



## EXPLORATORY FACTOR ANALYSIS OF ENTREPRENEURIAL ORIENTATION IN THE CONTEXT OF BANGLADESHI SMALL AND MEDIUM ENTERPRISES (SMES)

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### Abstract:

Generally, Exploratory Factor Analysis (EFA) is required to expose the appropriate items for using in the research instrument. Thus, this study takes steps to develop and validate instrument of Entrepreneurial Orientation (EO) construct through EFA particularly in the context of Small and Medium Enterprises (SMEs) in Bangladesh. This study is exercised EFA as it is far different from previous studies in terms of socio-economic, racial and cultural status and some items of the previous studies are no longer suitable for current research. More importantly, maximum number of previous studies examined only innovativeness, pro-activeness, and risk-taking as the dimensions of EO. However, quite a few researchers concentrating on other substantial attributes of EO. Hence, there is still no common agreement among researchers as the number of dimensions as well as items should be employed to measure EO. So, this study has examined innovativeness, pro-activeness, risk-taking, and resource-leveraging as the core dimensions to measure EO and also presenting an instrument of EO. This study adopted a cross-sectional research design, while quantitative data was collected from 384 SMEs across eight states in Bangladesh, using structured survey. Based on the reliability testing, this study finalized the instrument to twelve (12) items yielding three (3) dimensions, i.e., innovativeness (3 items), pro-activeness (3 items)

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risk-taking (3 items), and resource-leveraging (3 items). In this regard, researchers calculated the value of internal reliability (i.e., Cronbach Alpha value) for the current EO instrument. This study explained in detail the procedures for carrying out EFA analysis for EO construct. Future researchers could further extend the instrument presented in this study by cross-examining across the underdeveloped, developing and developed countries.

**Keywords:** exploratory factor analysis (EFA), entrepreneurial orientation (EO), small and medium enterprises (SMES), developing countries, developed countries

## 1. Introduction

Entrepreneurial activity denotes the detection of both potential and available opportunities and subsequently initiating new economic functions by forming new ventures (Reynolds et al., 2005). It is to be a popular choice of employment, particularly among developing nations and it acts as the engine of economic dynamism, particularly in such emerging economies (Al-Mamun et al., 2016). On the other hand, entrepreneurial orientation helps firm to be ahead of its competitors (Wiklund & Shepherd, 2003) and it supports firm's top management in describing the determination of organization, in nourishing the firm's vision and thereby in expressing the styles to gain competitive advantage. Even though it is accepted that entrepreneurial orientation and its attributes have been assessed to some extent in several previous studies (Levenburg & Schwarz, 2008; Raposo et al., 2008), however, the literature review revealed that there is still no common agreement among the researchers as the number of dimensions as well as items should be employed to measure EO (Bolton & Lane, 2012). Additionally, the existing studies, topically have focused only on certain components of EO, such as innovativeness, and risk-taking whereas other significant dimensions of EO construct, including pro-activeness, resource-leveraging etc., have been mostly neglected (Bolton & Lane, 2012). Therefore, this study has scrutinized innovativeness, pro-activeness, risk-taking, and resource-leveraging as the core dimensions to measure EO and also presenting an instrument of EO particularly in the context of Small and Medium Enterprises (SMEs) in Bangladesh. Moreover, the validity and reliability of questionnaire's items can be debated sometimes if the technique is not appropriate for developing and evaluating the instrument. Therefore, to gain the validity, reliability and to obtain the truly feasible items of measuring instrument, the researchers need to apply first the Exploratory Factor Analysis (EFA) process (Hoque & Awang, 2016a, Hoque & Awang, 2016b, Hoque & Awang, 2016c). This research has also explained the methods of obtaining validity and reliability of questionnaire's items by using EFA for measurement of EO construct.

## **2. Literature Review**

### **2.1 Study Context**

Small and medium enterprises (SMEs) represent 99.85% of the total business entities in Bangladesh, totaling to six million active establishments, and they are playing as the backbone of Bangladeshi economy (Hoque et al., 2018d; Hoque et al., 2017d; Hoque & Awang, 2016a, Hoque & Awang, 2016b, Hoque & Awang, 2016c). Perhaps it is why, the Government of Bangladesh (GOB) works closely with developmental organizations in order to improve the socio-economic status, predominantly by framing core policies as required for enhancing economic growth and minimizing inequality in the society via entrepreneurship development programs (Hoque & Awang, 2016a). Furthermore, socio-economic developmental organizations in Bangladesh also focus on boosting entrepreneurial activities through establishing SMEs (Siddiqui & Hoque, 2018; Hoque et al., 2016; Hoque & Awang, 2016b). As SMEs play such significant roles in the economy and reflect are a prime concern for the government and developmental organizations, it is therefore that this study focused on SMEs in Bangladesh.

