion theory, there are other scholars such as Bromile and Rau (2016), Patterson et al. (2004), and Carr et al. (2003) who did not explicitly take this “contagion” view, but instead focused on employees feeling and reacting to organisational climate which is partially shaped by SEO as the firm’s strategic posture (Stevenson and Jarillo, 1990) or behavioural tendency at a strategic level (Dwivedi and Weerawardena, 2018). In our view, these two camps are essentially talking up the same phenomenon, with the first focusing on the SEO as the start of the contagion process and the second focusing on the latter part of the process, when the organisational climate has been filled with SEO information.

The key independent variable of this study is eSEO, which conceptually stems from SEO and the contagion theory, and is applied to explain how SEO information originated at the meso-level is spread through and across employees at the micro-level of an organization.

### 2.3. *eSEO*

More recent studies (e.g., Santos et al., 2020; Kraus et al., 2019; Mustafa et al., 2016; Ferreira et al., 2015) acknowledge that the success of a firm's entrepreneurial endeavors cannot be separated from the firm's employees. Specifically, these employees, collectively, can contribute significantly to the firm's "capacity to transform entrepreneurial opportunities into new growth trajectories" (Santos et al., 2020). They can significantly help with the effectiveness of the firm's explorative activities, as they can drive innovation and generate opportunities for the firm they serve (Kraus et al., 2019). This is because EO cannot work if its functioning is limited to the meso-level (Kraus et al., 2019). It also has to permeate through the micro-level to be effective (Santos et al., 2020; Mustafa et al., 2016; Ferreira et al., 2015).

In spite of the fact that eSEO is born out of a micro-level conceptualization (Wales et al., 2020; Covin et al., 2020; Gawke et al., 2019) of SEO, we posit that eSEO is not simply a like-for-like reflection of SEO. This is mostly because SEO represents the strategic posture at the meso-level, while eSEO is the micro-level posture that strategically corresponds with SEO. SEO exhibits itself as cognitive information. This cognitive information is like TMT throwing a stone into a pond, creating a ripple effect down to the micro-level. As Hewertson (2020) points out, "each and every leadership choice you make has some kind of a 'ripple effect' that spreads out to your team and to the organization as a whole." Transferring the above metaphor back to itself, we posit that eSEO for each employee is not a simple average of SEO. In other words, eSEO can vary among different employees in the same organization.

Furthermore, what is found in studies involving SEO cannot automatically be generalised to similar studies that involve eSEO. The cognitive information of SEO when passing down to employees will not be felt the same by different employees who will react differently as a result. This is due to a number of well-known factors any of which can be at work to disrupt the communication process. These factors include "filtering, selective perception, information



overload, emotional disconnects, lack of source familiarity or credibility, workplace gossip, semantics, gender differences, differences in meaning between sender and receiver, and biased language” (University of Minnesota Libraries Publishing, 2021).

Therefore, conducting a study of eSEO and its potential impact on firm performance or a particular aspect of innovation performance becomes all the more important because it can enrich our understanding of the potential importance of SEO at the micro-level to the firm these employees are working for.

#### *2.4. TMT decision-making process*

Research has demonstrated that the effects of strategic orientations on firm innovation are bounded by the characteristics of the organizational context (Pehrsson, 2016). Like other strategic orientations, eSEO tends to depend on situational factors (Saebi et al., 2019; Zahra and Wright, 2016), such as TMT decision-making process. According to van Doorn et al. (2017), TMT decision-making process can motivate a firm’s EO to innovate, identify market opportunities, and subsequently achieve superior firm performance. Other studies such as Vandekerckhof et al. (2018), Shepherd and Rudd (2014), and Kownatzki et al. (2013) also suggest the relevance of TMT decision-making process to employees’ engagement in firm activities.

Proponents of the contagion theory, such as Su et al. (2020) and Balogun and Johnson (2004), focus on TMT information being spread through and among employees. Some other scholars (e.g., Bromiley and Rau, 2016; Patterson et al., 2004), though not explicitly using the term “contagion theory”, share the same view. They posit that TMT decision-making process not only has strategic importance, but also symbolic and functional importance which can significantly relate to employees’ perceptions, behaviors, and work outcomes.

Accordingly, we include TMT decision creativity and TMT decision speed, both of which are important attributes of TMT decision-making process (Lin et al., 2019; Zehir and Özşahin,

2008; Baum and Wally, 2003), as variables in our theoretical build-up and hypothesize that they can transcend their influences from the meso-level to the micro-level and can potentially moderate the effect of eSEO on product innovation performance.

TMT decision creativity is defined as the degree to which the TMT decision-making process is “novel, radical, and different from prevailing industry practices” (Lin et al., 2019, p. 3120). TMT decision creativity is considered because it is hypothesized to provide firms’ employees with diverse perspectives and valuable advantages for successfully leveraging the eSEO into enhanced product innovation performance. For example, a recent study suggested that TMT decision creativity enhances employees’ overall job performance through promoting the creative knowledge of the TMT members (Lin et al., 2019). Such TMT decision creativity is poised to broaden the attention span of social entrepreneurship employees, and affords novel insight into their eSEO.

TMT decision speed refers to how quickly TMT members “execute all aspects of the decision-making process, spanning from the initial consideration of alternative courses of action to the time at which a commitment to act is made” (Forbes, 2005, p. 355). TMT decision speed is considered because, although some studies indicate that TMT decision speed positively relates to new venture financial performance (Souitaris and Maestro, 2010) or innovation performance (Zehir and Özşahin, 2008), other studies argue that top managers’ high decision speed may discourage employees from engaging in creative processes, resulting in poor performance (Bakker and Shepherd, 2017). More specifically, one of the cornerstones of eSEO is innovation, which is the de facto application of creativity. This indicates the creative element of eSEO. Focusing on decision speed at the expense of decision creativity would inhibit the healthy functioning of this creative element within eSEO.

