

**Are profitable microfinance programs less efficient at reaching the poor?  
A case study in Cambodia**

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**Abstract**

This study examines relationships between the financial efficiency and social efficiency of microfinance institutions (MFIs) in Cambodia. Applying Data Envelopment Analysis (DEA) to 14 MFIs, we find that financially efficient, for profit MFIs are no less efficient at reaching the poor than non-profit ones. Larger MFIs appear more efficient at reaching the poor while smaller MFIs are more profitable. Cambodian MFIs are becoming less socially efficient over time while increasing their profitability. This could reflect mission drift as MFIs improve financial efficiency but focus less on serving the most clients possible. Our findings support the notion that financial and social objectives are not mutually exclusive but suggest that stakeholders should ensure that social outcomes are maintained.

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Key words: Microfinance institutions, Cambodia, Data Envelopment Analysis,

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## **1. Introduction**

Microfinance institutions (MFIs) are specialised financial bodies providing financial services to the poor. They have become increasingly important in Asia both in terms of their numbers and in the size of their activities. From India to Indonesia microfinance institutions are growing into sizeable financial service providers simply by providing small loans to poor entrepreneurs. From their small beginnings as Non Government Organisations (NGOs) some providers have grown to become listed companies<sup>1</sup>.

Their success story is not without its critics and some, such as Cull et al (2009), have suggested such profit-focussed MFIs have effectively become glorified moneylenders devoid of social purpose. Evidence of mission drift arose during recent events in India where the state of Andhra Pradesh was forced to control micro lenders following over lending and aggressive debt collection tactics (Augsburg & Fouillet, 2010). Even microfinance founder and Nobel Peace Prize winner, Muhammad Yunus, has criticised profit driven enterprises who are not “social businesses” (Malkin, 2008)

The above seems to suggest microfinance organisations have a choice to either evolve into corporations maximising shareholder value or remain financially stable institutions focussing purely on social goals.

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<sup>1</sup> Swayam Krishi Sangam (SKS) microfinance in India, for example, conducted an initial public offering (IPO) of US\$353m in August 2010 (Gunjan, Soumyadeep, & Srijit, 2010)

Indeed, microfinance's ultimate goal is a topic of some debate. Crabb (2008), Hishigsuren (2007) and Mersland & Strøm (2009; 2010) argue that the goal of microfinance is poverty alleviation. On the other hand Hudon (2009) claims microfinance is simply an extension of financial services to the poor segments of the community. It is not done purely to address poverty but rather to generate shareholder wealth. While self-sufficiency (both operational and overall) is a goal for all MFIs, some MFIs are mainly focussed on social goals and others on profits.

The motivation for this paper is to explore these differing goals and attempt to measure how financial success relates to social success. Can financially efficient, profitable MFIs still be effective at reaching the poor, or is achievement of one objective likely to be at the cost of less success with the other?

Our key distinction over prior studies is we investigate social efficiency, that is, social impact relative to its cost, in relation to financial efficiency (related to profitability). Previous social impact research, such as Hishigsuren (2007), have found increasingly an organisation's size can lessen its social achievements. Mersland & Strøm (2010) and Gutierrez-Nieto et al (2009) have also suggested companies, non-profit organisations and cooperatives have different cost structures thereby affecting their social impact.

None, however, have explored this social impact relative to its cost (or social efficiency) and compared it to profitability. This is our paper's main contribution. It determines whether more profitable, banking like firms, are less efficient at reaching poor clients than less profitable, non-government or cooperative

organisations. The examination of social efficiency is distinguished from social impact studies in that efficiency measures the social impact per unit of cost not simply an absolute social impact regardless of cost.

Our paper makes this contribution through examining the microfinance industry in Cambodia. Cambodia is selected because it has a highly developed MFI industry containing a roughly equal number of social and profit focused MFIs existing side by side. The data is analysed to determine MFIs' social and financial efficiency and whether these efficiency levels have changed over time.

The remainder of this paper is structured as follows. Section 2 explores prior microfinance literature on this social/profit dichotomy. Section 3 outlines the development of microfinance in Cambodia. Section 4 explains the data used in this analysis while Section 5 covers the DEA methodology utilised. Section 6 details the results and their possible interpretations. Section 7 identifies the implications of these findings and potential areas for future research.

## **2. Background Literature**

While not all MFIs focus entirely on either profitability or poverty alleviation, some MFIs seem to concentrate more on their social impact whereas others focus more on shareholder wealth. Socially focused MFIs might be compared to credit unions. They compete with other MFIs and banks in order to gain customers and will lose customers if they do not remain competitive. Like credit unions, they are not necessarily centred on maximising the value of their business but more on

serving the maximum number of customers in order to increase their social impact and, in the case of social MFIs, alleviating poverty.<sup>2</sup>

Profit focused MFIs, on the other hand, may have similar objectives to commercial banks. They are centred more on profits in order to maximise shareholder wealth and financially benefiting their owners than on any social impact and poverty reduction.

Additionally, it should be noted that there are other organisations that lie outside this spectrum, namely, state-owned banks that exist to provide a government service and also central banks and regulatory agencies that aim to regulate the banking sector. While this paper is more concerned with private MFIs, it is important to remember that these government organisations exist. notating

Social performance measurement is another issue. One study that explores this, Gutierrez-Nieto et al. (2009), did so by measuring the number of people the MFI served notating the number of women borrowers, as well as a poverty reach index. Others, however, argue that using a poverty reach index is inappropriate since the social goal of MFIs is simply to provide financial services to the poor rather than a complete panacea for poverty (Woller, 2007). While other social impact measurements have since been developed and tested (Sen, 2008), the number of

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<sup>2</sup> In order to survive, Bauer (2008) argues that credit unions seek to maximise the net gain vector of their members, that is, the net difference between deposit rates paid and loan rates received. By paying more for deposits and charging less on loans credit unions will gain market share.

people served is still widely utilised as a measure when considering longer term data.

### **3. Cambodian microfinance**

The Khmer Rouge government in the late 1970s completely eradicated all Cambodian banking and currency. The country reverted to barter with rice commonly being exchanged for other food, clothing and supplies. Subsequent Vietnamese occupation reintroduced local currency but it was not until the early 1990s that urban banking services resumed (Larson, 2001). Rural areas were largely ignored and left to an informal credit system dominated by private moneylenders. This suggested a need for microfinance in rural areas (Allden, 2009).

