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Analyzing entrepreneurial orientation impact on start-up success with support service as moderator: A PLS-SEM approach

Daisy Mui Hung Kee, Nurulhasanah Abdul Rahman

School of Management, Universiti Sains Malaysia, Penang, Malaysia

corresponding e-mail: [hasanah\(dot\)rahman89\[at\]yahoo\(dot\)com](mailto:hasanah(dot)rahman89[at]yahoo(dot)com)

address: School of Management, Universiti Sains Malaysia, 11800 USM, Penang, Malaysia

Abstract: This paper examines the Start-up Success of Spin-off and Symbiosis Company (SSC) using Entrepreneurial Orientation (EO) and Support Service. Notwithstanding the extensive study on start-up firms and Support Service, there is a missing link on how EO impacts Start-up Success, particularly in Malaysia case study. To address such limitation, this paper proposed that Start-up Success of SSC will be improved by EO and Support Service. A total of 120 SSC in Peninsular Malaysia were employed as respondents and data were analyzed using PLS-SEM analysis. The empirical results showed that EO is positively related to Start-up Success and intensify the potentials of Support Service as a moderator. As most of the related literature highlights the importance of Support Service, this study brings new perspectives on how EO is also significant in improving the Start-up Success. In addition, the critical discussion provided in this paper is expected to contribute to the body of knowledge on entrepreneurship studies and act as a future reference on the EO, support service, and SSC.

JEL Classifications: L26, M13

Keywords: EO, support service, start-up success, innovative enterprise, technopreneurs, Malaysia

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1. Introduction

Over the years, the expansion of Small and Medium Enterprise (SME) has shown remarkable contributions to the economic landscape worldwide. The SME is also prevalent as a significant contributor to the Gross Domestic Product (GDP), job creation, and possibly improving the international trade (Kushnir, Mirmulstein, & Ramalho, 2010; Czemiel-Grzybowska, 2013; Hilmersson & Johanson, 2016). Nevertheless, the SME performance is not as enlightening as expected especially in terms of the start-up success. According to Arasti, Zandi, and Bahmani (2014), the failure rate among start-ups within the first five years is more than 50 percent. The business failure corresponds to the situation where the business is financially unviable or the assets of the firm are not worth further harvesting (Jenkins & McKelvie, 2016). Thus, by referring to the contemporary concept of business success, many scholars attempt to relate Entrepreneurial Orientation (EO) as among the predictors of business success and considered EO as an important set of skills required by firm regardless of its size, sectors, and industries (Amin, 2015; Floren, Rundquist, & Fischer, 2016; Roundy, 2016). Despite the fact that EO denotes a highly significant relationship towards success and higher performance, the impact of EO on start-up firms appears to be limited and deemed as an under-researched area. Out of a considerable number of publications in the literature, the pool of resources on EO and start-up success is still at the infancy level. In fact, the role of support services in influencing such relationship is also very scarce.

At present, the establishment of Spin-off and Symbiosis Company (SSC) has fascinated researchers with some publications on how new ventures impact business performance (Roundy, 2016). SSC is also referred as the technopreneurs and was initiated by the Malaysian government as a collaborative effort between university and industry (Lim, Amat-Senin & Low, 2016). According to Bocken (2015), SSC is considered as new ventures or start-up firms which rely on other organizations regarding skills, resources, and business strategies. Nevertheless, SSC is considered as a new topic in entrepreneurship studies and calls for more research to be done in this area.

