The Impact of the Dimensions of Microfinance on Poverty Reduction: Confirmatory Factor Analysis (CFA) via Individual Measurement Models

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Abstract: **Poverty is one of the main socio-economic issues holding back the development of economic of the underdeveloped countries. Microfinance is financial services provided to poor households of individuals who have no access to formal financial programs. It has been identified as a key mechanism to reduce world poverty in the recent past. With the revolution of the microfinance sector, it has been able to provide a wide range of services. This study aims to observe the extent to which the dimensions introduced in modern microfinance have contributed to the eradication of poverty. Data were collected using Likert scale questionnaire with total of 496 borrowers benefited under Samurdhi Micro Finance programs in Sri Lanka. Collected data analyzed confirmatory factor analysis by using AMOS 21. The factor loading of the individual measurement models were displayed that 38 items were grouped properly in to the 6 constructs which higher than 0.6**

Key words: **Confirmatory Factor Analysis, Microfinance, Poverty**

I. INTRODUCTION

Microfinance, as per the Asian Development Bank (ADB), is the provision of a broad range of financial services, such as deposits, loans, payment services, money transfers, insurance to the poor, and their businesses (ADB, 2000). Dixit et al, (2019) stated that 'Microfinance refers to the providing of a broad spectrum of financial services to the low-income people' and it is closely associated with microcredit. Otero (1999) stated that microfinance is the provision of financial services to low-income people and very poor self-employed people. Cull and Murdoch (2017) defined it as, "Microfinance is generally seen as a way to fix credit markets and unleash the productive capacities of poor people who are dependent on self-employment." There are key elements of microfinance services such as credit services, savings service, non-financial services; social intermediation services (Kumari et al, 2019; Ali *et al.,* 2014; Ledgerwood, 1999). Consultative Group to Assist the Poor (CGAP) has mentioned that microfinance is the providing of credit, savings and other financial services to the poor. It includes credit services, money transfer services, pensions and insurance as well (Reille et al, 2009). Definition given by IFC of the World Bank Group explains the nature as well as the role of microfinance as follows – "Access to a range of microfinance services, such as savings, loans, micro insurance, and money transfers that enable poor families to invest in enterprises and in better nutrition, improved living conditions, and the health and education of their families" (IFC, 2019). According to Seibel, (2005) microfinance refers to "Financial intermediation between micro savings and microcredit that is powered by intermediation, legal recognition, regulation and mandatory supervision."

Microfinance is not a new concept, as all developed and developing countries have a long history of usage of this concept. During the 18th and 19th centuries, many European countries engaged in microfinance activities in an informal manner at first (Seibel, 2005). The concept of microcredit goes as far back as the 16th century when Jonathan Swift introduced a microcredit service to poor farmers under the Irish loan fund system, while the origin of microfinance goes back to the latter part of the 18th century when financial cooperatives were established by Friedrich Wilhelm Raiffeisen to provide financial support to the poor in the rural areas of Germany (Mader & Morvant-Roux, 2019; Schmidt *et al.,* 2016; Abiola *et al.,* 2011). In the mid-19th century, financial cooperatives spread rapidly in Europe, North America and then all over the world. To distinguish them from private financial cooperatives, government financial institutions were named as farmer's cooperatives in the 1950s (Abiola *et al.,* 2011). In the years following 1900 in Latin America, mobilization of the agriculture sector was the main goal of the rural financial institutions, which had the two key objectives of providing credit by mobilizing idle savings and enhancing investment by stimulating commerce in the rural sector, thus weaning away the people from the outdated feudal system.

The modern concept of microfinance rapidly spread all over the world after Mohammad Yunus won the Nobel Prize for the microcredit program of Grameen Bank in Bangladesh that was conceived by him (Febianto & Kefeli, 2019; Ali *et al.,* 2014). In 1974, a program was initiated by Grameen Banka and Muhammad Yunus for eradicating poverty in Bangladesh. He performed his experiment in the village of Jobra near the Chittagong University, testing it with women in the bamboo furniture market. Yunus lent amounts equivalent to $26 to $42 to these women, and they usually repaid their loans on time. Building on this experience, the providing of savings and microcredit facilities became the main activity of Grameen Bank. Finally, it provided microcredit services to a five-member group that was unable to gain financial support from

formal financial institutions (Khan *et al.,* 2017). Grameen Bank later expanded its microcredit services to several other villages in 1983 and in 2007. It covered over 36,000 villages in Bangladesh. The Grameen Bank in Bangladesh believes that its microcredit program allows 5% of its microcredit borrowers to rise above the poverty line annually. According to Noreen *et al.* (2011), borrowers of Grameen microfinance were escaping poverty at a monthly rate of 10,000. Muhammad Yunus and Grameen Bank won the Nobel Prize for their outstanding services toward eradicating poverty in 2006 (Gutiérrez-Nieto & Serrano-Cinca, 2019). After the Nobel Prize was awarded for the Grameen Bank microcredit program, the movement to popularize microcredit started as a global effort aimed at reducing poverty and inequality (Ali & Ghoneim, 2019). The concept of harnessing microfinance for poverty alleviation was introduced in many other countries following the experience of Grameen Bank.