One such program, the United Nations' UNDP/ILO Project "Small Enterprise and Informal Sector Promotion" worked together with the International Labor Organization to form the first Cambodian microfinance NGO, Association of Cambodian Local Economic Development Agencies (ACLEDA), in 1993 (Lintner, 2002). It operated in rural villages lending small amounts of US dollars<sup>3</sup> to poor entrepreneurs. It targeted disadvantaged groups such as refugees, the disabled,

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<sup>3</sup> The US dollar remains the dominant currency in Cambodia (Menon, 2008). Following its collapse in the 1970s the local Khmer Riel (KHR) is only used for small transactions less than US\$10 with dollars used for larger ones. The National Bank of Cambodia is gradually trying to reinstitute Riel as the main domestic used currency but is facing public trust issues (Ok, Kakinaka, & Miyamoto, 2010).

demobilised soldiers and widows. ACLEDA proved so successful that it gradually expanded its services to all community members not just the severely disadvantaged. By 1997 ACLEDA was financially stable and became independent of UNDP funding (BWTP, 2004).

In the mid 1990s a further 25-30 smaller microfinance programs established operations and quickly grew from serving 44,000 clients in 1994 to 214,000 people in 1998 (BWTP, 2004). A regulatory framework was gradually developed with the creation of the Credit Committee for Rural Development in 1995 and the Rural Development Bank in 1998 (Alden, 2009). Finally, in 1999, Cambodia's central bank, the National Bank of Cambodia (NBC), arranged for microfinance operations to be covered by the country's Financial Institutions Law and so became the MFIs regulator. It now operates a two level system (licensing and registration) for the larger and smaller institutions (BWTP, 2004).

The 1999 legislation also gave ACLEDA the opportunity to become a specialised bank. As a full service bank for the poor, ACLEDA claimed it could demonstrate lending to poor and low-income entrepreneurs was actually a profitable business strategy (Tan, 2008). With further reform in 2003, it became a full commercial bank and could raise capital from investors, wholesale lenders and business depositors (Freeman, 2007). Since 2000, ACLEDA has paid regular dividends with return on assets (ROA) typically of around 3 - 4 % and return on equity (ROE) of 15-20% (Tan, 2008). It is now the third largest commercial bank in Cambodia (comprising 12% of the system's assets) and the leading provider of microcredit (supplying over half the market). ACLEDA has been since used as a case study in

how post-conflict development programs can evolve into profitable, sustainable long-term microfinance operators.

In 2011 ACLEDA remains a unique case in the Cambodian financial sector. All other finance providers of finance can be described as either commercial banks or MFIs with minimal cross-over in between. The 27 commercial banks, 6 specialized banks, and 3 offices of foreign branches continue to represent a wealthy minority of residents, mainly in Phnom Penh and other urban areas (NBC, 2009).

In contrast, the 24 licensed MFIs (in addition to ACLEDA as a commercial bank) serve over a million (mainly rural) borrowers and 820,000 depositors across all 24 provinces in a country of 14 million people. As of September 2010 they had microloans outstanding of US\$589m and deposits of US\$887m with an average loan balance of US\$486 per borrower and an average deposit balance of US\$1034 per depositor (CMA, 2010). Microfinance activity in Cambodia increased greatly in the three years before the global financial crisis (GFC) with number of borrowers growing 23%, 29% and 31% during 2006, 2007 and 2008 respectively (IFC, 2009). This growth reversed to -17% in 2009 with the GFC, but returned to positive growth again in 2010 (CMA, 2010). The social impact is impressive in that 25% of low income households now utilise microfinance in some way (Alden, 2009).

The 24 MFIs licensed by the National Bank of Cambodia (NBC) include larger MFIs, such as Amret, Programme de Réhabilitation et d'Appui au Secteur Agricole

du Cambodge (PRASAC) and Sathapana<sup>4</sup>, charity owned NGOs such as VisionFund (VFC), which is owned and operated by World Vision, and Thaneakea Phum Cambodia (TPC), which is operated by Catholic Relief Services, as well as small private profit focussed companies such as Maxima. Their characteristics are provided in Table 1, number of customers in Fig. 1 and market share in Fig. 2.

Aside from the 24 licensed MFIs, there are also 26 small NGOs that are registered with the NBC because they provide credit programmes. These MFIs are very small<sup>5</sup> and have minimal data available. We therefore only evaluate the licensed MFIs.

#### **4. Data**

The availability of data reduces our sample from the 24 licensed MFIs in Table 1 to the 14 Cambodian MFIs listed in Table 2. The data set covers the period from 2003 to 2009 but as shown in Table 2 it is not complete for all MFIs across all years. All data was gathered from the MIX market database<sup>6</sup> and the Cambodian

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<sup>4</sup> The larger MFIs in Cambodia (AMRET, PRASAC and Sathapana) often started as NGOs in the 1990s. They are funded by foreign development banks and investment funds that provide their core finance through debt or equity investments.

<sup>5</sup> Licensing is required when an MFI's loan portfolio reaches KHR 1,000 million (US\$247,000) or savings mobilized from the general public reaches KHR 100 million (US\$24,700) and/or the number of their depositors or borrowers reaches 1,000 (NBC, 2009).

<sup>6</sup> Microfinance Information Exchange. (2011). Data Analytics. Retrieved from <http://mixmarket.org/data-center>

Microfinance Association (CMA) Network Information Exchange.<sup>7</sup> As ACLEDA is now a bank rather than an MFI it is not included in this study.<sup>8</sup>

**[INSERT TABLES 1 & 2 ABOUT HERE]**

**[INSERT FIGS 1 & 2 ABOUT HERE]**

## **5. Methodology**

MFI efficiency can be evaluated using similar techniques for banks (Gutierrez-Nieto, Serrano-Cinca, & Mar Molinero, 2007). For instance, Farrington (2000) applied accounting ratios (return on assets, cost per borrower, administration expense ratio and clients per staff member) to evaluate MFI efficiency and Arsyad (2005) took a similar approach to measure Indonesian MFI efficiency in terms of operating cost ratio, cost per unit of currency lent and cost per loan. Parametric or non-parametric testing can also be used to measure efficiency. Parametric testing was used by Hassan and Tufte (2001) with stochastic efficient frontier methodology applied to identify possible inefficiencies at Grameen Bank in Bangladesh.

