

# Management Characteristics of Cambodian Microfinance Institutions: Operational Efficiency and Management Objectives<sup>\*</sup>

Hidenobu Okuda<sup>a</sup> and Shi Minjie<sup>b</sup>

November 25th, 2016  
Raffles Hotel Le Royal, Phnom Penh.

<sup>\*</sup> This study is financially supported by a Grant-in-Aid for Scientific Research from the Ministry of Education and Science (Scientific Research C, No. 25380283).

<sup>a</sup> Hitotsubashi University: hokuda@econ.hit-u.ac.jp

<sup>b</sup> Master's Program, Graduate School of Economics, Hitotsubashi University

# Disclaimer

The views expressed here are those of the authors and do not necessarily represent those of the National Bank of Cambodia, or its authorities. The methodologies and practices explained here are proposals of the authors and may be different from those implemented at the National Bank of Cambodia and do not compromise either the policies or decisions of the Board of Directors of any other governing body of the institution.

## 1. Introduction

The difficulty in analyzing microfinance institutions is that these organizations, unlike other private financial institutions that pursue a rational management approach designed to maximize profits, conduct their activities to provide services to the poor for fostering reductions in poverty.

Additionally, different microfinance institutions target different management objectives. Management principles in these institutions are not uniform, as they are an amalgamation of an institution that places importance on sustainable operations and ensuring profits, and an institution that emphasizes poverty reduction, but does not necessarily concern itself with maintaining profits.

Therefore, when measuring the operating efficiency of microfinance institutions, the performance of efficiency measured will vary depending on whether factors of inputs and outputs are selected for assessment.

## 1. Introduction

Gutiérrez-Nieto et al. (2007), in accordance with microfinance institutions' characteristic to have extreme variety in their targeted management objectives, offered an objective method to analyze multifaceted selection of outputs and inputs, and utilized micro-data from thirty microfinance institutions in 8 Latin American countries.

This study will apply this method to Cambodia, and will more comprehensively and systematically examine microfinance institutions' management characteristics, which have been partially described by prior studies, by utilizing data collected from the National Bank of Cambodia's annual publications.

Specifically, this study measures the efficiency scores of thirty-four major microfinance institutions by using DEA, and then examines the multifaceted characteristics of these institutions by adopting principal component analysis to the efficiency scores obtained.

## 1. Introduction

This paper uses the following structure:

in Section 2, the operations of Cambodian microfinance institutions are explained, using descriptive statistics.

Section 3 explains the analytical method used in reference to the work of Gutiérrez-Nieto et al. (2007). Obtained measurement results are described in

Section 4, and Section 5 discusses an assessment of the microfinance institutions' management characteristics.

Section 6 concludes.

## 2. Microfinance Institutions in Cambodia

### 2.1 Historical background

### 2.2 Current situation

A total of forty-five microfinance institutions were registered as CMA members in the third quarter of 2014. However, NBC's 2013 annual report contained data for only thirty-six microfinance institutions.

This paper will investigate thirty-four major microfinance institutions, or non-NGO institutions, which have been licensed, registered, and approved by NBC, for which data has been fully available for analysis.

**Table 1. Operating Indices of Microfinance Institutions**

	Number of Villages	Number of offices	Foreign ownership	Total assets	Number of borrowers	Interest income	Loans	Number of employees	Operational expenses
<b>PRASAC</b>	12107	173	89%	1806503	196906	273096	1514398	2765	92123
<b>AMRET</b>	9758	87	98%	1003067	309458	198389	814112	1444	99318
<b>SATHAPANA</b>	8618	111	73%	832901	78862	131634	725451	2147	62792
<b>HATTHAKAKSEKAR</b>	8832	136	76%	717629	83416	119013	581942	1614	59821
<b>AMK</b>	11358	128	98%	406031	324499	97777	316839	2911	51469
<b>ANGKOR ACE</b>	85	1	0%	3682	121	281	923	12	471
<b>BAYON</b>	173	4	0%	3165	604	807	2482	22	427
<b>BORIBO</b>	34	3	0%	2438	52	411	2249	12	280
<b>KEY</b>	186	2	0%	2209	695	389	1572	23	457
<b>FARMER FINANCE</b>	1	1	100%	1582	306	1419	9	215	0

(Source) NBC, Annual Report 2014

(Notes) All values were as of the end of 2013. million KHR.

