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Unveiling the impact of economic and political globalisation on the efficiency of microfinance institutions

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Abstract. Microfinance Institutions (MFIs) strive to alleviate poverty by offering financial access and services to the poor in society. MFIs play a significant role in a country's social and economic advancement. This study aims to examine the relationship of the economic and political globalisation with the social and financial efficiency of MFIs in the Philippines and Malaysia from 2012 to 2020.

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There are two types of analysis adopted in this study: the non-parametric Data Envelopment Analysis (DEA) and the multiple panel regression model. In the first stage, the DEA approach is employed to determine the MFIs' level of efficiency. Next, the determinants of financial efficiency and social efficiency are identified through panel regression. The results of the robustness test show that MFIs have better and more effective financial efficiency compared to social efficiency. Therefore, this result shows that the MFIs concentrate more on profitability and sustainability of the operations and they tend to neglect their primary goal in terms of the social function, i.e., reducing poverty, since the scores for financial efficiency are higher than those for social efficiency. Furthermore, the MFIs, government, policymakers, investors, and future researchers benefit from the outcomes of this study, as they can obtain a comprehensive insight on the efficiency of MFIs and the variables that could contribute to the efficiency in MFIs.

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1. INTRODUCTION

Microfinance Institutions (MFIs) are organisations that focus primarily on providing microfinance to the poor in order to reduce poverty (Gessesse and Ambaye, 2014). MFIs are distinct from other formal financial institutions because of their smaller size and focus on providing services to the underprivileged. Without pledging collateral requirements, MFIs provide the poorer segments of the community with financial resources such as loans, savings, insurance, and non-financial services like education and health care. Their positive economic influence is visible in many aspects, including enhancing the entrepreneurship development in target groups of the poor (Shkodra et al., 2021), providing access for financial resources at markets with certain problems with digital services development (Stark, 2021). Efficiency in MFIs, according to ILO (2007), refers to the effective use of resources such as assets, human capital, and subsidies to produce output as indicated by the size of the active borrower base and the loan portfolio.

While MFIs do not function in the same way as conventional banks, Gutiérrez-Nieto et al. (2007) claim that this does not mean that MFIs do not make efforts to address concerns about profitability and efficiency. Due to rivalry with other MFIs for donor funds, as the number of MFIs is quickly increasing around the world, efficiency is essential. Private investors and financial institutions are getting more involved in the microfinance industry and placing more of an emphasis on efficient operations because doing so helps to cut down on resource waste. They are also more interested in funding MFIs that are efficient and sustainable. Commercialization, competition, and the withdrawal of subsidies highlight the need for MFIs to be efficient while providing financial services to the poor and ensuring financial self-sufficiency. Nevertheless, inefficiency of MFIs exists when compared to commercial banks due to their being incapable of covering the cost of providing loans out of the profit generated from the outstanding loan.

Goyal (2006) asserts that as a result of globalization, there is now more competition and interdependence among economies. According to Mishkin (2009), globalisation increases access to capital by making financial markets available to foreign capital in the country and by lowering the cost of loans used to support investments in profitable investment products (Ślusarczyk & Kot, 2012; Lacko et al., 2023).

Additionally, the globalisation of the capital markets affects the countries' ability to attract international investment and foster financial development. According to Samimi and Jenatabdi (2014) or Morvai et al. (2022), globalisation does have an impact on a country's economy, but whether this impact is favourable depends on the countries' income levels.

Thus, this study aims to examine the impact of MFIs specific and macroeconomic variables to the social and financial efficiency in the Philippines and Malaysia. Additionally, this research also seeks to establish the impacts of economic globalisation and political globalisation towards the social and financial efficiency of 88 MFIs in the Philippines and Malaysia from 2012 to 2020.

In this study, the next section will summarise the review of literature from past research. In section 3, the methodologies and variables adopted in this research will be explained in detail. Furthermore, section 4 will discuss the empirical findings whereas section 5 will conclude the findings, limitations and implications identified.

2. LITERATURE REVIEW

The competition among the MFIs is increasing, which causes the MFIs to operate efficiently to stand out among their competitors. Furthermore, the potential development of the MFIs attracted more investors such as commercial banks or private investors to provide funding in MFIs forces the MFIs to be more sustainable and efficient as they are more interested in funding MFIs that are better in utilising their resources.

The studies conducted by the researchers found out that the higher the MFIs size will increase the efficiency, where larger MFIs own more resources in reaching more low-income populations (Wijesiri et al., 2017). Some researchers, in contrast, concluded that size has a negative impact on MFIs' efficiency because larger MFIs may act hastily in operations when they have excess capacity (Bassem, 2008; Kipsha, 2013). However, Kim et al. (2018) and Akhtar et al. (2011) proposed that the relationship is weak and insignificant between size and MFIs' efficiency.

Moreover, Kipsha (2013), Wijesiri et al. (2017), and Wijesiri et al. (2015) stated that the age of MFIs has a significant positive relationship with efficiency. This is because as MFIs became more specialized in the industry, they will discover new approaches to seize the market to be sustainable as the MFIs grow and develop in time. But from a different angle, Wijesiri et al. (2017) claimed that older MFIs are less effective in reaching their outreach objectives. According to Wijesiri et al. (2015), older MFIs are less productive and make less profit than younger MFIs because they tend to diversify their loan portfolios away from the poor as they age. Gutiérrez-Nieto et al. (2009) stated that MFIs age which was used as an estimate for non-physical capital including market experience does not exert significant influence on MFIs' efficiency.

Additionally, Singh, Goyal and Sharma (2013), King'ori et al. (2017) as well as Wijesiri et al. (2015) stated that the ROA which represents the MFIs' financial ability has a positive correlation with the social efficiency of MFIs as the main concern of MFIs is the livelihood progression through reaching the unmet loan demand and covered by the MFIs with the specific resources or assets in satisfying the credit demands of the poor. In contrast, the studies done by Katuka and Mavhunga (2006), Havidz and Setiawan (2015) as well as Abdulai and Tewari (2017) show that the MFIs' ROA and efficiency are negatively correlated, where larger ROA has worsened the outreach performance of MFIs to offer crucial services for the poor in reducing poverty. However, the research findings conducted by King'ori et al. (2017) reveal that the ROA of MFIs, which is utilised as a proxy for the financial success of MFIs, has a weak association with the efficiency of MFIs.

Furthermore, Kar (2012) found that DTE benefits MFI outreach and cost-efficiency because the latter have more chances to access funding from financial and capital markets and do not need to substantially

rely on retained revenues to fuel future expansion. Mia and Soltane (2016) and Berger and Di Patti (2006) on the other hand, discovered that DTE and MFIs' profitability are negatively correlated, as DTE increases the institutions' risk exposure and liquidation risk. Nevertheless, Kinde (2012) stated that the MFIs' capital structure represented by DTE has an insignificant effect on financial sustainability.

The previous studies carried out by Ahlin and Lin (2006), Petria et al. (2015), Kosmidou (2008) and Zamore (2018) asserted that the GDP growth and MFIs' performance including sustainability, efficiency, and profitability, are positively related where the MFIs activity will increase due to the rising deposits made by customers and loans offered by the MFIs with a higher interest margin. Contrastingly, Kamarudin et al. (2016) and Bibi et al. (2018) claimed that when countries experience unstable economic growth, GDP has a negative impact on bank and MFIs' efficiency, leading to MFIs' customers obtaining fewer financial services, failing to meet the legal obligations of the loan, resulting in loan default, and lower outputs. Notwithstanding, Caro (2017) found that GDP has an insignificant impact on MFIs' performance and profitability.

According to Hissan (2014) and Amaliah, I., et al., (2021) the rate of inflation has a beneficial impact on the effectiveness and profitability of MFIs since it enables them to alter their interest rates, which leads to a faster revenue growth than cost. In contrast, Hissan (2014) found that if MFIs are unable to recognise an increase in inflation right away, it has a detrimental impact on their profitability and effectiveness. However, according to Caro (2017), and Vanroose (2008), the inflation rate has no significant impact on MFIs' profitability because borrowers are still able to repay the loan even as inflation rises.

Sufian and Kamarudin (2016) stated that the economic globalisation which indicates a broad movement of products internationally, transmission of information, flow of capital and transfer of technology will increase the efficiency of MFIs. Ekong (2016), on the other hand, asserted that there is a negative correlation between economic or financial globalisation and loan distribution, where the performance of MFIs' credit management deteriorates and a rise in non-performing loans.

