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A major debate in microfinance focuses on the existence of a trade-off between the financial sustainability of microfinance institutions (MFIs) and their outreach to poor clients. This paper adds to this debate by analyzing whether financial and social efficiency are mutually exclusive in a context of implicit subsidies by the state and international donors. We use data from a sample of 28 Vietnamese MFIs and apply Data Envelopment Analysis (DEA) to identify the existence of a trade-off. Our analysis shows that for Vietnamese MFIs financial and social efficiency are not related. We interpret this as evidence for the fact that there is no support to believe that there is such a trade-off. Subsidies, based on which most Vietnamese MFIs currently operate, helps them to show high financial efficiency, while at the same time being able to attain their social goals. Nevertheless, this model may not be sustainable in the long-term.

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Abstract

A major debate in microfinance focuses on the existence of a trade-off between the financial sustainability of microfinance institutions (MFIs) and their outreach to poor clients. This paper adds to this debate by analyzing whether financial and social efficiency are mutually exclusive in a context of implicit subsidies by the state and international donors. We use data from a sample of 28 Vietnamese MFIs and apply Data Envelopment Analysis (DEA) to identify the existence of a trade-off. Our analysis shows that for Vietnamese MFIs financial and social efficiency are not related. We interpret this as evidence for the fact that there is no support to believe that there is such a trade-off. Subsidies, based on which most Vietnamese MFIs currently operate, helps them to show high financial efficiency, while at the same time being able to attain their social goals. Nevertheless, this model may not be sustainable in the long-term.

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1. Introduction

Microfinance institutions (MFIs) focus on providing financial services to poor households who are excluded from the formal financial system. Having access to finance is crucial for the poor as this helps them to smooth their consumption, generate business opportunities and improve their inclusion in the formal economy in the long run (Collins et al., 2009). In some cases, microcredits can even empower rural women (Chan and Ghani, 2011). An important debate in the microfinance discussion focuses on whether it is possible for MFIs to be financially sustainable, i.e. not being dependent on subsidies, while at the same being able to reach out and serve a large number of poor clients (i.e. socially sustainable). Because providing financial services to the poor may be a very costly activity, focusing on outreach may, at least potentially, conflict with the financial sustainability of MFIs, i.e. there may be a trade-off between financial and social sustainability (Hermes and Lensink, 2007). Such a trade-off could question whether the microfinance sector is able to achieve its double bottom line mission of improving the lives of the poor while being independent of donor support in the long run.

Previous studies have investigated the trade-off between the social and financial sustainability of MFIs (see, e.g., Cull et al., 2007; Hermes et al., 2011). This paper adds to the debate on the trade off by analyzing whether financial and social sustainability are mutually exclusive, using data from a sample of 28 Vietnamese MFIs. We look into this question by focusing on the financial and social performance of these MFIs and analyze whether they are interlinked. We measure performance by focusing on the financial and social efficiency of institutions, using Data Envelop Analysis (DEA). In particular, we look at efficiency as the outcome of a process where input costs are minimized to obtain a given level of outputs, where outputs are both financial or social.

Analyzing the existence of a trade-off between financial and social sustainability using data from the Vietnamese microfinance sector is interesting, because microfinance in this country differs quite significantly in terms of its history and structure from microfinance in other emerging economies. Indeed, microfinance in the Vietnamese context can be termed

as the subsidized provision of microcredit due to active involvement of mass organizations and state development banks. While recent cross-country research suggests that unsubsidized MFIs may differ in terms of social performance (D'espallier et al., 2013), this paper provides new evidence on the potential efficiency trade-off in a context of large-scale subsidization such as Vietnam.

The question we address is whether, and if so, how this model of implicit subsidies based on which most Vietnamese MFIs currently operate affect their financial and social efficiency and whether this model can be sustainable in the long-term. This question is highly policy relevant in the Vietnamese context, since the country's government has recently shown to be willing to change its policies of subsidizing the microfinance sector and has therefore recently started to encourage market-based microfinance through independent non-governmental organizations (NGOs) and licensed MFIs. This change in policies is related to the recently emerging willingness of the authorities to commit to economic liberalization and international integration (Rowley and Wagner, 2010)

The remainder of this paper is structured as follows. Section 2 describes the main features of the Vietnamese microfinance sector and how it compares to its Asian and international peers. Section 3 reviews the literature that focuses on assessing MFI efficiency and in particular on the existence of a trade-off between financial and social efficiency. The DEA methodology and model selection is presented in section 4, followed by the description of the data and variables in section 5. Section 6 presents the results of the efficiency scores of the Vietnamese MFIs in our database and discusses the determinants of financial and social efficiency. Section 7 concludes.

2. The country context

Vietnam's poverty rate significantly decreased from 37 per cent in 1998 to about 14 per cent in 2011 (World Bank, 2011). Yet, since 2007 the country has been hit by the global economic downturn. Currently, it experiences growing economic turmoil, which, among other things has led to increasing inequalities between urban and rural areas and among regions. These

increasing inequalities provide fertile ground for the development of microfinance. Indeed, improving financial inclusion by providing a large scope of financial services, allowing the poor to develop income-generating activities, protect themselves from negative shocks, and build assets, is a relevant policy objective to favor the inclusion of the poor in the country's general move towards increased living standards.

At the same time, the structure of the Vietnamese microfinance sector, both in terms of regulation, policy interventions, targeted clients and lending practices, differs significantly from "mainstream" microfinance as implemented in most South Asian and Latin American countries. In fact, state banks and mass organizations linked to the Vietnamese state provide the major part of microfinance services at subsidized rates. The most important institutions of this formal, state-led system are the Vietnam Bank for Social Policy (VBSP) and Vietnam Bank for Agricultural and Rural Development (VBARD). They cooperate with mass organizations, such as the Vietnam Women's Union (VWU), which pilots a large number of microfinance schemes across the country. In this framework, the VWU is monitoring loan use and collects interests on behalf of the VBSP, while the final lump sum repayment on the principal amount is managed by the VBSP. VBSP is tax-exempt with no obligation to meet the State Bank of Vietnam's (SVB, i.e. the country's central bank) reserve requirement.

