Competitive Research Article

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Development and Validation of a Scale for Measuring Sustainability Factors of Informal Microenterprises – A Qualitative and Quantitative Approach

Abstract: The growing interest in sustainability has dominated the area of entrepreneurship research. However, the measuring of sustainability factors has been largely ignored. As a result, so far, no researchers have developed sustainability factor scales and this might lead to a question of scale validity. This paper attempts to fill this gap: the aim of this study is to develop and validate scales of sustainability factor by investigating a microenterprise from the informal sector. In its design, the study uses a mixed method research approach. In the qualitative phase, content analysis has been applied to analyse the transcribed field study interviews. This procedure explores and confirms the sustainability variables and factors. The quantitative data are analysed through Exploratory Factor Analysis (EFA) followed by Partial Least Square (PLS) approach. Quantitative analysis then validates the variables and factors. The study then specifies scales of sustainability factors in the context of an informal microenterprise and assesses them as reflective in nature. The limitations of the study are then identified and thoughts to stimulate future investigations discussed.

Keywords: sustainability, informal microenterprise, content analysis, validity, partial least square analysis

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1 Introduction

The field of entrepreneurship is an emerging field and consequently it is not surprising that the definition and core measurements in terms of sustainability performance remain obscure (Shepherd and Patzelt 2011). Although the issue has been discussed, there is no consensus on suitable measures for sustainability performance (Cooper 1993) in small firms. The majority of conceptual and empirical studies have dealt with the economic performance of the firm rather than the social and natural environmental performance. However, the best run enterprises energetically seek to discover and invent solutions that yield higher profits and better social outcomes. Enterprises are conscious that they need to measure their success not only by financial factors but also according to their economic, environmental and social contributions. In the early 1990s, the concept of achieving economic, social and environmental sustainability was enthusiastically promoted. However, recent debates recommend that “trade-offs and conflicts between economic, environmental and social aspects in corporate management and performance represent the rule rather than the exception” (Hahn et al. 2010, 218). Margolis and Walsh (2003) also call on scholars to explore the trade-offs between these three factors. Rouf (2012) states that micro-enterprises need to focus on a goal that covers economic, social and environmental concerns. Holt (2012) also presents a unique historical perspective on the experiences of green entrepreneurs, and offers insights into the latest wave of interest in social and environmental sustainability. Over the last two decades, the sustainability concept has been discussed by many academic scholars in terms of these three common factors (e.g. Santiago and Roxas 2013; Rouf 2012; Olsen 2008; McDonald and Oates 2006; Colbert 2004). However, so far, no study has attempted to develop and validate sustainability factor scales with respect to a measurement model. Consequently, it may be assumed that there are no scales specified in relation to a measurement model. Yet, as Allen and Hoekstra (1993, 100) stated: “sustainability without a stated scale has no meaning”. Coltman et al. (2008) claim the importance of both theoretical and empirical considerations for designing and validating appropriate measurement models. Coltman et al. (2008) argue that empirical evaluations build an important ground for content validity, especially to identify errors and wrongly conceived theories. Wrong specification of measurement models has significant impacts on research outcome and may even mislead organizational policy setting. Therefore, researchers must pay careful consideration in identifying and designing appropriate measurement model. In some cases, this choice is simple because the causal priority between the construct and the indicators is very clear. However,

in some cases, choosing the correct measurement model, i.e. reflective vs. formative measures, can be difficult (Hulland 1999; Diamantopoulos and Siguaw 2006).

This sustainability concept is described through several frameworks. Among these frameworks, the Global Reporting Initiative (GRI) is best known covering a wide range of sustainability indicators (Labuschagne, Brent, and Van Erck 2005). It is a multi-stakeholder approach to focus on, particularly corporate sustainability. The Human Development Index (HDI) by UNDP (2001) was developed by combining indicators of life expectancy, education and earning. Further, Sustainable Consumption Indicators (SCI) by UNEP (Bentley and de Leeuw 2003) focuses on consumption and production characteristics of industrialized regions for superior sustainability. Similarly, the IChemE framework focuses on “industrial ecology and cleaner production” (IChemE 2002). In addition, the Wuppertal framework establishes the association between the various indicators (Spangenberg and Bonniot 1998), and Labuschagne, Brent, and Van Erck (2005) suggest that the Wuppertal framework can be usable at the micro- or business/industry level with some modification. Labuschagne, Brent, and Van Erck (2005) developed a sustainability framework named the Sustainable Industrial Performance (SIP) by adding elements from other frameworks. The Lowell Center for Sustainable Production (LCSP) framework highlights production sustainability, but also focuses on environmental sustainability along with social and economic sustainability (Veleva and Ellenbecker 2000).

However, core measurements of sustainability factors continue to remain unknown for micro- or small businesses (Khan, Rowe, and Quaddus 2012). To date, there is no solid measure for sustainability factors in the microenterprise context. In the literature, most of the studies have dealt with the economic factors and ignore the social and environmental factors (Khan, Rowe, and Quaddus 2012). However, a few scholars have focused on economic factors along with non-economic factors (e.g. Kickul et al. 2010; Carr et al. 2011; Irava and Moores 2010; Lumpkin and Dess 1996). Generally, they have underlined non-economic factors with regard to mental fulfilment and how it connects to economic factors. Their studies have reflected the lack of argument about measurement issues and two main components of firm sustainability factors, namely social and environmental. Brüderl and Preisendörfer (1998) argue that survival can be considered as the minimum criterion for firm sustainability factors. Their arguments emphasized the minimum economic as well as social gain of the firm. In addition, Shepherd and Patzelt (2011) emphasize that research into the sustainability of micro- or small firms is required to consider and explore the firm activities in terms of three sustainability factors: economic, social and environmental.