Entrepreneurial Ecosystem evolves skills, resources, and capabilities of start-up firms on how to be entrepreneurial at the organizational level (Roundy, 2016). The original domains of Entrepreneurial Ecosystem are policy, finance, culture, supports, human capital, and markets (Isenberg, 2016). Roundy (2016) noted that Entrepreneurial Ecosystem could be analyzed using complexity theory which explains on how firms operate within micro-level interactions such as among entrepreneurs. For instance, existing entrepreneur informs the new entrepreneur about the skills needed to succeed in the early years; reflect the foundation of Entrepreneurial Ecosystem. Indeed, Auerwald (2015) has argued that Entrepreneurial Ecosystem has equal leverage in influencing start-up performance and therefore, could be treated as a focus of future research. In particular, this paper aims to evaluate the Entrepreneurial Ecosystem using fractions of the original domain through markets and support for entrepreneurship. With this connection, Entrepreneurial Orientation (EO) is best to describe Entrepreneurial Ecosystem as a proxy in explaining how the entrepreneurs co-evolve their roles and potentials to achieve business goals (Roundy, 2016) and reflect the market domain. In addition, the moderator of this study reflects another domain which is support for entrepreneurship.

The remainder of the paper proceeds as follows. First, as a basis for hypotheses testing, the literature reviews are prepared. Next, the research methodology and findings are presented in the succeeding sections. Also, the practical implications for practitioners are discussed, and finally, directions for future research are proposed.

2. Literature review

This paper aims to examine SSC and EO in managing Start-up Success using Support Service as a moderator. Testing these relationships in one model, place this study as among the pioneer by comparing the moderator effect on Start-up Success.

2.1. Start-up success

Hopp and Stephan (2012) focus on entrepreneurial human capital and culture as the antecedent of start-up success and defined success as the ability of a firm to generate positive cash-flows with sustainable firm operations. On the other hand, Janakova (2015) indicated that pre-condition of start-up success is the financing phase. Janakova highlights that increasing the profit/returns and minimizing the risks are the main measurement of start-up success. Previous scholars stressed that business success is best to be measured using financial indicators (Islam, Khan, Obaidullah, & Alam, 2011; Talaja, 2013; Omri, Frikha, & Bouraoui, 2015). However, this measurement is considered as biased and unsuitable to be used for the start-up firms as these firms are new to the market. They do not possess necessary information on profitability, sales growth, market share, and cash flow. All in all, even though there are numerous ways that past scholars defined success, financial and non-financial attributes are the main dimensions to measure success (Zulkifli & Rosli, 2013; Mooradian, Matzler, Uzelac, & Bauer, 2016). This study employs both financial and non-financial measurement to evaluate the start-up success.

2.2. Entrepreneurial orientation (EO)

EO has been anticipated as the strategic orientation of a business to mold specific entrepreneurial aspects of decision-making styles, practices, and methods to facilitate firm performance (Floren et al., 2016). A prior study by Arshad, Rasli, Arshad, and Zain (2014) stated that EO is significantly influenced business performance with innovativeness as the strongest predictor. Besides, Amin (2015) found that EO leads to higher performance as EO dimensions drive business owners to be more alert with their surrounding and promptly adapt to the market changes. The author revealed that a firm with a high degree of proactiveness provides competitive advantage from the competitors. The start-up firms are required to possess necessary skills such as innovativeness, proactiveness, and risk-taking to be exceptionally equipped to deal with market uncertainty (Adomako, Narteh, Danquah, & Analoui, 2016). The original measurements were developed by Miller (1983), and it was further developed into five dimensions with additional dimensions of autonomy and competitive aggressiveness on the firm level (Lumpkin & Dess, 2001).

Following definition from Wiklund and Shepherd (2005), innovativeness is the tendency and the behavior that contribute to innovation activities by supporting innovative ideas, experimentation, and creative processes. Meanwhile, proactiveness refers to the firm's ability to stay ahead of competitors in predicting future changes (Gunawan, Jacob, & Duysters, 2016), while risk-taking involves the act of willingness to undertake risky business decision (Rauch, Wiklund, Lumpkin, & Frese, 2009). Zehir, Gurol, Karaboga, & Kole (2016) defined competitive aggressiveness as the firms' competitive actions through differentiation of products/services to exceed their rivals, whereas autonomy reflects the independent action by the owner or the firms to encourage employees to perform well on behalf of the company.