Sufian and Kamarudin (2016) and Kurowska-Pysz et al., (2018) have noted a positive link between political globalization – the expansion in the size and complexity of political systems – and the effectiveness and performance of MFIs. These consequences become more evident in terms of increasing social responsibility at the country level (Oliynyk et al., 2023) and growing demand for high quality of public governance of social sphere (Aliyev, 2023). This is due to political integration driving reformation in political or economic processes which will encourage economic growth in the country. Nevertheless, Sufian and Kamarudin (2016) stated that political globalisation has a negative influence on the profitability, competitiveness, and productivity of MFIs.

In conclusion, the analysis of literature reviews revealed few gaps in the body of knowledge. First, there are limited number of studies that investigate the effects of macroeconomic factors, globalisation, and MFI-specific drivers on the social and financial efficiency of MFIs. Most of the research focuses on how various factors affect bank performance, profitability, and efficiency. Additionally, other studies presented varying and contradictory findings about the variables examined. Additionally, other studies only focus on how different variables affect the social or financial efficiency of MFIs and banks.

3. METHODOLOGY

This study gathers the secondary data from Philippines and Malaysia which consist of 88 MFIs for 9 years from the year 2012 to 2020. The frequency of the data is annually. As a result of limited data availability, this study's analysis is restricted to the sample period up to 2020. This limitation stems from the fact that the most recent data on globalization, which is a crucial variable of interest for this study, is only available

until 2020. The data source for the globalization index used in this study is accessible at <https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html>.

3.1. Data envelopment analysis (DEA)

During the initial step of analysis, the input-oriented technical efficiency (TE) of the MFIs is measured using the non-parametric DEA approach with the variable returns to scale (VRS) model. In fact numerous of prior studies used the DEA approach to measure the efficiency score of unit (Halaskova et al., 2022; Lazović-Pita et al., 2022; li et al., 2022; Yu et al., 2022). In this study, the VRS TE is used as the main measurement for the social efficiency and financial efficiency of the MFIs. According to Charnes et al. (1978), the DEA approach has been used for roughly 30 years to monitor and evaluate the production efficiency of decision-making units (DMUs) like MFIs. In addition, Banker et al. introduced the VRS model, also known as the BCC model, which extended the constant returns to scale (CRS) or CCR model that Charnes et al. (1978) proposed (1984).

The CCR model's expansion allowed for the evaluation of the MFIs' pure technical efficiency (PTE) that suggested by Banker et al. (1984) in the VRS model. This involves the decomposition of the TE into PTE and scale efficiency (SCE). The output orientation that maximises the level of output for a specific level of inputs is the BCC model. The PTE aids in evaluating the efficiency of the MFIs' purely management operations without being influenced by scale. The SCE assesses the MFIs' size. Hence, the scale inefficiency (SICE) arises when the MFIs' TE and PTE scores are different.

3.1.1. The CCR model's constant returns to scale model

In Figure 1, X_1 and X_2 represent the inputs 1 and 2, respectively, while Y represents the output. The technical efficiency (TE) measurement is made possible by the unit isoquant of the full efficiency firm, represented by PP' . Additionally, VV' stands for the iso-cost line. Two efficient DMUs are presented using the frontier-determining C and D inputs, and, A and B are technical inefficient (TIE).

The distances $A'A$ and $B'B$, which measure the amount by which all inputs might be proportionally reduced without a fall in output if a particular DMU uses inputs represented by points A and B , respectively, to generate a unit of output, can be used to describe the TIE of a certain DMU. In percentage terms, it is represented by the ratios $A'A/OA$ and $B'B/OB$. The ratios where all of the inputs could be decreased are these two ratios. According to Farrell (1957), TE is defined as one minus the $A'A/OA$ ($B'B/OB$), or OA'/OA (OB'/OB).

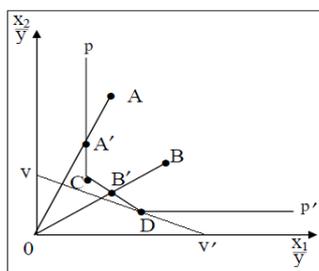


Figure 1. Input oriented piecewise linear convex isoquant

Either input- or output-oriented DEA is possible. The input-oriented DEA technique looks for the highest probable proportional drop in input utilisation while maintaining constant output levels for each company to establish the frontier. Additionally, for the output-oriented DEA, the DEA technique seeks the

largest proportional increase in output production while maintaining constant input levels. DMUs presumed ($k= 1,..,K$), vector of input represented as $x = (x_1, .., x_N) \in \mathfrak{R}^{N+}$ and vector of output represented as $y = (y_1, .., y_M) \in \mathfrak{R}^{M+}$. The TE of the DMU could be calculated using Equation (1):

$$TE_k = \frac{\lambda_1 y_{1k} + \lambda_2 y_{2k} + \dots + \lambda_M y_{Mk} = \sum_{m=1}^M \lambda_m y_{mk}}{v_1 x_{1k} + v_2 x_{2k} + \dots + v_N x_{Nk} = \sum_{n=1}^N v_n x_{nk}} \quad (1)$$

where,

TE_k = the technical efficiency score given to the k -th DMU

λ = weights of output

v = weights of input

Equation (1) can be converted into a linear programming using Equation (2) provided by:

$$\begin{aligned} DEAL(x,y) = \text{Min } \phi_k^{CRS} \quad & | [\phi_k^{CRS} \geq 0] \\ \text{s.t. } \sum_{k=1}^K \lambda_k y_k^m - s_m^+ &= y_o^m, \quad m = 1, \dots, M \\ \sum_{k=1}^K v_k x_k^n + s_n^- &= x_o^n, \quad n = 1, \dots, N \\ \lambda_k v_k, s_m^+, s_n^- &\geq 0 \end{aligned} \quad (2)$$

Under CRS approach, ϕ_k^{CRS} is the TE of the k -th DMU. The k -th DMU inputs are multiplied by parameter to scale them down by the smallest probable factor, subjected to the restriction that these minimized inputs still able to provide the original output bundle. The virtual DMU is composed to ensure that each sample will be used in other samples and that a comparison of the variation between virtual DMU and the real one can be made. The CRS model ϕ_k^{CRS} , y_o^m and x_o^n are represented as the DMU's outputs and inputs; whereas s_m^+ and s_n^- are represented as the DMU's outputs and inputs slacks, respectively. Thus, the DMU is deemed to be fully TE if the $\phi_k^{CRS} = 1$ and output and input slacks = 0.

3.1.2. The BCC model's variable returns to scale model and scale efficiency

3.1.2.1. The model of variable returns to scale

When only all DMUs are operating at their optimal scale, the TE calculation using the CRS technique is appropriate. However, it is unlikely that all DMUs will be operating at the optimum scale due to a number of problems, including imperfect competition, government regulation, and business financial issues. Therefore, the BCC DEA model's variable returns to the scale (VRS) approach is selected to address this problem. Equation must now have an additional convexity limitation (1).

By using the model Equation (3) below, the VRS approach proposes that the TE scores can be disintegrated into two elements, specifically PTE and SCE.:

$$\begin{aligned} DEAL(x,y) = \text{Min } \phi_k^{VRS} \quad & | [\phi_k^{VRS} \geq 0] \\ \text{s.t. } \sum_{k=1}^K \lambda_k y_k^m - s_m^+ &= y_o^m, \quad m = 1, \dots, M \\ \sum_{k=1}^K v_k x_k^n + s_n^- &= x_o^n, \quad n = 1, \dots, N \\ \sum_{k=1}^K v_k &= 1; \quad k = 1, \dots, K \\ \lambda_k v_k, s_m^+, s_n^- &\geq 0 \end{aligned} \quad (3)$$

The VRS method generates a convex monotone hull of intersecting planes that more closely encloses the data points than the CRS conical hull by using ϕ_k^{VRS} as the PTE of the k -th DMU. Therefore, using the CRS approach, the PTE score can be greater than or equal to the TE score. Since the convexity restriction

is not necessary for the CRS technique, it is possible to compare the inefficient DMU to other DMUs of different sizes. However, the VRS technique's convexity restriction ensures that the ineffective DMU will be compared to other DMUs of similar sizes.