While the above discussion demonstrates the progress of sustainability studies, they are still in the developing stages (Khan, Rowe, and Quaddus 2012) and there is a lack of sustainability studies in the context of entrepreneurship and micro- or small business research. Therefore, this study recognizes that research on the intersection between entrepreneurship and sustainability remains limited (Hall, Daneke, and Lenox 2010), especially when considering the decisions of microentrepreneurs (Holt 2012). While there is growing dialogue on sustainable enterprises (Perez-Sanchez, Barton, and Bower 2003; Nawrocka 2008; Retolaza, Ruiz, and San-Jose 2009; Rodgers 2010), there is little research on sustainable microenterprises, especially in measuring sustainability through the three main factors: economic, social and environmental that warrant attention in microenterprise sustainability studies. No empirical study has as yet been undertaken to develop and validate the sustainability factor indicators and measurement model. However, it is very important to specify a sustainability measurement model. This is because measurement models with wrong specification can impact the estimates of the measurement model and structural model parameters which could consequently provide specious empirical results (Diamantopoulos and Siguaw 2006; Jarvis, MacKenzie, and Podsakoff 2003). In response to these concerns, this study aims to explore and assess the measurement model specification of sustainability with its three factors, namely, economic, social and environmental. This paper investigates this objective by undertaking a mixed method study in the context of informal microenterprises in Bangladesh, a developing country. In Bangladesh, microenterprise development is viewed as a key policy strategy and the informal microenterprise is embraced, and a micro-credit programme and vocational and technical education have been initiated (Mahjabeen 2008; Alam and Miyagi 2004). Non-government organizations (NGOs) and international donor agencies also support these packages and strategies thinking that they have multiple positive impacts such as secure and well-paying jobs, less inequality and rapid economic growth in Bangladesh. Considering the importance of informal microenterprises, making them grow requires an understanding of the functions and dynamics that impact on the informal microenterprises' sustainable performance which all require an understanding of the specific country's context. The policy makers have neglected the very diverse nature of the informal microenterprises as well as the sustainable performance factors and dynamics in the course of policy implementation. Therefore, the current research suggests that effective and efficient implementation of policies and strategies requires comprehensive knowledge of the sustainability factor of informal microenterprises from a country-specific point of view. This study therefore seeks to contribute to the

emerging microenterprise sustainability literature by focusing on its measurement model assessment.

This paper is organized as follows: the next section presents the literature on sustainability variables and factors. This is followed by a section on research method, which combines the exploratory field study and questionnaire survey. Next, the results of the field study and survey are presented and discussed in some depth. Finally, the paper presents conclusions and suggestions for future research.

2 Sustainability Variables and Factors

Developing a scale for measuring sustainability factors of informal microenterprises requires initially exploring and determining the variables that link with its corresponding factors. Therefore, this study searches the literature to identify the significant variables of economic, social and environmental sustainability factors.

Economic sustainability refers to the focal variables such as employment, profit and sales in the context of micro- or small business (Venkataraman 2002). Bjerke (2007) states that a firm success is achieved when there is a substantial increase in sales, revenues or employees. Bigsten and Gebreyesus (2007) perceive a firm to be progressive if it increased in economic size in terms of employees. Scholars have been more interested in using the employees as an indicator of economic sustainability rather than other indicators. They argued that relying on other economic indicators such as income, profit and sales makes it difficult to compute due to incomplete records of microenterprise. However, change in employment is also seen as a traditional indicator because the number of workers in the firm depends on its sales and profit (Parker and Torres 1994). However, it is not appropriate to rely on the increase in the number of workers in informal microenterprise, since self-employment characterizes such businesses which are usually run by their owners. Use of unpaid family workers and casual workers is a common practice of informal activities. The implicit assumption of researchers is that an increase in the number of employees is related to higher growth in sales and profit (McPherson 1995). The informal microenterprise usually needs more voluntary family workers, casual workers or wage workers long after it has realized sales and profit (Parker and Torres 1994). Many scholars have used profit as an indicator of economic sustainability (e.g. Chen et al. 2007; Honig 1998; Davis et al. 2010; Kreiser and Davis 2010). It measures the difference between revenue and costs. In addition

to profit, some scholars have emphasized sales growth indicators as the best economic indicator (e.g. Zainol and Wan Daud 2011; Laforet 2011; Shrader and Siegel 2007). Sales/turnover provides a more objective measure of economic sustainability. Khan (2012) suggests four important variables for measuring economic sustainability in the context of informal microenterprises, i.e. employment, sales growth, income stability and profitability. This study considers five economic sustainability indicators such as employment, profitability, return on investment, sales growth and income stability. Under the economic construct, employment represents individual-level and national-level performance. Other indicators determine the enterprise level of performance rather than household and national-level analysis.