2.3. EO and start-up success

EO is deemed as a Start-up Success Accelerator as firms with strong EO are capable of outperforming other firms and surviving through their critical early years (Zulkifli & Rosli, 2013; Adomako et al., 2016). These new ventures that can sustain or enhance their EO over a period may achieve better results than their competitors and experience a higher growth rate (Bachmann, Engelen, & Schwens, 2016). There is an opportunity to focus on EO in start-up firms as its components drive technopreneurs to be more prepared through entrepreneurial behavior such as innovativeness, proactiveness, risk-taking, autonomy, and competitive aggressiveness (Miller, 1983; Lumpkin & Dess, 2001). These dynamic orientations are helpful in preparing start-ups to establish the business model, strategy and determine the product/service of a firm. For instance, innovativeness reflects the capability to innovate and lead the firm towards business success (Sara & Jackson, 2010). The innovation is not only focusing on the product development or differentiation but also concentrates on the product delivery. Consistently, Tajala (2013) noted that risk-taking in business is proven to improve higher performance. This finding indicated that the business owners/managers are determined to make a challenging decision and engage responsively in the customers' relationship.

Despite the positive relationship between EO and performance, there is a mass of literature failed to provide evidence in supporting the direct relationship. Therefore, some authors proposed that the EO-Performance link is indirect and a third variable is needed to explore the nature of this relationship further. Moving from the mixed findings, past literature had investigated the effects of mediating or moderating variables (Amin, 2015; Zehir, Can, & Karaboga, 2015) to shed light on the relationship between EO and performance. Motivating by this idea, this paper acknowledges the importance of EO as an enabler to Start-up Success and the following hypothesis is proposed:

H1: EO is positively related to start-up success.

2.3. Moderating factor: Support service

This paper seeks to explain the extent to which Support Service act as a moderator between Entrepreneurial Ecosystem and Start-up Success in a dynamic environment. In the context of entrepreneurial economy, Support Service is very critical to act as a bolster to emphasize the Start-up Success. In this study, Support Services were divided into four components namely; Technology-Related Services (TRS), Marketing-Related Services (MRS), Financial-Related Services (FRS), and Soft-Related Services (SRS).

- a. *Technology-related services (TRS)*: TRS are regarded as technological consultancy, the inclusion of execution and management of Research and Development (R&D), and the availability of technological transfer across industries for start-ups (Williams, 2013). These services also include further assistance in protecting the technological infrastructures and the encouragement to utilize technology in a business operation which eventually could increase the innovative behavior among technopreneurs. Bocken (2015) emphasized that TRS and innovation in business are viewed as a concept of key enabler to success. Janakova (2015) also noted that firms in Europe grow two to three times faster when they embrace digital technologies which reflect the advantages of access to TRS. Similarly, Lofsten (2016) indicated that when technopreneurs operate in a market of technology, they focus on integrating technology into an existing value chain which often involves collaboration with existing industry players to allow the exchange of expertise across industries. This action may improve the start-up resilience and secure their position in the hostile business environment. Thus, the following hypothesis is proposed:

H2: The relationship between EO and start-up success would be stronger when start-up firms received high TRS.

- b. *Marketing-related services (MRS)*: Market-related services consist of assistance in the search for customers and suppliers, marketing of products/services and technologies, as well as assistance with product/service commercialization (Didonet, Simmons, Diaz-Villavicencio & Palmer, 2016). Jones and Parry (2011) argued that start-up firms tend to rely on technical specialist rather than marketing experts on product/service marketing purposes, which explain the failure to survive at their early critical years. In fact, literature revealed that the main challenges for technopreneurs are to acquire business assets, build market chains and set up an established position in the market (Kamal, Zawawi & Abdullah, 2016). Besides, Rudawska (2010) asserts that market synergy is considered as the competitive advantage and act as the benchmark for customer satisfaction. Kamal et al. (2016) also noted that when firms employ MRS and collaborate with the necessary parties; then, such cooperation reinforces the market power and softens the market competition. Therefore, by considering the reliance of resources among technopreneurs, MRS possibly improves the firm competition at the market level and facilitate them towards improving Start-up Success. With that, the following hypothesis is postulated:

H3: The relationship between EO and start-up success would be stronger when start-up firms received high MRS.

