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MICROCREDIT COVERAGE IN MALAYSIAN MACROECONOMIC CONTEXT: AN EVIDENCE USING PANEL DATA ANALYSIS

***THILAGARANI SELVARAJ
ZULKEFLY ABDUL KARIM
AISYAH ABDUL-RAHMAN
NORSHAMLIZA CHAMHURI**
*Faculty of Economy and Management
Universiti Kebangsaan Malaysia*

**Corresponding author: strani19@gmail.com*

Abstract

This paper aims to examine the effect of macroeconomic condition on microcredit coverage in Malaysia. The Microcredit Organizations (MO) was established to complement the mainstream financial institutions but challenges remain with microcredit performances associated with microcredit coverage. The paper accordingly investigates the effects of macroeconomic condition on microcredit coverage in the Malaysian context. To achieve the objective, the static panel data technique is adopted, which comprises 13 states and 3 Federal Territories in the country, spanning 2011 to 2015. The findings reveal the resiliency of MO towards macroeconomic conditions in Malaysia. The increase in the inflation rate and agriculture GDP (LNAGDP) share shows significant negative and positive effects (non-resilient) on microcredit coverage. The main findings will assist in addressing the newly identified macroeconomic condition to improve on micro credit performance. Policy implications emanating from the study are expected to be relevant to the government, MOs and borrowers. The government

accordingly can make important contributions to borrowers by maintaining macroeconomic stability (inflation and LNAGDP share) through appropriate policies in order to achieve good microcredit coverage. MOs may revisit the existing quality regulation (MOs risk weighing loan disbursement) based on the macroeconomic condition which, in turn, can be used in outreaching more microcredit borrowers. Finally, this study may also help to elucidate specific understanding of the government and MO objectives in outreaching microcredit borrowers.

Keywords: *Microcredit coverage, macroeconomic condition, microcredit organisation, Malaysia.*

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Introduction

Microcredit denotes the provision of small-scale credit services to low income or unbanked people (Hermes, & Hudon, 2016; Hartarska, 2005). Similarly, Duvendack et al. (2011) and Asian Development Bank (2000) define microcredit as the provision of a broad range of credit services such as deposits, loans, payment services, money transfers, and insurance to poor and low-income households and microenterprises. Therefore, microcredit is an important element that can contribute significantly to the economic growth of a country by providing micro entrepreneurs with the capital needed to operate and expand their businesses through formal Financial Institution's (FI) such as Microcredit Organisation (MO).

MO was established as a way of financing poors or micro entrepreneurs who are underserved by mainstream FI in order to alleviate poverty and as an alternative microcredit system for their requirement (Battilana & Dorado, 2010; Morduch, 2000; Coleman, 2005). The mainstream FIs do not serve the microcredit applicants because they do not meet or lack of capacity to meet credit the lender's financing criteria. The microcredit applicants are perceived as being too risky and this will affect the organisational sustainability (such as bad microcredit quality). As such, they have been excluded from the mainstream financial system or from formal credit financial organisations (Shankar, 2013; Hermes & Lensink, 2007a). The problems associated with increased microcredit risk among the

microentrepreneurs is mainly due to the lack of documented history of the borrower's credit history and the long microcredit quality time frame associated with the borrowers. Since many of these borrowers are poor and have vague knowledge of the commercial viability of their projects, the FIs are also not overly committed in offering financial services.

In the Malaysian context, MOs are established and through loan officers, deliver financial services that can be life changing for the poor people (Canales, 2014). These MOs are established to provide permanent access to financial services for the critically poor or to poor households in the form of insurance coverage, money transfer and savings (Hassan et al., 2009). The provision of microcredit to micro enterprises is to improve their welfare by increasing the household income, reducing income disparity, enhance these households wellbeing and to be more sensitive towards economic vulnerability. The micro enterprises with viable businesses will be able to microcredit access and all these initiatives are expected to develop microenterprises to the next level (Bank Negara Malaysia (BNM) 2008). The collaborations among these MOs in providing entrepreneurship support programmes to micro, small and medium scale entrepreneurs can be strengthened in order to provide integrated assistance to procure more borrowers, which, in turn, may expedite poverty reduction. Currently, the three main MOs in Malaysia that assist the micro entrepreneurs are Amanah Ikhtiar Malaysia (AIM), Yayasan Usaha Maju (YUM) and TEKUN National. They are the main players that complement the initiatives of MOs through the provision of microcredit to entrepreneurs either in short or long terms (BNM, 2015) besides contributing to the economic development via interaction with other financial sectors such as the FI's.