Non-parametric testing has also been applied to test MFI efficiency, both on its own and together with parametric testing. Indeed, Leon (2001) found that parametric stochastic frontier testing and non-parametric Data Envelopment

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<sup>7</sup> Cambodia Microfinance Association. (2011). Network Information Exchange. Retrieved from <http://cma-network.org/drupal/InformationExchange>

<sup>8</sup> Indeed the size of ACLEDA seems to have biased efficiency tests where it has been included in the sample of Cambodian MFIs. Results containing ACLEDA are available on request.

Analysis (DEA) produced very similar rankings when applied to a set of Peruvian MFIs and concluded that they are both reasonable methods for measuring MFI efficiency.

In terms of selecting Data Envelopment Analysis (DEA) input and output combinations to analyse, Gutierrez-Nieto et al. (2007) emphasized country effects and NGO/non-NGO distinguishing features in their reporting of the efficiency of 30 Latin American MFIs. Ownership structure was also noted as an important factor by Haq, Skully, & Pathan (2009) who found that non-bank MFIs were more efficient at serving clients whereas bank MFIs were more financially efficient.

While these financial factors have been explored there has been limited examination of MFI social factors and efficiency. One of the few studies, Annim (2010), used a variety of parametric and non-parametric measures concluding that financial efficiency and social outreach had a positive link. It is useful to note that the above DEA studies all utilised worldwide data and emphasised the need for case study analysis such as conducted here.

Considering the above literature, the small size of our data set and the efficiency goals we are attempting to address (which include non-financial measures unsuitable for parametric analysis), DEA is considered the most appropriate method of analysis.

DEA, as developed by Charnes, Cooper and Rhodes (1978), has been utilised to study banking efficiency in numerous settings. Early examples include Sherman & Gold (1985) which used it to identify inefficient bank branches to improve

productivity and Oral & Yolalan (1990) who applied the methodology to 20 Turkish bank branches and found the analysis complementary to financial ratios. The relative efficiency of commercial banks has since been examined for the Nordic countries (Berg, Førsund, Hjalmarsson, & Suominen, 1993), large US commercial banks (Miller & Noulas, 1996), US financial services generally (Athanassopoulos, 1997), US banks operating internationally (Haslem & Scheraga, 1999), and Australian banks (Sathye, 2001). Further applications have explored banking efficiency in developing contexts such as India (Sathye, 2003), China before and after deregulation (Chen, Skully, & Brown, 2005) and Pakistan (Akhtar, 2010). The efficiency of credit unions has also been examined using DEA in Australia (Worthington, 2004), Canada (Pille & Paradi, 2002), and Ireland (Glass, McKillop, & Rasaratnam, 2010).

DEA utilises input and output data to create a best practice efficient frontier that plots a piece-wise representation of the maximum output per input (or minimum input per output). Those MFIs with combinations of input and output that lie on the frontier can be seen as efficient while those that lie inside the frontier appear relatively inefficient. A comparison of the efficient and inefficient organisations can then be explored to determine the source of these inefficiencies (Cooper et al., 2001). DEA can be applied using a constant return to scale (CRS) or variable return to scale (VRS) model.

The constant return to scale (CRS) measure can be written as follows:

$$\text{Max } \sum_{r=1}^s u_r y_{r0} \quad (1)$$

Subject to:

$$\sum_{r=1}^s u_r y_{rj} - \sum_{i=1}^m v_i x_{ij} \leq 0 \quad (2)$$

$$\sum_{i=1}^m v_i x_{i0} = 1; \quad (3)$$

$$-u_r \leq -\epsilon \quad (4)$$

$$-v_i \leq -\epsilon \quad (5)$$

where  $u_r$  and  $v_i$  are the variable weights to be determined by solving the above equation problem and  $y_{rj}$  and  $x_{ij}$  are known positive outputs and inputs of the  $j$ th decision making unit (DMU). Non-Archimedean conditions lead to  $u_r, v_i \geq \epsilon > 0$  for all  $r, i$ .

$$\sum_{i=1}^m v_i x_{i0} = 1 \quad (6)$$

is used in order to ensure that movement can be made between ratio form and linear programming form.

The result of this is to ensure

$$h_0^s = \sum_{r=1}^s u_r^s y_{r0} \quad (7)$$

The interpretation of the CRS equation is the maximisation of MFI output subject to unit input and in line with the condition that virtual output cannot exceed virtual input for any DMU.

The variable return to scale (VRS) model, as supplied by Banker, Charnes, & Cooper (1984), is as follows.

$$\text{Max } \sum_{r=1}^s u_r y_{r0} - u_0 \quad (8)$$

Subject to:

$$\sum_{r=1}^s u_r y_{rj} - \sum_{i=1}^m v_i x_{ij} - u_0 \leq 0 \quad (9)$$

$$\sum_{i=1}^m v_i x_{i0} = 1; \quad (10)$$

$$-u_r \leq -\varepsilon \quad (11)$$

$$-v_i \leq -\varepsilon \quad (12)$$

where  $u^*$  indicates the return to scale opportunities. It is implied that where  $u^* > 0$  there is a decreasing return to scale and where  $u^* < 0$  there is an increasing return to scale.

In this case DEA is to be applied across both MFIs and time periods. The efficient frontier created reflects a production possibility set that measures the optimal input and output combinations for all MFIs over 2003 to 2009.

The added dimension of time should provide insights into any possible efficiency changes over time for both individual MFIs and the industry as a whole. This has not been done in previous MFI studies, which have usually been restricted to one time period.

MFI efficiency measurement in this case requires two DEA models: one to measure social efficiency and one for financial efficiency. Their difference is the inputs and outputs. The social efficiency approach views MFIs as producing financial services in the same way that a farm produces food. Inputs such as labour, capital and fixed assets are seen to produce outputs such as transactions (Sherman & Gold, 1985), account activity (Berg, Gørsund, & Jansen, 1991) and total number of accounts or customers (Ferrier & Lovell, 1990). The social efficiency model is an application of the production approach that is widely used in the banking efficiency literature (Fethi & Pasiouras, 2010).

Our analysis uses personnel, operating expenses and equity as the inputs and the number of customers (savers and borrowers) as the outputs. The focus on people (both in terms of inputs and outputs) seems reasonable for social efficiency. An MFI that reaches the most number of people in terms of both saving and borrowing services using the least amount of labour, operating expenses and investment should maximise social efficiency (if we limit ourselves to outreach). This is based upon the assumption that all customers are created equal and that serving one customer, say in an urban centre, has the same impact as serving another in a rural area. This may be debateable in terms of poverty alleviation.