The micro- or small firm activities cannot be considered sustainable unless they are measured by social indicators in addition to economic indicators. Economic and non-economic gains are likely to differ across persons and organizations. For instance, some firms may be happy to primarily confirm the economic sustainability of their venture, but others may be simply motivated by receiving social gains (Shepherd and Patzelt 2011). This argument is based on the fact that some informal microenterprises define firm success as social needs rather than profit. Others' aspiration level may be derived from fulfilling positive social outcomes such as social recognition, empowerment and freedom. Some studies have defined social gains as including life expectancy, child survival, education, justice and equality for the society (e.g. Parris and Kates 2003). These indicators are not specific to the context of informal microenterprises. Therefore, social sustainability indicators are so far absent from entrepreneurship research, especially in the informal microenterprise field. In reality, the majority of informal microenterprises in developing countries start small businesses in order to change their unemployment status to employment status. This is because they feel depressed during their period of unemployment and need to seek ways to revive their social identity, freedom and empowerment. Therefore, this study has suggested several social sustainability indicators for informal microenterprises. Firstly, meeting basic needs is an indicator which covers a diverse range of basic human requirements such as food, clothing, accommodation, education and health. It refers to whether informal microenterprise activities can fulfil the basic requirements of the family or help to tackle long-term poverty (Khan, Rowe, and Quaddus 2012). This research has also included the indicator of quality of life which consists of freedom/control, social recognition, child labour and empowerment indicators (Khan, Rowe, and Quaddus 2012). Under the social construct, basic need represents household-level performance. Social recognition, child labour and empowerment indicators determine national-level analysis. Freedom/control indicators determine individual-level analysis.

Environment sustainability is also essential for micro- or small firms because the environment is a foundation of resources for the life support of society (Daily 1997). If aspects of the environment are not sustained, the lives of many species, including humans, can be threatened. Therefore, the entrepreneurial activities cannot be treated as sustainable without measuring environmental sustainability indicators in addition to the economic and social sustainability indicators. In comparison to economic and social sustainability factors, previous entrepreneurship research has largely ignored environmental sustainability. However, some entrepreneurship scholars have recently started to talk about environmental sustainability (Patzelt and Shepherd 2011). In the context of informal microenterprises, environmental sustainability indicators are difficult to explore since research has not yet been undertaken. Still, different aspects of the environmental sustainability discussion are continuing. In the field of entrepreneurship research, Patzelt and Shepherd (2011, 637) defined environmental sustainability as “the improvement of conditions of the natural environment – [which] is an important development goal in societies that are confronted with poor air quality and drinking water, over exploited soil and aquatic habitats, declining forests, and other diminished natural resources”. They stated that entrepreneurial activities can continue and be sustained by improving environmental conditions. The perceived environmental sustainability of microentrepreneurship also relates to a firm’s use of energy and water, creation of wastes and emissions, etc. While entrepreneurial activities such as informal microenterprise perhaps tend to possess a lesser environmental footprint compared to other businesses, they still have responsibilities for managing their business in such a way that they can minimize environmental vulnerability. The informal microenterprise often fails to execute appropriate waste collection, use energy and water responsibly or treat waste or dispose of it appropriately. Furthermore, it is difficult to enforce environmental outreach programmes and legislation as very few informal microenterprises could meet the high cost of enforcement when many small widely scattered firms are involved. Therefore, the environmental sustainability of informal microenterprise is challenging. This study has chosen five environment sustainability indicators such as use of energy and water, waste and emission, waste management, space management and hygiene factors as suggested by Khan, Rowe, and Quaddus (2012). The environmental construct indicators focus on national-level as well as global-level analysis.

The literature review reveals that micro- or small firm sustainability variables and factors are largely anecdotal and fragmented. The majority of studies have dealt with the economic factors of the firm rather than its social and environmental factors (Khan, Rowe, and Quaddus 2012). This study argues that for informal microentrepreneurial activities to be sustainable, they should achieve a positive balance in each of the areas of sustainability. The literature analysis also argues

that to date, no coherent assessment of measurement models has been considered. Drawing attention to these gaps, the current research has attempted to develop and validate a scale of three sustainability factors: economic, social and environmental.

3 Research Method

To understand the research topic, to validate the model and to obtain and analyse data, a combination of both qualitative and quantitative methods (mixed method) is applied in this study. Creswell and Miller (2000) assert that the mixed method utilizes the capability of various data collections and enhances the validity of research measurements. This is due to the fact that each method, either qualitative or quantitative, has its own limitations. More specifically, a mono-method study will “inevitably yield biased and limited results” (Greene, Caracelli, and Graham 1989, 2).

3.1 Qualitative Approach

The paucity in studies conducted in this field, particularly when measuring sustainability factors, calls for a qualitative research investigation. This approach is appropriate, as qualitative study is suitable to new studies for which existing theory seems insufficient (Eisenhardt 1989). Further, Denzin and Lincoln (2000, 3) assert that qualitative research involves an “interpretive and naturalistic” approach: “This means that qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them.” This study uses a multiple case-based field study because the research is explorative in nature, and attempts to contribute in theory and practice, and where the views and experiences of the participants are important (Benbasat, Goldstein, and Mead 1987). This qualitative study attempts to explore the phenomena of sustainability to validate and enhance the variables and factors that were identified as part of the literature review.