3.1.2.2. Calculation of scale efficiency

The scale efficiency (SCE), which indicates that inefficiency may be caused by the usage of DMUs of an inappropriate size, measures the impact of DMU size on system efficiency. Equation provides the model of SCE scores for the k-th DMU (4):

$$SCE_k = \frac{TE}{PTE} = \frac{\phi_k^{CRS}}{\phi_k^{VRS}} \quad (4)$$

If the $SCE_k = 1$, the DMU is either SCE or CRS, whereas if the $SCE_k < 1$, the DMU is scale inefficient (SCIE). By performing both CRS and VRS DEA on the same data, this can be accomplished. If there is a difference between the DMU's two TE scores, then the DMU has SCIE. The difference between the PTE score and TE score can be used to calculate the SCIE. The input-oriented TIE of point B under CRS is shown in Figure 2 to be the distance BBC. On the other hand, the TIE would just be BBv under VRS.

Scale inefficiency is consequently caused by the change between BcBv. The SCE measure will provide information on the degree of inefficiency resulting from the failure to operate with CRS, but it cannot be used to determine if a DMU is running in a range of increasing returns to scale (IRS) or decreasing returns to scale (DRS). By completing an additional DEA problem with non-increasing returns to scale (NIRS) imposed, it is possible to determine the information pertaining to the IRS or DRS.

Therefore, the difference between the NIRS TE and VRS TE scores could be used to infer the type of SICE that are caused by either IRS or DRS. The DMU is operating at IRS if the VRS TE @ PTE differs from the NIRS TE (point B). In contrast, the DMU is operating at DRS (point D) in Figure 3 if the VRS TE @ PTE equals the NIRS TE.

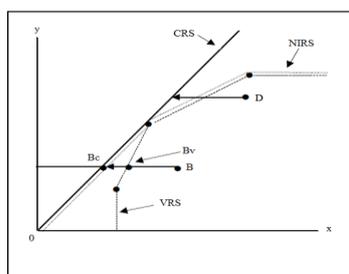


Figure 2. Economies of scale in DEA

3.1.3. Inputs, outputs, approaches, and the choice of variables

Sufian (2007) stated that arguments occur between the researchers on the description and determination of the MFIs' inputs and outputs in the function of the microfinance. The definition of the inputs and outputs is essential to measure the MFIs' efficiency accurately even though the inputs and outputs may vary due to the classification of the sector. In the MFIs theory literature, two approaches are generally applied which are the production approach and intermediation approach (Sealey and Lindley, 1977). According to Gutierrez-Nieto et al. (2007), both of the production and intermediation approaches are adopted by the MFIs because the MFIs' operations are distinct.

The production approach describes MFIs as production units where the MFIs utilise funds, assets, labour as inputs to generate outputs such as loans, deposits and other financial services (Bassem, 2008; Haq

et al., 2010). MFIs are responsible to perform the financial transactions involved in the deposit accounts and process all the required documents like loans. Some studies declared that the inputs such as employee assets, personnel and operating costs are vital in providing a loan portfolio which will generate outputs like financial revenue or amount of the active borrowers that are involved in measuring the production efficiency (Bassem, 2008; Kipesha, 2013). Moreover, the studies conducted by DeYoung (1997) and Fried et al. (1993) also applied the production approach.

Furthermore, the intermediation approach which is otherwise known as the asset approach is another method that is widely used to identify the inputs and outputs. A lot of researchers prefer to use the intermediation approach during the first stage of the Data Envelopment Analysis (DEA). According to Chu and Lim (1998), this approach describes the MFIs as an intermediary between the borrowers and the depositors to produce loans to the poor for profit or non-profit purposes. In this method, the surplus units' deposits serve as the inputs, and the loans given to the deficit units serve as the outputs. Some microfinance efficiency studies that adopted the intermediation approach including the study carried out by Haq et al. (2010) used the cost per saver, cost per borrower and operating expenses as the input variables in producing the gross loan portfolio which serves as the measurement of the MFIs intermediation efficiency in Vietnam. Besides, the study conducted by Gutierrez-Nieto et al. (2007) utilise the number of loan officers and operating costs as the input variables in producing the number of loans outstanding, interest and fee revenue as well as gross loan portfolio.

During the selection of the MFIs' inputs and outputs in the DEA method, arbitrage issues will always happen (Ariff & Can, 2008; Berger & Humphrey, 1997). Hence, the intermediation approach is adopted in this research as the MFIs are more appropriate to be classified as financial assistance entities under the consideration of the researchers.

Cooper et al. (2002) claim that there is a rule that must be followed when choosing the input and output items. The following is a general rule of thumb that lays out the general rules for selecting and picking the inputs and outputs:

$$n \geq \max \{m \times s, 3 \times (m + s)\} \tag{5}$$

where: n is the number of DMUs

m is the number of inputs

s is the number of outputs

Table 1

Output and input variables of social efficiency

Social Efficiency	Financial Efficiency
Input	Input
i. Asset	i. Asset
ii. Operating Expenses	ii. Operating Expenses
iii. Personnel	iii. Personnel
Output	Output
i. Average Loan Balance	i. Financial Revenue
ii. Number of Borrowers	

3.2. Panel regression analysis

The relationship between the MFIs specific determinants, macroeconomic factors, and globalisation indicators, as well as the MFIs' social and financial efficiency, is examined in this study using the panel regression method (Banker et al., 2010). The DEA efficiency scores are utilized as the dependent variable

in this regression analysis. The following baseline regression model is estimated by taking the social and financial efficiency scores as the dependent variables:

$$\begin{aligned} Efficiency_{i,t} = & \beta_0 + \beta_1 LnTA_{i,t} + \beta_2 LnAge_{i,t} + \beta_3 LnROA_{i,t} + \beta_4 LnDER_{i,t} + \beta_5 LnGDP_t \\ & + \beta_6 LnInf_t + \beta_7 LnKOFTrGldf_t + \beta_8 LnKOFTrGldj_t \\ & + \beta_9 LnKOFPOGldf_t + \varepsilon_{i,t} \end{aligned} \quad (6)$$

Where Efficiency is the social and financial efficiency scores originated from the VRS TE DEA method; MFI's size ($LnTA$), age ($LnAge$), profitability ($LnROA$), leverage ($LnDER$), economic growth ($LnGDP$), and inflation rate ($LnINF$). Globalisation covers the economic and political globalisation dimensions. The economic globalisation involves actual trade flow in investments, goods, and services ($LnKOFTrGldf$) and restriction on the import, trade and capital account imposed by the government ($LnKOFTrGldj$) while political globalisation comprises size growth and complexity of the global political system ($LnKOFPOGldf$); whereas ε is the error term and subscripts i and t stand for individual MFIs and period.

In the panel regression models, this study has included four MFIs' specific determinants and two macroeconomic factors (Aqel, 2022). For further investigation, Equation (6) is re-estimated where the two pillars of globalisation dimensions which consist of a total of three globalisation indexes are added to examine the relationship between the globalisation dimensions and the MFIs' efficiency. The globalisation indexes are measured by the scales within 0 to 100 where 100 stand for the maximum value. A score of 100 implies that there is a greatest level of globalisation. The higher the score value, the better the impacts of economic globalisation and the political globalisation toward the MFIs' efficiency.

Table 2

Description of MFIs Specific, Macroeconomics and Globalisation Variables

Variables	Note	Data Sources
MFIs' Specific Determinants:		
$LnTA$	MFI's size that is approximated by the natural logarithm of all MFI's assets.	Microfinance Information Exchange (MIX) market www.mixmarket.org
$LnAge$	Natural logarithm of the total number of years the MFI has been operational as a measure of MFI's age.	Microfinance Information Exchange (MIX) market www.mixmarket.org
$LnROA$	Profitability that is calculated using the natural logarithm of the profit or net income to total assets ratio.	Microfinance Information Exchange (MIX) market www.mixmarket.org
$LnDER$	Leverage that is calculated as the ratio of total indebtedness to total equity divided by the natural logarithm.	Microfinance Information Exchange (MIX) market www.mixmarket.org
Macroeconomics Conditions:		
$LnGDP$	Gross domestic product calculated as the national gross domestic product's natural logarithm.	International Monetary Fund (IMF) www.imf.org
$LnINF$	Consumer price index that is calculated as the natural logarithm of the index.	International Monetary Fund (IMF)

		www.imf.org
Globalisation Dimensions:		
Economic Globalisation		
$LnKOFTrGldf$	Trade, foreign direct investment, portfolio investment, and income transfers to foreign nationals. Actual trade flows in investments, goods, and services are taken into account when measuring economic globalisation.	2020 KOF Globalisation Index https://kof.ethz.ch/en/
$LnKOFTrGldj$	The limits on capital accounts, mean tariff rate, and unreported import obstacles. measured the government's restrictions on commerce, financial flows, and imports.	2020 KOF Globalisation Index https://kof.ethz.ch/en/
Political Globalisation		
$LnKOFPoGldf$	The presence of embassies, participation in missions of the UN Security Council, and membership in international organisations The size growth and complexity of the world political system are two factors used to measure political globalisation.	2020 KOF Globalisation Index https://kof.ethz.ch/en/