The financial efficiency model treats microfinance institutions as financial services providers that are attempting to maximise the value of their financial income while minimising the cost of the business and thereby maximise profits and shareholder wealth. The outputs are therefore the total value of savings and loans and the inputs are the same costs needed for the social model: personnel, operating expenses and equity. The key difference is the use of loan portfolio value and deposit value as outputs rather than simply the number of savers and borrowers. Again this is reasonable as a MFI seeking to maximise shareholder wealth is more likely to seek the highest value of business for the lowest costs rather than maximise the number of customers served.

This model is an application of the intermediation approach which is the other widely used banking efficiency technique aside from the production approach.<sup>9</sup> Banking literature using the intermediation approach argues that, rather than producing something, banks are actually intermediaries that convert their available funds into loans. Intermediation studies vary in their treatment of deposits as an input or output (Fethi & Pasiouras, 2010). In this study we are treating deposits as an output since deposits do not yet represent a sizeable and reliable source of funds for Cambodian MFIs to convert into loans: the role of deposit-taking is rather as a service to holders of cash.

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<sup>9</sup> The debate between the production and intermediation approaches has been longstanding and unresolved. See Holod & Lewis (2011) for a useful history of the discussion.

Our social/financial framework reflects a similar dichotomy used to measure credit union and bank efficiency. Due to the differing goals of credit unions and banks (discussed in Section 2), there is a similar divergence in the outputs used in credit union and bank efficiency studies. For example, Piesse and Townsend (1995) and Worthington (1998) both include expenses, labour, and capital as inputs and number of depositors and number of borrowers as outputs while bank efficiency studies such as Berg, et al. (1993) and Aly, Grabowski, Pasurka, & Rangan (1990) include the same inputs but with loan portfolio values and deposit values as outputs.<sup>10</sup>

A summary of the different models are provided in Table 3. Descriptive statistics of the data used are provided in Table 4.

**[INSERT TABLES 3 & 4 ABOUT HERE]**

### **Spearman rank order correlations**

Three results stand out from the correlation figures in Tables 5 and 6 between the inputs and outputs: the low correlation coefficients for deposit funds, borrower numbers and depositor numbers. The low correlation of deposit funds with inputs suggests that deposits do not grow or decline with the MFI generally. This suggests that Cambodian MFIs mainly provide loans and that deposit funds are a secondary focus.

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<sup>10</sup> For a summary of efficiency studies including their inputs/outputs refer to Worthington (2010) for credit unions and Fethi & Pasiouras (2010) for banks.

Borrower numbers exhibit lower correlations with inputs relative to gross loan portfolio figures. Again this suggests that MFI increases in size (in terms of operating costs, equity and personnel) are more closely linked with loan portfolio values rather than the number of customers served. This result is even more pronounced with depositor numbers, the coefficients for which are very close to zero. It appears that the number of depositors is completely irrelevant to both the size of the MFI and the number of borrowers served. The correlations suggest that loan values are the main driver of MFI growth and that any auxiliary focus on deposits is still in terms of cash rather than depositor customer numbers. These results are consistent with the existence of mission drift.

**[INSERT TABLES 5 & 6 ABOUT HERE]**

## **6. Estimation results and discussion**

The results from the financial efficiency and social efficiency models are compared firstly across the different MFIs (Tables 7 and 8). It should be noted that some efficiency scores differ across these models. For example, AMK ranks highly according to the social efficiency model but poorly on financial efficiency. As AMK is an NGO and targets disadvantaged customers in rural areas rather than the high value clients in the city, it may be efficient in supplying microfinance services to numerous customers but has not generated sufficiently high loan balances to increase profitability.

Conversely, the strong performance of Sathapana Limited (an MFI with a corporate structure) in the financial efficiency model but not in social efficiency may suggest

that its high market share and low number of customers (as seen in Figs. 1 and 2) are generating efficiency in terms of cash value but not customer numbers.

While such social and financial disparities appear in some instances, Fig. 3 and Fig. 4 demonstrate other results. Fig. 3 ranks the MFIs in terms of financial efficiency with the least financially efficient MFIs on the bottom and the most financially efficient on the top. Fig. 4 similarly ranks the MFIs from top to bottom but instead by social efficiency. The results show that a number of MFIs maintain both high levels of social and financial efficiency. For example, Chamroeun is ranked first in terms of both financial efficiency and social efficiency. AMRET and TPC also manage high ranks in both.

These results suggest that financial and social efficiency are not mutually exclusive. Socially focussed MFIs do not necessarily sacrifice financial efficiency in order to maximise their outreach. Thus it appears that an MFI can proverbially 'have its cake and eat it too' by serving additional poor people as it makes money. The results also show that some MFIs are unsuccessful at both financial performance and poverty alleviation. That is, certain MFIs (such as Seilanithih) are socially and financially inefficient relative to their peers. These MFIs may need to change their practices in order to be sustainable from a charity or market standpoint.

The size rankings in Tables 7 and 8 also provide some interesting results. The top four financially efficient MFIs are the four smallest in terms of portfolio value and are also very small in terms of client numbers. This suggests that these small MFIs

should be the most profitable. In contrast, the size rankings in Table 8 suggest that larger MFIs are the most socially efficient. The six largest MFIs (in terms of client numbers) are also among the top seven socially efficient firms even when ranked in terms of variable returns to scale. This indicates that large MFIs can serve Cambodian clients more efficiently than smaller MFIs.

Scale efficiency appears to have a limited impact on results<sup>11</sup>. Almost all MFIs have relatively high levels of scale efficiency approaching 1. A notable exception is Maxima which lacks scale efficiency in terms of its social impact. For some reason Maxima is able to utilise its size efficiently for profit outcomes rather than social outcomes. There may be scope for Maxima to boost customer numbers by adopting measures utilised by other, more socially scale efficient MFIs.

**[INSERT TABLES 7 & 8 ABOUT HERE]**

**[INSERT FIGS 3 & 4 ABOUT HERE]**

### **How efficiency has changed over time**

To obtain a measure of trends in efficiency through time we have had to reorganise our data set so as to give us a balanced panel.<sup>12</sup> We have done this in two ways, looking at 7 institutions for a 7-year period (2003-2009) and 10 institutions for a 5-year period (2005-2009).

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<sup>11</sup> Detailed results are available on request

<sup>12</sup> We would not otherwise know whether differences in efficiency between years were a reflection of different sets of institutions being included in individual years' data sets. See Tulkens & Vanden Eeckaut (1995).