3.1.1 Sample Selection

Creswell (2012) suggests a sample size of 5 to 25, whereas Morse (1994) recommends at least 6. This study samples 14 cases: eight tea-stall owners, three NGOs

and three local government authorities. Since tea stalls are prominent among informal microenterprises, i.e. hotel and restaurant services constitute 0.21% of the total GDP in Bangladesh (Maligalig, Cuevas, and Rosario 2009), the tea-stall microenterprises were chosen as a main sample category. This technique is appropriate as King, Keohane, and Verba (1994) state that researchers should choose a community very carefully in order to make sure that it is especially representative of the population. In addition, by way of triangulation, NGOs and local governments who are knowledgeable about informal microenterprise sustainability conditions were interviewed as this approach was likely to produce valuable and consistent data (Weiss 2008). As mentioned earlier, since NGOs support several packages (e.g. micro-credit programme, and vocational and technical education) and it is considered that they have multiple positive impacts such as increased employment, reduced inequality and rapid economic growth in Bangladesh, three NGOs which worked with microenterprise development were chosen. Similarly, three local government authorities (ward commissioners of the city) were selected because these local authorities assist local underprivileged microenterprises with their development. All interview participants were from Khulna City, the third largest city of Bangladesh. The interviews were conducted in July 2011.

3.1.2 Data Collection and Analysis Procedure

This study used a semi-structured interview as a method of collecting relevant qualitative data to explore and refine key variables and factors (see Appendix A). Data were obtained via one-to-one personal interviews. This technique allows the freedom of probing for further in-depth explanations and details in specific key areas. During the interview sessions, the interviewees were able to express ideas freely, while clarification could be made by interviewers. The interview data were noted and recorded with the permission of the participants. The interviews were conducted in Bangla and then translated into English. Rigour of the data was enhanced by having the transcripts translated back into Bangla and validated by another researcher.

The transcribed interviews were analysed using content analysis method. Content analysis can determine key variables, factors and their links. Miles and Huberman (1994) assert that content analysis technique is useful in exploratory research to examine the determinants of behavioural patterns. Inductive logical thinking skills were applied to extract and classify the data and constructs. Inductive process starts with conducting, transcribing and analysing the interview transcripts. The transcripts were reviewed in full to uncover key patterns/

themes. The indicative process was finished by using keywords to identify the emerging themes.

3.2 Quantitative Approach

To develop an instrument for measuring sustainability factors in the context of informal microenterprise, this study began by exploring cited variables under each factor as outlined in Section 2. Through this process, 15 variables were identified that reflect three sustainability factors: economic, social and environmental. Next, the field study attempted to discover new variables and to confirm existing variables that matched with the literature as described in Section 4. After confirming the sustainability factors and variables with assistance from the literature review and the qualitative field study, the quantitative phase of the research was aimed at finding and validating the important variables and factors.

3.2.1 Instrument Development

In order to develop scales for the sustainability factors of informal microenterprises, the creation and sorting of items was undertaken. The aim of items creation was to ensure content validity by choosing the appropriate items for the factor. By contrast, the aim of items sorting was to guarantee factor validity. In order to produce an items pool for each factor, items were recognized from the literature; additional items were produced via the field study; and finally, field study analysis was aligned with current scales to match factor definitions (Churchill Jr 1979; MacKenzie, Podsakoff, and Podsakoff 2011; Moore and Benbasat 1991) by an analyst having proficiency in both English and Bangla. A six-point Likert scale was used for respondents to express their opinion of the extent of their agreement and disagreement with each statement (see Appendix B). The reason for the choice of this scale was to avoid a central tendency error. The pattern of choosing the “neutrality” answer is commonly found in conducting research in Asian countries, including Bangladesh (Trompenaars and Hampden-Turner 1998).

3.2.2 Instrument Testing

Following the reviews from pre-test procedure, a pilot survey was conducted with the purpose of ensuring the applicability of the data. The tea-stall

microentrepreneurs were targeted for data collection. Respondents were selected by simple random sampling method. The respondents were approached for a face-to-face interview and they were informed about the objective of the research. Then the microentrepreneurs who agreed to participate in the survey were selected for data collection. Not less than one hundred usable responses were obtained from a pilot survey, conducted in Khulna City, Bangladesh, between October and November 2011. In this stage, this study conducted an exploratory factor analysis (EFA) for several reasons. It enables to ease a number of items under few underlying latent factors. It also ensures factor validity by assessing items load on the right factor. The aim of such factor validity is to evaluate factors independent of the nomological net. The study applied varimax rotation method in order to show convergent and discriminant validity. The study also used the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity to evaluate the appropriateness of factor analysis.

3.2.3 Confirmatory Study

Though the pilot study validated the items and the factor structure of the proposed informal microenterprise sustainability scale, it provided little evidence of convergent, discriminant and nomological validity. Consequently, confirmatory factor analysis (CFA) was used to assess the refined instrument thoroughly over a larger group of samples.