- c. *Financial-related services (FRS)*: Financial-related support services are directly connected with the capital acquisition and choice of financing sources such as through loans, grants, tax relief, and so forth (Jones & Parry, 2011). Despite that there are numerous financing schemes for small firms, Czemieli-Grzybowska (2013) revealed that the accessibility to FRS is the main issue as the authority; especially the banks have rigid requirements on loans and micro-credits. The statistics from International Finance Corporation (2010) showed that very few small firms obtained loans from banks and explained the reason of insufficient funds (see Czemieli-Grzybowska, 2013). Also, previous studies revealed three main challenges to start-up firms which are access to talent, excessive bureaucracy, and limited early stage financial capital (Isenberg, 2014).

Consistent with Jedrzejczyk and Kuceba (2015), the authors conclude that FRS is considered as the most important area of support in the form of subsidies and customized loans for the core business activity. At an early stage of SSC, product differentiation is very crucial to distinguish a business from another business. Adequate financial support may facilitate this concern by targeting new markets and producing a new range of products/services to remain relevant in the marketplace (Jones & Parry, 2011; Czemieli-Grzybowska, 2013). Indeed, financial support was regarded as the ultimate motivation or driving force of Start-up Success as FRS is intended to cover the costs of product/service development, marketing activities and business investments especially for the early stage of start-up firms. Therefore, the following hypothesis is presented:

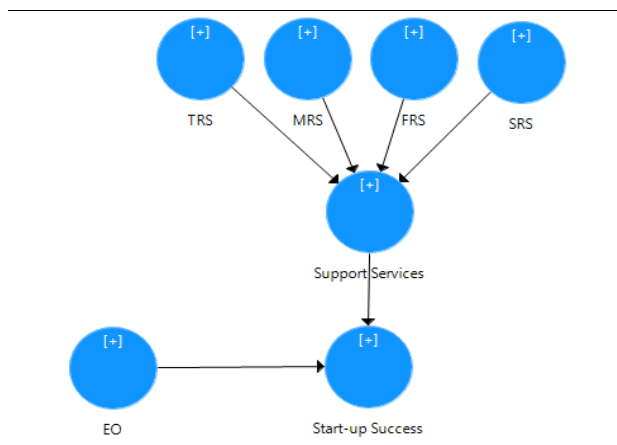
H4: The relationship between EO and start-up success would be stronger when start-up firms received high FRS.

- d. *Soft-related services (SRS):* Soft services refer to the general type of support such as through entrepreneurial courses, seminars, modules, and professional consultation. These services typically assist technopreneurs in developing a business network and enhance their know-how in dealing with market uncertainty (Jarle Gressgard, Amundsen, Merethe Aasen, & Hansen, 2014). A study by Chrisman and McMullan (2004) revealed that start-up firms with adequate SRS had a higher survival rate and better growth than firms that had not used this service. Previous literature also suggested that support agencies offer tacit and explicit knowledge that technopreneurs could use to create competitive advantage, which eventually explaining the positive impact on the start-up performance (Badrinas & Vila, 2015). For that reason, technopreneurs require necessary soft support services to broaden their horizon with non-technological skills and knowledge as to build collaborative networking with external parties. By having this type of Support Service, the firms are expected to become more independent and equipped to improve the Start-up Success. Thus, the following hypothesis is suggested:

H5: The relationship between EO and start-up success would be stronger when start-up firms received high SRS.

Based on the literature review, the research model was developed as presented in Figure 1.