The 1980s can be identified as a significant decade in microfinance history as many MFIs began to provide microcredit facilities to their clients on a large scale (Noreen *et al.,* 2011; Robinson, 2001). With the significant contribution it made by empowering the poor, microfinance came into prominence in poverty alleviation in developing countries. Asian and African countries widely established government and non-governmental microfinance institutions to provide financial support to the poor. After 1990, microfinance spread rapidly in many developing countries and a large amount of Microfinance institute were created (Febianto & Kefeli, 2019; Robinson, 2001). The 1990s were named as the "decade of microfinance" due to the rapidly increasing volume of MFIs and providers in the global level (Dichter, 1999). The Microcredit Summit was launched in 1997 to provide microcredit facilities for empowering the poor and developing their small-scale businesses. The microfinance summit targets to access one hundred seventy five million of the poorest households and the women in their households, thus ensuring that in 100 million households the income will increase above US$1 per day (Daley-Harris & Laegreid, 2006). The number of microfinance programs has grown from 618 to 3,133 from the end of 1997 to the end of 2005. Meanwhile, the number of women receiving microcredit loans enlarged by 99.8 million (Noreen *et al.,* 2011). Due to the significant contribution of microfinance toward the eradication of poverty in the world, United Nation has been declared the year 2005 as the International Year of Microcredit (Shetty & Vasanthi, 2019), with the objective of "Building Inclusive Financial Sectors to achieve Millennium Development Goals." Former Secretary-General of the UN, Mr. Kofi Annan issuing a message to the International Year of Microcredit said, *"Microfinance has proved its value in many countries as a weapon against poverty and hunger.* During the previous decades, poverty was a major issue in the world. The global drive toward combating poverty was presented in the year 2000 by the Millennium Project that aimed to achieve the major Millennium Development Goals (MDGs) by the end of 2015, while stating that the eradication of extreme poverty was the first goal of the project. In 2015, the Millennium Project had added 17 new aims while still giving priority to eradicating poverty. In an effort to contribute to the global attempt to alleviate poverty and inequality, the modern concept of microfinance has been applied all over the world as a powerful tool (Ali, *et al.,* 2019). Microfinance is widely used as an effective tool to ensure inclusive growth and empower poor women (Shetty & Vasanthi, 2019). The success of microfinance can be seen in many countries like Bangladesh, India, Africa and China. Bangladesh has proven the effectiveness of microfinance by having 20 million clients and showing that microfinance is able to eradicate poverty. China has proven the usefulness of microfinance by using it to promote enterprises that have flourished. China did not have any experience with MFIs before 2005. In earlier decades the government had used microfinance as mechanism for poverty alleviation, but promoted the commercialization of microfinance only after 2005. The experiences with microfinance industry in sub-Saharan Africa were appreciated by many of those governments, which implemented various measures for encouraging microfinance (Aryeetey, 2005). The concept of joint liability of microfinance was followed many microfinance institutions with the development of microfinance industry in the world. This concept is one of the most popular concept among credit lenders nowadays.

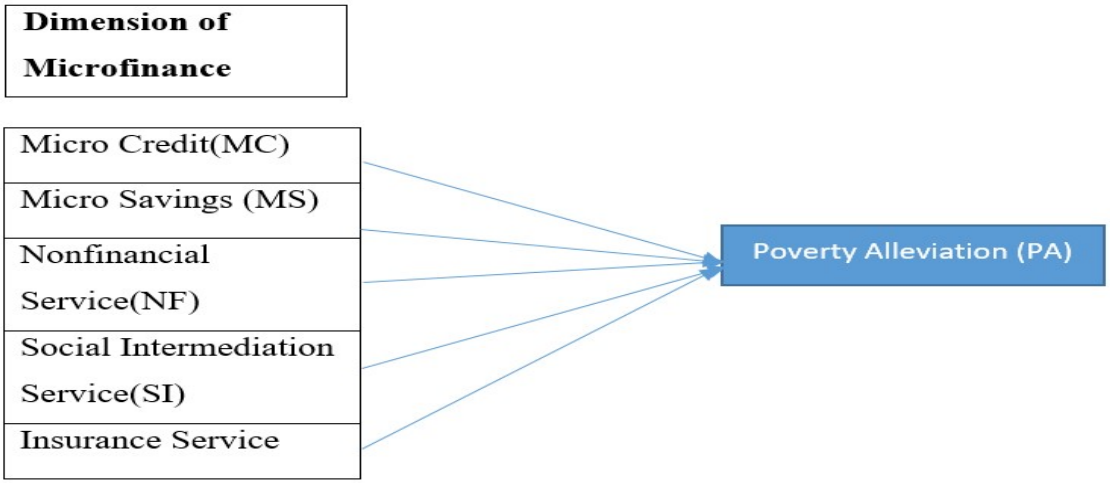
During the past few years microfinance has been playing a significant role in eradicating poverty and empowering the poor economically and socially in Sri Lanka. After 1990 decades, Sri Lankan governments were launched different microfinance programs for poverty alleviation. Samurdhi program is the current government microfinance program in the country and Samurdhi banking society is the main government microfinance banking society. The main objective of this banking society was to provide credit and set up the institutional framework to serve the poor by reducing the other credits from informal sources. Samurdhi bank provides the group credit to poor for developing their income earning projects by using concept of joint liability of microfinance.