Results across time suggest an increase in financial efficiency over the seven-year sample period. (Fig. 5). In contrast, Fig. 6 indicates a general decline in social efficiency since 2003. This disparity between social and financial efficiency over time could suggest that while Cambodian MFIs are becoming less efficient in terms of borrower and saver numbers, they are becoming more efficient in terms of the portfolio value of their loans and savings.

One explanation is the expansion of microfinance more deeply into rural areas may have reduced their social efficiency due to the additional costs of accessing rural customers. When investing in rural branches, MFIs are exposed to the risk that new branches will initially serve relatively few borrowers and savers thereby not generating the same customer numbers per staff member as existing urban branches and so lacks their economies of scale. The ‘low hanging fruit’ appears already picked.

Another explanation for declining social efficiency is that MFIs are spending fewer resources in generating new customers and more resources on improving profitability. This could reflect the mission drift discussed above.

Further evidence of mission drift is their increasing financial efficiency over time. The increased profitability may be due to attracting more upmarket customers (possibly by new entrants) which has increased portfolio turnover significantly with a comparatively smaller increase in operating expenses and staff. This may suggest a focus by MFI management on maximising profit outcomes as operations

expand. The factors underlying these changes seem an excellent area for further research.

**[INSERT TABLES 9 & 10 ABOUT HERE]**

**[INSERT FIGS 5 & 6 ABOUT HERE]**

## **7. Conclusions**

This study investigates the social and financial efficiency of MFIs in Cambodia, with the goal of determining whether more profitable MFIs are less efficient in achieving social outcomes. Our DEA results suggest that financially efficient MFIs can simultaneously be efficient in achieving social goals. That is, profit focussed MFIs in emerging markets can target social objectives without necessarily sacrificing profitability.

These findings also suggest that some MFIs (at least in Cambodia) may have ignored social goals and solely pursued financial efficiency. These (albeit smaller) institutions seem to generate additional profitability from a lower number of clients. Over time, an overall shift towards improved financial efficiency may be occurring at the expense of social efficiency.

Such mission drift represents a risk to microfinance as the industry becomes increasingly market driven. While it is possible to be both profitable and socially efficient, it is by no means inevitable. So for microfinance to achieve its social

goals with a market based structure, it will need to develop further methods to ensure its social outcomes are also being met.

Future research could apply better measures of social efficiency (rather than client numbers as used here). One could also explore other reasons why some MFIs are inefficient both socially and financially and whether this declining social efficiency in Cambodia is a worldwide phenomenon.

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**Table 1**

Licensed Cambodian MFI characteristics

	<b>Microfinance Institution</b>	<b>Short Name</b>	<b>Year</b>	<b>Additional products</b>	<b>Main funding source</b>	<b>% MF</b>
			<b>license</b>	<b>offered (aside from loans)</b>		
1	Angkor ACE Star Credits Limited	AngkorACE	2010	None	S/holder Capital	91-100
2	Angkor Mikroheranhvatho (Kampuchea) Co. Ltd	AMK	2004	Savings	S/holder Capital	91-100
3	Amret Microfinance Institution	Amret	2001	Savings	Grants, Savings, S/holder	91-100
4	Cam Capital Co., Ltd	CamCapital	2010	None	S/holder Capital	91-100
5	Cambodian Business Integrated in Rural Development	CBIRD	2005	Savings	Savings, S/holder Capital	91-100
6	Chamroeun Microfinance	Chamroeun	2005	Savings, insurance, training	Grants	91-100
7	Samic Microfinance	SAMIC	2005	Savings, insurance	S/holder Capital	81-90
8	Cambodia Rural Economic Development Initiatives	CREDIT	2004	Savings	Grants, Savings, S/holder	91-100
9	Entean Akpevath Pracheachun	EAP	2007	None	S/holder Capital	91-100
10	Farmer Finance Ltd	Farmer	2007	None	S/holder Capital	91-100
11	Farmer Union Development Fund	FUDF	2008	None	S/holder Capital	91-100
12	First Finance PLC	First	2009	Home loans	S/holder Capital	91-100
13	Green Central Microfinance	GCMF	2008	None	S/holder Capital	91-100
14	Hattha Kaksekar Limited	HKL	2003	Savings	Savings, S/holder Capital	91-100
15	Intean Poalroath Rongroeurng	IPR	2005	Savings	S/holder Capital	81-90
16	Maxima Mikroheranhvatho Co. Ltd	Maxima	2005	Savings	S/holder Capital	91-100
17	Programme de Réhabilitation et d'Appui au Secteur Agricole du Cambodge Ltd	PRASAC	2005	Savings	Grants	91-100
18	Samrithisak Microfinance Limited	Samrithisak	2010	None	S/holder Capital	91-100
19	Sathapana Limited	Sathapana	2001	Savings, Fund Transfers	Savings, S/holder Capital	91-100
20	Seilanithih Limited	Seilanithih	2003	Savings	Grants, Savings, S/holder	91-100
21	Tong Fang Micro Finance Ltd	TFMF	2002	None	S/holder Capital	91-100
22	Thaneakea Phum Cambodia	TPC	2003	Savings	Grants, S/holder Capital	91-100
23	VisionFund Cambodia	VisionFund	2001	Savings	Grants, Savings, S/holder	91-100
24	YCP Microfinance Ltd	YCP	2009	None	S/holder Capital	91-100

**Sources:** Mixmarket ([www.mixmarket.org/mfi/country/Cambodia](http://www.mixmarket.org/mfi/country/Cambodia)) and CMA ([www.cma-network.org/information.htm](http://www.cma-network.org/information.htm)) (Jan 20, 2011)

**Table 2**

Data availability for MFIs

MFI	Years available						
AMK	NA	2004	2005	2006	2007	2008	2009
AMRET	2003	2004	2005	2006	2007	2008	2009
CBIRD	NA	NA	NA	2006	2007	2008	2009
Chamroeun	NA	NA	NA	NA	2007	2008	2009
CREDIT	2003	2004	2005	2006	2007	2008	2009
HKL	2003	2004	2005	2006	2007	2008	2009
IPR	NA	NA	NA	2006	2007	2008	NA
Maxima	NA	2004	2005	2006	2007	2008	2009
PRASAC	2003	2004	2005	2006	2007	2008	2009
Sathapana Limited	2003	2004	2005	2006	2007	2008	2009
SAMIC	NA	NA	NA	2006	2007	2008	2009
Seilanithih	2003	2004	2005	2006	2007	2008	2009
TPC	2003	2004	2005	2006	2007	2008	2009
VFC	2003	NA	2005	2006	2007	2008	2009