### **2.2 Background of Entrepreneurial Orientation**

Van de Ven & Poole (1995) mentioned in their study that Child (1972) forwarded the origins of entrepreneurial orientation from a strategic-choice perspective asserting that new-entry opportunities could be effectively undertaken by purposeful enactment. Later, Lumpkin & Dess (1996) further articulated that EO could be defined as processing, practicing, and decision-making actions that lead to such new entries. According to Wiklund & Shepherd (2003), entrepreneurial orientation obtained its roots from the strategy making process related literature and research based on early indications from firms' internal and external environments suggested that EO can expedite a firm's action and thereby aid them to be ahead of the competition. More often, EO is regarded as a higher order construct, and each dimension of EO construct (i.e. pro-activeness, innovativeness, risk-taking, and resource-leveraging) may have a different relation to the performance variables (Davari & Farokhmanesh, 2017; Zeebaree & Siron, 2017). Thus, EO as one of the important resources that influence SME's performance can be seen as an explicit way by which SMEs relate to opportunities that are available in the environment.

### **2.3 Dimensions of Entrepreneurial Orientation (EO)**

According to Beattie (2016) and Richard et al. (2004), EO has been conceptualized in existing literature as having three to five dimensions, which may vary independently. However, three dimensions of EO have been commonly used in the literature: innovativeness, pro-activeness, and risk taking but there exists one more component that is resource-leveraging which has been identified based on early theories (i.e. Resource Based Theory and Resource Advance Theory) and have been considered as additional and significant component to the EO construct. Hence, based on current

literature, this study emphasizes the following four EO dimensions in order to develop a valid measure of the EO construct: innovativeness, pro-activeness, risk-taking, and resource-leveraging.

#### **2.4 Innovativeness**

Schumpeter (1942) was pioneer to point out the importance of innovation in the entrepreneurial process. He mentioned innovativeness is about pursuing and giving support to novelty, creative processes and the development of new ideas through experimentation. According to Mahmood & Hanafi (2013) innovativeness is a significant factor to characterize entrepreneurship which could be described as the efforts to discover new opportunities and which comprise experimentation and creativity that results in new products and services, or and enhanced technical traits of existing services and products. Moreover, according to Hult et al. (2004), innovativeness is vital and since entrepreneurship emerges to be a significant orientation that managers need to foster, thus creativity and innovativeness among entrepreneurs are considered an important driver of entrepreneurial orientation.

#### **2.5 Pro-activeness**

The second dimension of EO is pro-activeness. Rauch et al. (2009) and Lumpkin & Dess (2001) mentioned that pro-activeness is a concept which indicates opportunity-seeking, forward-looking viewpoints categorized by introducing of innovative products and services in advance of the competitors acting in expectation of potential demands. As a matter of fact, pro-activeness involves adopting initiatives to influence the environment for getting benefit, whereas responsiveness involves being accommodative towards competitors' challenges and therefore EO involves both pro-activeness in pursuing opportunities and the will to aggressively respond to competition (Venkatraman, 1989).

#### **2.6 Risk Taking**

The third dimension, risk-taking, is often used to involve undertaking bold activities of devoting valuable resources to ventures in changeable environments (Rauch et al., 2009). According to Lumpkin & Dess (1996), organizations with entrepreneurial orientation are frequently illustrated by risk-taking concept that is normally perceived as a trait frequently exercised to explain entrepreneurship. Whereas, Miller & Friesen (1982) mentioned that risk taking implies to the degree to which entrepreneurs are eager to make large resource commitments and it is widely used as a dimensions of EO. Thus, the risk-taking dimension of EO is to place the firm towards the absorption of uncertainty as opposed to a paralyzing fear of it.