In view of the above, the 11th Malaysia Plan 2016-2010 (Economic Planning Unit 2015) and the SME Masterplan 2013), have addressed the microcredit issues such as on the microcredit coverage. Generally, the most pressing challenges faced by micro entrepreneurs around the world are lack of access to credit (Cotler & Woodruff, 2008; Kurwijila & Due, 1991; Mel et al., 2007; Tambunan, 2007; Schoombee, 2000). In addition to the above, Schoombee (2000) found that the lack of access (coverage) to formal bank credit was one of the important problems faced by South African micro entrepreneurs in the SME sectors. Mel et al. (2007) supported the idea that missing microcredit markets is the

main constraint for small businesses to grow. In Malaysian context, the Government is taking various initiatives to address the financing needs especially in the areas where gaps exist (SME Corporation Malaysia, 2018).

In this regards, previous findings generally showed evidence that the challenges faced by microcredit coverage were due to some factors including macroeconomic conditions (Imai et al., 2011; Muriu, 2011; Ahlin & Lin, 2006; Bassem 2009; Bibi et al. 2018; Ashraf & Hassan, 2011; Wooley, 2008). According to basic economy theory, the theory of Phillips curve explains that good macroeconomic indicators will influence business environment by creating business or job opportunities. In the end, these will help in the creation of employment and eventually support the overall economic growth. Creating business or job opportunities here will lead to better credit coverage amongst the entrepreneurs, improve their income levels and alleviate poverty or vice versa. Microcredit coverage here is determined by the sustainability of the given market conditions and the economic forces which are subject to changes and the poor population they serve. Woolley (2008) mentioned that more than 50 percent of small businesses failed before realising their real potential or before reaching their peak. This is indicative of the impact of macroeconomic condition such as GDPs, which vary, with the level of economic development in the country. Woolley (2008) also informed that MOs might sacrifice the microcredit coverage to the poor by cutting back outreach to compensate for the financial returns during poor economic condition. For example, in the 1990s, the Laos PDR macroeconomic condition (inflation rate) became volatile and inflation often reached three digits. The need for frequent price changes had disrupted MOs and their microcredit borrowers (Latourte, 2003).

In addition to the above, the decrease in MOs microcredit coverage (hence lower credit coverage) is mainly due to bad credit quality (which reduces financing ability) with resultant increase in cost of borrowing during economic downturn (Berrios, 2013). As such, macroeconomic condition influences the business environment for microcredit meant for small businesses (at current interest rates), and also unemployment rates. In 1998, Malaysia also faced similar recession impacts and experienced such situation like other countries when businesses slowed down and Small and Medium Enterprise (SMEs) were badly

affected. The SMEs in particular, with limited working capital, assets and skilled workforce were affected to a larger degree, especially those businesses in the service sector (Muhammad et al., 2010) despite strong evidence of commonality (macroeconomic condition) amongst the States and Federal Territory. This was proven when commercial banks shifted their attention to improve financial sustainability by financing big projects, such as those managed by oil palm, agricultural and manufacturing companies (commodities), whose outcomes were more promising (Agrobank, 2016) and thus, conversely reduced the microcredit coverage for micro entrepreneurs.

Even though the Malaysian government had implemented various government policies, action plans and initiatives such as microcredit schemes to assist during the recession, the survey findings conclude that almost 44.8 percent of respondents faced cash flow or liquidity problem particularly in manufacturing and agriculture sectors due to continuous challenges and diversifications in the business environment (SME Corporation Malaysia 2018). This may also indicate that industries were hesitant to additionally widen their businesses despite the difficulty in obtaining microcredit due to prevailing macroeconomic condition (SME Corporation Malaysia 2018). According to Samad (2007), competitive and resilient SMEs are important in the growth and development process of the Malaysian economy, including the adoption of appropriate strategy, since SMEs have great potential to be the engine of economic growth as could be seen in other developed countries both in the East and West, such as Japan and Germany. Most SMEs require support or assistance from the government especially for greater competitiveness in the global business environment such as the case in Malaysia. However, adequate attention has not been given in the previous research to consider the impact of macroeconomic condition on SMEs in the Malaysian context (Hashim, 2000; Hin et al., 201; Sim, 1991; Sim & Yap, 1997; 3).