Note: Table 2 is not complete for all MFIs across all years because of missing data as well as the fact that some MFIs (for example IPR) were established during the sample period

**Table 3**

## Model Inputs and Outputs

Social efficiency model				Financial efficiency model			
Inputs	Personnel (number)	Equity (million KHR)	Operating Expenses (million KHR)	Inputs	Personnel (number)	Equity (million KHR)	Operating Expenses (million KHR)
Outputs	Borrowers (number)	Depositors (number)		Outputs	Deposits (million KHR)	Gross Loan Portfolio (million KHR)	

**Table 4**

## Descriptive statistics of Inputs and Outputs

	Inputs			Outputs			
	Personnel (number)	Equity (million KHR)	Operating Expenses (million KHR)	Production model (Social efficiency)	Intermediation model (Financial efficiency)	Deposits (million KHR)	Gross Loan Portfolio (million KHR)
Max	1246	90273	39268	Borrowers (number)	Depositors (number)	12527	264155
Min	12	263	144	226262	90049	0	528
Average	267	15645	7937	891	0	1382	45823
Median	170	9415	4240	44577	8596	609	21445
St Dev	260	18481	8712	18126	2937	2297	59564

**Table 5**

Spearman rank order correlations of financial efficiency scores

	Personnel	Total equity	Operating expenses	Deposits	Gross loan portfolio
Personnel	1.00				
Total equity	0.94	1.00			
Operating expenses	0.98	0.95	1.00		
Deposits	0.52	0.37	0.47	1.00	
Gross loan portfolio	0.96	0.91	0.97	0.58	1.00

**Table 6**

Spearman rank order correlations of social efficiency scores

	Personnel	Total equity	Operating expenses	Number of borrowers	Number of depositors
Personnel	1.00				
Total equity	0.94	1.00			
Operating expenses	0.98	0.95	1.00		
Number of borrowers	0.74	0.74	0.77	1.00	
Number of depositors	0.04	0.01	0.00	-0.05	1.00

**Table 7**

Financial efficiency scores ranked across MFIs

Rank	MFI	N	Size Rank		Financial efficiency
			P	C	Average
1	Chamroeun	3	14	10	1.00
2	CBIRD	4	12	12	0.98
3	IPR	3	11	13	0.91
4	Maxima	6	13	14	0.91
5	HKL	7	4	6	0.87
6	Sathapana	7	3	7	0.81
7	SAMIC	4	9	11	0.74
8	AMRET	7	2	1	0.71
9	CREDIT	7	8	8	0.70
10	TPC	7	7	3	0.69
11	PRASAC	7	1	4	0.67
12	Seilanithih	7	10	9	0.66
13	AMK	6	5	2	0.45
14	VFC	6	6	5	0.45

**Table 8**

Social efficiency scores ranked across MFIs

Rank	MFI	N	Size Rank		Social efficiency
			P	C	Average
1	Chamroeun	3	14	10	1.00
2	AMRET	7	2	1	1.00
3	AMK	6	5	2	0.88
4	TPC	7	7	3	0.85
5	HKL	7	4	6	0.55
6	PRASAC	7	1	4	0.54
7	VFC	6	6	5	0.54
8	Maxima	6	13	14	0.48
9	CBIRD	4	12	12	0.43
10	SAMIC	4	9	11	0.40
11	Seilanithih	7	10	9	0.39
12	Sathapana	7	3	7	0.33
13	CREDIT	7	8	8	0.31
14	IPR	3	11	13	0.21

Notes: Results are from the variable returns to scale (VRS) model. N stands for the total number of data points for each MFI. P stands for the size rank in terms of portfolio value. C stands for the size rank in terms of total number of clients. Average stands for the average across years.

**Table 9**

Financial efficiency scores over time

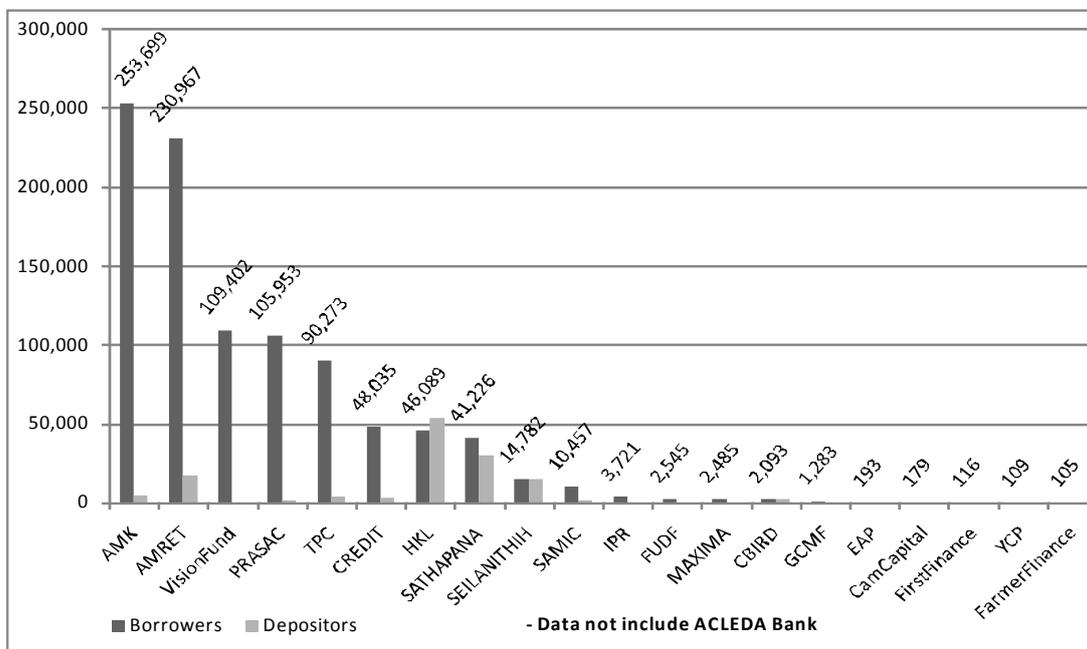
Panel 1					Panel 2			
Year	n	Avg	Median	Std dev	n	Avg	Median	Std dev
2003	7	0.70	0.59	0.23				
2004	7	0.74	0.67	0.19				
2005	7	0.74	0.79	0.19	10	0.80	0.78	0.20
2006	7	0.75	0.79	0.13	10	0.88	0.97	0.16
2007	7	0.88	0.86	0.12	10	0.84	0.84	0.17
2008	7	0.96	1.00	0.07	10	0.61	0.59	0.22
2009	7	0.93	1.00	0.09	10	0.66	0.63	0.19
Total	49				50			