#### **2.7 Resource-leveraging**

The fourth dimension of Entrepreneurial orientation is resource-leveraging. Leveraging means do more with less. Resource leveraging denotes analytically measuring the use of available resources, detecting the requirement for additional resources, or creating

new resources to address identified needs. Hence, entrepreneurs need to orient with resource-leveraging as resource-leveraging indicates capability to identify less-utilized resources, to see how the resources could be used in an innovative style or to convince those that control a resource to let them use it for doing more work with less. According to Nijssen (2017); Hoque & Awang (2016a); Morgan et al. (2004) resource-leveraging is internal and external resources using ability to achieve the vendors target. Achieving more with less resources through the skillful arrangement of resources is known as resource leveraging (Yang, 2018). One of the key challenges of SMEs is scarcity of resources (Hoque & Awang, 2016a, Hoque & Awang, 2016c). Thus, entrepreneurs can work out this problem by trying to achieve a maximum effect of scarce resources through resource-leveraging.

### 3. Research Methodology

This study used a cross-sectional research design to develop a valid and reliable measure for EO construct particularly in the context of SMEs in Bangladesh. The target population for this study is the SME owners in Bangladesh. This study then selected all eight states of Bangladesh i.e., Barishal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi, and Sylhet. A total of six million SMEs from the population across the eight states in Bangladesh. This study randomly selected 384 SME owners as the respondents and a total of 96 respondents from each location. Data was collected through a structured survey questionnaire.

#### 3.1 Research Instrument

For developing the EO measuring instrument, the study followed established procedures recommended by Churchill, (1979); and Gerbing & Anderson (1988) and which included conceptual definitions for innovativeness, pro-activeness, risk-taking, and resource-leverage. Subsequently, a structured questionnaire was developed for data collection to measure EO construct in this study which, consists of twelve (12) items measured using a seven-point interval scale. The seven-point interval scale was used to give respondents a wider response options that suit their utmost judgment (Hoque et al., 2017a; Hoque & Awang, 2016b). Table 1 provides the operational definitions along with the items developed for each of four dimensions of EO.

**Table 1:** Operational Definitions and Items of the four dimensions of EO construct

Operational Definition	Item Code	Statement
<b>Innovativeness</b> indicates the new ideas that are probable to convert into new products, services, processes, technology applications or markets.	EO1	Our firm is giving value to innovative strategies.
	EO2	Our firm marketed number of new lines of products and services.
	EO3	Our firm emphasizes on research and development.
Operational Definition	Item Code	Statement
<b>Pro-activeness</b> is a concept which indicates opportunity-seeking in	EO4	We initiate actions before than our competitors.
	EO5	We are the first to introduce new products and

advance of the competitors.		services.
	EO6	We always respond to unrelated opportunities
<b>Operational Definition</b>	<b>Item Code</b>	<b>Statement</b>
<b>Risk-taking</b> indicates willingness to chase opportunities that have a passable chance of yielding losses or gain.	EO7	We chose the projects according to the risk level.
	EO8	Our firm is brave enough to achieve goal.
	EO9	We always invest in unexplored business segment.
<b>Operational Definition</b>	<b>Item Code</b>	<b>Statement</b>
<b>Resource-leveraging</b> indicates the utilization of resources optimally, nonconventional way and the control of resources for getting better output.	EO10	In our business, we seldom ask employees to work extra hours.
	EO11	We would rather lease than purchase resources for our business.
	EO12	We have been able to leverage our resources by bartering.

### 3.2 Exploratory Factor Analysis (EFA)

EFA plays a vital role in this study to examine the interrelationships among the items of four dimensions of EO which are used to compress a group of items into a smaller set of combination factors with a minimum loss of information, and can be interpreted more easily and meaningfully (Field, 2006; Lewis-Beck, 1994; Duntmen, 1989) and hence laid the foundation of structural equation modelling (Hair et al., 2006).

The items used in this study have adapted from the instruments that have been developed by some previous researchers, as well as modifying some statements to suit the current research. According to Hoque et al. (2017c), Hoque & Awang (2016b), Hoque & Awang (2016c), Awang (2012) if a researcher adjusts the instruments previously set by the researchers and modifies statements appropriate to current research, then they must conduct the EFA procedure. This is because the current field of study may be different from previous studies, or the current research population is much different from previous studies in terms of socio-economic, racial and cultural status. Therefore, there may be some items that were previously built, and no longer appropriate for current research. Thus, researchers need to recalculate the value of internal reliability for the current instrument, the new Cronbach Alpha value (Hoque et al., 2018a, Hoque et al., 2018c, Hoque et al. 2017b; Hoque et al., 2017d; Hoque & Awang, 2016b; Awang, 2012).