Next to these state-led organizations, a number of commercial banks are starting to downsize their operations to target microfinance clients, the most active being Lien Viet Post Joint-stock Commercial Bank (Lien Viet Postbank), which results from the merging of Lien Viet Bank with the Vietnam Postal Savings Service Company (VPSC), the first post bank in Vietnam. Another major formal microfinance provider is the People's Credit Fund (PCF), a cooperative network created through the reform and merger of former rural credit cooperatives in the early 1990s. The PCF provides financial services such as credit and savings facilities to local rural farm households and entrepreneurs. It mostly provides credit to lower middle-class rural entrepreneurs and not to the poorest rural dwellers.¹

¹ For this reason PCF has been left out of the analysis in this paper.

The remainder of microfinance services is provided by a small but growing non state-led sector, consisting of local and international NGOs, social funds and schemes directly implemented by mass organizations. Many of these organizations face difficulties to serve larger number of customers. The two largest microfinance actors in this category are CEP and TYM, which (indirectly) are linked to state-related actors such as the Ho-Chi-Minh Labor Federation (in case of CEP) and the VWU's (TYM).

Finally, next to these formal institutions and NGOs, microfinance in Vietnam is provided informally, by Ho's/Hui's (ROSCAs), friends and relatives without interests and with flexible terms, and through moneylenders with high average interest rates. The informal sector's share within the Vietnamese microfinance is estimated at 11 per cent in a report commissioned in 2011 by the Vietnam Microfinance Working Group (VMWG). Recourse to informal financial service provision is still popular, especially in rural areas, as their flexible terms make it easier for rural dwellers to cope with uncertainties during the harvest period. Informal consumption loans are also popular as the formal sector mainly provides investment loans, sometimes based on politically biased criteria.

The Vietnamese government has recently taken actions to reform the formal sector subsidized-lending system, which costs more than USD 200 million to the government's budget each year (Nguyen and Vogel, 2012). In 2005, a new legal framework was established (and amended in 2007) to create favorable conditions for microfinance organizations and programs in the semi-formal sector to formalize them into licensed small-scale financial institutions providing microfinance services under supervision of the SBV. In Credit Institution Law No. 27/2010, MFIs were for the first time considered as official credit institutions to be supervised by the SBV. As of December 2013, two MFIs (TYM and M7) have successfully obtained their license and other semi-formal MFIs are considering applying for it. However, many MFIs are still reluctant to engage in this transformation process, due to higher reporting costs, a constraining regulatory framework, and the uncertainties surrounding the process' outcomes. In December 2011 The Prime Minister of Vietnam officially approved a National Microfinance Strategy to 2020 with the objective to "develop a safe

and sustainable microfinance system in order to ensure social welfare and sustainable poverty eradication” (VMWG, 2011).

Comparing the Vietnamese MFIs to peer organizations in countries in the Asia-Pacific region in which microfinance is relatively important² provides the following picture.³ First, Vietnamese MFIs are smaller than their Asian peers, in terms of total assets (8 times smaller), gross loan portfolio (6.5 times smaller), and number of staff (5 times smaller). Moreover, their staff is heavily feminized (75 per cent as compared to 44 per cent for the median Asian MFI). Second, Vietnamese MFIs have fewer clients – about twice as less active borrowers and 30 per cent less depositors. Their clientele is composed almost exclusively of women, while men constitute 20 per cent of total number of borrowers in the median Asian MFI. They are also more poor-focused with smaller loan size relative to the national per capita income (12.7 per cent versus in case of their Asian peers 32.5 per cent). Third, loan officers in Vietnamese MFIs are serving a higher average number of clients (75 per cent more) than their Asian peers. This high productivity may be partly explained by the fact that client monitoring is often handled by staff from the VWU and not by the MFI’s own staff. Their cost per borrower is only a fraction (20 per cent) of those of the median Asian MFI, while their operating expense ratio is twice as low. This high level of efficiency, especially compared to international standards in the microfinance sector, is closely linked to the number of implicit subsidies received from the VWU, which consist of voluntary and/or part-time staff handling credit monitoring operations or in-kind subsidies not recorded in the accounting systems. This cost-structure allows many Vietnamese MFIs to significantly limit their personnel expenses. Finally, as a consequence of their ability to transfer substantial costs to other organizations such as the VWU, Vietnamese MFIs have a higher return on assets than their Asian peers (3.8 per cent versus 2.8 per cent), even if they charge their borrowers twice as less fees and interests (18.1 per cent versus

² Cambodia, China, East Timor, Indonesia, Laos, Papua New Guinea, Philippines and Tonga.

³ The data provided in this paragraph are taken from Lebovics (2013) who also uses data from the Mix Market, the VMFWG, as well as directly from a number of Vietnamese MFIs not covered by the Mix Market database. The VBSP and the PCF are excluded from the analysis due to the significant difference in scale of operation and institutional characteristics with the rest of Vietnamese microfinance providers.

34.5 per cent). This low level of portfolio yield can both be explained by the competition from VBSP's subsidized lending, which pushes down microfinance interest rates, as well as by the lower (reported) operating expenses, allowing MFIs to charge low interest rates and fees while still covering costs. Thanks to their low cost structure, Vietnamese MFIs can better cover their (reported) expenses than their Asian peers, as measured by their high operational self-sufficiency ratio (135.4 per cent versus 121.9 per cent).⁴

To summarize the above discussion, the Vietnamese microfinance sector differs quite significantly in its history and structure from microfinance as organized in other Asian countries, with a high proportion of subsidized credit along with an active involvement of mass organizations and state development banks. In the remainder of this paper we focus on analyzing how this model of implicit subsidies affects operations and the sector's performance in terms of attaining high levels of financial and social performance.