**Table 10**

Social efficiency scores over time

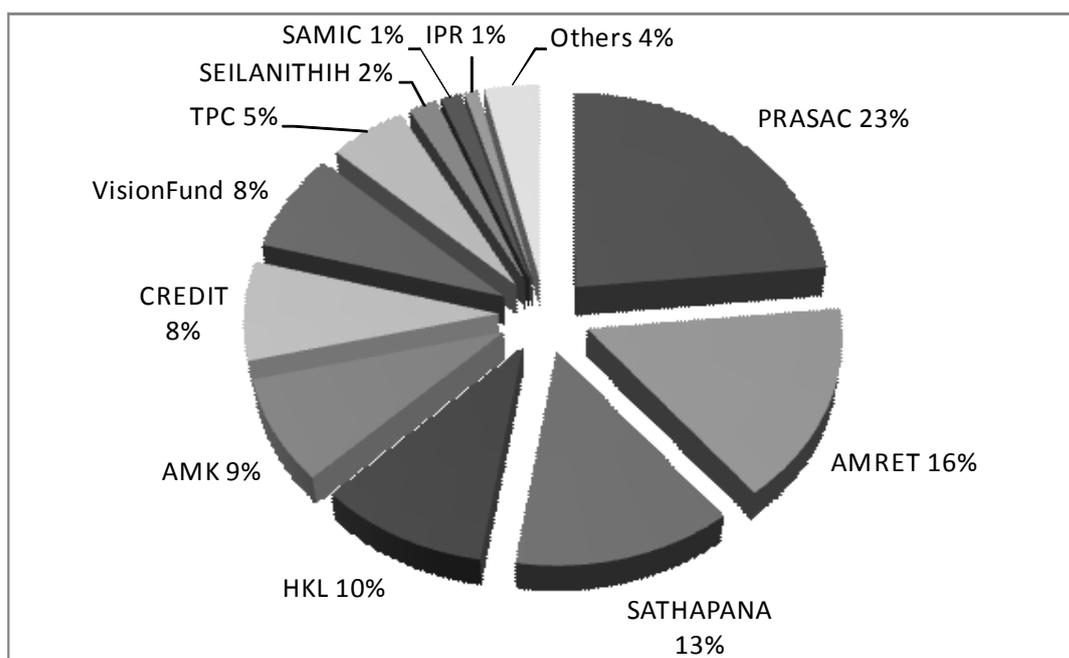
Panel 1					Panel 2			
Year	n	Avg	Median	Std dev	n	Avg	Median	Std dev
2003	7	0.84	1.00	0.21				
2004	7	0.76	0.84	0.24				
2005	7	0.61	0.60	0.29	10	0.69	0.66	0.29
2006	7	0.53	0.51	0.31	10	0.62	0.53	0.33
2007	7	0.51	0.47	0.30	10	0.57	0.51	0.30
2008	7	0.56	0.46	0.26	10	0.59	0.52	0.27
2009	7	0.54	0.40	0.26	10	0.56	0.47	0.30
Total	49				50			

Notes: Panel 1 contains a balanced panel of 7 MFIs (AMRET, CREDIT, HKL, PRASAC, Sathapana, Seilanithih, TPC) with data from 2003 – 2009. Panel 2 contains a balanced panel of 10 MFIs (AMK, AMRET, CREDIT, HKL, Maxima, PRASAC, Sathapana, Seilanithih, TPC, VFC) with data from 2005-2009.



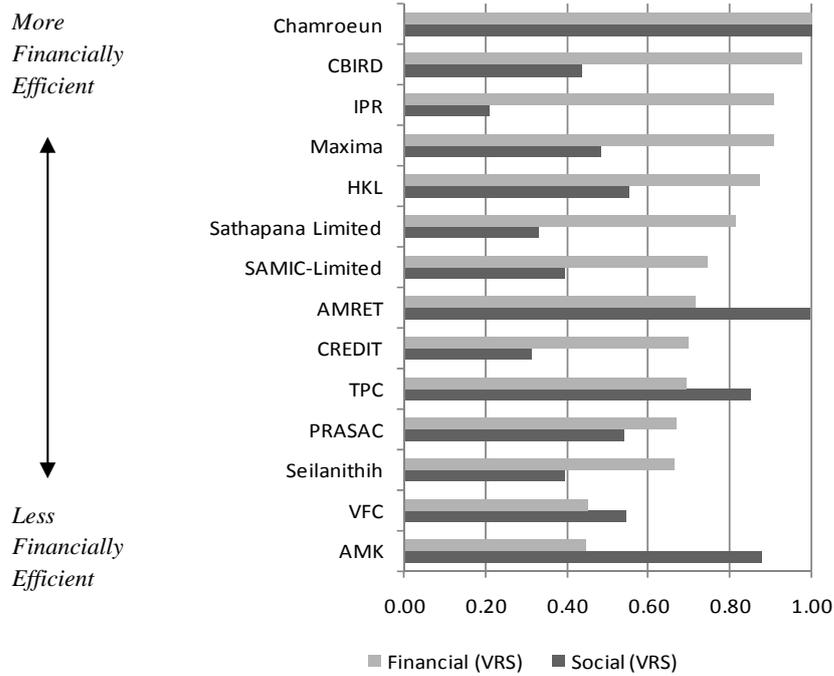
**Fig. 1.** Number of Borrowers and Depositors - September 30, 2010