II. STUDY FRAMEWORK

In order to analyze the dimension of microfinance and their effectiveness of poverty alleviation eradication, a study framework was developed based on past literature. Micro credit facilities can lead to an increase in the household income and in turn, raise the living standards, improve household performance and help to reduce poverty (Zhang & Qin, 2018; Haile & Folmer, 2012). Micro credit facilities can do much to enhance the prospects of small-scale businesses and increase their economic performance, thus leading to a reduction in poverty. The evidence shows that microfinance led to an increase in both family expenses and the accumulation of assets. Micro savings is another significant tool for eradicating poverty. Micro savings can be categorized into main two classes as mandatory savings and voluntary savings. The poor are able to use both mandatory and

voluntary savings to cope with financial shocks and to repay their loans (Kumari 2020, Mukherjee & Das, 2019; García-Pérez *et al.,* 2018; Robinson, 2001; Ledgerwood, 1999). Savings lead to increased repayment capacity and investment capacity and in turn, improve household economic performance and act as an influence to reduce poverty (Usman *et al.,* 2019; Adjei *et al.,* 2009; Barnes *et al.,* 2001; Dupas *et al*, 2014; Sewamala *et al.,* 2010). Therefore, based on the previous research micro saving used as a one of independent variable of the study. MFIs also provide non-financial services to their beneficiaries, in such areas as enterprise development training, skills development training, social capital development services, marketing training, etc. Related researches on microfinance have recognized that non-financial services were able to increase the efficiency of microfinance programs (Karaivanov *et al.,* 2018; Lensink *et al.,* 2018; Ali *et al.,* 2014). The different types of training and advisory services lead to the development of human capabilities, acquisition of skills, and empowerment of the poor. They enhance the performance of small to medium scale businesses, help raise household incomes and reduce poverty (Rathnayake *et al.,* 2019; Ledgerwood, 1999). Therefore, this dimension also used as an independent variable in the study. The fourth independent variable is social intermediation service. Social intermediation service is one of the key elements of microfinance services (Rosenman, 2019; Ali *et al,* 2014; Ledgerwood, 1999; Mosley & Hulme, 1998). Social mediation leads to the development of both human resources and institutional capital. It increases the self-reliance of marginalized groups, empowers them to engage in formal financial transactions, and increase the business and household performance of the poor. According to previous research, insurance service has used as last independent variable of the study. Insurance service is one of the key tools provided by microfinance institutions for coping with the risk on assets and on the lives of clients (Mosley, 2009). There are two types of insurance, which are personal insurance and business insurance. Health issues are the main reason for the poor to lose their repayment ability. Heavy expenditure on major health issues are a significant source of risk for the world's poor as they are usually not insured (Gertler & Gruber, 2002). Having good health and business insurance will lead to the enhanced well-being of households and better business performance, which in turn, will reduce poverty. Poverty alleviation is the only one dependent variable of the study. The study conceptualized the five dimensions of Micro Credit (MC), Micro Savings (MS), Non-Financial Services (NF), Social intermediation Service (SI) and Insurance service (IN) as the independent variables of microfinance. The study conceptualized Poverty Alleviation (PA) as the dependent variable.

Figure: 1 Conceptual Framework



III. RESEARCH METHODOLOGY

The study was utilized the survey method using five-point Likert scales questionnaires. The simple random sampling method was used to collected data from Kegalle, Rathnapura, Colombo, Kandy and Gampha districts in Sri Lanka. The districts were selected based on high poverty rates of the year 2019. 496 questionnaires were used as usable cases from total returned 538 questionnaires. 65 factors were consisted in the questionnaire. The collected data were analyzed by descriptive analysis, exploratory factor analysis (EFA) and Confirmatory factor analysis (CFA). Descriptive analysis was tested central tendency and normality of the data set using SPSS 21 version. EFA is generally used for data reduction to arrive at a smaller set of variables than those in the original set. Confirmatory factor analysis (CFA) is a statistical technique used to verify the factor structure of a set of the observed variable. The study utilized the AMOS extension version of SPSS 21.