The main focus of this empirical research is to provide new insight to the microcredit business sector by examining the effects of macroeconomic conditions on breadth of microcredit coverage in the Malaysian context. Thus, the paper contributes to the microcredit coverage by extending the existing literature which further helps to improve policy measures (in terms of macroeconomic indicators) that are needed to

promote microcredit coverage. The role of macroeconomic conditions is important in improving the delivery system for microcredit coverage and consequently to support the microcredit ecosystem. The sequence of this paper begins with the introduction, followed by the review of literature, research methodology, results and discussion and finally the conclusions.

Literature Review

This section highlights the determinants from the perspective of the macroeconomic condition on the breadth of microcredit. Identifying the right determinants is important in achieving good microcredit coverage. Hence, many studies have focused on the relationship between the macroeconomic conditions on microcredit coverage but the results have been rather inconsistent (Ahlin et al., 2010; Al-Azzam & Mimouni, 2016; Hermanto & Astuti, 2013; Hermes et al., 2009, Honahan, 2004; Gonzalez, 2007; Woolley, 2008). In recent years many studies discovered that the macroeconomic condition is an important determinant of MO coverage (Ahlin & Lin, 2010; Ashraf & Hassan, 2011; Bibi et al., 2018; Imai et al., 2011; Muriu, 2011). For example, the coverage was shown to be dependent on the country-level macroeconomic condition such as the growth of GDP which had a significant and positive impact (Zopounidis & Kosmidou, 2008; Kosmidou et al., 2005). Conversely, some studies found modest or no relationship between macroeconomic condition on MO coverage (Hermanto & Astuti, 2013; Mimouni, 2017; Muriu, 2011; Woolley, 2008;). Hence, past studies on MO coverage have generally produced two contradicting results; namely, (i) alleviate outreach, and (ii) worsen outreach. This study will revisit the determinants using variables considered in the previous studies that can contribute to wider MO coverage.

The literature generally recorded that MO coverage (outreach) was more developed in countries with good economic condition (Ahlin et al., 2011; Armendáriz & Vanroose, 2009). Macroeconomic conditions, such as GDP and inflation, have a strong relationship with the microcredit coverage. For example, a study by Ahlin and Lin (2010) concluded that macroeconomic indicators (such as GDP per capita, growth in GDP, domestic credit to the private sector, percentage of service in GDP, percentage of industry in GDP or inflation) generally

influenced MOs' outreach variables such as borrower growth, microcredit-size growth, and portfolio growth. MOs cover costs well with higher macroeconomic growth due to better performance such as lower default rates and operating costs (Ahlin et al., 2010). MOs' coverage increased in countries with good economic condition where operational costs were recovered when economic growth is stronger (Ahlin et al., 2011; Armendáriz & Vanroose, 2009). This occurred because the cost coverage was commendable in a country with higher macroeconomic growth due to better performance such as lower default rates and operating costs per borrower or larger average loan (Ahlin et al., 2010). The study by Imai et al. (2011), which comprised data from 97 countries spanning from 2005 to 2008 shows that macroeconomic (such as the GDP per capita and share of domestic credit to GDP) and financial factors were positively correlated to MOs' coverage. On the other hand, macroeconomic condition such as GDP was expected to have a negative impact on the outreach of MOs. The growth in GDP may increase household income, hence reduce the demand for microcredit. This reduction was due to the uncertainty of the impact of GDP growth on microcredit interest rates which can lead to crowding out, at least within formal finance, or conversely, elicit no reaction from competitors (Cull et al., 2009; Mimouni, 2017).