### **3. Hypotheses development**

eSEO can be carried out through employees' entrepreneurial activities in response to social issues, meeting organizational performance (Gali et al., 2020; Halberstadt et al., 2020). One of the indicators of social organizations' performance is innovation performance (Dwivedi and Weerawardena, 2018). As noted by Hughes et al. (2018), not only do top managers play essential roles in generating entrepreneurship in firms, but all organizational members can potentially contribute to innovation. Mustafa et al. (2016) also indicate that innovation is the most common behavior during personal entrepreneurial activities. Although previous researchers demonstrate the important roles of individual EO (Covin et al., 2020; Santos et al., 2020; Gawke et al., 2019; Kraus et al., 2019) and SEO (Gupta et al., 2020) in innovation activities, there have been far fewer studies, if not none at all, regarding the impact of eSEO on innovation performance, which is the focus of this study.

In developing the hypotheses, we expect each dimension of eSEO to be positively associated with product innovation performance. First dimension is innovativeness. We conceptualize innovativeness as an employee's "tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes" (Lumpkin and Dess, 1996, p. 142); proactiveness as an employee's forward-looking viewpoint from which employees actively pursue opportunities to introduce innovations to gain competitive advantages (Hughes and Morgan, 2007); risk-taking as an employee's tendency of risk-taking inherent in original activities (Hughes and Morgan, 2007). The interpretations of innovativeness and proactiveness capture a spirit of risk-taking in social entrepreneurial behavior (Anderson et al., 2015), which is a key source of innovation.

As for the other three dimensions of eSEO, social mission orientation reflects an employee's behavioral tendency of devotion to creating and sustaining social value (Dwivedi and Weerawardena, 2018; Gamble and Moroz, 2014). Sustainability orientation reflects an employee's behavioral tendency for long-term social responsibility (Du et al., 2016;

Weerawardena et al., 2010). Effectual orientation reflects an employee's behavioral tendency toward proactively managing limited resources to achieve social solutions (Szambelan et al., 2020; Werhahn et al., 2015).

Referring to these three dimensions' expected association with innovation performance, Certo and Miller (2008) indicate that social mission is a key dimension and must be fundamental in the conceptualization of social entrepreneurship. Gandhi and Raina (2018) further contend that the purpose of social enterprises is to create superior value for firms' customers by providing new products with a social mission. With regard to sustainability orientation, Hossain et al. (2017) propose that sustainability orientation is inherent in social entrepreneurship. Further, using sustainability orientation as a management philosophy, Du et al. (2016) find that sustainability orientation improves new product development (NPD) performance. As for effectual orientation, Szambelan et al. (2020) regard it as a strategic direction that emphasizes social entrepreneurial decision-making among employees which ultimately affects firms' innovation performance. In addition, Werhahn et al. (2015) indicate that, relying on entrepreneurial heuristics, effectual orientation can be used as the basis for social entrepreneurs to create new products.

Extant studies have demonstrated the effect of EO on innovation performance at the meso-level (e.g., Adams et al., 2019; Baker et al., 2016; Alegre and Chiva, 2013). Recent studies indicate that the role of EO at the micro-level has been considered as one of the critical factors in innovation performance (e.g., Gomezel and Rangus, 2018; García-Granero et al., 2015). Further, some studies have found a positive correlation between EO in social purpose organizations and their innovation performance (e.g., Gandhi and Raina, 2018; Du et al., 2016; Werhahn et al., 2015). Based on the rationales and empirical studies, we propose that employees with strong eSEO should also be able to create superior product innovation performance.

**Hypothesis 1:** eSEO is significantly and positively associated with product innovation performance.

In terms of TMT decision creativity, we expect that TMT members making creative decisions are able to motivate social entrepreneurship-oriented employees to concentrate their efforts on the development of product innovation. Specifically, when identifying emerging social entrepreneurial initiatives, TMT members need to assess the strategic fit between social entrepreneurial activities and the business environment (van Doorn et al., 2017). In addition, TMT members engaged in creative decision-making process can encourage employees to provide the wide range of new knowledge that potentially benefits social entrepreneurial initiatives (Somech and Drach-Zahavy, 2013). What is more, TMT decision creativity enables social entrepreneurship-oriented employees to broaden their innovation scope by encouraging them to become involved in an expansive search to collect new knowledge (Rao and Tilt, 2016). As a result, employees' social entrepreneurship-related ideas or solutions are more likely to become viable. While social entrepreneurial initiatives arising from eSEO may complicate the innovation development process, the distinct advantage of the TMT decision creativity function can overcome these uncertainties and, eventually, add much to firms' innovation performance (Lin et al., 2019). Further, TMT decision creativity increases the combinative ability of employees (Elbanna et al., 2017), which enables firms to realize innovation by integrating emerging social entrepreneurial initiatives and current innovation activities. Therefore, we hypothesize that:

**Hypothesis 2:** TMT decision creativity moderates the effect of eSEO on product innovation performance, such that in the presence of high TMT decision creativity, product innovation performance gain from eSEO is greater.