3. Financial versus social sustainability: A brief review

Two approaches are dominant in discussions on the trade-off between financial and social sustainability (Robinson, 2001). According to the so-called "financial systems" approach, there is no trade-off between sustainability and the number of poor clients served. Actually, this approach argues that a larger pool of poor clients can be serviced once an MFI becomes financially sustainable, i.e. financial and social sustainability are complements rather than substitutes. Emphasizing financial sustainability and commercializing microfinance allow for increasing outreach by attracting additional funds from private investor and ensuring the long-term provision of financial services to the poor. Similarly, increased competition, better regulation and new technologies can improve the long-term efficiency of MFIs, which may help generating additional resources to increase access to financial services for the poor. Therefore,

⁴ It should be noted, however, that some Vietnamese MFIs have a tendency to understate nonperforming loans, leading to lower levels of loan-loss provisioning. Reprogramming and refinancing of overdue loans are also practices that limit loan loss provision expenses, which may again overstate the sector's sustainability.

according to this approach, increased financial and social sustainability can go hand in hand. The importance of long-term financial sustainability for MFIs started to be emphasized in the 1990s when the financial systems approach received more and more attention.

In contrast, supporters of the so-called “poverty lending” approach focus on the predominance of the welfare of clients rather than the sustainability of institutions. They argue that the poor cannot afford to pay the higher interest rates MFIs need to charge in order to become financially sustainable. It is costlier for an MFI to serve remote rural and poorer communities as compared to urban and marginally poor clients. Financial and social sustainability may therefore be in conflict at some point of the MFI’s expansion and struggle against competitors. Consequently, MFIs may be pushed to increase the size of loans they provide as a way to increase financial margins, which means they move up-market and start serving less poor customers, a process known as “mission drift”. Thus, according to the poverty lending approach financial and social sustainability are substitutes, i.e. there is a trade-off between these two goals of MFIs. The poverty lending approach was dominant during the early days of microfinance, i.e. in the 1970s, 1980s and early 1990s.

Since the 1990s, with the rising attention of financial sustainability, the debate on the trade-off between financial and social sustainability has gained prominence among microfinance practitioners as well as among academic researchers. Researchers aim at measuring the financial and social performance of MFIs and subsequently investigate whether the performance of one type of performance goes at the cost of the other. Overall, the results of empirical studies seem to be mixed.

A number of studies find supporting evidence for the view that financial and social sustainability are substitutes. One of the first studies investigating the trade-off is by Cull et al. (2007). Using a dataset of 124 MFIs in 49 countries, they find that individual lending-based MFIs focus more on wealthier clients, perform better in terms of profitability, but score lower on the depth of outreach (degree of poverty), indicating that there seems to be evidence for a trade-off between financial and social performance. Research by Gonzalez (2007) supports this finding. He

showed that efficiency improvements are not driven by a higher number of loans per staff member, but by increasing the average loan size, thus at the expense of the poorest clients. Hermes et al. (2011), who use panel data of 435 MFIs, Annim (2012), who uses balanced panel data of 164 MFIs, Louis and Baensens (2013), who use panel data for 456 MFIs, and Abate et al. (2013), using data from Ethiopian MFIs, all find evidence that outreach is negatively related to the cost efficiency of MFIs. Cull et al. (2011) stress that transforming MFIs into formalized banking institutions generates costs for MFIs, which in turn may negatively affect their outreach. McIntosh and Wydick (2005), using data from Ugandan MFIs, argue that increasing competition between MFIs goes at the cost of their social performance. Kablan (2012) investigates the trade-off hypothesis for 104 MFIs in countries of the West African Monetary Union and finds evidence consistent with the existence of a trade-off. Roberts (2013) analyzes the relationship between interest rates on the one hand and adopting the for-profit legal form, appointing private sector representation and traditional banking experience to advisory boards, and participating in more extensive for-profit networks on the other hand. He shows that a stronger for-profit orientation correlates with higher interest rates for MFI clients, indicating that there may be a trade-off between financial and social performance. At the same time, however, he finds that financial sustainability is not improved when MFIs raise interest rates, because profit orientation is also associated with higher MFI costs. Bos and Millone (2013) use data of 1,146 MFIs and find that financial and social sustainability are not necessarily substitutes. A considerable number of MFIs in their sample are able to offer small loans at affordable costs. At the same time, however, they show that once MFIs increase loan size to reap economies of scale, outreach decreases. Moreover, they find that focusing lending on women has a negative impact on efficiency.

Other studies do not find clear evidence for the existence of a trade-off in microfinance. Gutierrez-Nieto et al. (2009; 2011) find a low but significant positive correlation between social and financial efficiency. They conclude that profitability and social efficiency follow their own track, while there is no apparent trade-off between financial and social efficiency.

Crawford et al. (2011), using data on Cambodian MFIs, also obtain more balanced results. They find that for-profit MFIs are no less efficient at reaching the poor than non-profit ones, but they also observe that Cambodian MFIs are becoming less outreach efficient over time while increasing their profitability. Omri and Chkoundali (2011) analyze financial and social performance of 16 Mediterranean MFIs and find that financial sustainability is associated with higher interest rates. At the same time, however, focusing on the poor does not seem to compromise financial performance. Bédécarrats et al. (2012), based on survey data from 295 MFIs in 51 countries, argue that financial and social performance can both be achieved as long as MFIs have a well-planned social performance management strategy. Kar (2013) uses data from 409 MFIs and finds a positive association between MFI size and average loan amount, suggesting some mission drift is going on. He finds similar results when female borrower participation is used as a measure for outreach. Overall, however, he claims that concerns for mission drift can be validated if defined as a distinctive trade-off between increased profit-motivation and depth of outreach of MFIs. Louis et al. (2013) apply a self-organizing map methodology to investigate whether there exists a trade-off. Based on data from 650 MFIs they find evidence there is a significant positive relationship between social efficiency and financial performance. Piot-Lepetit and Nzongang (2014) investigate village banks in Cameroon and show that for almost half of these banks there is no trade-off between financial and social sustainability; for 15 per cent of the village banks they do find a trade-off.