Cambodia Microfinance Association

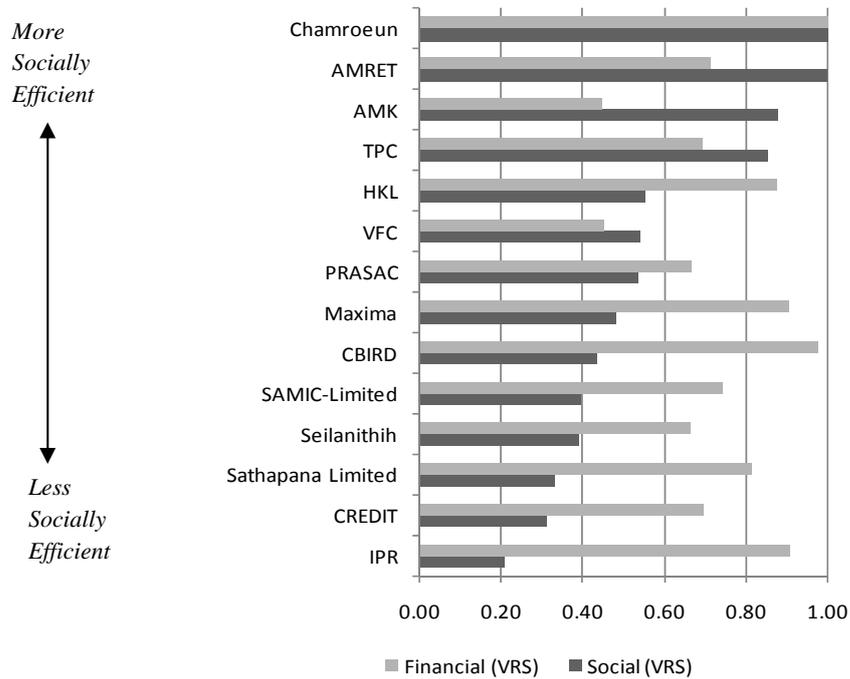


**Fig. 2.** Market Share by Loan Outstanding - September 30, 2010

Cambodia Microfinance Association

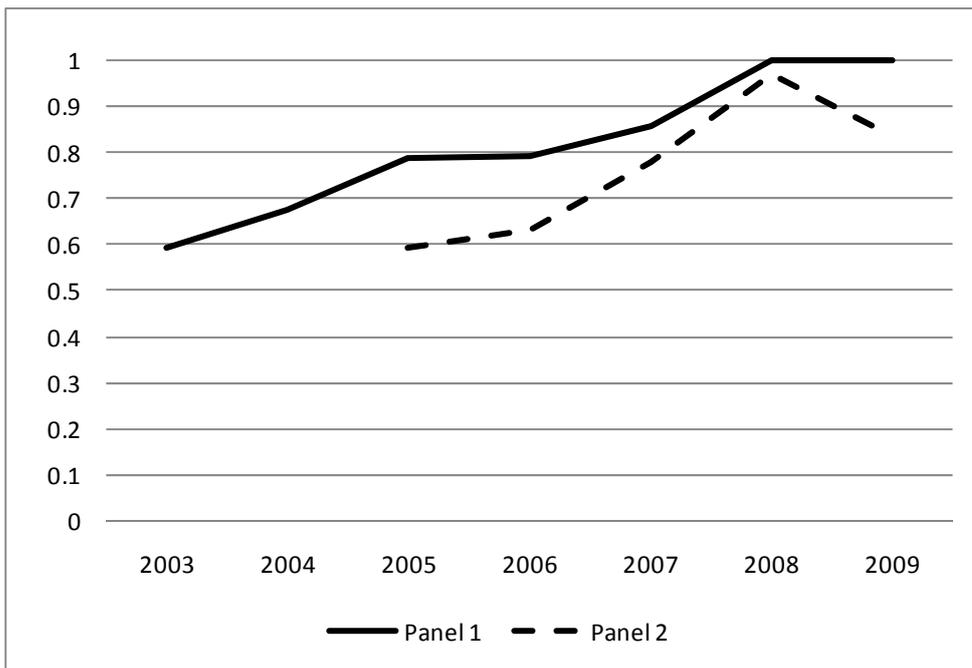


**Fig. 3.** Social and financial efficiency scores ranked in order of financial efficiency

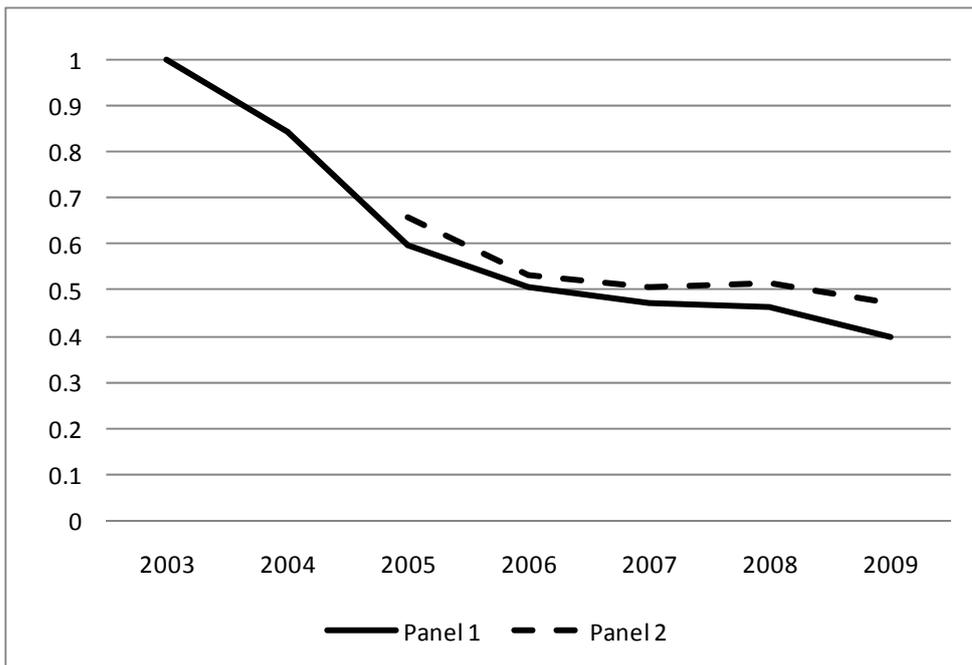


**Fig. 4.** Social and financial efficiency scores ranked in order of social efficiency

Notes: Variable returns to scale (VRS) model results shown.



**Fig. 5.** Median financial efficiency scores over time



**Fig. 6.** Median social efficiency scores over time

Notes: Panel 1 contains a balanced panel of 7 MFIs (AMRET, CREDIT, HKL, PRASAC, Sathapana, Seilanithih, TPC) with data from 2003 – 2009. Panel 2 contains a balanced panel of 10 MFIs (AMK, AMRET, CREDIT, HKL, Maxima, PRASAC, Sathapana, Seilanithih, TPC, VFC) with data from 2005-2009.