FIGURE 1. RESEARCH FRAMEWORK



3. Sample

This study uses primary data collected from technopreneurs who are the owner of 120 SSC from all sectors in Malaysia through questionnaires. Respondents in this study consist of SSC owner-managers, who are currently responsible for day-to-day operations, bottom-line decisions, and directions of their business. The respondents were identified from the Malaysian Technology Development Corporation (MTDC) and Research Universities (RU) such as USM, UM, UTM, UKM and UPM. An official email request was forwarded to get copy of dataset for SSC to establish a sampling frame. A total of 120 questionnaires were distributed with 79 usable questionnaire were received. Thus, the response rate is 65.8% and it is considered as high response for management type of research.

4. Measures

The measurements used were based on previous studies in Entrepreneurial Ecosystem, Support Service, and Start-up Success. Entrepreneurial Orientation was used as a proxy to represent Entrepreneurial Ecosystem and are measured using 13 items (Fellnhofer, Puumalainen, & Sjogren, 2016), while Support Service was measured using seven items for TRS, five items for MRS, nine items for FRS, and 11 items for SRS (Knockaert, Vandenbroucke & Huyghe, 2012). The components of Start-up Success were measured using 18 items adapted from a study by Zhou and de Wit (2009). The questionnaires were evaluated on a seven-point Likert scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree. The assessment of the internal consistency was validated to be acceptable with Cronbach’s alpha ranging from $\alpha = 0.92$ to 0.96 . For instance, the Cronbach’s value for MRS is 0.92 , followed by EO ($\alpha = 0.93$), Start-up Success ($\alpha = 0.94$), FRS ($\alpha = 0.95$), TRS ($\alpha = 0.96$), and SRS ($\alpha = 0.96$) with the highest Cronbach’s value.

5. Analysis and results

Descriptive statistics and characteristics of the sample are shown in Table 1. From the table, the majority of the respondents are male (51.8%) and more than half of the respondents aged between 20 to 35 years old (65.8%). About 48 percent of the SSC owner-managers hold Bachelor’s degree and 93.7 percent of them employed less than 30 employees who place them as small firms (refer to Table 1).

TABLE 1. DESCRIPTIVE STATISTICS

VARIABLES		FREQUENCY	PERCENTAGE
Gender	Male	41	51.8
	Female	38	48.1
Age	20 - 35	52	65.8
	36 - 50	24	30.4
	55 and above	3	3.8
Level of education	Diploma	3	3.8
	Bachelor’s Degree	38	48.1
	Master’s Degree	21	26.6
	PhD	17	21.5
Number of employees	Less than 5	0	0
	6 - 15	0	0
	16 - 30	74	93.7
	More than 30	5	6.3

The profile of respondents, according to the type of industries showed that 50.6 percent is services, 27.8 percent is manufacturing, and 6.3 percent is agriculture (refer to Table 2).

TABLE 2. CHARACTERISTICS OF SAMPLE

VARIABLES		FREQUENCY	PERCENTAGE
Type of industries	Services	40	50.6
	Manufacturing	22	27.8
	Agriculture	5	6.3
	Others	0	0

In analyzing the research model, PLS-SEM analysis technique was employed using the SmartPLS 3.2.6 software. The reliability and validity of the instruments are tested using Composite Reliability (CR), Average Variance Extracted (AVE) and Discriminant Validity (Hair, Hult, Ringle, & Sarstedt, 2014). These results are provided in Table 3 on Measurement Model and Table 4 for Discriminant Validity. Another test to conduct is the Structural Model which showed the relationships that were hypothesized (Ringle, Wende & Becker, 2015). Hair et al. (2014) recommend looking at the R², effect sizes (f^2) and the predictive relevance (Q^2) to assess the Structural Model.

TABLE 3. MEASUREMENT MODEL.

VARIABLES	CR	AVE
EO	0.944	0.565
Support services	0.986	0.581
Start-up success	0.948	0.626

There are two items were deleted due to low loadings which are TRS1 and TRS5. Thus, the results of CR and AVE are improved. Next, evaluating the discriminant validity results, the outer loadings on correlated constructs are greater than all of its loadings on other constructs which validate the discriminant validity test.