On the contrary, MOs were reaching to more borrowers during bad macroeconomic conditions (such as inflation) and showed positive and significant impacts on the breadth of outreach regressions as consistently reported by Hartarska (2005), Athanasoglou et al. (2008), Bassem (2009) and Bibi et al. (2018) that established and large institutions, including those operating under high inflation environments managed to increase the breadth of microcredit outreach as they covered more borrowers. Some studies have explained that when there is an increase in interest rate due to macroeconomic condition, there will be some form of crowding out from FI which increases the microcredit demand towards MO's increase (Vanroose & D'Espallier, 2009) since the interest rate is lowest in the market compared to FI's. Macroeconomic conditions such as inflation affect the microcredit payment capacity of borrowers in which higher inflation can improve the ability of the borrowers to repay their microcredits by reducing the real value of outstanding debt (Nkusu, 2011). It can therefore increase the microcredit coverage as this will create cash flow for the MOs. Conversely, bad macroeconomic conditions worsen the microcredit coverage. For an

example, inflation lowers real rates of return for an MO (lowers MOs' returns), and may cause growth in conservatively large inflation premium into interest rates. Therefore, the increase in inflation will lead to the increase in credit risk (Ahlin et al., 2011; Fofack, 2005; Khemraj & Pasha, 2009) in the form of positive relationship. When the credit risk in MOs increases, the microcredit coverage will subsequently reduce due to the effect of the MO's cash flow.

In addition to the above, some studies have reported that macroeconomic condition has little or no relation with microcredit coverage and is resilient to the condition (not or less sensitive). Studies by Krauss and Walter (2006), Gonzalez (2007), Woolley (2008), Hermanto and Astuti (2013) and Mimouni (2017) concluded that MOs showed high financial resilience during economic downturn as compared to that of FIs.

In Malaysia, studies related to the microfinance are very limited and mainly focused on the microcredit repayment and poverty (Al-Mamun et al., 2014; Samer, Sayed et al., 2015; Mokhtar et al., 2012; Nawai & Shariff, 2013; Selvaraj, 2019). Even though the findings show significant impact of Malaysian microcredit, several weaknesses have been identified mainly in the methodology section such as bias selection and the effect of demographic characteristics. Given this backdrop, this study fills the gaps of the literature by identifying the area that is under-explored such as the microcredit coverage and how it has been affected by the macroeconomic condition in Malaysia using the actual data.

Research Methodology

Data Description

In this study, the panel data analysis approach was employed. The dependent variables represent the breadth of microcredit (proxy by number of borrowings) (Christen et al., 1995; Cull et al., 2007; Hermes et al., 2011) of a MO. The macroeconomic determinants in this study serve as the independent variables for the 13 states and three federal territories (state specific) in Malaysia. All the independent variables data were collected from the Department of Statistic Malaysia and Economic Planning Unit Malaysia. Meanwhile, the dependent

variable data (breadth of microcredit) was collected from an existing Government-sponsored microcredit programmes undertaken by a Government MO in Malaysia. The MO here also complements the initiatives by the Financial Institutions in Malaysia (Bank Negara Malaysia, 2015) for the development of sustainable and commercially driven micro entrepreneurs.

Based on data availability, the study was conducted from 2011 to 2015, spanning a total of five years and comprises 13 states and 3 Federal Territories in the country (making a total of 80 observations) with a balanced panel data. The finding uses the total microcredit coverage (breadth of microcredit) at the end of each financial year in the current microcredit cycle based on each state and federal territory. The study examines the short-term (5 years) implications as consequence to the unavailability of extensive and reliable historical data on microcredit in Malaysia.

MO performance indicators are predicted by the three key macroeconomic variables namely mean monthly household income, inflation and sectorial Gross Domestic Product (GDP) (Ahlin, 2011). In addition, the selections of the sectors are based on the SME definition which covers sectors such as services, manufacturing and agriculture (SME Corp, 2013). This study involves a number of borrowers currently operating micro enterprises in viable businesses. The selection procedure thus adopted was to overcome sampling bias through avoiding non-clients of the MO.