As for TMT decision speed, we propose that the effects of eSEO on product innovation performance are enhanced when TMT decision speed is slow. In fast TMT decision-making, employees' social entrepreneurial initiatives are often overlooked because TMT members tend to rely primarily on their experience to focus on the meso-level decision to initiate social entrepreneurial initiatives (McMullen, 2015). As Bingham and Eisenhardt (2011) suggest, TMT tends to make fast decisions based on the lessons they have learned from similar situations. van Doorn et al. (2017) also find that firms facilitate decision speed by using TMT members' intuition. Therefore, in the circumstance of high TMT decision speed, employees with strong eSEO might perceive that there are fewer opportunities to capture TMT members' attention on their social entrepreneurial initiatives. What is more, quick decision-making process could discourage social entrepreneurship-oriented employees from concentrating social entrepreneurial initiatives on innovation because they expect that they will not have sufficient time for innovation projects (Rahimnia and Molavi, 2020). As such, employees could perceive discouragement of their motivation during the innovation development activities (Byron et al., 2010). Accordingly, we hypothesize that:

**Hypothesis 3:** TMT decision speed moderates the effect of eSEO on product innovation performance, such that in the presence of high TMT decision speed, product innovation performance gain from eSEO is lesser.

Building on the arguments discussed earlier, creative TMT decision appears to be most effective when TMT decision is slow. This is because slow TMT decision speed helps social entrepreneurship-oriented employees translate social entrepreneurial initiatives into a social entrepreneurial portfolio (Elbanna et al., 2017). In addition, the fragmented nature of social entrepreneurial initiatives at the fuzzy front end of innovation development needs slow TMT decision speed (Karimi and Walter, 2016). As such, TMT creative decisions have more value

if TMT members consider and slowly integrate various perspectives of social entrepreneurial initiatives.

In addition, when TMT decision speed is slow, TMT members have sufficient time to focus on employees' social entrepreneurship-oriented efforts. In this way, employees perceive a supportive environment when TMT members empower employees' efforts aimed at social entrepreneurial initiatives. These are the major sources of innovation development (Lin et al., 2019). What is more, slow TMT decisions could enhance the development of creativity, because slow TMT decision-making produces a context of no time pressure inhibiting employees' social entrepreneurial initiatives (e.g., Beck and Schmidt, 2013). Simsek et al. (2015) also suggest that routinized processes enhance employees' entrepreneurial initiatives when TMT members leave employees sufficient time to pay attention to their entrepreneurship-related work. Overall, we hypothesize that:

**Hypothesis 4:** TMT decision speed enhances the moderating effect of TMT decision creativity in the eSEO-product innovation performance relationship, such that when a low TMT decision speed is combined with high TMT decision creativity, the positive effect of eSEO on product innovation performance is increased.

## **4. Research method**

### *4.1. Data collection*

Social enterprises by their nature need to be innovative in order to be able to generate innovative solutions to social problems (Del Giudice et al., 2019; Doherty et al., 2014). In this regard, we follow Defourny and Nyssen's (2017) four major social enterprise models and place the firms in our study in the social business model. More specifically, this study dealt with a subset of social enterprises that are labelled as social businesses by Defourny and Nyssens (2017). This particular social enterprise relies on all sorts of strategies and tactics commonly

espoused by normal for-profit enterprises for meeting their dual purposes. It needs not only to fulfill its social purpose, as often carved in stone in their mission statement, but also to meet its economic purpose so as to survive, grow, and earn enough income to support its social purpose (Defourny and Nyssens, 2010). Both purposes are important but the social one should be more central because primacy of social mission is what is needed for them to be rightfully called social enterprises. We claim that our surveyed firms entirely meet this requirement because one of the key criteria in our choice of eligible firms is that more than 50% of their sales have to come from provision of products and services for fulfilling social needs, indicating their “primacy of social mission” (Nicholls, 2006).

In Taiwan, where data for this study was collected, there are many examples of technology firms making use of the technology they have to achieve social goals. For example, a pioneer in eco-friendly hair care, O’right was founded in 2002 and uses coffee oil as an ingredient extracted from 100% spent coffee grounds through innovative technologies with a meticulous, anti-bacterial process of drying and supercritical fluid extraction. Another example is that of Miniwiz, founded in 2007 to continuously reuse resources by developing new waste recycling technology to increase the amount of waste recycled and reused. Elsewhere in the UK, for example, “tech for social good”, refers to non-profit and for-profit organizations that are using digital technology to tackle some of the world’s toughest challenges, has become an official policy guideline (UK Government, 2019).

Finally, employees in social issue-related technology firms are engaged in social knowledge-intensive jobs and have to proactively learn new technologies to deal with new social problems. Therefore, these firms provide a suitable empirical setting and we decided to identify the sample from among technology firms. This is in line with previous social enterprise studies which also used technology firms (e.g., Desa and Basu, 2013; Desa and Kotha, 2006). What is more, the TMT decision-making process is considered as a potentially important factor



in this study, and technology firms are rightly regarded as suitable for decision-making research (Souitaris and Maestro, 2010).

Accordingly, following Global Entrepreneurship Monitor (2014), we defined the target population as Taiwan-based technology firms that have used 50% or more of their profits to address social problems. To collect data effectively, we contacted three government institutes that have collaborated on social-oriented projects with technology firms that were listed in the Ministry of Economic Affairs. To double check, these firms were identified by phone to verify whether they had been involved in the social-oriented projects held by the government institutes and had used 50% or more of their profits to address social problems. These screening processes are important because social enterprises are perceived as organizations that can fill gaps generated by either market or government failures (McMullen and Bergman, 2017; Grimes et al., 2013). As a result of these procedures, we obtained a list of 329 social enterprises.

It is worth noting that we obtained different data from different respondents in each social enterprise to reduce the problem of common method bias (Podsakoff et al., 2003, p. 898). In addition, we used the longitudinal method to collect dyadic data because the effects of eSEO, TMT decision-making process, and product innovation can evolve over time (Ployhart and Vandenberg, 2010) and, thus, it needs time for these variables to materialize (Rindfleisch et al., 2008). What is more, following previous studies (e.g., Yildiz et al., 2020; Kadic-Maglajlic et al., 2017), we used a meso-to-micro level approach to collect two-level data, namely, collecting data from TMT members for TMT decision creativity and speed (at the meso-level) as well as data from employees for eSEO (at the micro-level).