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. MFIs' efficiency - social and financial efficiency

Table 3 presents the results of the TE, PTE and SCE for the MFIs' social and financial efficiency, indicating their trends from 2012 to 2020. The results of social efficiency scores revealed that the mean of TE showed a rising trend from 2012 to 2014 where the TE mean increased from 34.70% to 37.74% in 2013 and 39.71% in 2014. However, during 2015 and 2016, the mean of TE exhibited a decrease at 38.68% and 37.63% in 2015 and 2016 respectively. Afterwards, the TE mean slightly increased to 37.80% in 2015. In 2018, the mean of TE illustrated a slight drop at 37.40% but increased to 37.98% in 2019 but dropped again to 37.67% in 2020.

On the other hand, the mean of TE for the MFIs' financial efficiency recorded an increase from 74.29% to 76.40% from 2012 to 2013. Nevertheless, in 2014 and 2015, the TE mean displayed a decreasing trend where the mean of TE decreased from 74.53% to 72.91%. Then, the TE mean rises to 74.42% in 2016 and dropped to 72.75% in 2017. Next, during 2018 and 2019, the mean of TE increased to 75.38% and 75.98% respectively, before dropping to 74.38% in 2020.

Besides, according to the results from all years (2012 – 2020), the TE mean of the MFIs' social efficiency is recorded at 37.70%, which means that there is an inefficiency (TIE) of 62.30%. It can be found out that the pure technical inefficiency (PTIE) heavily influenced the TE at 54.82% as compared with scale inefficiency (SCIE) which is inefficient at 15.42%. Thus, the findings suggested that all the MFIs should fully utilise 37.70% of the input or reduce the input by 62.30% in attaining their output efficiency.

Additionally, the financial efficiency of in all years indicate the TE mean is 74.56% where the TIE is 25.44%. The result indicates that the PTIE (20.63%) highly affects TE in comparison with (SCE) where its inefficiency is only recorded at 5.75%. Hence, the results recommended that all the MFIs should exploit the input at 74.56% or lessen the input by 25.44% to obtain their output efficiency.

In a nutshell, the results in both tables illustrate that the pure managerial inefficiency (measured by PTIE) instead of the size inefficiency (proxied by SCIE) of MFIs' operation majorly contributed to the inefficiency of TE for the social and financial efficiency of all the MFIs during 2012 to 2020. Therefore, it can be concluded that all the MFIs were facing managerial inefficiency issues in making use of the inputs or resources to generate the most favorable number of outputs in the most effective way.

Table 3

Social and financial efficiency scores of MFIs in Philippines and Malaysia

Efficiency Measures	No. DMUs	SE	FE	SE	FE	SE	FE	SE	FE
		Mean		Min		Max		Std. Dev.	
Year: 2012									
TE	88	0.3470	0.7429	0.0280	0.3230	1.0000	1.0000	0.2546	0.1481
PTE	88	0.4045	0.7994	0.0480	0.5110	1.0000	1.0000	0.2689	0.1515
SCE	88	0.8371	0.9322	0.3240	0.6180	1.0000	1.0000	0.1648	0.0849
Year: 2013									
TE	88	0.3774	0.7640	0.0530	0.2540	1.0000	1.0000	0.2268	0.1478
PTE	88	0.4416	0.7987	0.0920	0.3110	1.0000	1.0000	0.2641	0.1516
SCE	88	0.8707	0.9582	0.4320	0.6260	1.0000	1.0000	0.1346	0.0633
Year: 2014									
TE	88	0.3971	0.7453	0.0150	0.3070	1.0000	1.0000	0.2380	0.1407
PTE	88	0.4661	0.7871	0.0200	0.5290	1.0000	1.0000	0.2697	0.1443
SCE	88	0.8669	0.9522	0.4230	0.3070	1.0000	1.0000	0.1435	0.0912
Year: 2015									
TE	88	0.3868	0.7291	0.0300	0.4520	1.0000	1.0000	0.2312	0.1484
PTE	88	0.4580	0.7635	0.0470	0.5170	1.0000	1.0000	0.2589	0.1487
SCE	88	0.8483	0.9576	0.4480	0.5280	1.0000	1.0000	0.1385	0.0821
Year: 2016									
TE	88	0.3763	0.7442	0.0340	0.4370	1.0000	1.0000	0.2244	0.1365
PTE	88	0.4555	0.8031	0.0520	0.5220	1.0000	1.0000	0.2634	0.1458
SCE	88	0.8393	0.9301	0.4400	0.6290	1.0000	1.0000	0.1453	0.0754
Year: 2017									
TE	88	0.3780	0.7275	0.0190	0.3000	1.0000	1.0000	0.2211	0.1473
PTE	88	0.4581	0.7922	0.0270	0.3180	1.0000	1.0000	0.2612	0.1590
SCE	88	0.8416	0.9229	0.4290	0.5620	1.0000	1.0000	0.1492	0.0804
Year: 2018									
TE	88	0.3740	0.7538	0.0290	0.3670	1.0000	1.0000	0.2222	0.1456
PTE	88	0.4631	0.8009	0.0430	0.5100	1.0000	1.0000	0.2730	0.1463
SCE	88	0.8315	0.9425	0.3860	0.5840	1.0000	1.0000	0.1614	0.0713
Year: 2019									
TE	88	0.3798	0.7598	0.0500	0.3480	1.0000	1.0000	0.2183	0.1405
PTE	88	0.4697	0.8066	0.0680	0.3480	1.0000	1.0000	0.2615	0.1464
SCE	88	0.8287	0.9447	0.3920	0.6980	1.0000	1.0000	0.1634	0.0686
Year: 2020									
TE	88	0.3767	0.7438	0.0297	0.3486	1.0000	1.0000	0.2312	0.1449
PTE	88	0.4496	0.7921	0.0470	0.4597	1.0000	1.0000	0.2656	0.1496
SCE	88	0.8479	0.9422	0.4117	0.5506	1.0000	1.0000	0.1482	0.0784
Year: All Years									
TE	792	0.3770	0.7456	0.0320	0.3485	1.0000	1.0000	0.2298	0.1444
PTE	792	0.4518	0.7937	0.0493	0.4473	1.0000	1.0000	0.2651	0.1492
SCE	792	0.8458	0.9425	0.4095	0.5670	1.0000	1.0000	0.1499	0.0773

Note: SE = Social Efficiency, FE = Financial Efficiency, TE = Technical Efficiency, PTE = Pure Technical Efficiency, SCE = Scale Efficiency

4.2. Robustness test: Social and financial efficiency with VRS TE, PTE and SCE

The analysis of results generated from the DEA method raises an important question concerning the statistical significance of the differences in the TE, PTE, and SCE of the social and financial efficiency of

the MFIs. Bortz and Schuster (2010) suggested the use of the Mann-Whitney (Wilcoxon) test to evaluate whether two independent samples selected from populations having the same distribution, as opposed to the common paired t-test, which is known to be less powerful under negative correlations. Additionally, Kamarudin et al. (2016) indicated that non-parametric tests, such as the Mann-Whitney (Wilcoxon) test and the Kruskal-Wallis test, and other parametric tests, including t-tests, can be used to obtain robust results.

The robustness test results from the parametric t-test in Table 4 reveal that the financial efficiency of the MFIs in the Philippines has a higher mean TE than social efficiency (0.858>0.264), and this difference is statistically significant at the 1% level. Similarly, the parametric t-test results in Table 5 demonstrate that the MFIs in Malaysia also have a higher mean TE for financial efficiency compared to social efficiency (0.425>0.091), and the difference is statistically significant at the 1% level. Moreover, Table 6 shows that, in both the Philippines and Malaysia, the mean TE for financial efficiency is greater than that for social efficiency (0.878>0.501), and this difference is statistically significant at the 1% level. Additionally, the PTE and SCE mean values for financial efficiency are higher than those for social efficiency in all MFIs based in the Philippines and Malaysia, as well as in both countries, from 2012 to 2020.