This measure offers a few advantages for microcredit coverage in Malaysia. Firstly, the data should offer a good reflection of the actual microcredit coverage since these were sourced, over a year, from active borrowers who were operators of micro enterprises with viable businesses from each state and the federal territory (state specific data). Secondly, the findings will potentially provide new insight into the microcredit sector since few studies have been conducted on the issue of MOs coverage by microcredit programs in Malaysia. According to Mokhtar et al. (2011), research on MO performance in individual-based lending schemes mostly relate to rural banks or semi-formal financial organisation. Table 1 shows the variable description for determinants of macroeconomic conditions on the microcredit coverage (breadth of microcredit) in Malaysia.

Table 1

*The Effects of Macroeconomic Conditions on Microcredit Coverage:
Variable Description*

Variables	Descriptions	Source
DEPENDENT VARIABLE		
BRD	log of total breadth of microcredit in state i-at time t (number of borrowing – state specific data)	MO, Malaysia
INDEPENDENT VARIABLE		
MHI	log of mean monthly household income (state specific data)	DOSM
INF	inflation rate (state specific data)	DOSM
LNAGDP	log of Agriculture GDP share (state specific data)	EPU, Malaysia
LNMGDP	log of Manufacturing GDP share (state specific data)	EPU, Malaysia
LNSGDP	log of Service GDP share (state specific data)	EPU, Malaysia

Static Panel Regression Model

The study applied the static panel techniques that include pooled OLS, random effects (RE) and fixed effects (FE) models in estimating the impact of macro-economic condition determinants on the microcredit coverage. The regression model in the study adapted (based on the availability of data) the independent variable that incorporated the macroeconomic condition indicator. The advantage of panel data analysis is, it provides a rich and powerful study as both the space and time dimension of the data is considered. The combination of the two dimensions’ observation provide more informative data, variability, less multi collinearity among variables, more degrees of freedom and efficiency. Several estimation and inference problems namely heteroscedasticity and autocorrelation due to time series of cross-section observations also can be corrected using several estimation techniques (Gujarati 2009).

Thus, the model for regression of microcredit coverage (BRD) is shown below:

$$\log BRD_{it} = \beta_0 + \beta_1 \log MHI_{it} + \beta_2 \log INF_{it} + \beta_3 \log AGDP_{it} + \beta_4 \log MGDGP_{it} + \beta_5 \log SGDP_{it} + \eta_i + \mu_{it} \quad (1)$$

In equation (1), i represents cross section (states specific), and t is the time series (starting from 2011 until 2015). The dependent variable is the log of number of borrowing (as a proxy for breath of microcredit), whereas the independent variables of interest are the macroeconomic condition indicator proxies by the log of mean monthly household income by state (MHI), state inflation rate (INF), log of agriculture GDP share (LNAGDP), log of manufacturing GDP share (LNMGDP) and log of service GDP share (LNSGDP). The error terms are assumed to follow one-way error components which consist of state specific effect (η_i) and the remainder error term (μ_{it}). According to the literature, it is expected that monthly household income (Imai et al. 2011), agriculture GDP share, manufacturing GDP share and service GDP share (Ahlin et al., 2011; Leegwater & Shaw, 2008) are positively related to microcredit coverage whereas inflation is expected to be negatively related (Ahlin et al., 2011; Hermanto & Astuti, 2013).

The baseline model in equation (1) will be estimated using three competing models, namely POLS, RE, and FE. The main differences between these three models are pooled OLS model assumed the homogeneity of all cross-sectional in which the intercept and the slope are the same across units and time. To test whether the data should be pooled or not, the Breusch-Pagan (BP), Lagrangian Multiplier (LM) test is first applied. The hypothesis of the test is: $H_0: \sigma_\eta^2 = 0$ versus $H_A: \sigma_\eta^2 > 0$. If the H_0 is rejected, this indicates that the pooled model is inappropriate. Thus, we proceed to the Hausman test to choose between Fixed Effect (FE) or Random Effect (RE) models. These two models assume that each units (countries) have their own intercepts, while restricting the slope to be homogenous. Specifically, Fixed Effect (FE) assume that the country fixed effect (η_i) is a part of constant, whereas Random Effect (RE) assume that the country fixed effect (η_i) is a part of error term. The hypothesis of the test is: $H_0: \text{Cov}(\eta_i, X_{it}) = 0$ versus $H_A: \text{Cov}(\eta_i, X_{it}) \neq 0$. If the H_0 is rejected, the fixed effect is favoured.