In early-2018, to collect the data on TMT decision creativity and TMT decision speed, we emailed questionnaires to TMT members (CEOs or vice presidents who represented the decision makers in the social enterprises). A total of 247 questionnaires were collected from

the email survey. Of those collected, 36 questionnaires were removed because they were invalid. After eliminating them, we were left with valid responses from 211 social enterprises.

In late-2018, email invitations were sent to 4,209 employees by way of 211 participating social enterprises, to respond to eSEO and control variables (risk propensity and self-enhancement motive) through an online survey. To increase response rates, we recruited an e-commerce company with expertise in conducting online surveys. In line with previous studies (e.g., Fan and Yan, 2010) proving the effectiveness of sending up to three reminder emails, we sent the first round of reminder emails to recipients of our survey who had not completed and sent back the questionnaire one week after the first emails, and a second round of reminder emails to recipients who had not replied after another week. Over a period of four weeks, 2,567 employees had completed the survey, achieving a response rate of 60.9%. The sample we had should be considered adequate because, although we cannot meet the demanding 30/30 rule of thumb (Kreft, 1996; at least 30 groups with 30 individuals in each group), we have more than enough social enterprises and at least five employees as respondents in each social enterprise; and because having enough firms is more important than having enough employees in each firm (Scherbaum and Ferreter, 2009).

In late-2019, we contacted NPD managers of the same 211 social enterprises by email, asking them to assess product innovation performance and control variables (prior innovation performance and technological turbulence). Five of the social enterprises could not be reached, leading to 206 respondent firms. As such, each social enterprise had two respondents (TMT member and NPD manager).

In early-2020, to complement the self-reported data (Creswell and Creswell, 2017), we retrieved secondary proxy data on product innovation performance from China Credit Information Service. This secondary proxy data consisted of sales from new products of each of the 206 social enterprises for the years 2017 and 2019.

Overall, the final sample consisted of 2,567 employees as well as one TMT member and one NPD manager from each of the 206 social enterprises. For employees, 59% of respondents were male and 73% of them had a bachelor's degree. The TMT members and NPD managers had a mean social enterprise experience of 11.7 years. The average number of employees was 352 and the average annual sales revenue was US\$ 897.02 million. The social enterprises in the sample included chemicals (19.9%), energy (18%), health (16.9%), bio-tech (15.5%), information technology (14.6%), and others (15.1%). We used social enterprise age and size to compare participating and nonparticipating respondents. The results suggest there is no significant ( $p < 0.05$ ) difference in either case.

**---Insert Table 1 about here---**

#### *4.2. Measurement*

Prior to this study, there has not been credible and comprehensive scale for measuring eSEO. Therefore, we have to develop the measurement scale of eSEO from scratch. According to Dwivedi and Weerawardena (2018) and Kruas et al. (2017), they extend the EO research and conceptualize SEO as an underlying behavioral orientation, which encompasses (1) innovativeness, (2) proactiveness, (3) risk-taking, (4) social mission orientation, (5) sustainability orientation, and (6) effectual orientation. We did not take these six dimensions for granted by claiming that eSEO must also consist of these same dimensions. But we do take them into account when developing the scale items of eSEO.

It has to be brought to attention here that Satar and Natasha (2019) have successfully developed the scale of individual SEO. However, the scale they developed has four dimensions, namely, innovativeness, risk-taking, proactiveness, and social passion. We deem that these may not be comprehensive. What is more, we feel a bit lost when reading the transition from the dimensions obtained in literature review to the reduced number of dimensions finalized in their study. Therefore, we decide not to use the dimensions in Satar and Natasha's (2019) for our

study but instead properly follow the scale development process as illustrated by Churchill (1979) to develop the scale, including the dimensions and their constituent items, of eSEO.

First, following previous studies that capture EO at the micro-level (Covin et al., 2020; Gawke et al., 2019; Kollmann et al., 2017; Gupta et al., 2016; Ferreira et al., 2015; Goktan and Gupta, 2015; Lechner and Gudmundsson, 2014; Bolton, 2012; Monsen and Boss, 2009) and the framework proposed by Heggstad et al. (2019), Churchill (1979), and Gerbing and Anderson (1988), we conducted a convenience sample of 32 in-depth interviews with employees who had experience in practicing eSEO. None of these employees would be the employees in the final sample.

Second, to capture all of the important points covered in the interviews, detailed notes were taken and the proceedings of the interviews were tape recorded. With particular interviewees, follow-up interviews were conducted, if necessary, to clarify issues or explore them more deeply. After carefully examining the transcripts, we and three other academics manually and electronically (NVivo 12) converted interviewees' open-ended responses into an initial pool of items.

Third, to assess face and content validity, we conducted two pilot tests (Churchill, 1979). As for the first pilot test, the other convenience sample of three academics and 67 employees were interviewed to detect ambiguous questions, check the face and content validity of the measurement scales, and certify the wording of the items. For the second pilot test, refined scales were tested with another convenience sample of 121 employees with previous experience in eSEO. Eventually, some minor adjustments were made regarding wording. As a result, the final eSEO scale contains 19 items. These 19 items load nicely on their respective six dimensions which collectively constitute eSEO. These six dimensions are innovativeness, proactivity, risk-taking, social mission, sustainability, and effectual behaviors all at the micro-level.

We measured TMT decision creativity with three items adapted from Menon et al. (1999), and measured TMT decision speed with three items adapted from Baum and Wally (2003). Following De Luca and Atuahene-Gima (2007), we measured product innovation performance using five items: market share, return on assets, return on investment, profitability, and sales over the previous two years. In terms of secondary proxy data, product innovation performance was assessed by the percentage change in sales attributed to new products from  $t_0$  (2017) to  $t_1$  (2019), which can be translated into  $(\text{sales}_{t1} - \text{sales}_{t0})/\text{sales}_{t0} \times 100$  in mathematical terms.