A total of 450 survey questionnaires were completed. A sufficiently large sample is very important so that generalization trends can be derived by studying this sample. Twelve questionnaires were excluded due to excessive missing data. The sampling approach was based on a simple random sample. The data-gathering strategy under the survey method is generally predicated on the nature of survey interaction and the mode of questionnaire administration (Malhotra 2008). This study used location intercept techniques because these methods ensure good response rates in comparison with other methods (Andaleeb 2001; Malhotra 2008). This strategy was executed in a physical setting in the local language in Bangladesh (Andaleeb 2001). The survey instrument together with a covering letter explaining the purpose and instruction of the survey was provided to the micro-firm owners. The duration of the period in which the survey was conducted was around five months between January 2012 and May 2012 in Khulna City, Bangladesh. There were 12 questionnaires that had to be discarded due to invalid responses or missing values. The response rate for the study was 87%. As this was a study intended to measure effects and make

generalizations about a population, the size of the response rate compellingly exceeded the minimum threshold level (>60%) for a face-to-face survey (Wholey, Hatry, and Newcomer 2010).

To estimate the sustainability measurement model, this study applied Partial Least Square (PLS)-based structural equation modelling (SEM). The SEM technique allows the simultaneous modelling of associations among multiple independent and dependent variables (Chin 2010). Coupling the econometric perspective of prediction and the psychometric perspective of construct validity, it enables the measurement of unobservable (latent) variables using observable measures (or manifest variables, items or indicators) by explicitly modelling measurement error (Chin 1998). The data of the questionnaire survey were analysed through PLS analysis. PLS path modelling is based on an algorithm that, firstly, estimates the best weights of each block of the measurement model and then estimates the path coefficients in the structural model (Chin and Newsted 1999). Thus, the latent variable component scores or weight estimates depend on how well the measurement model is specified. PLS is more appropriate when the measurement items are not well established and are used within a new measurement context (Barclay, Higgins, and Thompson 1995). Moreover, the capability of handling formative as well as reflective indicators and constructs was one of the greatest incentives to adopt PLS. The decision to model a construct as either reflective or formative was made based on four major criteria suggested by Jarvis, MacKenzie, and Podsakoff (2003): (1) direction of causality from construct to items, (2) interchangeability of items, (3) covariation among items and (4) nomological net of construct items.

4 Result of Field Study

The field study, which used in-depth content analysis, identified and confirmed 15 variables. The extracted variables were labelled under the three factors, i.e. economic, social and environmental. The results of the field study are presented and interpreted in detail below.

Economic sustainability is considered to consist of several aspects: employment, sales growth, income stability, profitability and return on investment. Employment was considered as a positive indicator by field study participants. Micro-firms A and D, and NGO I, for example, “*it is my job*” (Micro-firm D). Micro-firms A, B, D and G agreed that their sales were gradually increasing: “*gradually growing*” (Micro-firm A); “*customer base is increasing*” (Micro-firm B); “*sales are increasing day by day*” (Micro-firm D) and “*it became big because of*

customers and God" (Micro-firm G). In addition, NGOs I and L observed the positive sales growth of micro-firms. Income stability is also an important indicator for measuring economic performance. Micro-firms A–H confirmed that their income was not stable over time. It fluctuated depending upon the location, days, seasons and weather. Nevertheless, they moderately agreed that their income fluctuated at an acceptable level, for example, *"I do not get the same earnings all the season"* (Micro-firm C); *"income always remains the same"* (Micro-firm D) and *"Income may be good one day but it may be bad next day"* (Micro-firm E), and these views were similarly narrated by NGOs I and J and Local government L. Return on investment also appeared as an important indicator. Micro-firms A, B and D reported that *"return on investment is moderate"* (Micro-firm A); *"profit margin is medium"* (Micro-firm B) and *"income is so far so good"* (Micro-firm D). The profitability of micro-firms was also confirmed from the field study data. Most of the micro-firms as well as the NGO and local government participants strongly supported the profitability of micro-firms: *"profitable business"* (Micro-firm A); *"profitable business"* (Micro-firm B); *"profitable business for me"* (Micro-firm C); *"business is profitable"* (Micro-firm F); *"make a profit"* (Micro-firm H); *"a profitable business"* (NGO I); *"quite profitable"* (NGO J); and *"earn profits"* (Local government L).

Several social indicators were found to reflect micro-firms' social sustainability, namely, basic needs, social recognition, empowerment, freedom and control, and child labour. All participants viewed micro-firms as a way to fulfil the daily basic needs of their family, for example, *"we cannot bear all these things [basic needs]"* (Micro-firm A); *"We bear the family expense somehow"* (Micro-firm B) and *"able to maintain the life living cost"* (Micro-firm C). NGO and local government participants provided contrary information by stating that, for instance, micro-firm activities *"cannot provide per-day minimum caloric intake for the family"* (NGO I) and *"difficult to fulfill basic needs"* (NGO K). As for freedom and control over the course of one's own lifestyle, some tea-stall owners found that informal microenterprises were the tool to reach that goal. Several tea-stall owners (Micro-firms A, B, C and G) agreed that their lifestyle was far better than in their previous jobs, such as working as a rickshaw puller or daily labourer. For example, Micro-firm G confirmed that *"I am now far better off than I was in my previous job"*. This view was also confirmed by Local government L and N. In terms of social recognition, Micro-firm B considered that the micro-firm generated moderate social recognition in society: *"I do feel my status in the society."* (Micro-firm B). However, Micro-firm C perceived that: *"it is not so prestigious a job"*. NGOs I and K viewed this identically: *"... better than a daily labourer or rickshaw puller"*. Moreover, a significant number of opinions emerged from the field study regarding social empowerment, for example,

“I have created some wealth” (Micro-Firm D) or *“I got a daughter married”* (Micro-Firm E). Furthermore, since the child labour issue was considered sensitive, none of the tea-stall owners mentioned the involvement of children in their micro-firms. However, field observations revealed that micro-firms used child labour on a part-time basis. NGO I and Local government L confirmed the use of child labour in micro-firms.