Results and Discussion

Descriptive statistics for the dependent and independent variables which comprise data on five variables are provided in Table 2. Standard deviation is a popular measure of variability because it returns to the original units of measure of the data set. Overall, the dependent variable and independent variable mean and standard deviation values are close to each other. A low standard deviation (BRD, MHI, INF, LNAGDP, LNMGDP, and LNSGDP) indicates that the data points tend to be close to the mean (expected value) while a high standard deviation indicates that the data points are spread out over a wider range of values. For an example, the coefficient of variation for MHI is less than 1 which indicates a relatively a low variation.

Table 2

The Effects of Macroeconomic Conditions on Microcredit Coverage: Descriptive Statistics

Variable	Observations	Mean	Std. Dev	Min	Max
BRD	80	7.4971	1.3242	3.8918	8.8511
MHI	80	8.5309	0.3274	7.9920	9.3837
INF	80	2.64	0.6223	1.7	3.2
LNAGDP	80	21.6382	2.1704	14.5087	23.5612
LNMGDP	80	22.8704	1.4372	19.8095	24.9696
LNSGDP	80	23.8404	1.1326	21.54	25.71

Correlation Matrixes

Prior to performing the regression analysis, the calculation on correlation coefficients provides a first look at the relationship that may exist between the variables (Table 3). As can be seen, there is a low degree of correlation between the dependent variables. Overall, the index (between the independent variables) passes the statistical validity test for a valid instrument as indicated by the significant correlation coefficients ranging from $r = 0.003$ to $r = 0.639$. Collinearity therefore would not be a serious problem in this estimation. The

low degree of correlation between the independent and dependent variables does not imply that the cross relationship is not significant (correlation is not causation) (Gujarati, 2009). Multiple regressions analysis such as panel analysis effectively estimate(s) this relationship where the influence of all other terms are controlled in the model and any other influence can be effectively removed.

Table 3

The Effects of Macroeconomic Conditions on Microcredit Coverage: Correlation Matrixes

	BRD	MHI	INF	LAGDP	LNMGDP	LNSGDP
BRD	1					
MHI	-0.3243	1				
INF	-0.0692	0.1273	1			
LNAGDP	0.3840	-0.6388	0.0028	1		
LNMGDP	0.1612	0.0902	0.0132	0.3195	1	
LNSGDP	0.1065	-0.0815	0.0187	-0.0403	0.1823	1

Static Panel Regression

Table 4 summarises the static panel regression results of the effects of macroeconomic condition variables on microcredit coverage (breadth of microcredit) in Malaysia and the details of each estimation, that is, the pooled ordinary least square (POLS), fixed effect (FE) and random effect (RE). Selection for all models is based on the p-value of the test. Firstly, BP multiplier test was conducted to select between POLS and RE. The null hypothesis (H_0) informs that if the p-value is more than α level (0.05), then we can conclude that the OLS is the suitable model since the H_0 was not rejected. Conversely, when the p-value is less than 0.05, the H_0 is rejected, hence the RE is the suitable model for selection in this model. The Hausman test was subsequently carried out to select the best model between RE and FE. Since the p-value of the test is lower than 0.05 the H_0 is rejected. However, this study failed to reject the H_0 . RE estimator is found to be better than FE and POLS as shown in column [3]. Both the Hausman and theta statistics favour RE over FE. The RE model used for panel data assumed that

the differences between individuals were random as opposed to fixed. It was assumed to be a random variable that was uncorrelated (independent) with the regressor. This assumption is important for the RE Model and is necessary for its consistency but not for the FE Model.