TABLE 4. DISCRIMINANT VALIDITY RESULTS

	1	2	3	4	5	6	7
EO	0.752						
FRS	0.406	0.860					
MRS	0.257	0.685	0.900				
SRS	0.333	0.832	0.706	0.851			
Start-up success	0.596	0.265	0.304	0.103	0.791		
Support services	0.382	0.753	0.843	0.812	0.257	0.863	
TRS	0.257	0.564	0.798	0.513	0.283	0.708	0.808

The Structural Model confirmed the relationship between Entrepreneurial Ecosystem and Start-up Success with Support Services as moderator. The R² value was 0.325 suggesting

that 32.5% of the variance in Start-up Success could be explained by EO. There was a positive relationship ($\beta = 0.597$, $p < .01$) between EO and Start-up Success. Thus, supported the H1.

To examine the moderating role of Support Services through TRS, MRS, FRS, and SRS between EO and Start-up Success, the interaction effect was calculated (Henseler & Chin, 2010). The interaction/moderating effect of Support Services on Start-up Success is statistically significant as provided in Figure 2 ($\beta = 0.546$, $p < .1$). In addition, when the interaction effect was added into the model, the R^2 was increased to 0.360, giving an R^2 increase by 3.5%. The sum of interaction term size ($0.597 + 0.042 = 0.639$) and deemed as high value (Hair et al., 2014), thus explains the moderation effect of Support Services to improve Start-up Success. Thus, H2 - H5 were also supported.

FIGURE 2. INTERACTION EFFECT

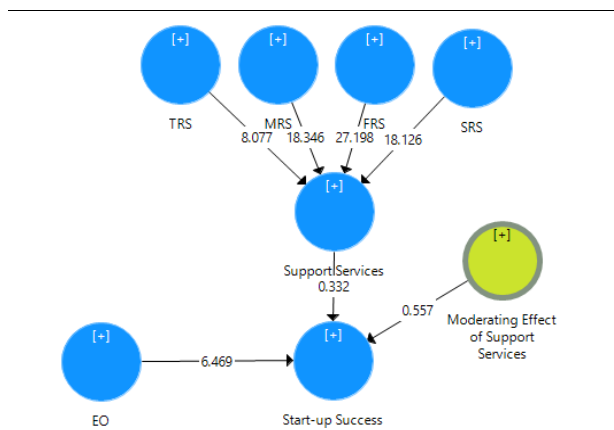
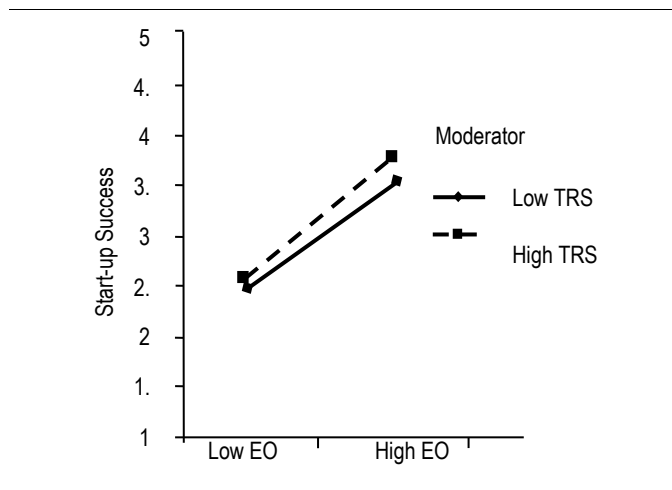


FIGURE 3. INTERACTION PLOT TRS



By comparing the constructs of Support Services: FRS has the highest moderation effect ($\beta = 27.198$), followed by MRS ($\beta = 18.346$), SRS ($\beta = 18.126$) and TRS ($\beta = 8.077$). The effect size (f^2) was also calculated to measure the impact of EO and Support Services on Start-up Success. The f^2 of the interaction effect is 0.05 and regarded as a small effect (Hair et al., 2014). The Q^2 value is 0.195 suggesting that the model has medium predictive relevance. In short, the PLS-SEM analysis revealed that the relationship between EO and Start-up Success was stronger when moderated by Support Service.