4. Method

Several empirical studies discussed in the previous section measure performance of MFIs in terms of efficiency, i.e. how does an individual MFI perform (financially and/or socially) as compared to the maximum performance it can reach given the available resources. Efficiency can be measured by using either parametric or non-parametric techniques. One of the most widely used non-parametric techniques is the so-called Data Envelopment Analysis (DEA) approach (Charnes et al., 1978; Banker et al., 1984). DEA combines input and output data to calculate a best practice

efficient production frontier. This efficient frontier plots a piece-wise representation of either the minimum input per output or the maximum output per input (Crawford et al. 2011). In the context of the analysis in this paper, DEA allows to distinguish between efficient and relatively inefficient MFIs. The former operate on the frontier while the latter are performing below the frontier. The distance from the production frontier is a measure of the inefficiency of an individual MFI.⁵

One advantage of DEA as compared to parametric approaches is that it does not require an ex ante specification of the functional form to be applied to the data in order to estimate efficiency scores. It is less data demanding and can handle small sample sizes. Finally, it allows to perform peer analysis while also accommodating the inclusion of any kind of input and output in different measurement units without the need to standardize the data. As such, it seems more suitable to measure MFIs' efficiency and performance as it can include both financial and non-financial information in the same model to calculate efficiency scores (Ben Soltane 2008).

However, DEA does not handle measurement errors.⁶ Moreover, it imposes conditions on homogeneity, i.e. it assumes that institutions carry out similar activities and produce comparable products and services so that a common set of outputs can be defined; it also assumes that similar resources are available to all institutions and that they operate in a similar environment. This means that comparisons of the efficiency of MFIs are best carried out within a single country context (Balkenhol and Hudon 2011).

DEA allows for different assumptions regarding the nature of return to scales, as it can be performed using a constant return to scale (CRS) or a variable return to scale (VRS) model. The CRS model relies on the assumption that there is no relationship between the scale of operations and the efficiency level, which leads to calculating Overall Technical Efficiency (OTE) scores for each MFI. Yet, these OTE scores can be biased

⁵ We do not provide a detailed discussion of the DEA approach in this paper. For detailed accounts of this approach, see, e.g., Charnes et al. (1978) and Banker et al. (1984).

⁶ Stochastic frontier analysis, which is an alternative non-parametric approach, does take into account measurement errors. Yet, data requirements for this approach are much higher, making it not suitable for the analysis in this paper.

downward by scale inefficiencies if not all MFIs are operating at optimal scale. By assuming variable return to scale, the VRS model allows to calculate pure technical efficiency scores (PTE), i.e. the measurement of technical efficiency that is not influenced by scale efficiency (SE) effects. Although in theory, it may be important to decompose OTE scores into PTE and SE scores, our data analysis reveals that the correlation between OTE, PTE and SE for both financial and social efficiency measures is high (i.e. ranging between 0.71 and 0.83). We therefore focus our attention on the analysis of OTE scores in the remainder of this paper, which is in line with the approach taken by several other studies in the literature (see, e.g., Gutierrez-Nieto et al., 2009; 2011).⁷

Next, we discuss whether we should take an input or output orientation. Calculations of efficiency may either focus on maximizing outputs, i.e. keeping inputs constant while maximizing output levels; or focus on minimizing inputs, i.e. keeping output levels constant while reducing the use of inputs as much as possible. Kumbhakar and Lozano Vivas (2005) argue that most DEA studies in banking use input-oriented models, as the banking industry is focused on cost-minimization, while output levels are mainly determined by demand factors. Similar arguments hold for MFIs. We therefore opt for using an input-oriented DEA model.

In selecting inputs and outputs of banks two approaches have been used in the literature, i.e. the production approach and the intermediation approach. The production approach considers financial institutions as production units that use standard inputs to process financial services. Examples of inputs used in this approach are total assets, operating costs and number of employees; outputs are usually the number of borrowers and/or savers. The intermediation approach considers financial institutions as intermediaries between savers and borrowers. Inputs used in this approach include loanable funds, deposits, financial costs, number of employees, equity and/or total assets; outputs include gross loan portfolio and/or financial income. According to Gutierrez-Nieto et al. (2007; 2009;

⁷ In the remainder of the paper we use the term efficiency, referring to the overall technical efficiency (OTE) scores.

2011), the production approach is best suited for most MFIs, as their emphasis is on granting loans, rather than collecting deposits. In fact, many MFIs do not even collect deposits, which is a crucial aspect of the intermediation approach, but receive donations and subsidies.

Both the production and intermediation approach focus on the financial efficiency of MFIs. However, these institutions have two goals, i.e. financial and social efficiency. DEA can also be used to calculate social efficiency scores. Whereas inputs may be the same, outputs should reflect the social goal of MFIs. This is why efficiency studies for MFIs have used variables such as the number of loans made to women, the number of customers below the poverty threshold, the impact on the community as measured by the number of clients within the community or an indicator combining both depth (degree of poverty) and breadth (number of clients served) of outreach (e.g. Gutierrez-Nieto et al., 2009; Crawford et al., 2011).

5. Data

Data for all input and output variables described in the previous section, as well as for all other institutional characteristics used in the analysis, have been collected for a sample of 28 non state-owned formal and semi-formal Vietnamese MFIs for the year 2011.⁸ Data have been obtained from the Mix Market database and the VMFWG, as well as directly from a number of Vietnamese MFIs not covered by the Mix Market database.⁹ In selecting our measures of input variables, financial outputs and social outputs, we borrow from previous MFI efficiency studies. First, with respect to the input variables, we use total liabilities, operating costs and total number of staff. Total liabilities is measured as all net liabilities accounts, including net equity; operating costs are defined as expenses related to operations, including all personnel expense, depreciation and amortization, and

⁸ Unfortunately, for most Vietnamese MFIs data for earlier years was not available in the data bases provided by Mix Market and VMFWG. In terms of the number of MFIs we use in our analysis, this is comparable to some of the previous studies; see, e.g., Gutierrez-Nieto et al. (2007) who use data from 30 Latin American MFIs, Haq et al. (2010), using data for 39 MFIs, and Ben Soltane (2008), who has data for 35 MFIs in the Mediterranean region.

⁹ The VBSP and the Central Credit Fund are not included in our sample, because they are clearly different from the other MFIs in terms of their scale of operation and institutional characteristics.

administrative expense; and the number of staff is measured as the number of individuals who are actively employed by the MFI.

Second, our financial output variables consist of the gross loan portfolio and financial revenue. The gross loan portfolio is defined as the MFI's outstanding loans including current, delinquent and restructured loans, and excluding loans that have been written off; financial revenue is measured as revenue generated from the gross loan portfolio and from investments plus other operating revenue.