### 3. Previous Studies

Gutiérrez-Nieto et al. (2007) avoided specifying a predefined combination of input and output choices from specific viewpoints, which was the commonly adopted methodology in previous studies.

Instead, in the first step of their analysis, they involved the all possible selections of input and output, including both outreach-oriented and sustainability-oriented choices. They measured DEA-based efficiency score of microfinance institutions with respect to all combinations of input and output choices, or “specifications” in their terminology.

Next, in the second step of analysis, by conducting a principal component analysis (PCA) of each specification’s measured DEA score, they examined how operational efficiency aspects of microfinance institutions pertained to the diversified management targets of individual institutions.

The study succeeded in offering a discussion of the differences regarding the management efficiency of outreach-oriented and sustainability-oriented microfinance institutions.



## 4. Analytical Method

### 4.3 Selection of input and output factors and the dataset

According to Yaron (1994), evaluation of microfinance institutions needs double framework of assessment; one is outreach framework for evaluating financial access for the poor the other is sustainability framework for evaluating institution's financial stability and profitability. Following these frameworks, this paper sets evaluation criteria as described in **Table 2**.

**Table 2. Assessment Framework for Operational Characteristics of MFIs**

Outreach framework	Sustainability framework
Number of borrowers (output) Amount of loans (output)	Interest income (output) Operating expenses (input) Number of employees (input)

## 4. Analytical Method

### 4.3 Selection of input and output factors and the dataset

Three outputs and two inputs are assumed in this study, in the same manner as in Gutiérrez-Nieto et al. (2007).

**Table 3. Inputs and Outputs included in DEA Efficiency**

Outputs	Inputs
<b>Output 1. Number of borrowers</b>	Input A. Operating expenses (million KHR)
<b>Output 2. Outstanding amount of loans</b>	
<b>Output 3. Interest income (million KHR)</b>	Input B. Number of employees

## 5. Measurement Results

### 5.1 DEA efficiencies

The operational efficiency of each microfinance institution calculated by using DEA under the assumption of constant return to scale are shown in **Table 5**.

Different combinations of inputs and outputs generate different views of the way in which a microfinance institution operates.

The efficiency results of each institution depend on the combination of input and output specifications and therefore the efficiency results for sustainability-oriented specifications differ from those for outreach-oriented specifications.

**Table 5. MFIs Efficiency Results under the 21 Specifications**

	A1	A12	A123	A13	A2	A23	A3	AB1	AB12	AB123	AB13
<b>PRASAC</b>	0.30	0.67	0.67	0.59	0.64	0.64	0.53	0.30	1.00	1.00	0.65
<b>AMRET</b>	0.90	1.00	1.00	0.90	0.89	0.89	0.54	0.90	1.00	1.00	0.90
<b>BORIBO</b>	0.02	0.22	0.22	0.18	0.22	0.22	0.18	0.02	0.45	0.45	0.27
<b>KEY</b>	0.13	0.14	0.14	0.13	0.11	0.11	0.07	0.17	0.27	0.27	0.17
<b>FARMER FINANCE</b>	0.14	0.24	0.24	0.18	0.22	0.22	0.15	0.16	0.43	0.43	0.22

	AB2	AB23	AB3	B1	B12	B123	B13	B2	B23	B3
<b>PRASAC</b>	1.00	1.00	0.65	0.24	0.90	0.90	0.54	0.90	0.90	0.54
<b>AMRET</b>	0.95	0.95	0.56	0.35	0.62	0.62	0.35	0.61	0.61	0.27
<b>BORIBO</b>	0.45	0.45	0.27	0.02	0.45	0.45	0.27	0.45	0.45	0.27
<b>KEY</b>	0.26	0.26	0.11	0.17	0.27	0.27	0.17	0.26	0.26	0.11
<b>FARMER FINANCE</b>	0.43	0.43	0.22	0.16	0.43	0.43	0.22	0.43	0.43	0.22

## 5. Measurement Results

### 5.2 Estimation results of principal component analysis

PCA was conducted in Step 2 for extracting the comprehensive information to understand the operational characteristics of Cambodian micro-finance institutions from the data on efficiency results obtained in Step 1.

Factor loadings by PCA, regarding the efficiency results in **Table 5**, are given in **Table 6**.