We controlled variables for their relevance to employee, firm, and industrial factors. For employee factors, we controlled for age, gender, educational level, risk propensity, and self-enhancement motive. We controlled risk propensity by adapting six items from Colquitt et al. (2006), because risk propensity is a personality trait and is one of the determinants of strategic risk behavior (Das and Teng, 2001). We also controlled self-enhancement motive by adapting six items from Yun et al. (2007), because employees with a high self-enhancement motive strive to see themselves in a positive light (Jordan and Audia, 2012). For firm factors, we controlled for social enterprise age and size as well as prior innovation performance. Social enterprise age was measured by the number of years the social enterprise had been established, while social enterprise size was measured by the number of employees. We controlled for prior innovation performance because firms with high prior innovation performance are more likely to have a positive effect on current innovation performance (Liang and Liu, 2018; Yanadori and Cui, 2013). We measured prior innovation performance with two items adapted from Gao et al. (2015). For industrial factor, technological turbulence was measured using four items (Zhou and Wu, 2010).

## **5. Analyses and results**

### *5.1. Measurement validation*

We used the MPlus Exploratory Structural Equation Modeling technique to examine the internal consistency of the scale because it combines exploratory factor analysis and confirmatory factor analysis in one procedure and avoids the problems related to the traditional two-step process (Muthén and Muthén, 2017). By allowing the latent constructs of eSEO, TMT decision creativity, TMT decision speed, product innovation performance, and control variables to correlate freely, we find that the variables collected from employees indicate a good fit ( $\chi^2/\text{d.f.}=1.93$ ,  $p < 0.001$ ; root mean square error of approximation (RMSEA) = 0.04; comparative fit index (CFI) = 0.96; incremental fit index (IFI) = 0.95). The results for the variables collected from TMT members and NPD managers also indicate a good fit ( $\chi^2/\text{d.f.} = 1.89$ ,  $p < 0.001$ ; RMSEA = 0.03; CFI = 0.96; IFI = 0.96). The standardized factor loadings range from 0.71 to 0.87, all of which are significant ( $p < 0.01$ ).

The discriminant validity of the constructs was assessed in two ways. First, we compared the chi-square value of the model with that of the unconstrained model (Gerbing and Anderson, 1988). The results indicate that the unconstrained model is supported. Second, by calculating the shared variances between pairs of constructs to identify whether they were lower than the square roots of all average variance extracted (AVE) values of the individual constructs, we find that the AVE values are higher than the correlations between constructs (Fornell and Larcker, 1981).

Overall, as shown in Table 1, the values of Cronbach's alpha, composite reliability and AVE for the constructs are well above the cut-off values suggested by Bagozzi and Yi (2012). In addition, basic descriptive statistics, correlation matrix, and the square root of AVEs of constructs are presented in Table 2.

**---Insert Table 2 about here---**

## *5.2. Hypotheses testing*

To test the hypotheses, multi-level modeling (Aguinis et al., 2013) using hierarchical moderated regression analysis (Aiken and West, 1991) was employed. To reduce the chance of multicollinearity, we mean centered all latent variables. The results show that multicollinearity is not a concern in the present data since the largest variance inflation factor is 1.92, well below the cut-off value of 5 (Hair et al., 2016).

Table 3 shows the results of the regression model. Model 1 shows the results with the control variables only. Model 2 presents the main effects of eSEO, TMT decision creativity, and TMT decision speed. Model 3 depicts the results of the interaction effects. Model 4 presents the results of the three-way interaction. Note that Model 4 is used to report the results of the hypotheses because of performing the best and explaining 43% of the total variance.

As shown in Model 4 (Table 3), eSEO is significantly and positively associated with product innovation performance ( $\beta = 0.36; p < 0.001$ ). Hypothesis 1 is supported. In addition, the relationship between eSEO and product innovation performance is positively moderated by TMT decision creativity ( $\beta = 0.31; p < 0.001$ ). Figure 2A (the simple slopes) suggests that eSEO is positively associated with product innovation performance when TMT decision creativity is high ( $\beta = 0.36; p < 0.001$ ), but not when it is low ( $\beta = 0.04; p > 0.10$ ). Thus, Hypothesis 2 is supported. However, Hypothesis 3 is not supported because the interaction between eSEO and TMT decision speed is not significant ( $\beta = -0.13; p > 0.10$ ). Finally, the three-way interaction is negatively significant ( $\beta = -0.24; p < 0.01$ ). Figure 2B (the plotted three-way interaction) demonstrates that a high level of eSEO ( $\pm 1$  standard deviation) achieves the highest level of product innovation performance when TMT decision creativity is high and TMT decision speed is slow.

We also used the secondary proxy data of product innovation performance to test the hypotheses. The results shown in Table 4 (Model 4) are in line with the results of the survey

data in terms of Hypothesis 1 ( $\beta = 0.37$ ;  $p < 0.001$ ), Hypothesis 2 ( $\beta = 0.33$ ;  $p < 0.001$ ), Hypothesis 3 ( $\beta = -0.14$ ;  $p > 0.10$ ), and Hypothesis 4 ( $\beta = -0.27$ ;  $p < 0.01$ ).