Finally, we construct a poverty outreach measure as our first social output variable. Poverty outreach can be measured by focusing on the breadth (i.e. the number of poor clients reached) and the depth (i.e. the extent to which the poorest clients are reached) of outreach. Similarly to Gutierrez-Nieto et al. (2009), we account for both dimensions by comparing the average loan balance per borrower to the annual average income in the province(s) where the MFI operates. Annual income per capita for each Vietnamese Province where MFIs operate were taken from the National Household Living Standards Survey 2010 published by the Vietnamese General Statistics Office (GSO, 2011). Averages of different provinces are used for MFIs operating in more than one province. Thus, we calculate K_i as the ratio of the average loan balance per borrower of MFI i with the average annual income per capita in the province(s) where the MFI i operates:

$$K_i = \frac{\text{Average loan balance per borrower}}{\text{Average annual income in MFI's operating area}} \quad (1)$$

The lower the value of K , the smaller the average loan in relative terms. Next, for each MFI we standardize the value of K_i to the (0,1) range by removing the minimum value of K and dividing by the range of K . The depth of outreach P_i is obtained as follows:

$$P_i = 1 - \frac{K_i - \text{Min}(K)}{\text{Max}(K) - \text{Min}(K)} \quad (2)$$

The closer P_i is to 1, the higher the depth of outreach. We then multiply P_i by the number of active borrowers for MFI i to obtain an outreach indicator that takes into account both breadth and depth of outreach, i.e. a socially efficient MFI is an MFI that makes a large number of small loans targeted to the poorest borrowers.

Our second social output variable is number of depositors, measured as the number of clients with any type of deposit account, whether voluntary or compulsory. We include the number of depositors as a social output, in addition to the above described credit-based outreach indicator, as following Collins et al. (2009) we consider deposit and saving services to be equally important as credit facilities for poor clients. We also opt for number of deposits accounts over total amount deposited as in the Vietnamese context savings products are not very developed, and the fact that an MFI proposes such service to the greatest number of clients is sufficient as such to be considered socially beneficial to poor clients, irrespective of the amount deposited per depositor.

Descriptive statistics of the input and output variables are provided in Table 1.

<Insert table 1 here>

6. Empirical analysis

We start by reporting our findings on the efficiency scores of the MFIs in our sample. Table 2, panel A shows the results for the financial efficiency and social efficiency scores using DEA analysis. For both efficiency dimensions MFIs are ranked based on the overall technical efficiency score. As can be seen from table 2, panel A, Vietnamese MFIs exhibit high levels of financial efficiency compared to international standards. Nine of 28 MFIs are 100 per cent financially efficient. On average, Vietnamese MFIs can reduce inputs by almost 6 per cent, keeping output at the same level. Further analysis (not reported) reveals that overall technical inefficiency is mainly due to pure technical inefficiency (65 per cent), rather than scale inefficiency (35 per cent). Table 2, panel A, furthermore shows there is no

relationship between the size of MFIs and their financial efficiency: among those showing 100 per cent efficiency are both large (e.g. CEP), medium sized (e.g. M7 Can Loc and Uong Bi) and small MFIs (e.g. Ninh Binh WDF, VietED MF and Women Development Fund Lao Cai).

<Insert table 2 here>

The picture is different when we look at social efficiency scores. Table 2, panel B, shows that 8 MFIs are 100 per cent socially efficient. Differences between MFIs are also more pronounced: whereas efficiency scores for financial efficiency range between 75 and 100 per cent, these scores run from 38 per cent 100 per cent for social efficiency. On average, Vietnamese MFIs can reduce inputs by more than 25 per cent and at the same time keep social output at the same level. Again further analysis (not reported) shows that for the sample as a whole, pure technical inefficiencies (scale inefficiencies) contribute to 56 (44) per cent of overall social inefficiencies. As was true for financial efficiency, no apparent relationship can be observed between MFI size and social efficiency scores.

Table 3 provides an overview of the MFI rankings for the two efficiency dimensions. Two MFIs (i.e. CEP and CAFPE BR-VT) are both 100 per cent financially and socially efficient. CEP is by far the largest MFI in our sample serving 173,419 borrowers. These two institutions thus use an optimal mix enabling them to obtain a given level of loan portfolios and financial revenues, as well as obtaining given levels of the breadth and depth of outreach at minimum costs. At the same time, however, the table shows that for most other MFIs there are significant ranking differentials with respect to financial and social efficiency. For example, Chi-Em is very outreach efficient while ranking very low in terms of financial efficiency. M7 DB District and CSOD have average scores for both efficiency dimensions; TCVM Thanh Hoa, WV Vietnam, Binhminh CDC and BTV are relatively inefficient, both socially and financially. Table 3 thus at least suggests that financial and social efficiency are not mutually exclusive, i.e. the table does not show any clear relationship between financial and social efficiency. In terms of the discussion about whether financial and social

efficiency would be complementary (i.e. the “financial systems” approach) or substitutes (i.e. the “poverty lending” approach) these results do not seem to support either of these two positions.

<Insert table 3 here>

Table 4 provides additional evidence on the relationship between financial and social efficiency for Vietnamese MFIs. This table presents the Spearman Rho Rank-Order correlation coefficients for our efficiency scores, as well as for a number of MFI characteristics.¹⁰ The table shows that financial and social efficiency scores are not correlated, corroborating the results shown in table 3. This seems to suggest that the Vietnamese microfinance sector does not experience a trade-off between financial and social efficiency; there is also no evidence for a positive relationship between financial and social efficiency. Thus, in Vietnam socially efficient MFIs are, on average, no less financially efficient than other MFIs. As discussed in section 2, these high efficiency indicators can be explained the specific low-cost, low competition and subsidized structure of the microfinance sector in Vietnam. These characteristics allow MFIs to keep costs low, reducing the need to increase average loan sizes to cover costs. This contrasts with the situation in, for example many Latin American countries, where the market mechanism in the microfinance sector are stronger and subsidies are more exceptional.