FIGURE 4. INTERACTION PLOT MRS

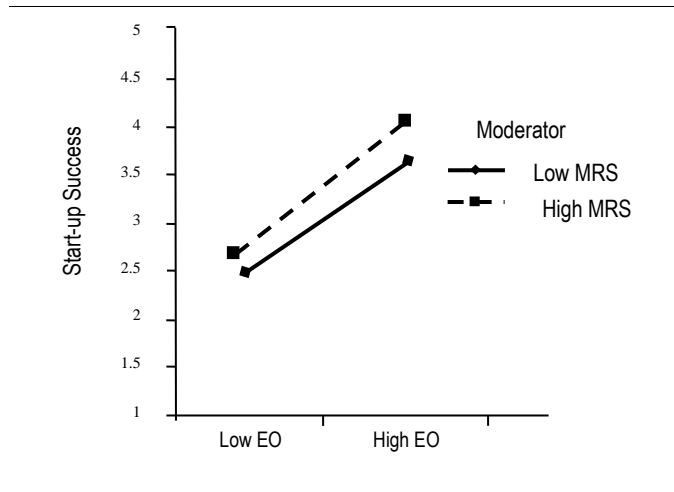


FIGURE 5. INTERACTION PLOT FRS

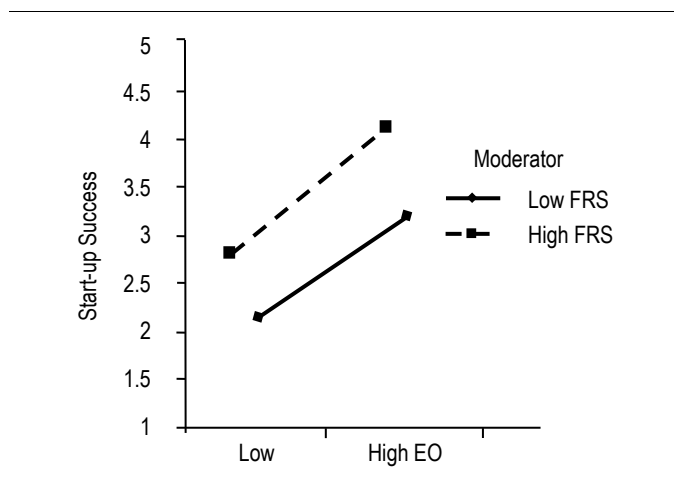
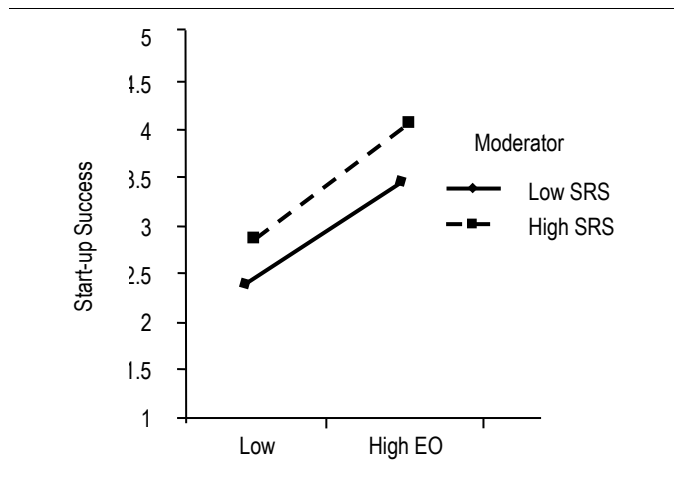