**---Insert Tables 3 and 4, and Figure 2 about here---**

## **6. Discussion**

Social entrepreneurship researchers strive to understand the effectiveness of SEO and its situational factors. Building on the RBV and contagion theory, this study extends SEO research to demonstrate how eSEO affects product innovation performance and how TMT decision creativity and TMT decision speed leverage eSEO, leading to enhanced product innovation performance. The findings verify the effects of eSEO on product innovation performance and highlight the roles of TMT decision-making process. While the results indicate that high TMT decision creativity enhances the effect of eSEO on product innovation performance, we do not find that high TMT decision speed has the negative effect. However, the effect of eSEO on product innovation performance is the greatest significant when TMT decision creativity is high and TMT decision speed is slow (both the survey data ( $\beta = -0.24$ ;  $p < 0.01$ ) and the secondary proxy data ( $\beta = -0.27$ ;  $p < 0.01$ ) as well as Figure 2B (the plotted three-way interaction) show the support to this point). Therefore, our findings have valuable implications for social entrepreneurship academics and practitioners.

### *6.1. Theoretical contributions*

First, EO has been found to link strongly with many organizational, environmental, managerial, and strategic phenomena (Covin and Wales, 2019). This demonstrates the importance of EO in effecting specified outcomes as well as being affected by identified antecedents of the organization. The construct of EO being well defined and measured also contributes to the pretty high probability of significance found in studies linking EO to specific antecedents or outcomes. A shortcoming of this is that the models developed in many studies



on EO and its extension such as SEO may be long-linked and in response to this. In this study, we extend research on social entrepreneurship (e.g., Wales et al., 2020; Covin et al., 2020; Gawke et al., 2019) by investigating the role of SEO at the micro-level, namely, eSEO.

The results confirm the beneficial effect of eSEO on firms' product innovation performance. Thus, the findings of this work shed light on the important role of eSEO in product innovation, which provides new insight into the importance of eSEO in product innovation performance. Prior social entrepreneurship research often assumes managers in social entrepreneurship firms can automatically generate greater innovation performance (van der Have and Rubalcaba, 2016; El Ebrashi, 2013). Aided by RBV which posits that strategic orientations, including SEO at the micro-level, are imitable resources that can contribute to the organization's competitive advantage, this study has empirically proven that eSEO is related to innovation performance.

Second, TMT decision creativity is found to have a positive effect on the relationship between eSEO and product innovation performance. As such, this study advances previous creativity literature by theorizing the positive effect of TMT decision creativity on assessing viability of entrepreneurial initiatives in the social context (van Doorn et al., 2017). However, high TMT decision speed is shown not to have a negative effect on the relationship between eSEO and product innovation performance. Although prior studies have agreed that high TMT decision speed has been positively linked to the initial development of entrepreneurship and innovation activities (Shepherd and Rudd, 2014; Hmieleski and Ensley, 2007), our finding suggests that high TMT decision speed does not seem to add to the beneficial effect of eSEO.

Thus, one of the most novel findings of this paper is that high TMT decision creativity and low TMT decision speed combined together contribute the most to product innovation performance when eSEO is high, but the same combination will not positively contribute to the same outcome variable when eSEO is low. This finding is of pivotal importance because,

in practice, high decision speed is usually beneficial and one classic example is that the product development time from opportunity identification, to concept generation, to product launch lasted only about 8 months for Apple iPod, which turned out to be a huge global success. In theory, with high decision speed, a firm can more likely be in a position to reap first-mover advantage (Baum and Wally, 2003), such as faster new product trials, referrals, and adoptions and, thus, experience superior innovation performance (Zehir and Ozsahin, 2008).

We draw on double dissociation theory to explain this novel finding. Double Dissociation theory (Dorfman et al., 2008) which originates from the creativity field and has been developed on the basis of Martindale's work (1981, 1989, 1995, 1999, 2007), states that for tasks requiring high creativity such as product innovation projects driven by employees' high eSEO which contain high risk, high innovativeness, and highly proactive manner, low speed is preferred so as to allow enough time to solve complex issues. On the contrary, for tasks requiring low creativity such as product innovation projects linked to employees' low eSEO which signifies low risk, low innovativeness, and much less proactive manner, high speed works well because the nature of the tasks involved does not require human brain to stop and ponder before deciding on the next step of the task.

The double dissociation theory has also highlighted the difficulties involved in the field of TMT decision creativity and TMT decision speed. This theory is deployed to explain the results related to decision speed and decision creativity in this study. Our findings clearly indicate the effect of TMT decision creativity is complex as it depends on if eSEO is high or low. So what does it mean by high eSEO or low eSEO? We can diagnose into the components of eSEO to look for the answer. eSEO is composed of six dimensions, namely innovativeness, proactiveness, risk-taking, social mission orientation, sustainability orientation and effectual orientation. Among these dimensions, the first three take more weights based on the results of the relative strengths of these six dimensions by running chi-square difference tests. Wales

(2019) also suggests that new entry is a key phenomenon of being entrepreneurship. Being more innovative, proactive, and risk-taking can lead to new entry of greater novelty. Therefore, there are both conceptual and statistical back-ups for these three dimensions to be key to SEO as well as eSEO.

When employees exhibit high levels of innovativeness, proactiveness, and risk-taking for engaging in innovation activities and therefore demonstrate high eSEO, the creative tasks required for these innovation activities are more likely to be those requiring the inhibition or interfering information, such as negative priming. On the contrary, when they show low levels of innovativeness, proactiveness, and risk-taking thereby showing low eSEO, the creative tasks for the innovation activities they participate are more likely to be those not involving cognitive interference such as concept verification task.

As a result, double dissociation theory confirms that concept verification tasks do not benefit much from high creativity and these tasks can be properly completed at high speed. On the contrary, negative priming tasks benefit from high creativity and low speed. When eSEO is high, employees need to carry out more negative priming tasks for their innovation activities. These innovation activities are expected to generate best performance when high decision creativity is coupled with low decision speed.