<Insert table 4 here>

Table 4 also shows that social efficiency and productivity of staff, measured as the ratio of the number of active borrower on the total number of staff employed by the MFI, are correlated positively, suggesting that serving a higher number of borrowers increases poverty outreach. Moreover, social efficiency is positively correlated with return on assets, negatively correlated with operational expense ratio and cost per borrower,

¹⁰ We use Spearman Rho Rank-Order correlation coefficients rather than Pearson correlation coefficients, because the latter are subject to biases if variables are not normally distributed, which is the case in our sample.

and positively associated with operational self-sufficiency. These outcomes suggest that better financial performance provides MFIs with better opportunities to increase outreach. Finally, social efficiency shows a weakly positive correlation with the age of the institution, suggesting that social performance of institutions increases as they become more experienced.

With respect to financial efficiency, table 4 suggests that this is positively correlated with return on assets and operational self-sufficiency, and negatively with the operational expense ratio. These results are generally in line with what has been observed elsewhere. Moreover, financial efficiency is positively correlated with the age of the institution, i.e. more experienced institutions are more financially efficient.

Next, we investigate whether financial and social efficiency are related by using multiple regression analysis. We apply Tobit regressions, because our efficiency measures are censored, i.e. their values are bounded between zero and one. Table 5, column [1], provides the outcomes of the analysis using financial efficiency as the dependent variable. The table shows that financial and social efficiency do not seem to be associated, as the coefficient for the social efficiency variable is not statistically significant. This corroborates the results from the correlation analysis in table 4. The results in table 4 furthermore show that financial efficiency is positively associated with the MFI's age, supporting the idea that mature MFIs on average have been able to learn how to implement loan delivery efficiently. This result supports the correlation analysis reported in table 4. Moreover, financial efficiency is negatively associated with the operating expense ratio, which suggests that financially efficient MFIs operate at lower cost. Finally, cost per borrower is positively associated with financial efficiency. This may be expected as costs per borrower increase with average loan sizes and higher loan size is associated with financially more efficient MFIs. Return on assets and operational self-sufficiency are not associated with financial efficiency, which is not in line with the outcomes of the correlation analysis. These latter results suggest that financial performance and financial efficiency do not necessarily go hand in hand in the case of Vietnamese MFIs.

<Insert table 5 here>

Table 5, column [2], provides the results of the regression analysis using social efficiency as the dependent variable. Again, the results show that financial and social efficiency are not associated as the coefficient for the financial efficiency variable is not statistically significant, corroborating the results presented in tables 4 and 5, column [1]. Next, the table shows that the productivity of staff members appears to be an important driver of social efficiency. Moreover, cost per borrower is negatively associated with social efficiency. This is to be expected as the costs per borrower increase with average loan size and social efficiency is associated with lower loan sizes. Finally, the analysis shows no association between social efficiency and financial performance (return on assets, operational self-sufficiency and operating expense ratio) or the MFI's age. Apparently, it does not matter for socially efficient MFIs to perform well financially and/or to have developed experience in reaching out to the poor.

To conclude, based on the multivariate analysis, it seems that financial and social efficiency do not show any relationship. This may be seen as evidence for the fact that in the context of Vietnam there is no trade-off between these two goals of MFIs, i.e. they are not substitutes. At the same time, there is also no evidence that the two may complement each other. Therefore, neither the claims of the poverty lending approach (stressing the trade-off hypothesis), nor those of the financial systems approach (arguing in favor of complementarity) do seem to hold in the Vietnamese context. Moreover, the multivariate analysis shows that financial and social efficiency of MFIs in Vietnam are driven by different sets of factors. Whereas for financial efficiency learning effects and being cost efficient seem to be crucial, for social efficiency the quality of staff but also the leadership of the top managers appears of importance (Chan, 2010).

Discussion: The Controversial Role of Subsidies

The high level of subsidizations of Vietnamese MFIs is controversial. For instance, Bateman (2011, p. 198) considers that the Vietnamese

microfinance model "...has been an extremely successful financial model in terms of attaining these original development goals. Of course, there has been a financial cost to this success. Some local financial institutions are not fully self-sustaining, and require regular government subsidies."¹¹ We have already pointed out that currently Vietnamese MFIs benefit from a number of implicit subsidies received from mass organizations, such as the VWU, which consist of voluntary and/or part-time staff handling of credit monitoring operations or in-kind subsidies not recorded in the accounting systems. This cost-structure allows many Vietnamese MFIs to significantly limit their personnel expenses, which represent the largest portion of MFIs' costs. Moreover, Vietnamese MFIs also receive subsidies, in terms of grants or concessionary loans, from a variety of international donors.

These subsidies help MFIs to show high financial efficiency, while at the same time being able to attain their social goals as well. Many MFIs, including the largest ones, are operationally self-sufficient (OSS) and are thus able to cover their cost with their revenues. Nevertheless, their low levels of financial self-sufficiency suggest that if one removes subsidies from their revenues, most of Vietnamese MFIs would no longer be able to cover their expenses. The dependence on subsidies may be problematic in the context of financial crises when both local and international subsidies decrease. Moreover, thanks to the economic growth in the country and the decrease of deep poverty during recent years (Rowley and Warner, 2010), Vietnam is no longer included by all donors in their list of poor countries. This may imply that grants are to be decreased in the future. This is all the more worrisome as uncertainty prevails about the future of the Vietnamese economy (Rowley and Troung, 2009). Therefore, the Vietnamese model of subsidizing operations does not seem to be a long-term sustainable model unless all domestic and international public actors guarantee continuous subsidization.

Some authors have also argued that excessive subsidization may reduce incentives to optimize and improve operations, a phenomenon

¹¹ In his analysis, Bateman (2011) mainly refers to the state-owned VBSP, VBARD and People's Credit Funds. Nevertheless, the same reasoning with respect to the role of subsidization also holds for the smaller MFIs. These institutions are also subsidized, albeit less than the state-owned organizations.

frequently called “soft budget constraint”. Analyzing a sample of international MFIs, Hudon and Traca (2011) show that subsidization leads to better productivity but that marginal productivity decreases above a certain threshold of subsidization. Donors and state actors’ responsibility is thus to find the appropriate and most efficient level of subsidization.