**Table 6. Component Loading Matrix**

Specifications: Combinations of Inputs and Outputs	PC1	PC2	PC3
A1	-0.644	-0.715	-0.080
A12	-0.922	-0.167	-0.290
A123	-0.936	-0.153	-0.285
A13	-0.896	-0.226	-0.362
A2	-0.815	0.359	-0.336
A23	-0.884	0.292	-0.324
A3	-0.805	0.385	-0.365
AB1	-0.616	-0.757	-0.036
AB12	-0.969	0.045	0.09
AB123	-0.975	0.062	0.078
AB13	-0.896	-0.207	-0.285
AB2	-0.903	0.333	0.114
AB23	-0.936	0.307	0.103
AB3	-0.817	0.371	-0.219
B1	-0.545	-0.799	0.158
B12	-0.882	-0.048	0.448
B123	-0.891	-0.028	0.434
B13	-0.784	-0.395	0.133
B2	-0.825	0.256	0.479
B23	-0.861	0.220	0.442
B3	-0.740	0.230	0.148
contribution ratio	0.71	0.13	0.09
cumulative contribution ratio	0.71	0.84	0.93

## 5. Measurement Results

### 5.2 Estimation results of principal component analysis

When we look at PC1, all specifications demonstrated a strong contribution to PC1. PC1 implies the overall efficiency of each microfinance institution in both sustainability and outreach. (MFIs operate with consideration to both A and B to some extent.)

⇒ The overall efficiency of microfinance institution increases as an institution's score under PC1 decreases, or approaches -1.

When we look at PC2, the factor loadings of outreach-oriented specifications were the closest to -1. For sustainability-oriented specifications, all factor loadings were positive, and were close to 1. (Outreach and sustainability are in a trade-off relationship.)

⇒ As an microfinance institution's score increases under PC2, the institution is more sustainability oriented. In contrast, as an institution's score decreases under PC2, the institution is outreach.

## 5. Measurement Results

### 5.2 Estimation results of principal component analysis

When we look at PC3, comparing the specifications with number of employees as input, against the specifications with operational expenses as input, the former specification group was all negative, while the latter specifications group was all positive. (Productivity of inputs are diverse among MFIs.)

⇒ PC3 implies that microfinance institutions fall into two groups of management strategy, and they will seek to be efficient in terms of either number of employees (the amount of output per employee is high), or operational costs (the amount of output per operational costs is high)