We also apply contagion theory (Su et al., 2020; Balogun and Johnson, 2004; Waldman and Yammarino, 1999) to explain how information about SEO as behavioral tendency at the meso-level can be transmitted to employees aiding their formulation of eSEO. The same theory can also explain how information about decision creativity and decision speed at the meso-level can be spread across to employees potentially mediating the effect that their eSEO exert on the firm's product innovation performance.

Specifically, according to contagion theory, the information being contagious and spread throughout organization from top to bottom can have two forms. First is cognitive while second

is emotional. In earlier days, most contagion theory related papers were about cognitive information. More recently, attention has been switched to emotional information (Hatfield et al., 2014). Contagion theory is about information in its broadest sense (not only written and verbal, but also non-verbal such as behavioral) being contagious throughout the whole organization and this information can be of any type such as decision-making style or strategic orientation from top management team and how it is spread through to every corner of the organization.

Against the backdrop of the above common understanding of decision speed, a potential explanation for the negative effect of high TMT decision speed is that, while high TMT decision speed enables firms to respond quickly to competitors' actions (Souitaris and Maestro, 2010), it may be possible for social entrepreneurship-oriented employees to not perform to the highest standard even when TMT members have an efficient decision speed, if they do not have enough knowledge to understand an efficient decision speed, if they fail to appreciate the importance of eSEO in firm performance. Another possible explanation is that the indirect contributions of TMT decision speed to the index of innovation performance we used are more complicated than what the current literature shows. For example, the use of the indicators of innovation performance could be positive at the meso-level analysis, but negative at the micro-level analysis. Or, the effect of high decision speed on eSEO is positive at first (the speedier the better) but, above a certain threshold, it turns into a negative effect (too speedy and then no good). Overall, we go beyond a simplified application of decision speed to the eSEO to identify the salient features of TMT decision speed.

All in all, TMT decision speed is complex in nature as it can bring benefits at the meso-level, but is disadvantageous at the micro-level. It can be beneficial at an earlier stage but then bring undesirable outcomes at a later stage. As a result, its positive impacts can be counteracted by the negative effects it brings, leading to non-significance of this variable in its expected

moderating effect of eSEO on product innovation performance. In addition, Wales et al. (2015) recommend EO related studies to develop tighter models that can “demonstrate close causal adjacency between EO and its antecedents and consequences” (p. 12). We, therefore, argue that our model has achieved this “close causal adjacency” target, because not only the significant linkage between eSEO and product innovation performance can be theoretically and statistically explained, but also this linkage has been made tighter by adding two moderating variables, decision creativity and decision speed, both of which have statistically and conceptually justified their place in the model.

Third, another new theoretical insight that researchers of EO can gain from this study is the contribution of multi-level research (Wales et al., 2020). Specifically, previous research on TMT decision-making process has focused mainly on the meso-level and their influences on firm performance (e.g., Shepherd and Rudd, 2014). In contrast, this study focuses on how these processes influence eSEO at the micro-level to obtain product innovation outcomes. Without doing meso-to-micro level research such as this study is doing, we may never find out how or if TMT decision speed (at the meso-level) can negatively influence eSEO (at the micro-level). As such, by using a meso-to-micro level approach to shed light on the moderating effects of social entrepreneurship decision-making on eSEO, this study echoes a recent paper arguing that multi-level research can potentially contribute to theoretical development in the management literature (Wales et al., 2020; Covin et al., 2020; Gawke et al., 2019).

What is more, this study responds to Covin and Wales’ (2019) suggestion to “recognize level-of-analysis differences and agglomeration effects-or the lack thereof” (p. 13) in the demonstration of EO and its extension such as SEO within the organization being studied. We treat SEO as the meso-level construct and generate eSEO as a new construct for measuring SEO at the micro-level. We argue that it is most unlikely if not outright impossible that eSEO of all employees exhibit full agglomeration effects resulting in their equivalence to SEO. There

will be partial agglomeration effects because part of eSEO shown by different employees are a direct result of SEO's ripple effect down to functional and lower levels of the organization. However, these agglomeration effects will stop short at the point when employees' personalities and personal attributes contribute to their respective eSEO.

Finally, this study demonstrates why both TMT decision creativity and TMT decision speed are important in the eSEO-product innovation relationship. Our findings indicate that social entrepreneurship-oriented employees contribute the most to product innovation performance in TMT decision contexts characterized by high creativity and low speed. This new insight explicates how TMT decision creativity interacts with TMT decision speed to affect the impact of social entrepreneurial activities at the micro-level on product innovation performance of social enterprises. Furthermore, there have been studies on the effects of interaction between decision creativity and decision speed in other areas, but research on the impacts of this interaction on product innovation performance, particularly in the social entrepreneurial sector, has not been found. The concept generation task for product innovation is usually ambiguous. If this task is unambiguous and relatively easy, the resulting innovation is not likely to generate a big success (Slater et al., 2014). For ambiguous tasks, Kwiatkowski et al. (1999) find that there is a negative relationship between creativity and speed. More highly creative people have shown cognitive disinhibition and defocused attention, which has been contended by Eysenck (1995) as he studied the link between creativity and cognitive disinhibition. Therefore, their speed in mental processing and decision-making is slow as they are not good at filtering out irrelevant aspects of stimuli. This study confirms that the negative correlation between decision creativity and decision speed in ambiguous task situations, as found in psychological studies, appears to occur also in the product innovation process among social entrepreneurship firms at the micro-level.