Our empirical findings contribute to the literature on the performance of state-led institutions in Asia. For instance, Burgess and Pande (2005) analyze the performance of the Indian nation-wide social banking program¹² and find that it significantly reduces poverty in rural areas; at the same time, however, the program is not sustainable. D’espallier et al. (2013) show that unsubsidized Asian MFIs tend to charge higher interest rates than the others. If Vietnamese MFIs do not quickly adapt to an environment in which the direct and indirect subsidies are significantly reduced or secure long term financing, it could be a matter of only a few years before the trade-off between financial and social efficiency, which has been found to be significant in a number of microfinance studies, becomes apparent in the Vietnamese microfinance sector as well.

7. Concluding remarks

In this study we examined whether there is a trade-off between financial and social efficiency of MFIs in Vietnam. This is a hotly debated issue, both in academic and policy circles, but existing empirical evidence is inconclusive. Also in Vietnam policy makers are currently considering policies that may have an impact on the financial and social efficiency of MFIs. Therefore, an empirical analysis focusing on the financial and social efficiency performance of MFIs operating in the country may make an important contribution to policy making. At the same time, it may also add to the empirical literature in general by showing the importance of taking into account the country-specific setting in order to understand how financial and social efficiency may be related.

The results from the DEA analysis indicated that first of all Vietnamese MFIs on average are highly financially and socially efficient.

¹² This government program imposed a branch license policy requiring banks to open four branches in rural unbanked locations for every branch opened in an already banked (typically urban) location.

Next we carried out simple correlation and multivariate regression analysis to see whether, and if so, to what extent financial and social efficiency are associated. The analyses clearly showed that both types of efficiency do not show any relationship, which led us to conclude that in the context of MFIs in Vietnam, there is no support to believe that there is a trade-off or a complementarity between being financially and socially efficient. The fear of a so-called “mission drift” associated with this trade-off between financial efficiency and social outreach is therefore ungrounded in case of the Vietnamese microfinance sector.

Recently, the Vietnamese government has shown to be willing to change its policies of subsidizing the microfinance sector and has started to encourage market-based microfinance through independent non-governmental organizations (NGOs) and private licensed MFIs. It would be very interesting to evaluate what the effects of these policies are on the financial and social efficiency of MFIs. We leave this for future research.

We acknowledge that the small sample of MFIs on which this study is based is one of its limitations. Moreover, the data we use are for one year. Yet, as was mentioned above, data availability regarding MFIs in Vietnam is currently rather low. Future studies looking into the efficiency of MFIs could therefore profit a lot when data for more MFIs and more years will become available in the near future.

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Table 1: Descriptive Statistics of Inputs and Outputs

	<i>N</i>	<i>Mean</i>	<i>Median</i>	<i>Min</i>	<i>Max</i>	<i>Std. Deviation</i>
<i>Total liabilities</i>	28	3,221,121	526,779	82,145	46,248,183	9,306,110
<i>Total number of staff</i>	28	64	23	3	371	99
<i>Operational costs</i>	28	293,863	52,428	6,134	3,660,750	790,930
<i>Gross loan portfolio</i>	28	3,040,556	532,101	89,846	44,647,899	8,950,451
<i>Financial revenues</i>	28	608,618	95,128	6,844	9,175,848	1,833,035
<i>Poverty outreach measure</i>	28	12,601	2,988	0	173,419	33,303
<i>Number of depositors</i>	28	17,577	4,926	0	198,779	40,400

Source: Data have been obtained from the Mix Market database and the VMFWG, as well as directly from a number of Vietnamese MFIs not covered by the Mix Market database. Total liabilities, operational costs, gross loan portfolio and financial revenues are given in USD.

See Appendix for a description of the variables.

Table 2, Panel A: Financial Efficiency Scores

<i>Rank</i>	<i>MFI</i>	<i>Overall technical efficiency (%)</i>	<i>Size rank</i>	
			<i>Gross loan portfolio</i>	<i>Number of active borrowers</i>
1	CAFPE BR-VT	100	8	7
1	CEP	100	1	1
1	M7 Can Loc	100	14	17
1	M7 Dong Trieu	100	7	10
1	M7 Mai Son	100	12	16
1	M7 Uong Bi	100	11	14
1	Women Dev. Fund, Ninh Binh	100	24	27
1	VietED MF	100	27	28
1	Women Dev. Fund, LaoCao	100	22	25
10	WU, Son LA	99.93	17	13
11	Dariu	99.78	4	5
12	M7 Ninh Phuoc	99.73	15	11
13	Fund for Women Dev. – HCM	98.61	6	8
14	M7 DBP City	98.19	16	19
15	M7 DB District	96.57	18	18
16	TYM	95.82	2	2
17	MCDI	93.27	21	21
18	CSOD	92.38	25	23
19	TCVM Thanh Hoa	90.84	9	6
20	Women Dev. Fund, Soc Trang	90.67	28	22
21	BTWU	89.85	19	20
22	WU Ha Tinh	89.45	3	4
23	NMA	88.10	5	3
24	Binh Minh CDC	86.74	13	12
25	An Phu Development Fund	86.46	26	26
26	WV Vietnam	84.37	10	9
27	Chi-Em	79.67	20	15
28	BTV	75.71	23	24
<i>Average</i>		94.15		

Note: MFIs are ranked based on their overall technical financial efficiency scores using DEA. Size rank refers to the ranking of MFIs based on their size, either in terms of their gross loan portfolio or the number of borrowers they serve.