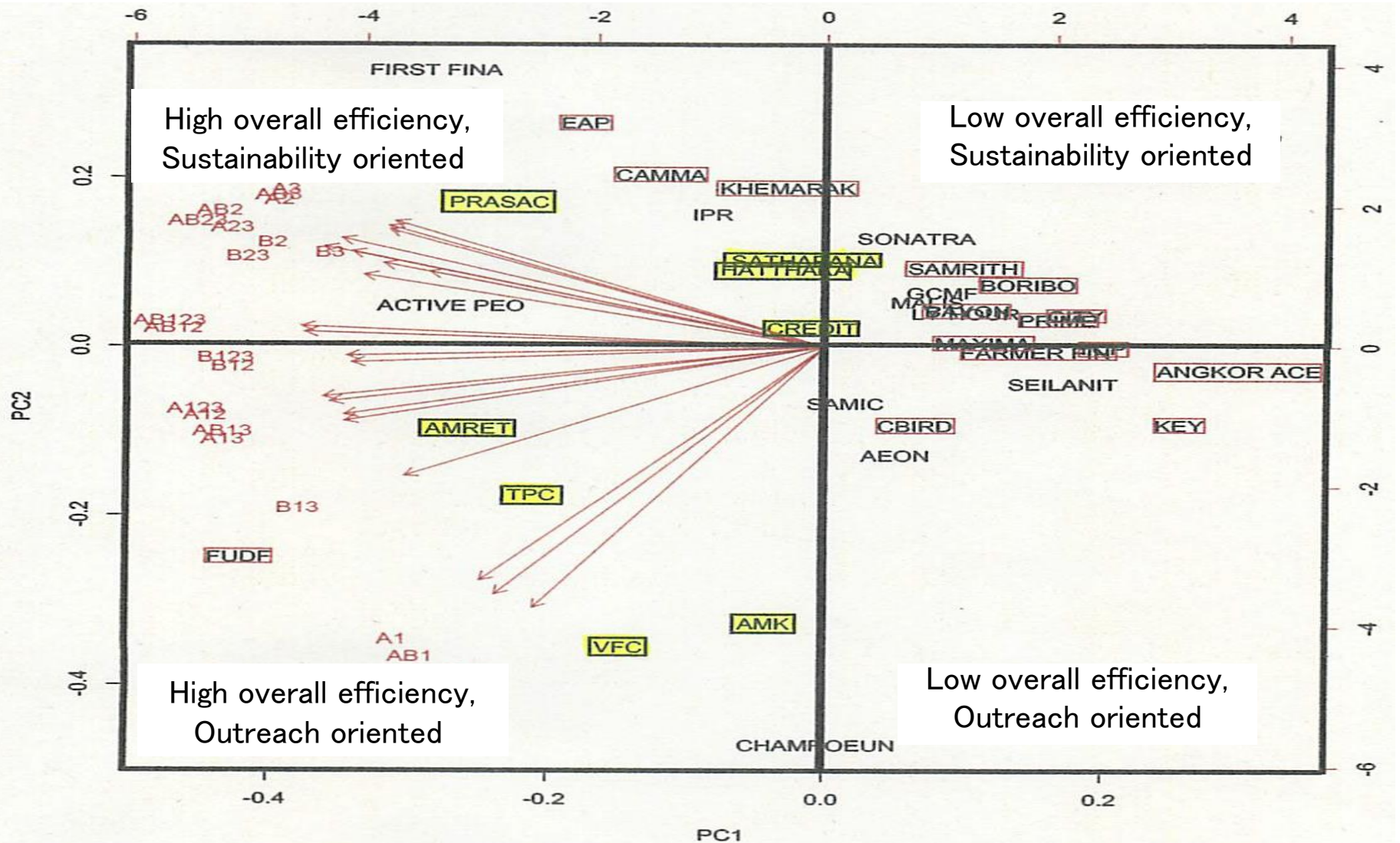
## 5. Measurement Results

### 5.3 Observations

**Figure 1** plots a plot of the microfinance institutions' scores under PC1 and PC2.

The horizontal axis represents each institution's score under PC1; overall efficiency increases as an institution's score moves to the left on the plot. The vertical axis represents institutions' scores under PC2; an institution's orientation towards outreach increases as its score moves downward on the plot, and its orientation towards sustainability increases as its score moves upward. The origin of the plot (0,0) represents the mean score; points plotted to the left or right of the mean, or above or below, represent scores above, or below, the mean.