Table 4

Static Panel Regression Results of Microcredit Coverage (Breadth of Microcredit)

Explanatory variables	Expected coefficient sign	[1] Log of BRD [POLS]	[2] Log of BRD [FE]	[3] Log of BRD [RE adjusted]
Log of Household Income	+	-0.559 (0.637)	-1.243 (1.066)	0.379 (0.281)
Inflation	-	-0.117 (0.229)	-0.166*** (0.0454)	-0.185*** (0.0433)
Log of Agriculture GDP	+	0.170* (0.1)	0.7 (0.955)	0.296** (0.171)
Log of Manufacturing GDP	-	0.0629 (0.117)	0.106 (1.213)	-0.00261 (0.264)
Log of GDP Service	-	0.111 (0.131)	2.688 (1.707)	0.269 (0.303)
Constant		4.817 (7.418)	-63.09* (36)	-8.017 (7.071)
Observations		80	80	80
R-squared		0.176	0.301	0.2519
Number of code		16	16	16
F Test			142.23 (0.0000)	
BP			144.32 (0.0000)	
Hausman			3.39 (0.4944)	

Note: (a) Dependent variable is microcredit coverage (breadth of microcredit - BRD); (b) p-values in parentheses ; (c) * p < 0.1, ** p < 0.05, *** p < 0.01 indicates significance at the 1 percent, 5 percent and 10 percent levels respectively; (d) The standard errors for RE and FE regression are adjusted (corrected) for heteroscedasticity and correlation across observation both over time and within the same period.

Table 4 shows the specifications in the use of panel data. The size of each economic sector is measured for every state in order to gauge future sensitivity (Mendelsohn et al., 2000). The final findings, as presented in column [3], shows that the R-squared (R^2) estimation of 0.25 for BRD, as a dependent variable, suggests a very low level of explanatory value. This indicates that MOs performance for the BRD is less likely to be significantly tied to macroeconomic indicators. The overall SMEs in Malaysia are more resilient to changes in the domestic economy with GDP registering growth of 6.1 percent in 2015 despite the weak external environment (SME Corporate Malaysia, 2016).

As expected, the estimation results indicate that the two variables, namely inflation and log of GDP agriculture, were statistically significant negative and positive at the 1 percent and 10 percent level respectively. The final model shows that the increase of 1 unit in inflation would reduce the BRD of outreach by 0.185 percent, while one percent increase in GDP agriculture would increase it by 0.296 percent. Meanwhile, LHI, log of GDP manufacturing and log of GDP service were not statistically significant in their influence on the BRD.

The findings show that changes in manufacturing the Gross Domestic Product (GDP) share, for example, do not have significant effect (resilient) on BRD. The manufacturing sector can be explained as high performing due to technologically advanced sub-sectors and related infrastructure (SME Corporate Malaysia, 2016; Frontier Issues, 2017). The sector can be considered to be more resilient to changes in the domestic economy (Ahlin, 2011; Wooley, 2008). Overall, based on the final model, inflation and log of agriculture GDP is influential on or sensitive to (non-resilient) BRD. For example, when the inflation is low, it influences an increase in BRD (number of borrowings). In terms of sectorial GDP, the GDP of agriculture has significant effect on the BRD in the final model, in which the increase in GDP of agriculture, increases BRD. GDP of manufacturing and GDP of service do not significantly influence BRD which remained consistent in all the three models. This shows that the two GDPs are resilient to BRD. This shows that borrowers are confident in obtaining microcredit when the macroeconomic condition is good.

Macroeconomic condition, namely inflation, has a strong relationship with microcredit coverage and the finding is in line with those reported

in the literature. As expected, the analysis shows that inflation is negative and significantly associated with microcredit coverage. The increase in inflation leads to an increase in the credit risks or default rates (Ahlin et al., 2011; Fofack, 2005; Khemraj & Pasha, 2009) due to lower real rates of return for an MO (higher operational cost) and large inflation premium. This will subsequently reduce the MO's capital resources and affect microcredit coverage. Additionally, the increase in inflation rate also decreases real income and weakens the borrowers' ability to repay their microcredits on time (Nkusu, 2011). When the borrowers' ability in repayment weakens, it will reduce the capital resources available for lending for the MOs and this will in turn weaken microcredit coverage of the MO. Hence, MOs will be less profitable when inflation is high (Vanroose & D'Espallier, 2013).

These findings were also supported by Ahlin (2011) who demonstrated that inflation robustly slowed down the overall growth of lenders, though there was no significant relationship with growth of borrowers (breadth of microcredit coverage). Lenders responded conservatively to inflation due to upward adjustment of prices (more than offsetting higher capital costs) and downward adjustments of quantity. This appears to slow the MOs intensive growth based on the current inflation level and may not represent the high-inflation level (Ahlin, 2011). Inflation may also affect the cost of funds due to the tightening on borrowers' incentives as consequence to delay in repayment, which also affect default (Ahlin et al., 2011).