Table 2, Panel B: Social Efficiency Scores

<i>Rank</i>	<i>MFI</i>	<i>Overall technical efficiency (%)</i>	<i>Size rank</i>	
			<i>Gross loan portfolio</i>	<i>Number of active borrowers</i>
1	CAFPE BR-VT	100	8	7
1	CEP	100	1	1
1	Chi-Em	100	20	15
1	M7 DBP City	100	16	19
1	M7 Ninh Phuoc	100	15	11
1	NMA	100	5	3
1	Women Dev. Fund, Soc Trang	100	28	22
1	WU, Son LA	100	17	13
9	MCDI	99.02	21	21
10	WU Ha Tinh	94.90	3	4
11	Dariu	88.92	4	5
12	M7 DB District	88.70	18	18
13	Fund for Women Dev. – HCM	83.00	6	8
14	CSOD	81.67	25	23
15	BTWU	70.35	19	20
16	M7 Mai Son	68.98	12	16
17	M7 Uong Bi	68.85	11	14
18	Women Dev. Fund, Ninh Binh	64.19	24	37
19	M7 Dong Trieu	60.13	7	10
20	M7 Can Loc	58.88	14	17
21	TYM	55.30	2	2
22	TCVM Thanh Hoa	55.23	9	6
23	An Phu Development Fund	49.11	26	26
24	BTV	46.20	23	24
25	Women Dev. Fund, Lao Cao	44.55	22	25
26	WV Vietnam	40.32	10	9
27	Binh Minh CDC	38.18	13	12
28	VietED MF	8.52	27	28
<i>Average</i>		<i>73.75</i>		

Note: MFIs are ranked based on their overall technical social efficiency scores using DEA. Size rank refers to the ranking of MFIs based on their size, either in terms of their gross loan portfolio or the number of borrowers they serve.

Table 3: Comparative Ranking of Financial and Social Efficiency Scores

<i>MFI</i>	<i>Comparative ranking</i>	
	<i>Financial efficiency</i>	<i>Social efficiency</i>
An Phu Development Fund	19	15
Binh Minh CDC	26	28
BTV	28	24
BTWU	23	21
CAFPE BR-VT	1	1
CEP	1	1
Chi-Em	27	1
CSOD	15	13
Dariu	11	17
Fund for Women Dev. – HCM	12	18
M7 Can Loc	1	25
M7 DB District	14	16
M7 DBP City	13	1
M7 Dong Trieu	1	23
M7 Mai Son	1	20
M7 Ninh Phuoc	17	1
M7 Uong Bi	1	22
MCDI	21	12
NMA	24	1
TCVM Thanh Hoa	22	26
TYM	20	14
VietED MF	1	11
Women Dev. Fund, Lao Cao	1	19
Women Dev. Fund, Ninh Binh	1	10
Women dev. Fund, Soc Trang	16	1
WU Ha Tinh	18	9
WU Son La	10	1
WV Vietnam	25	27

Note: Comparative rankings are taken from the results presented in table 2, panels A and B.

Table 4: Correlation Matrix

	<i>Financial efficiency</i>	<i>Social efficiency</i>	<i>Age</i>	<i>Staff productivity</i>	<i>Operational expenses</i>	<i>Cost per borrower</i>	<i>Return on assets</i>	<i>Operational self-sufficiency</i>
<i>Financial efficiency</i>	1							
<i>Social efficiency</i>	0.0479 (0.809)	1						
<i>Age</i>	0.3998** (0.035)	0.3284* (0.088)	1					
<i>Staff productivity</i>	0.2154 (0.271)	0.5194*** (0.004)	0.3835** (0.043)	1				
<i>Operational expenses</i>	-0.4336** (0.021)	-0.3497* (0.068)	-0.1475 (0.454)	-0.3684* (0.054)	1			
<i>Cost per borrower</i>	0.0134 (0.946)	-0.6943*** (0.000)	0.0775 (0.695)	-0.2981 (0.123)	0.7221*** (0.000)	1		
<i>Return on assets</i>	0.5553*** (0.002)	0.4184** (0.026)	0.5106*** (0.005)	0.6836*** (0.000)	-0.4782*** (0.010)	-0.1925 (0.326)	1	
<i>Operational self-sufficiency</i>	0.5076*** (0.005)	0.3381* (0.078)	0.3036 (0.116)	0.5977*** (0.000)	-0.6782*** (0.000)	-0.3551* (0.0637)	0.8945*** (0.000)	1

Note: The table presents Spearman Rho Rank-Order correlation coefficients. P-values are given between brackets. ***, ** and * denote significance at the 1, 5 and 10 per cent level, respectively.

Table 5: Determinants of Overall Financial and Social Efficiency

	<i>Financial efficiency</i>	<i>Social efficiency</i>
	[1]	[2]
<i>Social efficiency</i>	0.067 (0.062)	
<i>Financial efficiency</i>		1.274 (0.984)
<i>Age</i>	0.004** (0.002)	0.010 (0.009)
<i>Staff productivity</i>	0.000 (0.000)	0.001*** (0.000)
<i>Operational expense ratio</i>	-0.711* (0.375)	0.937 (1.481)
<i>Cost per borrower</i>	0.003*** (0.001)	-0.012*** (0.004)
<i>Return on assets</i>	0.158 (0.648)	-3.067 (2.441)
<i>Operational self-sufficiency</i>	0.097 (0.098)	0.037 (0.349)
<i>Constant</i>	0.777*** (0.147)	-0.538 (0.919)
<i>Number of observations</i>	28	28
<i>Log Likelihood</i>	26.749	0.251
<i>X²</i>	35.542	27.672

Note: P-values are given between brackets. ***, ** and * denote significance at the 1, 5 and 10 per cent level, respectively.

APPENDIX

Description of variables used in the DEA and multivariate analysis

Age: number of year of activity of the MFI.

Cost per Borrower: ratio of operating costs of an MFI on the average number of active borrowers of the MFI.

Financial revenue: measured as the revenue generated from the gross loan portfolio and from investments of the MFI, plus other operating revenue.

Gross loan portfolio: the MFI's outstanding loans including current, delinquent and restructured loans, and excluding loans that have been written off.

Number of depositors: the number of clients with any type of deposit account, whether voluntary or compulsory.

Operating costs: expenses related to operations of an MFI, including all personnel expense, depreciation and amortization, and administrative expense.

Operational expense ratio: ratio of operating costs of an MFI on the average gross loan portfolio of the MFI.

Operational Self-Sufficiency (OSS): ratio of financial revenue of an MFI on the sum of financial expense, impairment loss and operating expense of the MFI.

Poverty outreach measure: ratio of the average loan balance per borrower of an MFI on the average annual income per capita in the province(s) where the MFI operates, standardized to the (0,1) range.

Return on Assets: ratio of net operating income on total assets.

Staff productivity: ratio of the number of active borrower on the total number of staff employed by the MFI.

Total Assets: all net asset accounts.

Total Liabilities: all net liabilities accounts, including net equity.

Total number of staff: number of individuals who are actively employed by the MFI.