Environmental sustainability also covers a varied range of indicators. Every organization contributes to degrading the environment through factors such as water and energy use, waste and emissions, waste management, space management and hygiene factors. As for the water and energy used, almost every micro-firm from the field study believed that they used water and energy at a minimal expenditure level and in an environmentally friendly manner. Along with others, Micro-firm C affirmed that they *“use[d] chaff processing wood for making fire. Now it is almost 9 kg every day ... need almost 8 pitchers of water per-day”*. NGOs I and J confirmed these statements. In addition, participants noted that the creation of waste and emissions was also at acceptable levels. Micro-firms C, D and E mentioned that chaff-log was a good thing and it emitted a low level of smoke. NGOs I, J and K confirmed these views. All micro-firms provided positive statements regarding waste management, for example: *“we produce waste tea. Sometimes we throw it out or put it on the tree plant base. We put the ashes in the ‘Kachu’ tree. It makes the tree base strong. We make fire with waste plastic bags. We sweep three times a day”* (Micro-firm A). Conversely, NGOs I and J and Local government M and N disagreed with these statements. The hygiene factor was also reflected in a positive manner in the field study. All the micro-firms pointed out that they cared about the hygiene factors when they served customers, for example: *“I always try to keep the biscuits and other food products in a clean box and serve the tea in clean cups”* (Micro-firm F). NGO I disagreed with this statement.

This study has made an attempt to cross-examine factors and variables in the context of informal microenterprises. This study also has labelled these variables and factors in line with the literature, where possible. For example, the variable *profit* was identified by several studies such as Chen et al. (2007), Honig (1998) and Kreiser and Davis (2010) suggesting that *“profit”* serves as a proxy for net income from the business and shows the prospects of a given venture. This was reflected by field study participants' statements.

Table 1 shows the list of variables identified in each factor as well as the anonymous participants that mentioned the variables in the industry. Out of the 15 identified variables, only one variable such as *“ensures basic needs”* was confirmed by 13 field study participants. On the other hand, at least one variable was mentioned by all participants.

Table 1: Variables and factors – explored from the field study.

Factors\items	Field study participants													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
<i>Economic</i>														
Provides employment to us and others	✓			✓					✓					
Sales growth	✓	✓		✓			✓		✓			✓		
Income stability	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		
Return on investment	✓	✓		✓					✓	✓	✓		✓	
Profitability	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓		
<i>Social</i>														
Ensures basic needs for our family	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Enhances our social recognition in society			✓	✓	✓	✓			✓		✓	✓		
Improves our empowerment in society					✓	✓	✓		✓	✓	✓	✓	✓	✓
Provides freedom and control	✓	✓	✓				✓		✓			✓		✓
Concerned about child labour use									✓			✓		
<i>Environmental</i>														
Uses utilities in an environment-friendly manner	✓	✓	✓	✓	✓		✓	✓	✓	✓				
Produces few wastes and emissions				✓	✓	✓			✓	✓	✓		✓	
Concerned about waste management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Uses small space to set up and operate business				✓	✓							✓		
Concerned about hygiene factors	✓	✓	✓	✓	✓	✓	✓	✓	✓					

5 Result of Survey

In the quantitative analysis, this study conducted EFA and PLS approaches respectively. From the result of PLS, this study assessed the convergent validity, discriminant validity and nomological validity of the scales for the measurement model. In order to do that, this study applied PLS algorithm and nonparametric bootstrapping.

5.1 Exploratory Factor Analysis

In the EFA results, the KMO value was 0.922 (>0.50), confirming the measure of sampling adequacy, and Bartlett’s test of sphericity value was 6,036.299, df = 105, significant at $p = 0.000$, and provided evidence for a significant correlation among the variables. The sums of squared loadings from the three factors have the cumulative value of 72.845% in explaining the total variance in data. Throughout the process of EFA, those items that did not load properly on a particular factor (<0.40) or if they had cross-loadings were deleted (see Table 2).

Table 2: Exploratory factor analysis (rotated factor matrix).