## *6.2. Managerial implications*

Our findings offer some important implications for managers of social entrepreneurship firms and decision-making process. First, high speed decision-making is often praised as a desirable strategy (Bakker and Shepherd, 2017; Shepherd and Rudd, 2014; Hmieleski and Ensley, 2007). This study is not to dismiss this strategy altogether. However, our findings suggest that high speed decision-making is not always a panacea. Speedy decisions can expedite NPD process, allowing a new product to be developed and launched more quickly, thus reaping first mover advantages. However, this strategy will not work as expected or may even be counter-productive in the strong eSEO context which emphasizes innovativeness, proactiveness, and risk-taking. In such a context, it is deemed better to lower decision speed while increasing decision creativity. The reason is that in this environment creativity, as opposed to speed, is more crucial. If the firm strives to increase decision speed, it will give a wrong signal across the firm about what is emphasized at the meso-level and this will be incongruent with the essence of the eSEO environment.

Second, managers are advised that their firm includes meso-level and micro-level. A TMT decision works best only when it is well understood, received and implemented by people of different levels in the firm. For example, a TMT decision that emphasizes speed may work at the meso-level, but may be poorly understood, received and implemented at the micro-level. This study has found, empirically, that high decision speed, while workable or even desirable at the meso-level, does not work well at the micro-level in strong eSEO environment when employees are needed to actually carry out the NPD process. What is needed in this environment is high decision creativity, but instead employees are given a wrong signal—focus on speed instead of creativity—by TMT of the firm. As a result, product innovation performance will suffer. The lesson learned here is that different TMT decision-making process have significantly differing impacts on employees' commitments in eSEO.

Third, running a business is like walking a tightrope, with little room for mistakes, as managers need to play with a number of variables simultaneously. Applying this “balancing act” concept to what is found in this study, means managers should acknowledge the interplay among TMT decision speed, TMT decision creativity, and strength of eSEO which collectively will affect product innovation performance of the firm. This study which is the first to study the interaction between eSEO and TMT decision-making process in affecting product innovation performance, finds that employees need TMT decision support when they apply eSEO to innovation activities. Specifically, when employees are adopting strong eSEO as the mainstream policy, TMT members should strive to increase the creativity of their decision-making, as this will be reflected in the innovation activities carried out by their employees. On the other hand, TMT members should refrain from speeding up their decision-making process. Otherwise, their employees will feel the time pressure which will adversely affect the quality of the innovation activities they are working on. In a nutshell, the three variables and their interplay that managers in the social enterprise sector should get acquainted with are that their firms’ product innovation effort will be best rewarded if the eSEO environment is strong, TMT decision speed is low, and TMT decision creativity is high.

Fourth, the development and deployment of eSEO in current business environments shows critical challenges for managers. Specifically, managers are under increasing pressure not only to maximize revenue, but also to respond rapidly to social demand in an entrepreneurial way. As such, managers must continuously scan and adjust their existing strategic orientations to adapt to these current business environments. Our findings suggest that managers can enhance their product innovation performance by taking necessary steps that can enhance eSEO. These steps can be: (1) innovativeness, (2) proactiveness, (3) risk-taking, (4) social mission orientation, (5) sustainability orientation, and (6) effectual orientation, as with recent studies on individual EO (e.g., Covin et al., 2020; Gawke et al., 2019).



Considering the specifics of operating in social entrepreneurship settings, a social entrepreneurship firm needs to do more to achieve desired innovation performance. First, it needs to closely observe what their employees have been doing with regard to fulfilling the social mission because this dimension (social mission orientation) is considered an essential characteristic of social entrepreneurs (Dwivedi and Weerawardena, 2018; Gamble and Moroz, 2014), which is critical to generating superior innovation performance (Lubberink et al., 2018). Second, as pursuit of sustainability is a common characteristic of social entrepreneurship firms (Hossain et al., 2017), these firms should ensure their employees devote a sufficient amount of resources to cultivate their sustainability orientation and integrate it in the NPD process, which eventually materializes into product innovation benefits (Du et al., 2016). Third, since employees' effective implementation of social entrepreneurship tasks assigned to them is key to the subsequent performance of the firm, social entrepreneurship firms must inject the spirit of effectual orientation not only at the meso-level but also the micro-level (Gupta et al., 2020). As such, managers should encourage employees to use effectual orientation in guiding their decision-making. This way the social entrepreneurial activities carried out by the employees are certain to contribute in an optimal or near optimal manner to a firm's performance including production innovation performance (Szambelan et al., 2020). All in all, by adhering to all of the above six dimensions of eSEO, social entrepreneurship firms not only can enhance their social value and fulfill their social mission (Wales et al., 2020; Covin and Wales, 2019; Kraus et al., 2017), but also improve their innovation performance as found in the statistical results of this study.

### *6.3. Limitations and future research*

This study has some limitations that provide suggestions for future research. First, this study finds that TMT decision speed has a negative impact on the relationship between eSEO and product innovation performance. However, due to complex dimensions of eSEO, the

moderating effect of TMT decision speed may follow an inverted U-shaped curve under certain dimensions. Specifically, the more rapidly a decision is made, the better, but above a certain threshold, a continual increase in speed leads to inferior product innovation performance. Future researchers could explore this potential phenomenon further. In addition, extant research (e.g., Hambrick et al., 2015) describes several attributes of decision-making process (Bromiley and Rau, 2016), such as TMT decision comprehensiveness or TMT decision quality, which could be examined in future research.

Second, while several factors in the current study have been controlled in product innovation performance, other influential variables have been found in previous studies, such as R&D intensity and industry maturity. This may limit the application of TMT decision creativity and TMT decision speed to product innovation performance. Future study could consider these variables to verify our theoretical model.

Third, social enterprises are situated between traditional non-profit and traditional enterprises (Doherty et al., 2014) or considered hybrid organizations (Bacq and Janssen, 2011). The point is that social enterprises need to make a surplus to achieve their social mission in almost every industry. Thus, this study is limited to the social enterprises in which we collected data from technology firms. While we controlled for a number of important sources of firm heterogeneity, future research could extend our research model to other specific industries, such as service.

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