In this study, Kiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were exercised to determine sampling adequacy that is suggested to check the case to variable ratio for the analysis being conducted. Bartlett's test of sphericity should be significant at ( $P < 0.05$ ) for the factor analysis to be appropriate (Hair et al., 2010). The KMO ranges from 0 to 1, but the general acceptable index is over 0.6 (Hoque & Awang, 2016b; Hoque & Awang, 2016c; Hoque et al., 2016). Total variance explained was also examined as an extraction process of items to reduce them into a manageable number before further analysis. In this process, items with eigenvalues exceeding 1.0 are extracted into different components (Awang, 2012; Pallant 2007). Additionally, rotated component matrix was examined and only items with a factor loading above 0.6 were

retained for further analysis (Awang, 2012). Nevertheless, in the process of the exploratory factor analysis, reliability analysis for the measuring items was conducted and only items with a Cronbach's Alpha of 0.7 and above were considered. Hair et al. (1998) and Awang (2012) suggested that a Cronbach's Alpha of 0.60 or higher provides a reliable measure of internal consistency, whereas a score of 0.70 reveals that the instrument possesses a high reliability standard (Hoque & Awang, 2019; Hoque et al. 2018b; Hoque et al. 2017c; Hoque & Awang, 2016b; Hoque et al., 2016; Awang, 2012).

#### 4. Results of Exploratory Factor Analysis

To determine the underlying dimensions and items of the EO construct, and also to validate the quality of the instrument, this study was conducted using three hundred eighty-four (384) respondents. There were four dimensions and 12 newly developed items for the EO construct in this study. Among 12 items of EO construct, 3 items belong to innovativeness dimension, 3 items belong to pro-activeness dimension, 3 items belong to risk-taking dimension, and 3 items belong to resource-leveraging dimension. The result of this study is therefore presented as follows:

**Table 2: KMO and Bartlett's Test for the items of EO Construct**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.716
	Approx. Chi-Square	1686.582
Bartlett's Test of Sphericity	df	66
	Sig.	.000

The general acceptance index of KMO is over 0.6. In Table 2 above, the KMO value of 0.716 is excellent as it exceeds the recommended value of 0.6. Additionally, the significance value of Bartlett's Test of Sphericity must be less than 0.05 for the factor analysis to be acceptable. Bartlett's Test significance value in Table 2 is 0.000 which meet the required significance value of less than 0.05 (Hoque et al., 2017b; Hoque & Awang, 2016b; Awang, 2012). Therefore, KMO value close to 1.0 and Bartlett's test significance value close to 0.0 suggest that data is adequate and appropriate to proceed further with the reduction procedure.

**Table 3: Total Variance Explained for EO construct**

Comp.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	<b>3.463</b>	28.856	28.856	3.463	28.856	28.856	2.760	22.999	<b>22.999</b>
2	<b>2.569</b>	21.411	50.267	2.569	21.411	50.267	2.716	22.633	<b>45.632</b>
3	<b>2.415</b>	20.128	70.396	2.415	20.128	70.396	2.643	22.028	<b>67.660</b>
4	<b>2.146</b>	17.885	88.281	2.146	17.885	88.281	2.474	20.621	<b>88.281</b>
5	.401	3.340	91.621						
6	.279	2.322	93.943						

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7	.223	1.860	95.803					
8	.176	1.464	97.267					
9	.124	1.036	98.303					
10	.080	.665	98.968					
11	.066	.550	99.518					
12	.058	.482	100.000					

Note: Principal Component Analysis as the extraction method

Total variance explained is also an extraction process of items to reduce them into a manageable number before further analysis. In this process, components with eigenvalues exceeding 1.0 are extracted into different components (Hoque & Awang, 2016b; Awang, 2012; Pallant, 2007). As can be seen in Table 3, the output reveals that the EFA has extracted four dimensions or components of EO construct with eigenvalue 3.463 for component number 1, 2.569 for component number 2, 2.415 for component number 3, and 2.146 for component number 4 respectively. This indicates that the items are grouped into four dimensions or components and would be considered for further analysis. The above table also shows that total variance explained is 88.281%.