Furthermore, the results of the parametric t-test are corroborated by the Mann-Whitney and Kruskal-Wallis tests, which indicate that the TE, PTE, and SCE for financial efficiency have greater means than those for social efficiency in the MFIs of both the Philippines and Malaysia. In summary, the parametric and non-parametric tests reveal that, from 2012 to 2020, all TE, PTE, and SCE mean values for financial efficiency are higher than those for social efficiency in all MFIs based in the Philippines and Malaysia. This finding suggests that the MFIs are more focused on profitability and sustainability of their operations, which tends to overshadow their primary goal of reducing poverty through their social function.

Table 4

Robustness tests of MFIs' Social and Financial Efficiency in Philippines 2012-2020

Test Statistics	Parametric Test		Non-parametric Test			
	t-test		Mann-Whitney test		Kruskall-Wallis test	
	t (Prb>t)		z (Prb > z)		x ² (Prb > x ²)	
	Mean	t	Mean rank	z	Mean rank	x ²
Technical Efficiency						
Social Efficiency	0.264	-44.265 ^a	338.111	-15.187 ^a	338.111	533.875 ^a
Financial Efficiency	0.858		900.182		900.182	
Pure Technical Efficiency						
Social Efficiency	0.547	-19.230 ^a	587.420	-35.124 ^a	587.420	527.531 ^a
Financial Efficiency	0.687		887.520		887.520	
Scale Efficiency						
Social Efficiency	0.883	-17.545 ^a	520.720	-15.487 ^a	520.720	188.110 ^a
Financial Efficiency	0.987		898.540		898.540	

Note: ^{a, b, c} indicates significance at 1%, 5% and 10% levels respectively.

Table 5

Robustness tests of MFIs' Social and Financial Efficiency in Malaysia 2012-2020

Test Statistics	Parametric Test		Non-parametric Test			
	t-test		Mann-Whitney test		Kruskall-Wallis test	
	t (Prb>t)		z (Prb > z)		x ² (Prb > x ²)	
	Mean	t	Mean rank	z	Mean rank	x ²
Technical Efficiency						
Social Efficiency	0.091	-10.803 ^a	8.524	-4.951 ^a	8.524	23.652 ^a
Financial Efficiency	0.425		24.825		24.825	
Pure Technical Efficiency						
Social Efficiency	0.214	-8.351 ^a	9.185	-4.527 ^a	9.185	19.886 ^a
Financial Efficiency	0.788		23.963		23.963	
Scale Efficiency						
Social Efficiency	0.551	-3.587 ^a	11.213	-3.310 ^a	11.213	10.355 ^a
Financial Efficiency	0.753		21.973		21.973	

Note: ^{a, b, c} indicates significance at 1%, 5% and 10% levels respectively.

Table 6

Robustness tests of MFIs' social and financial efficiency in Philippines and Malaysia 2012-2020

Test Statistics	Parametric Test		Non-parametric Test			
	t-test		Mann-Whitney test		Kruskall-Wallis test	
	t (Prb>t)		z (Prb > z)		x ² (Prb > x ²)	
	Mean	t	Mean rank	z	Mean rank	x ²
Technical Efficiency						
Social Efficiency	0.501	-38.132 ^a	420.122	-26.587 ^a	420.122	691.800 ^a
Financial Efficiency	0.878		989.879		989.879	
Pure Technical Efficiency						
Social Efficiency	0.489	-29.980 ^a	459.542	-22.812 ^a	459.542	516.898 ^a
Financial Efficiency	0.804		951.500		951.500	
Scale Efficiency						
Social Efficiency	0.877	-15.250 ^a	562.450	-13.579 ^a	562.450	1770.530 ^a
Financial Efficiency	0.930		853.010		853.010	

Note: ^{a, b, c} indicates significance at 1%, 5% and 10% levels respectively.

4.3. Determinants of efficiency level in microfinance institutions

Based on Table 7 and 8, there are a total of five models employed. In model 1, the MFIs' specific determinant variables such as LnTA, LnAge, LnROA and LnDER are included to form a baseline regression model. Model 2 is made up of the MFIs' specific determinant variables and the macroeconomics factors, LnGDP and LnINF. In addition, model 3, 4 and 5 include the globalisation dimensions including the economic globalisation where each globalisation dimension is added into each model separately. To illustrate, model 3 consists of the MFIs' specific determinant variables, the macroeconomics factors and LnKOFTrGI_{df}. While in model 4, LnKOFTrGI_{dj} is included along with the MFIs' specific determinant variables and the macroeconomic factors. Lastly, model 5 is constituted of the MFIs' specific determinant variables, the macroeconomic factors and the LnKOFPoGI_{df}.

During the initial stage, the results of the Breusch Pagan and Lagrangian Multiplier Chi-Square (BP and LM x²) test reveal that all the significance levels in p-value of the five models for social and financial efficiency are smaller than 5%. Thus, these results indicate that panel model is more appropriate as compared to the pooled data ordinary least square (OLS) for all the social and financial efficiency models. Nonetheless, a dilemma will occur in choosing either a Fixed Effect (FXE) or Random Effect (RE). Therefore, the Hausman test is conducted to select the most appropriate method where the FXE is the

most suitable method when the results show a 1% to 5% significance level. In contrast, the RE method is chosen if the findings of the significance level exceed 5%. FXE is adopted in Models 2, 3 and 4 while RE is applied in model 1 and model 5 for the MFIs' social efficiency. Meanwhile, the MFIs' financial efficiency regression analysis, models 3 and 4 adopted the FXE model while models 1,2 and 5 adopted the RE model. In fact the selection of this estimation method has been followed by many of the prior studies (Afriyie, 2022).

4.3.1. Interpretation of MFIs' social efficiency regression result

As shown in Table 7, in all the five models, there is a negative relationship between the MFIs' size with the MFIs' social efficiency with the significance level at 1%. This result indicates that the bigger the MFIs' size in terms of total assets, the MFIs' social efficiency is lower. A larger MFI may operate hastily in satisfying the customers' requirements when it has excessive capacity in the operation. This is because MFI owns a huge base of customers and it may be facing difficulties in delivering sufficient services to its customers while unable to fully focus on its main goal, which is fulfilling the social needs of the poverty-stricken people. Bassem (2008) also agreed with this argument as the results showed that the medium sized MFIs have a higher efficiency as compared to large MFIs in the Mediterranean region.

Besides, the operation years of the MFIs also exhibited a constant negative association with the MFIs' social efficiency in model 2, 3, and 4 at 1% significance level. The longer the MFIs number of operation years, the lower social efficiency. The older MFIs are prone to offer their loan portfolio towards the less poor, which has gone off track from its principal goal in providing assistance to the poor in obtaining a loan. Besides, the MFIs will transform their operations into other legal structures such as offering diversified products to various kinds of customers rather than concentrating on giving services to the poor as time passes to sustain their operations in the long term. This justification is in line with Wijesiri, et al. (2017) where the study stated that the older MFIs have lower efficiency in achieving their outreach goals in comparison with the younger MFIs.

Furthermore, the MFIs' profitability showed a negative relationship with the MFIs' social efficiency in all the models. The result of the finding implies that the higher the profitability or return on assets in MFIs, the lower the MFIs' social efficiency. The MFIs are incapable of enhancing social efficiency while converting their assets into profits. Also, this may be due to the MFIs emphasizing too much in generating profits through the utilisation of the resources and assets instead of attaining their main objective in reducing poverty by offering loans to the poor. Hence, MFIs with higher ROA are prone to have worse outreach performance in delivering financial services to the needy which direct to lower social efficiency levels. These explanations are aligned with the studies disclosed by Abdulai and Tewari (2017).

Also, in all models, the MFIs' social efficiency and leverage level are strongly correlated. This finding shows that the MFIs' social efficiency increases as the degree of operations, as financed by debt, increases. MFIs that rely less heavily on their own earnings and instead raise more money from other financial and capital markets will be better able to lend to the underprivileged. A larger level of leverage could also help MFIs reach out to the underprivileged and provide for their financial needs. The research of Kar (2012), which found that MFIs' efficiency rises as leverage rises, is compatible with the conclusions of the study.