IV. EXPLORATORY FACTOR ANALYSIS

Exploratory Factor Analysis (EFA) was run separately all six variables for 65 factors. EFA has removed the factor from 65 to 38, in the analysis (Kumari, 2020). All the factor loading

for remains 38 factors were greater than 0.5. Table 1presents the summary of the Exploratory Factor Analysis

Table 1: Summary of the Exploratory Factor Analysis

Variable	KMO values	Number of before EFA	Number of before EFA
Micro Credit	.887	10	06
Micro Savings	.893	10	06
Nonfinancial Service	.904	10	06
Social Intermediation ervice	.888	10	06
Insurance Service	.851	10	05
Poverty Alleviation	.931	15	09

Source: Research data, 2019

4.2 Confirmatory Factor Analysis (CFA) via Individual Measurement Model

CFA model statistics were developed for each variable separately using the factors which were selected from EFA findings. Most frequently used estimation method of default is Maximum likelihood (ML) estimation (Wickramaratne, 2019; Arbuckle & Wothke, 1999). ML estimation assumes that the observed variables follow the multivariate normal distribution and it produces estimates with very desirable properties. The standardized and unstandardized estimate of the model fit is present in the path diagram covariance, regression weights, intercepts and variances measures are displayed by unstandardized estimations.

(Hayduk 1987) Model fit measures utilized to do a comparison of the theory with reality. There are many measures to obtain the model fit, among these several measures are most frequently used to describe the model fit such as Chi-square ($\chi 2$), normed chi-square ($\chi 2$ /df), the Comparative Fit Index (CFI); Godness of Fit Index (GFI), Tucker-Lewis Index (TLI) and Root-Mean-Square Error of Approximation (RMSEA). Hair et al., (2013); Holmes-Smith, (2000) suggested that the measures which have to be concerned especially for sample size higher than 250. This study was concerned these model fit indices since the sample size is more than 250. The cut was used by researcher depending on their literature support. Table 4.36 presents the cut off values of widely employed in a model fit (Sharif et al., 2019; Byrne, 2016; Hair et al, 2013; Wheaton et al, 1977). This study was concerned these model fit indices.

Table: 2 Cut-off Values of Model Fit Indices

Model Fit Indices	Cut-off Value
Normed Chi-square CMIN/DF ($\chi 2$ /df)	A number smaller than 2.0 is considered very good, and between 2.0 and 5.0 is acceptable.
Root Mean Square Error of Approximation.(RMSEA)	RMSEA< 0.08 or less than
The Comparative Fit Index (CFI)	CFI> 0.90 indicates a very good fit.
Tucker-Lewis coefficient(TLI)	TLI> 0.90 indicates a very good fit.
Goodness-of-Fit Index GFI	GFI> 0.90 indicates a very good fit.
Normed Fit Index (NFI)	NFI>0.90 indicates a very good fit.
Standardized root mean residual (SRMR)	(SRMR)<0.8 indicates a very good fit.

Source: Adapted from Hair et al, 2013

In exploratory work, modification indices play a significant role to develop the model fit (Byrne, 2016) this will saw some potential way to improve the poor model. In the first step, all parameters should check for the size for confirming the appropriate size which is over higher than 0.7 for most of them. In the same time, Critical Ratios (CR) must see that higher than = ± 1.96 and significant at the 0.001 level. Further error variances should be checked to be recognized as the negative variances.

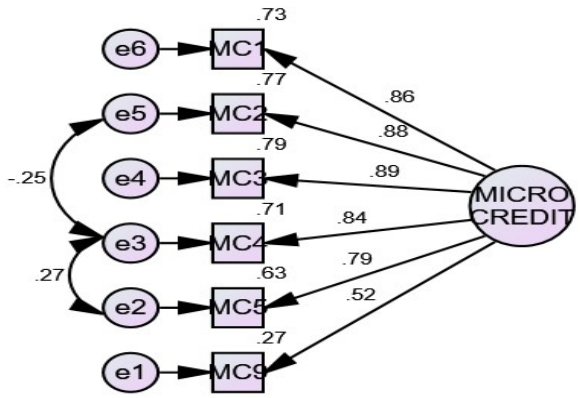
4.2.1 Confirmatory Factor Analysis (CFA) via Individual Measurement Model for Micro Credit

According to Byrne (2016), the initial aim of the CFA is to filter the model developed with EFA. Hence, CFA was developed to a single construct after framing the latent structure with the relationship between latent variables and observed variables from EFA. There were 21 distinct sample moments and 12 distinct parameters to be estimated, above cut off value used based on Hair et al., (2013) as sample size more than 250. RMSEA value .114 and CMIN/DF is 7,458 indicated an issue with a model fit. CFI and GFI were.972, TLI= .954. Model fit indicated room for further improvement.