**Figure 1. Distribution Plot for PC1 and PC2**



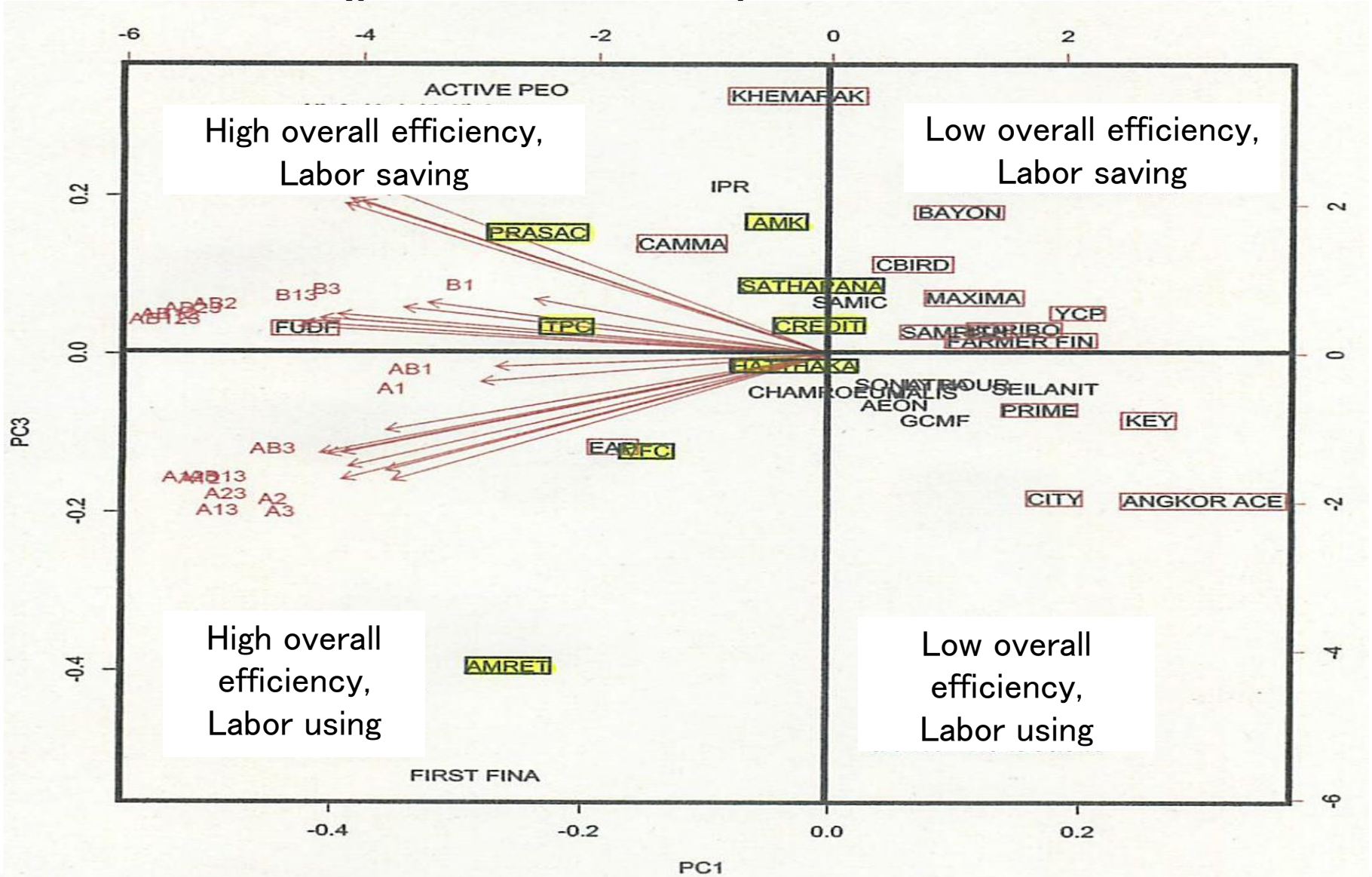
## 5. Measurement Results

### 5.3 Observations

**Figure 2** shows each institution's score under PC1 and PC3.

The horizontal-axis of **Figure 2** describes overall efficiency, which increases as points shift to the left. The vertical-axis describes whether institutions adopt a management strategy with staff count efficiency or cost-effective operational spending. As an institution's score fell lower on the plot, cost-effective operational spending (i.e., saving the operational costs and using the number of employees more intensively was selected) as a management strategy. Likewise, as an institution's score fell higher on the plot, staff count efficiency (i.e., saving the number of employees and spending the operational costs more intensively was selected) as a management strategy.

**Figure 2. Distribution Map for PC1 and PC3**



## 6. Conclusion

### Findings

Based on this analysis,

- (1) large-scale microfinance institutions exhibited higher overall efficiency,
- (2) approximately two-third of microfinance institutions were focused on sustainability and remaining one-third were focused on outreach, and
- (3) less than one-fifth of microfinance institutions exhibited both high overall efficiency and also focused on outreach as a management characteristic.
- (4) In addition, foreign microfinance institutions exhibit comparatively higher overall efficiency, and
- (5) small-scale and local microfinance institutions use employees efficiently, e.g., saving the number of employees.

## 6. Conclusion

### Policy implications

First, as large-scale microfinance institutions exhibited higher overall efficiency, expanding the scale of operations is required to improve operational efficiency. Considering this point, it can be said that efforts by the Cambodian government to expand the scale of microfinance institutions, are reasonable from a development perspective of the nation's financial sector.

Second, according to the results of the analysis, majority of Cambodian microfinance institutions emphasize sustainability instead of outreach. The fact that several microfinance institutions were eventually converted to commercial banks seems to confirm that their management strategies were oriented strongly toward sustainability. This observation may suggest that the Cambodian government must construct policy that increases access to microfinance institutions for the poor, and it is necessary to cultivate an environment where more people can take advantage of microfinance.

.

## 6. Conclusion

### Policy implications

Third, according to the results of this paper's analysis, majority of Cambodian microfinance institutions emphasize sustainability instead of outreach. The fact that several microfinance institutions were eventually converted to commercial banks seems to confirm that their management strategies were oriented strongly toward sustainability. This observation may suggest that the Cambodian government must construct policy that increases access to microfinance institutions for the poor, and it is necessary to cultivate an environment where more people can take advantage of microfinance.

**Thank you very much for your kind attention.**