Factors	Items	Cronbach's alpha					
		Before refined scale			Refined scale		
		EC	SO	EN	EC	SO	EN
Economic (EC)	Provides employment to us and others (EC1)	0.839			0.830	0.226	0.180
	Sales growth (EC2)	0.888			0.882	0.132	0.130
	Income stability (EC3)	0.735			0.741	0.333	0.111
	Return on investment (EC4)	0.880			0.891	0.171	0.126
Social (SO)	Ensures basic needs for our family (SO1)		0.536		0.498	0.520	0.290
	Enhances our social recognition in society (SO2)		0.813		0.229	0.817	0.299
	Improves our empowerment in society (SO3)		0.745		0.251	0.764	0.395
	Provides freedom and control (SO4)		0.769		0.329	0.781	0.332
Environmental (EN)	Uses utilities in an environment-friendly manner (EN1)			0.689	0.228	0.398	0.732
	Produces few wastes and emissions (EN2)			0.657	0.180	0.537	0.693
	Concerned about waste management (EN3)			0.709	0.114	0.287	0.776
	Concerned about hygiene factors (EN5)			0.932	0.127	0.158	0.860

In this way, EC5, SO5 and EN4 items were deleted. The remaining 12 items were retained for the next run of EFA. As presented in Table 2, the second round of EFA with varimax rotation yielded three factors. The refined model explained 76.360% of the cumulative variance. In this stage, both the KMO measure ($0.903 > 0.50$) and Bartlett's test of sphericity ($p = 0.000$) were significant. Reliability analysis, i.e. Cronbach's alpha of the extracted three factors, was then computed, which exceeded the cut-off value of 0.70 (Nunnally and Bernstein 1991). Thus, the reliability of the refined model was established. Overall, the study shows that all the factors are composed of four items. Some researchers suggested a minimum of two valid items for a construct in EFA (Chin 2010). This notion is also recommended by the scale development study (Wetzels, Odekerken-Schroder, and Van Oppen 2009).

5.2 Partial Least Square Analysis

The study used PLS-SEM to check the properties of the measurement model in terms of convergent validity, discriminant validity and nomological validity (Barclay, Higgins, and Thompson 1995; Hulland 1999). To ensure the convergent validity of measurement indicators this study investigates the item reliability, average variance extracted (AVE) and composite reliability (CR). Referring to Table 3, it is apparent that loadings for all items are more than the minimum threshold level of 0.7 with reference to Ringle, Sarstedt, and Straub (2012). Moreover, the t -value, obtained from bootstrapping, showed that all loadings are significant at the 0.05 level. Therefore, all items are retained. To examine the convergent validity of measurement models this study calculated AVE and CR (Chin 2010; Fornell and Larcker 1981). Table 3 reports that the CR values of all constructs exceed the cut-off level of 0.70 and the AVE for all construct is more than 0.50 suggested by Fornell and Larcker (1981). To establish discriminant validity, the square root of the AVE was compared to the inter-construct correlations. Table 3 presents the square root of AVE (diagonal elements) and the correlations between constructs (off-diagonal elements). It shows that the square root of AVE was greater than the off-diagonal elements across the row and down the column. These findings have shown that all the results were satisfactory which confirms the establishment of discriminant validity at the construct level. In the final analysis for discriminant validity, cross-loadings for each item were explored and compared across all constructs (Hair, Ringle, and Sarstedt 2011). This procedure was conducted to fulfil the assessment at the item level. In this test, analysis was conducted by measuring the extent to which the indicator loadings of a construct differed from the loadings of other constructs. The matrix of loading and cross-loading is shown in Table 3. The results indicated that all

Table 3: Convergent validity and discriminant validity.

Factors	Items	Psychometric properties				Cross-loading				AVE Sqrt root	
		L	L t-v	AVE	CR	EC	SO	EN	EC	SO	EN
Economic (EC)	EC1	0.915	113.043	0.820	0.948	0.915	0.544	0.403	0.906		
	EC2	0.909	103.828			0.909	0.488	0.319			
	EC3	0.871	55.848			0.871	0.571	0.375			
	EC4	0.926	127.463			0.926	0.511	0.339			
Social (SO)	SO1	0.819	43.787	0.799	0.941	0.627	0.819	0.546	0.585	0.894	
	SO2	0.901	74.864			0.455	0.901	0.629			
	SO3	0.929	143.574			0.464	0.929	0.679			
	SO4	0.922	115.558			0.545	0.922	0.656			
Environmental (EN)	EN1	0.910	124.161	0.793	0.939	0.422	0.664	0.910	0.398	0.703	0.890
	EN2	0.906	89.695			0.401	0.749	0.906			
	EN3	0.875	54.961			0.291	0.561	0.875			
	EN5	0.869	63.122			0.281	0.499	0.869			

Abbreviations: L – Loadings, L t-v – Loadings t-value, AVE – Average Variance Extracted, CR – Composite Reliability.

Figure 1: Nomological validity.
Abbreviations: EO – Economic, SO – Social, EN – Natural Environmental.

items demonstrated higher loadings in their respective constructs in comparison to their cross-loadings in other constructs. Therefore, this confirmed that the measurement model had strong discriminant validity at the items level. For nomological validity, the *t*-value, obtained from bootstrapping, showed that all loadings are significant at the 0.05 level which confirms the establishment of nomological validity at the item and construct level (see Figure 1).

Based on the outcomes shown in Table 3 and Figure 1, the overall results for the measurement model have provided satisfactory empirical support for reliability, convergent validity, discriminant validity and nomological validity of the model.