In the measurement model standardized residuals values and estimation of factor loading were considered to delete to items for improving the measurement model. If any item having a factor loading less than 0.5 and standardized residuals higher than ±2.5 should be deleted from the measurement model, it was displayed that all factors loading more than 0.6. As Hair et al., (2013) suggest, the standardized residuals were checked for identifying which was exceeds ± 2.5. There were no values of standardized residuals items exceed ± 2.5. Modification indices (MI) values less than 10 will not have any significant contribution to improve the model (Byrne, 2016), Hence, initially checked whether there were MI values over 15 and identified two MI in the error terms. Identified two MI as e2<-> e3 (MI=32, 969) e3<-> e5 (MI=23.722) When drawn covariance among them and estimated again the measurement model, with this modification, finally obtained a good model fit.

The new RMSEA value was 0.39 which was less than 0.8 and CFI has increased to 0.998. New CMIN/DF was 1.743 which was less than 3. Furthermore, TLI and NFI have increased and they were respectively .995 and .994. Hence decided to keep the model in this stage after meeting main model fit requirements, it to be tested again in the final full measurement model and the structural model. Following figure 2 and table 3 presenting the develop measurement model for Micro Credit it fit indices.

Figure: 2 Developed Measurement Model for Micro Credit (MC)



Source: Research Data Analysis, 2019

Table: 3 Fit indices of the Developed Measurement Model for Micro Credit (MC)

Model Fit Indices	Cut of value	Fit Indices	Acceptance Level
Chi-square (χ2) Degrees of freedom		12.199 (p=0.094) 7	
Absolute fit measures			
Goodness-of-fit index (GFI) Root mean Square Error of Approximation .(RMSEA) Root mean square residual (RMR) Standardized root mean residual (SRMR) Normed chi-square	>0.9 <0.8 <5 <3	0.992 .039 .012 0.132 1.743	Accepted
Incremental fit measures			
The Comparative Fit Index (CFI; Tucker-Lewis coefficient(TLI) Normed Fit Index (NFI)	>0.9	.998 .995 .994	Accepted
Parsimony fit index			
Adjusted goodness-of-fit index (AGFI) Parsimony normed fit index (PNFI)	>.9 >.7	.977 .464	Accepted

Source: Research Data Analysis, 2019

Table: 4 Fit indices of the Developed Measurement Model for Micro Savings (MS)

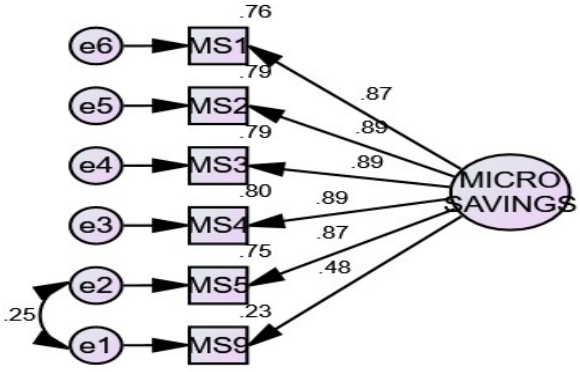
Model Fit Indices	Cut of value	Fit Indices	Acceptance Level
Chi-square (χ2) Degrees of freedom		19.909 (p=0.11) 8	
Absolute fit measures			
Goodness-of-fit index (GFI) Root mean Square Error of Approximation .(RMSEA) Root mean square residual (RMR) Standardized root mean residual (SRMR) Normed chi-square	>0.9 <0.8 <5 <3	0.986 .055 0.13 0.123 2.489	Accepted
Incremental fit measures			
The Comparative Fit Index (CFI; Tucker-Lewis coefficient(TLI) Normed Fit Index (NFI)	>0.9	.995 .991 .992	Accepted
Parsimony fit index			
Adjusted goodness-of-fit index (AGFI) Parsimony normed fit index (PNFI)	>.9 >.7	.965 .529	Accepted

4.2.2 Confirmatory Factor Analysis (CFA) via Individual Measurement Model for Micro Savings

Based on the EFA factor loading, CFA individual measurement model was developed for Micro Savings by using six items. RMSEA value is .968 and CMIN/DF is 5.140 indicated an issue with a model fit. CFI and GFI respectively .985 and .965, TLI= .975 RMR 0.024 and SRMR is 0.243. The output values were displayed weather some incremental fit indexes were an acceptable level. However, RMSEA and Normed chi-square were not in the perfect fit and it said the room for further development.

For develop the CFA model of micro saving, factor loading and standardized residuals values were considered to delete to items. The developed model indicated the good model fit. The new RMSEA value was 0.55 which was less than 0.8 and CFI has increased to 0.998. New CMIN/DF was 2.489 which was less than 3 cut off value. Incremental fit measures were indicated very good fit, TLI and NFI have increased to respectively .995 and .992. Hence decided to keep the model in this stage after meeting main model fit requirements, it to be tested again in the final full measurement model and the structural model. Following table 4 and figure 3 present the model fit indices after developing the measurement model of Micro Savings.