In addition, there is a positive relationship between the economic performance in terms of gross domestic products with the MFIs' social efficiency in Model 2, 3 and 4. The result reveals that when the overall growth of the economy increases, the MFIs' social efficiency will improve too. When the economy grows, more customers are willing to save their money as deposits and repay their loan due to increase of income and cause the activities of the MFIs to rise. The MFIs will have more funds to be offered as loans in satisfying the loan requirements of the poor. Thus, the MFIs' social efficiency is enhanced when there is

an increase in economic growth. The finding is agreed with the research done by Ahlin and Lin (2006) where GDP shows positive impact on the performance of MFIs in terms of efficiency and profitability.

Aside from that, there is a negative correlation between actual economic globalisation and the social efficiency of MFIs. The increased economic integration and movement of product trading during economic globalisation do not result in a higher MFI's social efficiency level. The redistribution of capital and workers among the countries are negatively affected and lead to increase of income inequality and job losses in developed countries due to occurrence of unbundling of production during economic globalisation. These phenomena cause the people lose abilities in repaying the loan and direct the MFIs having problems in collecting the debts to offer new loans while meeting the loan requirements of the needy. Ekong (2016) shows congruence with this argument.

Besides, the restrictions of economic globalisation exhibit a negative association with the MFIs' social efficiency at 1% significance level. This finding indicates that the greater the restrictions, the lower the MFIs' social efficiency. For instance, by imposing higher restrictions on the capital account, the international allocation of capital (Guizani and Abdalkrim, 2022; Govdeli, 2022; Šubová et al., 2021), from countries that are rich in capital to less wealthy countries will cause a lower rate of return on people's savings in MFIs. Thus, the deposits in MFIs will decline and the MFIs may fail to offer sufficient loans to the poor. This event will cause the MFIs to struggle in meeting the social welfare of the needy which gives rise to lower social efficiency.

Finally, there is a statistically significant 10% negative correlation between the social efficiency of MFIs and political globalisation, as measured by country embassies, membership in international organisations, and participation in UN Security Council missions. This result indicates that when political globalisation increases in extent, the MFIs will be less socially efficient in meeting the loan needs of the poor. This situation worsens the competitiveness of the local MFIs as the MFIs are protected by the regulatory bodies where the regulatory bodies restrict the entry and activities of foreign financial institutions. Hence, the MFIs will be less productive and capable of delivering adequate loans to the poor in reducing poverty which lessens the MFIs' social efficiency. This revelation is in line with research performed by Sufian and Kamarudin (2016) where MFIs located in countries with higher political globalisation are less efficient.

4.3.2. Interpretation of MFIs' financial efficiency regression result

According to Table 8, there is a negative correlation between the MFIs' size ($\ln TA$) in Model 1, 2 and 5 with 1% significance level. This result suggests that the greater the size of MFIs from the aspect of total assets, the lower the financial efficiency in the MFIs. Smaller MFIs own higher levels of financial efficiency although the economies of scale predicted that bigger MFIs generate higher profits. Bigger MFIs tend to be efficient in outreach as they are paying more attention to increase their exposure on their products and expand their target market. However, this circumstance leads to some drawbacks such as inefficiency of using the assets and rise of operating costs as outreach requires a lot of initial adoption, time and efforts in the MFIs. Due to these drawbacks, the large MFIs will confront lower levels of financial efficiency as compared to the small and medium MFIs. The study conducted by Kipesha (2013) was consistent with this explanation. On the other hand, the MFIs' size is positively related to the financial efficiency in Model 3 and 4 with significance levels at 1% and 10% respectively. This finding indicates that the greater the size of MFIs, the higher the levels of financial efficiency. As the MFIs grow bigger in terms of their size, the MFIs will have higher profitability, efficiency and sustainability as the MFIs dependence on the funds subsidies from the governments and donors lessen. Besides, larger MFIs also can enjoy the higher economies scales which will reduce the operating costs and have a better financial efficiency in comparison with the smaller MFIs. These arguments are supported by the research carried out by as well as Wijesiri et al. (2017).

In addition, the number of years operation (LnAGE) has a negative impact on the MFIs' financial efficiency in Model 3, 4 and 5. The longer the total number of years of operation, the less financial efficient the MFIs are. This is because the younger MFIs will equip with more relevant knowledge on the contemporary financial and microfinance industries. Besides, the younger MFIs will be more innovative and adaptive in adopting suitable financial strategies based on the past practices and applications implemented by the mature MFIs. Hence, the younger MFIs will overtake the older MFIs in respect of the financial activities, operations, profitability and thus the financial efficiency.

In Table 8, the coefficient of the MFIs profitability exhibits a negative relationship with the MFIs' financial efficiency at 1% significance level in Model 3 and 4. This result shows that the higher the return on assets generated by the MFIs, the lower the level of financial efficiency. In contrast, less profitable MFIs tend to have higher financial efficiency. A trade-off is created where the MFIs tend to own less ability to fully utilise the assets in making higher profits when the level of financial efficiency increases. This may be due to the MFIs focusing excessively on the operating incomes rather than ensuring the operations are using the least resources to translate the financial resources into mission related activities. This is consistent with Katuka and Mavhunga (2006) and Haque et al., (2019).

Aside from this, there is a negative relationship between the economic growth (LnGDP) with the MFIs' financial efficiency with a significance level at 1% in Model 2 and 5 while significant at 10% in Model 4. According to this result, the MFIs are less financially efficient under rapid economic growth conditions. When the economic products produced increase, the people will receive more income and have a better living standard. Thus, the borrowers' attitude and behavior are influenced and they are more likely to demand less financial services from the MFIs. This situation causes the MFIs to produce lower outputs as the number of active borrowers under the assistance of MFIs will drop. In short, the MFIs' financial efficiency is negatively affected because the MFIs mission related activities including providing loan support to the poor will decline which create more unutilised financial resources. The findings from Kamarudin et al. (2016) and Bibi et al. (2018) are consistent with this justification.

Furthermore, the coefficient of inflation rate shows a positive correlation with the MFIs' financial efficiency in Model 2 and 5 with significance level at 1%. The result reveals that the increase of inflation rate will cause the financial efficiency of MFIs to grow. When the inflation rate rises, the MFIs are able to adjust its interest rates as certain MFIs can foresee the conditions that give rise to the increase of inflation rates. Hence, the MFIs can generate the revenue faster than the cost incurred by implementing relevant strategies on the financial services provided to fit in with the situation. The financial outputs of the MFIs will increase which will lead to increase of financial efficiency. Nevertheless, the inflation rate has a negative relationship with the financial efficiency of MFIs in Model 3. This finding indicates that higher inflation rate will direct to lower financial efficiency levels in the MFIs. Some MFIs may be unaware that inflation has risen up instantly and this condition will negatively affect the bank profitability. Also, higher interest rates arise due to increase of inflation rate will cause the MFIs to acquire funding from the suppliers at a higher cost as the MFIs normally acquire funding from related financial institutions and local money lenders who charged the interest on the funds at a very high rate. Thus, the financial efficiency of the MFIs will decline as the lending capacity of the MFIs drop and the financial outputs will decrease simultaneously and supported by Hissan (2014).

Next, the economic globalisation regarding the actual flows is negatively related with the MFIs financial efficiency in Model 3 at 1 % significance level. MFIs' financial efficiency decreases when there is an escalate economic globalisation of trends. Economic globalisation exerted a negative impact on the allocation of loans in the MFIs where the loan introduced by the MFIs dropped. The shoot up of the economic globalisation will ignore the emphasis and functions of MFIs. The investors will shift their attention and funds towards foreign products, foreign direct and portfolio investment as the movement of capital between

countries gets more hassle-free. Thus, the MFIs will receive less finance and support from the investors and the amount of loan offered will dwindle. This event will cause the MFIs' financial efficiency to drop as there is an excess of financial resources in the MFIs which cannot be transformed into objectives related activities. This explanation is supported by Ekong (2016).

Besides, there is a negative correlation between the component under the economic globalisation dimension, namely the hidden import barriers, rate of mean tariff, taxes on global trade and capital account limitations with the MFIs' financial efficiency at 1% significance level. From this result, the higher the presence of restrictions during economic globalisation, the lower the financial efficiency levels in the MFIs. To illustrate, higher trade and capital account restrictions were limiting the flows of portfolio including investment in equities and bank borrowing across countries may inhibit the MFIs' financial efficiency. The MFIs' foreign capital inflows can be hastily reversed if the country is confronting an adverse economic crisis. Thus, the MFIs will face difficulties in collecting sufficient funds and managing the financial resources to accomplish the goal related activities which cause the MFIs' financial efficiency to become worse.