6 Discussion

The objective of the study was to develop and validate a scale of sustainability factors in the context of informal microenterprise entrepreneurial activities. At first, this study established a conceptual definition of sustainability factors and indicators via a literature review. Next, the study used a field study approach to generate new items and confirm existing items identified in the

literature review which represents the sustainability factors. This process also assessed the content validity of the items. After confirming the content validity, this study formally specifies the measurement model. After that, this study runs an EFA to refine and purify the items. In this process, the items EC5, SO5 and EN4 were deleted. Finally, the PLS approach was conducted. In this step, the scales showed decent value criteria and a set of items loading and its corresponding *t*-values were significant. Further, AVE and the CR values also met the criteria and established the convergent validity of measurement models. Furthermore, good AVE square root and cross-loading values also confirmed the discriminant validity among the factors. This study also established nomological validity of the measurement model. Therefore, the findings confirmed a valid scale for measuring sustainability factors in the context of informal microenterprises. In the valid scale 12 items were established. This study found four indicators for economic factor, i.e. employment, sales growth, income stability and return on investment; four indicators for social factor, i.e. basic needs, social recognition, empowerment and freedom, and clusters for indicators for environmental factor i.e. water and energy use, waste and emission, waste management and hygiene factor. The findings also suggest a reflective scale of sustainability factor in the context of informal microenterprise. Although it is quite difficult for this study to relate the present findings to the few prior studies due to the fact that development and validation of a scale for measuring sustainability factors of informal microenterprise was hardly conducted, nevertheless this study makes a key contribution to theory, method and practice.

The study has identified a comprehensive, yet parsimonious, set of factors and variables, and validates the scales that help to predict the sustainability factors of informal microenterprise. More specifically, this study had extended the sustainability studies by specifying and estimating a scale for informal microenterprise sustainability factors. In terms of methodological contributions, this study has proposed a sustainability measurement model that is unique in the sense that it has been developed based on the literature review, field study data analysis and EFA. Further, this study has advanced a reflective measurement model of sustainability factors using PLS approach which will deliver new thoughts for variance-based SEM.

The implication of this study is highly relevant to the policy makers and relevant agencies' decision-making process in the microentrepreneurship context. This is because sustainability factors in the context of informal microenterprise activity have been confirmed to have influence on individual, group and society. This finding also improves the understanding of NGOs and donors about

the extent to which economic, social and environmental factors influence sustainability in the informal microenterprise context.

In spite of the key findings, this research needs to be considered in view of its limitations. This research was conducted within one domain of the informal microenterprise (i.e. tea-stall micro-firm) and in one country. But the reality is that informal microenterprises take place in the informal sector and their activities are largely varied and complex in terms of size, degree of informality and heterogeneity of business. Thus, there might be variation in the applicability of the scales in agriculture, manufacturing, hotels and restaurants, etc. Replication in other contexts would increase confidence in the research measurement model. The sample only represents informal microenterprises from an Asian developing country (i.e. Bangladesh). Therefore, there is a limitation regarding the generalizability of findings to other informal microenterprises in other developing countries. There may be a difference in the understandings of the scales of informal microenterprise in Asian, African and Latin American developing countries, and also in individualistic and collectivist communities.

7 Conclusion

This study has developed and validated a scale for measuring sustainability factors in the context of informal microenterprises via literature analysis, 14 field study interviews, collecting survey data from 438 microentrepreneurs and analysing data through EFA and PLS-SEM approaches. This study has provided solid empirical evidence. Specifically, this study has validated three sustainability factors and 12 variables, and this is a significant contribution to this emerging area of research. Finally, the model can serve as a research model for further investigations by incorporating more new variables and factors.

Appendix A: Field study protocol

Q.1. Does micro-firm business can make money?

(How do you see it?)

Q.2. Does micro-firm business can support their family?

(How do you see it?)

Q.3. Does micro-firm business harmful for environment?

(How do you see it?)

Appendix B-Questionnaire survey

The statements below describe the sustainable performance of your “micro-firm” in terms of economic, social, and environmental. Please read each statement carefully, and then indicate the extent to which you agree or disagree by circling the number on a scale of 1 (Strongly disagree) to 6 (Strongly agree).					
	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Strongly agree
<i>Economic sustainability</i>					
1 We see our micro-firm is providing employment to us and others.	1	2	3	4	5
Our micro-firm’s economic performance is at an acceptable level in terms of ...					
2 sales growth.	1	2	3	4	5
3 income stability.	1	2	3	4	5
4 return on investment.	1	2	3	4	5
5 profitability.	1	2	3	4	5
<i>Social sustainability</i>					
Our micro-firm...					
6 ensures basic needs for our family.	1	2	3	4	5
7 enhances our social recognition in society.	1	2	3	4	5
8 improves our empowerment in society.	1	2	3	4	5
9 provides freedom and control over the course of our own lifestyle.	1	2	3	4	5
10 is concerned about child labour use.	1	2	3	4	5
<i>Environmental sustainability</i>					
Our micro-firm...					
11 uses utilities (e.g. energy and water) in an environmental friendly manner.	1	2	3	4	5
12 produces few wastes and emissions.	1	2	3	4	5
13 is concerned about waste management.	1	2	3	4	5
14 uses small space to set up and operate business.	1	2	3	4	5
15 is concerned about hygienic factors.	1	2	3	4	5

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