There is also evidence that suggests MOs as performing better in economies (such as increase in GDP) with higher growth which may affect increase in micro-enterprise returns and the demand (increase coverage) for microcredit (Ahlin et al., 2011; Leegwater & Shaw, 2008; Wagner & Winkler, 2012). The share of GDP, such as those from the agriculture sector, also influences microcredit coverage (Leegwater & Shaw, 2008; and Ahlin et al., 2011). Differences in growth and performance are shown across each sector reflecting on the overall business environment, its functions and effects on sectorial structures (Fafchamps & Gabre-Madhin, 2001). Thus, MOs in countries with good economic conditions can achieve coverage or outreach, when the government provides suitable environment for all sectors. This can foster the increase of microcredit availability through government funds, which are distributed to the micro entrepreneurs. For an example, the higher the interest rate, the lower the demand for loans to the agricultural sector which results in limited productivity

and increased expenses, and which, in turn, lowers the capacity to service credit and vice versa (UNDP 2007; Samuel 2008). As such, the financial development of a country may also contribute positively to MOs' efficiency (Hermes et al., 2009). Accordingly, and in line with the government's priority for the agricultural sector (stable macroeconomic condition), several initiatives were taken by the MOs such as low interest rates and attractive loan conditions which have proved quite useful in expanding credit to this sector and also in extending its microcredit coverage. This effort is also based on the targets for the fiscal year agreed upon earlier. Additionally, the unstable income in the agriculture sector, due to high risk, (weather condition) induced it to be resilient to macroeconomic condition. In the Malaysian scenario, with the continuous challenging business environment, the survey discovered that approximately 44.8 percent of respondents face cash flow or liquidity problems, particularly in the manufacturing and agriculture sectors. Even though SMEs require funds and liquidity to sustain their business operations, demand for financing from financial institutions has decreased. This may indicate that SMEs were reluctant to further widen their debt exposure in their businesses (SME Corporate Malaysia 2016).

The above findings suggest that financial resilience of MOs may come from some of the unique characteristics of microcredit such as financing method, special operational techniques and clients, as compared to sacrificing outreach for financial sustainability in response to economic conditions (Woolley 2008). For example, there may be some institutions that are generally high performing and more resilient to changes in the domestic economy. It is therefore important for us to consider that there exist an institution whose coverage does not correlate with sectorial GDP. There is some evidence and possibility that such institution can exist and that firms are not necessarily affected by the domestic economy. The findings may also suggest that microcredit may be effective (resilient) even in areas and times of unstable domestic economy condition, and as such, it does not affect the manufacturing sector and service sector outreach (Ahlin, 2011; Woolley, 2008).

Conclusions

The purpose of this study is to identify macroeconomic condition determinants that affect microcredit coverage in Malaysia. The findings

provide new insight into improving on microcredit performance through microcredit coverage. The study also contributes to the existing body of knowledge in some areas that convey implications for academics, MOs and policymakers. The effect of macroeconomic condition variables was assessed with focus on the influence of household income, inflation, agriculture GDP share, manufacturing GDP share and service GDP share on microcredit coverage (proxy by breadth of microcredit). The findings conclude that changes in the domestic economy, namely inflation and GDP agriculture, are more sensitive (non-resilient) and influential on microcredit coverage relative to other variables examined. Household income, GDP of manufacturing and GDP of service sectors are not significantly affected since the breadth of microcredit is consistent in all the three models thus indicating that both sectors are resilient. Based on these findings, the government can contribute to the microcredit industry through sustaining macroeconomic stability (increase Agriculture GDP and reduce inflation rate). The MOs may also increase their organisational competence by looking into macroeconomic determinants that influence microcredit coverage in Malaysia. Future research should thus focus on the influence of macroeconomic condition on other dimensions in microcredit outreach. The outreach here exemplifies effort to extend microcredit services to the people who are underserved by FIs. The research should therefore focus and explore other areas such as the impact of the organisational delivery system in addition to the macroeconomic condition that can help to improvise the outreach of MO.

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