The political globalisation has a negative link with the MFIs financial efficiency that is statistically significant at 1%. This result demonstrates that financial efficiency levels in MFIs decrease as political globalisation becomes more intense. As political globalisation accelerates, there will be increased political collaboration and governmental and intergovernmental organisations that will oversee financial institutions' operations and influence. The financial industries, including MFIs, banks, and other financial institutions, will be impacted by these actions and influences. As a result, the bodies will restrict international banks' admission and development while allowing MFIs to possess unique advantages over foreign institutions, worsening the competitiveness of MFIs. Due to competition from other financial institutions providing comparable financial services, MFIs will therefore be less adept at managing the financial resources they obtain. As MFIs become less productive and may need more assets and borrowing to maintain operations, the financial efficiency will decline. This reasoning is consistent with Sufian and Kamarudin (2016).

Table 7

Regression result on the social efficiency of microfinance institutions in Philippines and Malaysia

Variables	Model 1			Model 2			Model 3		
	OLS	FXE	RE	OLS	FXE	RE	OLS	FXE	RE
Constant	1.595 ^a	1.844 ^a	2.9224 ^a	1.833 ^a	0.488	3.258 ^a	2.650 ^a	2.153 ^a	4.198 ^a
	<i>0.387</i>	<i>0.433</i>	<i>0.79</i>	<i>0.521</i>	<i>0.525</i>	<i>0.699</i>	<i>0.518</i>	<i>0.58</i>	<i>0.639</i>
MFIs' Specific Determinants									
LnTA	-0.385 ^a	-0.183 ^a	-0.280 ^a	-0.199 ^a	-0.185 ^a	-0.301 ^a	-0.187 ^a	-0.182 ^a	-0.352 ^a
	<i>0.016</i>	<i>0.008</i>	<i>0.044</i>	<i>0.021</i>	<i>0.008</i>	<i>0.049</i>	<i>0.048</i>	<i>0.007</i>	<i>0.06</i>
LnAGE	-0.287 ^a	-0.310 ^a	0.025	-0.311 ^a	-0.331 ^a	0.028	-0.218 ^b	-0.224 ^a	0.051
	<i>0.025</i>	<i>0.031</i>	<i>0.071</i>	<i>0.044</i>	<i>0.035</i>	<i>0.071</i>	<i>0.096</i>	<i>0.021</i>	<i>0.068</i>
LnROA	-0.501 ^a	-0.587 ^a	-0.200 ^c	-0.500 ^a	-0.488 ^a	-0.192 ^c	-0.478 ^a	-0.451 ^a	-0.178
	<i>0.051</i>	<i>0.051</i>	<i>0.09</i>	<i>0.075</i>	<i>0.051</i>	<i>0.095</i>	<i>0.098</i>	<i>0.043</i>	<i>0.125</i>
LnDER	0.184 ^b	0.191 ^b	0.081 ^c	0.255 ^b	0.196 ^b	0.098 ^b	0.199 ^a	0.186 ^b	0.099 ^c
	<i>0.091</i>	<i>0.098</i>	<i>0.047</i>	<i>0.093</i>	<i>0.092</i>	<i>0.054</i>	<i>0.075</i>	<i>0.079</i>	<i>0.078</i>
Macroeconomics Conditions									
LnGDP				-0.095	0.651 ^a	-0.124 ^a	-0.080 ^b	0.404 ^b	-0.099 ^a
				<i>0.095</i>	<i>0.168</i>	<i>0.041</i>	<i>0.048</i>	<i>0.192</i>	<i>0.039</i>
LnINF				-0.052 ^c	0.085	-0.039 ^a	-0.053 ^a	0.078	-0.039 ^a
				<i>0.035</i>	<i>0.178</i>	<i>0.021</i>	<i>0.022</i>	<i>0.159</i>	<i>0.021</i>
Globalisation Dimensions									
LnKOFTrGldf							-0.199	-0.357 ^a	-0.289 ^b
							<i>0.139</i>	<i>0.102</i>	<i>0.127</i>
LnKOFTrGldj									
LnKOFPoGldf									
R-sq	0.556	0.475	0.19	0.533	0.54	0.255	0.588	0.587	0.282
Adj R-sq	0.532	0.462	0.18	0.527	0.545	0.239	0.578	0.58	0.273
F-statistic	176.021 ^a	55.405 ^a	40.006 ^a	89.998 ^a	45.620 ^a	29.444 ^a	77.526 ^a	40.114 ^a	25.224 ^a
BPLM x ²		1872.222 ^a			1871.874 ^a			1784.240 ^b	
Haus. x ²		8.035 ^c			16.543 ^b			17.878 ^b	
Obs.		792			792			792	
Est		RE			FXE			FXE	

Note: ^{a, b, c} indicates significance at 1%, 5% and 10% levels respectively. Figure in the *italic* are standard errors

Table 7

Continued

Variables	Model 4			Model 5		
	OLS	FXE	RE	OLS	FXE	RE
Constant	2.784 ^a <i>0.691</i>	2.159 ^a <i>0.526</i>	3.185 ^a <i>0.66</i>	15.277 ^b <i>7.123</i>	6.801 ^a <i>1.701</i>	16.524 ^b <i>7.257</i>
MFIs' Specific Determinants						
LnTA	-0.196 ^a <i>0.068</i>	0.198 ^a <i>0.009</i>	0.287 ^a <i>0.088</i>	0.189 ^a <i>0.079</i>	0.187 ^a <i>0.012</i>	-0.287 ^a <i>0.052</i>
LnAGE	-0.289 ^b <i>0.094</i>	-0.235 ^a <i>0.031</i>	0.026 <i>0.076</i>	-0.306 ^b <i>0.095</i>	-0.236 ^a <i>0.031</i>	-0.088 <i>0.096</i>
LnROA	-0.481 ^a <i>0.091</i>	-0.470 ^a <i>0.051</i>	-0.180 ^c <i>0.095</i>	-0.540 ^a <i>0.091</i>	-0.477 ^a <i>0.058</i>	-0.190 ^c <i>0.091</i>
LnDER	0.199 ^a <i>0.092</i>	0.199 ^b <i>0.082</i>	0.089 ^b <i>0.035</i>	0.201 ^a <i>0.08</i>	0.220 ^b <i>0.081</i>	0.092 ^b <i>0.052</i>
Macroeconomics Conditions						
LnGDP	-0.099 ^a <i>0.032</i>	0.395 ^a <i>0.13</i>	-0.125 ^a <i>0.042</i>	-0.205 ^a <i>0.053</i>	0.444 ^b <i>0.201</i>	-0.180 ^a <i>0.058</i>
LnINF	-0.034 ^a <i>0.012</i>	0.153 <i>0.192</i>	-0.036 ^a <i>0.01</i>	-0.01 <i>0.02</i>	0.158 <i>0.186</i>	0.01 <i>0.029</i>
Globalisation Dimensions						
LnKOFTrGIdf						
LnKOFTrGIdj	-0.283 <i>0.195</i>	-0.388 ^a <i>0.175</i>	-0.035 <i>0.128</i>			
LnKOFPoGIdf				2.777 ^c <i>1.74</i>	1.402 ^a <i>0.45</i>	-2.900 ^c <i>1.62</i>
R-sq	0.457	0.498	0.191	0.477	0.478	0.205
Adj R-sq	0.44	0.481	0.187	0.47	0.469	0.199
F-statistic	77.529 ^a	40.316 ^a	25.234 ^a	78.005 ^a	40.123 ^a	25.900 ^a
BPLM x ²		1772.292 ^a			1700.247 ^a	
Haus. x ²		16.514 ^b			13.009 ^c	
Obs.		792			792	
Est		FXE			RE	

Note: a, b, c indicates significance at 1%, 5% and 10% levels respectively. Figure in the *italic* are standard errors

Table 8

Regression Result on the Financial Efficiency of Microfinance Institutions in Philippines and Malaysia