FIGURE 6. INTERACTION PLOT SRS



The coefficients obtained from the PLS Algorithm was used in order to plot the interaction between EO, Support Service, and Start-up Success. The interest is placed on the gradient of the slopes. The slope which has the steeper gradient indicates that the positive relationship is indeed stronger when the moderator received higher value. Thus, these results support the hypothesized relationship as proposed earlier. By referring to the Figure 3, the interaction plot illustrate the relationship between EO and FRS (EO*FRS) with the dotted line labeled as high FRS. It has steeper positive gradient and indicate that the relationship between EO and Start-up Success is stronger when more or high FRS was received. The other support services also produced similar results (refer to Figures 4-6) which are positive gradients that reflect the stronger relationship between EO and Start-up Success when more or high support services (MRS, SRS, and TRS) were received.

6. Discussion and conclusions

Findings from this study discovered that EO practices by SSC play a critical role in determining the Start-up Success. These results contribute to the literature of entrepreneurship studies by highlighting the impact of EO on Start-up Success as well as to shed light on how Support Service had successfully moderate such relationship. Indeed, this paper is the pioneer to study the Support Services as a moderator through TRS, MRS, FRS, and SRS between EO and Start-up Success.

The role of Support Service as a moderator is also enlightening. Even though EO is not a new concept in entrepreneurship the owner-managers are not aware of the magnitude of change that it could make. For instance, SSC owner-managers operate their business according to the conventional way of doing business which is abiding demand and supply rules. However, as narrated above, EO is capable of bringing out the best of entrepreneurs as it acts as the platform for them to be entrepreneurially innovative, proactive, risk-taking, autonomous and competitive aggressive. Also, by employing EO, SSC may not only act on demand and supply, but they are capable of spawning opportunity and creating demand in the market.

As predicted earlier, FRS has the highest moderation impact because financial support is the most important leverage in business (Czemieli-Grzybowska, 2013; Roundy, 2016). This finding is aligned with Ahmad and Seet (2009) that revealed financial challenges are the

primary reason that caused business failure. Thus, by providing adequate support on FRS may improve Start-up Success and at the same time secure start-up survival. Interestingly, MRS was recorded as the second component of Support Service that highly moderates the impact of EO on Start-up Success as compared to SRS and TRS. Known to all that technology and marketing strategy are the major assets of a business to remain relevant in this globalized era (Rahimic & Ustovic, 2011; Bocken, 2015). However, the empirical evidence from this study indicated that technology alone is not the only key to improving Start-up Success. In the same way, strong marketing campaign per se does not necessarily enhance the Start-up Success. Nevertheless, these two support systems are complementary to each other and regarded as a balanced concept with additional support of FRS and SRS. Together, these Support Services are essential to equip start-up firms with a competitive advantage and reinforce the degree of Start-up Success.

The major implication of this paper is to emphasize the role of industry, as a supplementary support in promoting and providing Support Services to the SSC. This study focused on SSC because the support needed is different as compared to the other businesses in a stable market and industry (Benghozi & Salvador, 2014; Bocken, 2015). Future research needs to be directed to develop the model on Support Services further to ensure its potentials are well-utilized. In fact, policy-makers may consider these findings especially on financial and soft-related support services such as flexible micro-credit, consultations, courses and technological expertise. Further, this study complements previous literature by considering all support service from financial to technological support.

Above all, this paper has its limitations as this study is cross-sectional in nature. Thus, a longitudinal study will help to establish the extent to which the hypothesized relationships might be causal. Next, a larger sample size would provide a higher degree of predictive modeling and statistical significance. Also, comparative studies across sectors and countries are needed to understand further the variables used in this study. To sum up, this study has found that EO is statistically related to Start-up Success and the relationship is moderated by the role of Support Service. It is advisable for the SSC owners to fully utilize the Support Service received either from the government or non-government body as a competitive advantage to survive. Integrated synergies from the EO and Support Service may support emerging new ventures development as a roadmap to improve Start-up Success.

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