Figure: 3. Modified Measurement Model for Micro Savings (MS)



Source: Research Data Analysis, 2019

4.2.3 Confirmatory Factor Analysis (CFA) via Individual Measurement Model for Non-Financial Services

In the exploratory factor analysis, 6 items were selected for further analysis. CFA individual measurement was developed by using these remain items. RMSEA value is. 118 and CMIN/DF is 7.942 indicated an issue with a model fit. CFI and GFI respectively .970 and .949, TLI= .949. The output values were displayed weather some incremental fit indexes were an acceptable level. However, RMSEA and Normed chi-square were not in the perfect fit and it said the room for further development.

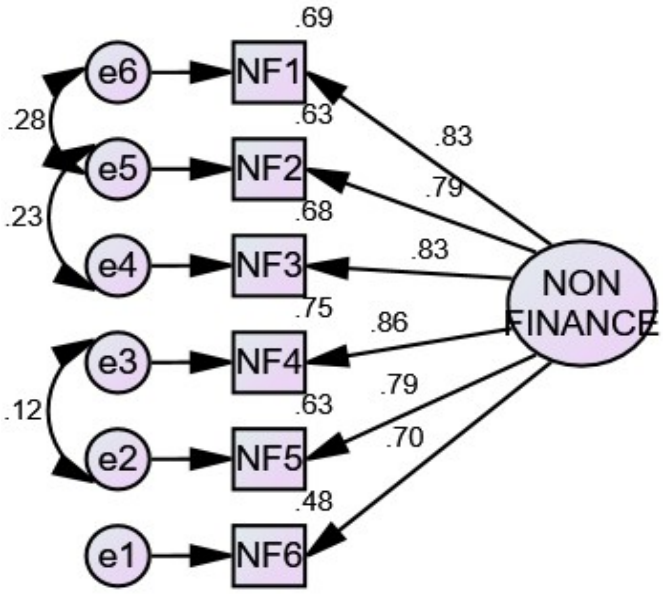
The modification indices saw some higher values which able to modify the model. Two connecting covariance was drawn between e5 < --> e6 (MI=17. 208) and e2 < -- > e3 (MI=16.439), and estimated again the measurement model; however the fit indices were indicated the further improvements. Hereafter again checked the MI values which were highest. Identified one MI among e4<-> e5 (MI=11.845) which was greater than 10. With this modification, finally obtained a good model fit.

Table: 5. Model Fit Indices for Developed Measurement Model of Nonfinancial Services

Model Fit Indices	Cut of value	Fit Indices	Acceptance level
Chi-square ($\chi 2$)		21.044 (p=0.002)	
Degrees of freedom		06	
Absolute fit measures			
Goodness-of-fit index (GFI)	>0.9	0.986	Accepted
Root mean square error of approximation (RMSEA)	>0.8	0.71	Accepted
Root mean square residual (RMR)		0.010	Accepted
Standardized root mean residual (SRMR)	<0.5	0.176	Accepted
Normed chi-square CMIN/DF	>3	3.507	Accepted
Incremental fit measures>0.9			
The Comparative Fit Index (CFI)		0.993	Accepted
Tucker-Lewis Index(TLI)		0.982	Accepted
Normed Fit Index (NFI)		0.990	Accepted
Parsimony fit index			
Adjusted goodness-of-fit index (AGFI)	>0.9	0.951	Accepted
Parsimony normed fit index (PNFI)	>0.7	0.396	Accepted

Source: Research Data Analysis, 2019

Figure: 4 Developed Measurement Model for Non-Financial Services (NF)

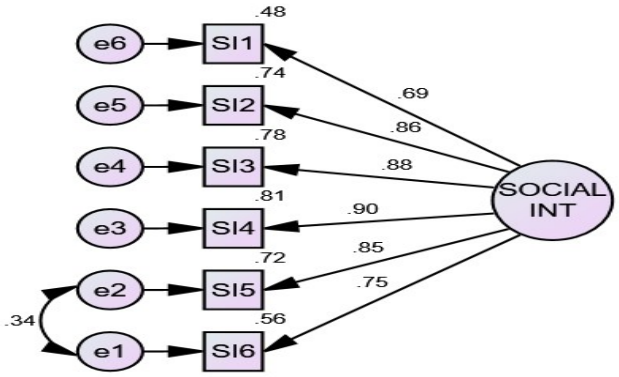


Source: Research Data Analysis, 2019

4.2.4 Confirmatory Factor Analysis (CFA) Individual Measurement Model for Social Intermediation Services (SI)

Based on the EFA factor loading, CFA individual measurement model was developed for Social Intermediation Services. The CFA model for social intermediation services was developed based on the EFA findings. There were 6 items in the initial model and 21 distinct sample moments and 9 distinct parameters to be estimated, Chi-square = 56.526 with degrees of freedom 9 and p-value was 0.000. All the parameters were estimated over 0.5 The RMSEA value .103 and CMIN/DF was 6.281 problem with a model fit. CFI and GFI respectively .979 and .962, TLI=. 966. RMR 0.022 and SRMR was 0.226. The output values were displayed that some fit indexes were at an acceptable level. However RMSEA and Normed chi-square were not in the perfect fit, hence it was indicated the room for further development. Indices of the model fit summary tables of SI were indicated that poorly fit at the initial stage, therefore, standardized residuals and regression weight was checked to modify the initial model. It seemed that standardized residuals were less than ± 2.5 and regression weight was higher than 0.5. Hence, it was considered the modification indices which higher than 15 to further development of the model. Two MI indicated the higher covariance which was able to modify the model. Two connecting covariance have drawn between e1< -- > 2 (MI=42, 328) As a result of this modifications, the model was improved as norm chi- square=1.335 and RMSEA=0.26 and AGFI=0.981, hence, decided to keep the model in this stage. Figure 5 and Table 6 present the improved CFA model for Social intermediation Services.