**Table 4:** Rotated Component Matrix of EO construct

Item Code	Statement	Comp. 1	Comp. 2	Comp. 3	Comp. 4
EO1	Our firm is giving value to innovative strategies.	0.952			
EO2	Our firm marketed number of new lines of products and services.	0.971			
EO3	Our firm emphasizes on research and development.	0.933			
EO4	We initiate actions before than our competitors.		0.971		
EO5	We are the first to introduce new products and services.		0.921		
EO6	We always respond to unrelated opportunities		0.943		
EO7	We chose the projects according to the risk level.			0.958	
EO8	Our firm is brave enough to achieve goal.			0.892	
EO9	We always invest in unexplored business segment.			0.941	
EO10	In our business, we seldom ask employees to work extra hours.				0.856
EO11	We would rather lease than purchase resources for our business.				0.916
EO12	We have been able to leverage our resources by bartering.				0.946

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

The results in Table 4 show that the EFA procedure has extracted four components. Each component has certain number of items with their respective factor loading. In this study, only item having factor loading above 0.6 will be retained since it indicates the usefulness of items in measuring the particular construct (Hoque & Awang, 2019; Awang et al., 2017a; Awang et al., 2017b; Hoque & Awnag, 2016b; Awang, 2012). As a result, the above rotated component matrix shows that all 12 items having a factor loading above 0.6, and therefore all 12 items will be considered for further analysis under four dimensions or components of EO construct.



#### 4.1 Reliability Analysis for the Measuring Items of EO

Reliability analysis is a technique used to assess the measuring items under each construct and evaluate the degree to which they are error-free. The well-known value of Cronbach's Alpha is used to measure the reliability of items. Nevertheless, several authors differ on the acceptance value of Cronbach's Alpha as an indicator of internal consistency of items. Kerlinger and Lee (2000) suggest a Cronbach's Alpha of more than 0.5 for valid internal consistency reliability. Hoque & Awang (2016b), Uma Sekaran & Roger (2013), Awang (2012), Hair et al. (1998), Nunnally & Bernstein (1994), Nunnally (1978) suggested that a Cronbach's Alpha of 0.6 or higher provides a reliable measure of internal consistency, while a score of 0.70 reveals that the instrument possesses a high reliability standard (Hoque & Awang 2019; Hoque et al., 2018c) and is considered in this research.

**Table 5:** Reliability Statistics for the four Components of EO Construct

Component	Number of items 3 in a component	Cronbach's Alpha	Cronbach's Alpha based on standardized item
Component 1	3	0.952	0.952
Component 2	3	0.936	0.937
Component 3	3	0.927	0.927
Component 4	3	0.893	0.893

As shown in Table 5, there are 3 items of component 1 which is innovativeness, 3 items of component 2 which is pro-activeness, 3 items of component 3 which is risk-taking, and 3 items of component 4 which is resource-leveraging of EO construct in this study. The Cronbach's Alpha for each component is computed and possesses a high reliability standard as 0.952, 0.936, 0.927, and 0.893 for component 1, component 2, component 3, and component 4, respectively. Thus, the results show that all reliability measures for the four dimensions or components of EO construct has exceeded the required value of 0.6. As a result, the extracted dimensions or components with their respective items as shown in Table 5 are reliable and appropriate to measure the EO construct. Therefore, this study recommended to employ those items for measuring EO constructs in the future researches.

#### 5. Conclusion

The present study contributes to the measurement of EO construct, particularly in the context of SMEs in Bangladesh. The EFA results of the present study produced a structure which extracts four dimensions of EO. The dimensions of EO are innovativeness, pro-activeness, risk-taking, and resource-leveraging as well as those dimensions can be measured by 12 items developed in this study as all reliability measures for the four dimensions or components of EO construct has showed high Cronbach's Alpha value, meets Bartlett Test achievements (significant), KMO (> 0.6), factors loading exceeds the minimum threshold of 0.6. This reflects that the items not

set aside are applicable in this study (Awang et al., 2017a; Awang et al., 2017b; Hoque & Awang, 2016c; Awang, 2012). The rigorous scale development and validation procedures of the present study have ensured that the new EO instrument is internally consistent and stable across samples.

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