Variables	Model 1			Model 2			Model 3		
	OLS	FXE	RE	OLS	FXE	RE	OLS	FXE	RE
Constant	-0.421 ^c <i>0.251</i>	-0.352 ^c <i>0.187</i>	0.221 <i>0.176</i>	-0.298 ^b <i>0.138</i>	-0.682 <i>0.665</i>	0.3 <i>0.189</i>	0.288 <i>0.593</i>	3.445 ^a <i>0.4</i>	-0.201 <i>0.254</i>
MFIs' Specific Determinants									
LnTA	0.102 ^a <i>0.01</i>	0.035 ^a <i>0.012</i>	-0.028 ^a <i>0.015</i>	0.025 ^a <i>0.009</i>	0.032 ^a <i>0.008</i>	-0.067 ^a <i>0.019</i>	0.029 ^a <i>0.014</i>	0.032 ^a <i>0.007</i>	-0.052 ^a <i>0.019</i>
LnAGE	-0.072 ^a <i>0.011</i>	-0.098 ^a <i>0.019</i>	-0.019 <i>0.016</i>	-0.077 ^a <i>0.009</i>	-0.080 ^a <i>0.009</i>	-0.005 <i>0.021</i>	-0.096 ^a <i>0.015</i>	-0.087 ^a <i>0.009</i>	-0.017 <i>0.019</i>
LnROA	-0.289 ^a <i>0.032</i>	-0.258 ^a <i>0.052</i>	-0.018 <i>0.044</i>	-0.254 ^a <i>0.033</i>	-0.235 ^a <i>0.044</i>	-0.012 <i>0.057</i>	-0.282 ^a <i>0.025</i>	-0.175 ^a <i>0.02</i>	-0.038 <i>0.047</i>
LnDER	-0.027 <i>0.047</i>	-0.028 <i>0.053</i>	-0.007 <i>0.019</i>	-0.023 <i>0.045</i>	-0.024 <i>0.047</i>	-0.01 <i>0.02</i>	-0.022 <i>0.075</i>	-0.021 <i>0.051</i>	-0.009 <i>0.02</i>
Macroeconomics Conditions									
LnGDP				-0.038 <i>0.031</i>	0.258 <i>0.351</i>	-0.058 ^a <i>0.019</i>	-0.055 <i>0.032</i>	-0.128 <i>0.099</i>	-0.061 ^a <i>0.026</i>
LnINF				0.010 ^b <i>0.009</i>	-0.188 <i>0.193</i>	0.023 ^a <i>0.008</i>	0.01 <i>0.009</i>	-0.188 ^a <i>0.051</i>	0.023 ^a <i>0.011</i>
Globalisation Dimensions									
LnKOFTrGIdf							-0.157 <i>0.132</i>	-0.859 ^a <i>0.076</i>	0.133 ^a <i>0.074</i>
LnKOFTrGIdj									
LnKOFPoGIdf									
R-sq	0.152	0.169	0.019	0.161	0.172	0.045	0.168	0.221	0.075
Adj R-sq	0.15	0.162	0.013	0.159	0.162	0.032	0.15	0.218	0.07
F-statistic	31.742 ^a	11.996 ^a	2.998 ^a	21.003 ^a	11.011 ^a	4.603 ^a	18.202 ^a	12.351 ^a	5.978 ^a
BPLM x ²		1493.130 ^a			1498.450 ^a			1489.203 ^a	
Haus. x ²		5.352			7.862			35.621 ^a	
Obs.		792			792			792	
Est		RE			RE			FXE	

Note: a, b, c indicates significance at 1%, 5% and 10% levels respectively. Figure in the *italic* are standard errors

Table 8

Continued

Variables	Model 4			Model 5		
	OLS	FXE	RE	OLS	FXE	RE
Constant	1.150 ^b <i>0.484</i>	4.682 ^a <i>1.595</i>	0.852 ^a <i>0.296</i>	11.958 ^a <i>1.235</i>	16.872 ^a <i>2.102</i>	7.055 ^a <i>1.887</i>
MFIs' Specific Determinants						
LnTA	0.087 ^a <i>0.009</i>	0.032 ^c <i>0.017</i>	-0.045 ^a <i>0.018</i>	0.029 ^a <i>0.006</i>	0.035 ^a <i>0.009</i>	-0.038 ^a <i>0.019</i>
LnAGE	-0.089 ^a <i>0.009</i>	-0.087 ^b <i>0.052</i>	-0.018 <i>0.02</i>	-0.081 ^a <i>0.007</i>	-0.089 ^a <i>0.009</i>	-0.038 ^c <i>0.019</i>
LnROA	-0.218 ^a <i>0.075</i>	-0.178 ^a <i>0.068</i>	-0.025 <i>0.065</i>	-0.172 ^a <i>0.019</i>	-0.178 ^a <i>0.018</i>	-0.009 <i>0.05</i>
LnDER	-0.028 <i>0.047</i>	-0.028 <i>0.087</i>	-0.014 <i>0.025</i>	-0.018 <i>0.041</i>	-0.019 <i>0.057</i>	-0.009 <i>0.02</i>
Macroeconomics Conditions						
LnGDP	-0.077 ^c <i>0.051</i>	-0.302 ^b <i>0.174</i>	-0.052 ^a <i>0.017</i>	-0.062 ^a <i>0.022</i>	-0.382 ^a <i>0.187</i>	-0.067 ^a <i>0.017</i>
LnINF	0.027 ^a <i>0.009</i>	0.057 <i>0.048</i>	0.015 ^a <i>0.003</i>	0.045 ^a <i>0.004</i>	0.028 <i>0.075</i>	0.029 ^a <i>0.007</i>
Globalisation Dimensions						
LnKOFTrGldf						
LnKOFTrGldj	-0.402 ^a <i>0.187</i>	-1.097 ^a <i>0.383</i>	-0.124 ^b <i>0.021</i>			
LnKOFPoGldf				-2.800 ^a <i>0.292</i>	-3.874 ^a <i>0.432</i>	-1.601 ^a <i>0.511</i>
R-sq	0.182	0.198	0.062	0.19	0.229	0.069
Adj R-sq	0.173	0.182	0.058	0.181	0.22	0.061
F-statistic	20.777 ^a	12.100 ^a	4.958 ^a	22.963 ^a	12.009 ^a	56.050 ^a
BPLM x ²		1501.212 ^a			1495.959 ^a	
Haus. x ²		18.154 ^b			6.284	
Obs.		792			792	
Est		FXE			RE	

Note: a, b, c indicates significance at 1%, 5% and 10% levels respectively. Figure in the *italic* are standard errors

5. CONCLUSION

The main purpose of this study is to carry out investigation on the relationship between the determinants of MFIs' specific and macro-economic, with the efficiency of MFIs in the Philippines and Malaysia. Besides, this study also aims to determine the impacts of economic globalisation and political globalisation towards the social and financial efficiency of 88 MFIs in the Philippines and Malaysia from 2012 to 2020. The result reveals that the MFIs in both the Philippines and Malaysia are focusing more on profitability and sustainability rather than accomplishing its main goal, which is to reduce poverty by providing loans to the poor.

For the MFIs' specific results, the size of MFIs shows a negative relationship with social efficiency while exhibits a positive and negative relationship with the financial efficiency. Next, the MFIs year of operations and return on assets have a significant negative impact on both social and financial efficiency. There is, however, a significant positive relationship between MFIs' leverage and debt-to-equity ratio with social efficiency only. In terms of macroeconomic conditions, economic growth shows mixed results with social efficiency and a negative relationship with financial efficiency. Meanwhile, the inflation rate has a significant positive and negative influence on the financial efficiency but an insignificant impact on social efficiency. Meanwhile, for all the economic globalisation index in terms of economic globalisation (actual flows and restrictions) and political globalisation, the variables have a negative relationship with the MFIs' social and financial efficiency.

This study's empirical findings may be useful and have significant implications for related parties such as MFIs, policymakers, and investors who are looking for proactive approaches to ensure production and operations reach their optimal utilisation point. Hence, by mastering the information on these internal and external factors, the MFIs can determine which factors contributed the most to the efficiency and recognise which variables should be enhanced to increase their productivity in the long term. Moreover, the findings

of this study also benefit governments or policymakers which have substantial influences on the financial activities of MFIs. This study provides them with critical information for developing and evaluating appropriate strategies during the implementation of relevant laws and policies to assist MFIs in increasing their social and financial efficiency. Furthermore, investors can gain more insights and knowledge through the findings of this study. Finally, the investors can equip themselves with more ideas on the social and financial efficiency of the MFIs. This study may help them decide whether to invest in MFIs and whether the investment will produce favourable results to maximise their earnings. Nevertheless, the investors tend towards looking at the financial performance of the MFIs as compared to the social outcomes as they are profit-oriented.

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