Figure: 5. Developed Measurement Model for Social Intermediation Services (SI)



Source: Research Data Analysis, 2019

Table: 6 Model Fit Indices for Developed Measurement Model of Social Intermediation Services.

Model Fit Indices	Cut of value	Fit Indices	Acceptance level
Chi-square (χ2)		10.679 (p=0.221)	
Degrees of freedom		8	
Absolute fit measures			
Goodness-of-fit index (GFI)	>0.9	0.993	Accepted
Root mean square error of approximation (RMSEA)	>0.8	0.26	Accepted
Root mean square residual (RMR)		.009	Accepted
Standardized root mean residual (SRMR)	<0.5	.0096	Accepted
Normed chi-square CMIN/DF	>3	1.335	Accepted
Incremental fit measures>0.9			
The Comparative Fit Index(CFI)		0.999	Accepted
Tucker-Lewis Index(TLI)		0.998	Accepted
Normed Fit Index (NFI)		0.995	Accepted
Parsimony fit index			
Adjusted goodness-of-fit index (AGFI)	>0.9	0.981	Accepted
Parsimony normed fit index (PNFI)	>0.7	0.531	Accepted

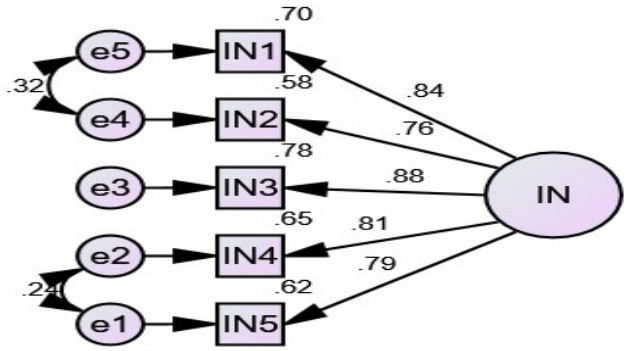
Source: Research Data Analysis, 2019

4.2.5 Confirmatory Factor Analysis (CFA) Individual Measurement Model for Insurance Services

Five factors filtered from EFA and those were used to create an initial measurement model of insurance services. There were 5 items in the initial model and 15 distinct sample moments and 10 distinct parameters to be estimated, Chi-square = 59.719 with degrees of freedom 5 and p-value were 0.00. All the parameters were estimated were over 0.5 while the majority over 0.7. RMSEA value .149 and CMIN/DF is 11.944 problems with a model fit. CFI and GFI were 968 and 951. TLI=. 935. RMR 0.026 and SRMR was 0.296. The output values displayed that incremental fit indexes were at an acceptable level. However, RMSEA and Normed chi-square were not in the perfect fit and it was indicated the room for further development.

All the values of standardized residuals were less than ± 2.5, and the regression weight was higher than 0.5. The modification indices one higher values which able to modify the model which was greater than 15. Two connecting covariance have drawn between e1< -- > e2 (MI=22.886) e4< -- > e5 (MI=31.312) When used this MI values modified the initial model, the model was improved as norm chi- square= and RMSEA=0.34and CFI=999. Therefore the model retains in this stage to further analysis. Following table 7 and figure 6 present the measurement model of Insurance services after modification.

Figure: 6 Developed Measurement Model for Insurance Services (IN)



Source: Research Data Analysis, 2019

Table: 7 Model Fit Indices for Developed Measurement Model of Insurance Services

Model Fit Indices	Cut of value	Fit Indices	Acceptance level
Chi-square (χ2)		4.740(p=.192)	
Degrees of freedom		3	
Absolute fit measures			
Goodness-of-fit index (GFI)	>0.9	0.996	Accepted
Root mean square error of approximation (RMSEA)	>0.8	0. 034	Accepted
Root mean square residual (RMR)		.007	Accepted
Standardized root mean residual (SRMR)	<0.5	. 076	Accepted
Normed chi-square CMIN/DF	>3	1.586	Accepted
Incremental fit measures>0.9			
The Comparative Fit Index (CFI)		0.999	Accepted
Tucker-Lewis Index(TLI)		0.997	Accepted
Normed Fit Index (NFI)		0.997	Accepted
Parsimony fit index			
Adjusted goodness-of-fit index (AGFI)	>0.9	0.981	Accepted
Parsimony normed fit index (PNFI)	>0.7	0.299	Accepted

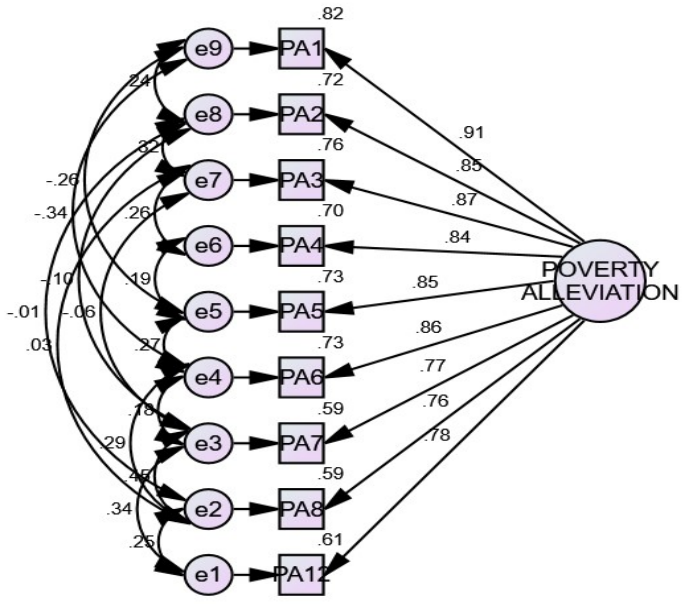
Source: Research Data Analysis, 2019

4.2.5 Confirmatory Factor Analysis (CFA) Individual Measurement Model for Poverty Alleviation

9 factors filtered from EFA and those were used to create an initial measurement model of poverty alleviation. Based on the EFA factor loading, CFA individual measurement model was developed for poverty alleviation. Figure 4.11 presents factor loading for each item in an initial individual measurement model to measure the latent constructs of poverty alleviation. There were 9 items in the initial model and 21 distinct sample moments and 14 distinct parameters to be estimated, Chi-square = 357,055 with degrees of freedom 27 and p-value was 0.000. All the parameters were estimated were over 0.6 while majority over 0.7. RMSEA value.176, CMIN/DF is 13,224 and CFI= .867 indicate problem with a model fit. NFI and GFI, GFI and AGFI were not in the acceptable level. The output values displayed that majority of model fit indices were not in the required range. Therefore model fit indicated room for further improvement.

Model fit indices were indicated that poorly fit the model at the initial stage, therefore, standardized residuals and regression weight was checked to modify the initial model. The modification indices indicated many covariance which higher than 15 of MI values. The connecting covariance had drawn between the indicated errors. Since the model fit indices indicate further improvement, used MI values greater than 10 for modifying the model. As a result of these modifications, the model was improved as norm chi-square=and RMSEA=0.75 and AGFI=0.926 CFI=993 and TLI= 976. Hence decided to keep the model in this stage. Figure 7 and Table 8 present the improved CFA model for Poverty Alleviation.

Figure: 7 Developed Measurement Model of Poverty Alleviation



Source: Research Data Analysis, 2019

Table: 8 Model Fit Indices of Developed Measurement Model of Poverty Alleviation

Model Fit Indices	Cut of value	Fit Indices	Acceptance level
Chi-square (χ2)		41,912 (p=.000)	
Degrees of freedom		11	
Absolute fit measures			
Goodness-of-fit index (GFI)	>0.9	0.982	Accepted
Root mean square error of approximation (RMSEA)	>0.8	0.75	Accepted
Root mean square residual (RMR)		.015	Accepted
Standardized root mean residual (SRMR)	<0.5	.150	Accepted
Normed chi-square CMIN/DF	>3	3.810	Accepted
Incremental fit measures>0.9			
The Comparative Fit Index (CFI)		0.993	Accepted
Tucker-Lewis Index(TLI)		0.976	Accepted
Normed Fit Index (NFI)		0.990	Accepted
Parsimony fit index			
Adjusted goodness-of-fit index (AGFI)	>0.9	0.926	Accepted
Parsimony normed fit index (PNFI)	>0.7	0.303	Accepted

Source: Research Data Analysis, 2019

V. CONCLUSION AND FUTURE RESEARCH DIRECTION

This study aims to observe the extent to which the dimensions introduced in modern microfinance have contributed to the eradication of poverty. Confirmatory factor analysis (CFA) is a statistical technique used to verify the factor structure of a set of the observed variable. The model fit indices indicated the good model fit for all the dimensions namely, micro credit, micro savings, nonfinancial service, social intermediation services and insurance service. The dimension of poverty alleviation also has a good model fit indices. Therefore, these analyses confirm the factor structure of a set of the observed dimension for further analysis. In the next step, combined this six individual measurement model and draw overall initial measurement model for validating dimensions of microfinance on poverty alleviation.

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