

Introduction

Microfinance practitioners have often sought a single, easy-to-understand indicator for evaluating the performance of microfinance institutions (MFIs). To date, the most commonly used indicator has been financial self-sufficiency (FSS). However, FSS is an incomplete model of an institution's performance, as is any single number. The subsidy-dependence index (SDI) has been suggested as an alternative measure that more accurately reflects an MFI's reliance on subsidies relative to its peers. In this article, we investigate some of the similarities and differences between FSS and SDI and compare both indicators on MBB data from 2003 – 2007.

What is SDI?

The SDI model has been proposed and fleshed out by Yaron and others in a series of papers.¹ The SDI is 'designed to measure the self-sustainability level of the MFI with a single number.' To measure this, SDI enumerates a range of subsidies potentially received by an MFI (on an annual basis) and compares the total subsidy to the income received by the MFI on its loan portfolio. The comparison of total subsidy and income from loans (in the form of the SDI) yields two results:

[A]n indication of the percentage by which the average yield obtained on the MFI's LP [loan portfolio] would have to increase in order to make it subsidy independent. It also indicates the cost to society of subsidizing the MFI, relative to the interest plus fees paid by the target clientele to the MFI.²

We will cover the formulas for SDI and FSS in more detail below.

Models vs. Parameters

Before stepping into a comparison of FSS and SDI, it is important to keep in mind the distinction between model and parameters. FSS and SDI both incorporate parameters or external factors — such as the inflation rate — to adjust MFI performance numbers for context. If we were to calculate SDI and FSS using different rates for adjustments, it would not be a reasonable comparison since we would simultaneously have to account for differences in the models and in the rates chosen. Consequently, we will first look at the models, assuming they have the same parameters. Then, we can look at the impact of different parameters on both models.

Comparing Definitions

In this section, we break down the formulas for FSS and SDI to try to understand each model in terms of the other.³ The formula for FSS can be stated simply as:

$$FSS = (\text{Adjusted Revenue} / \text{Adjusted Expense}) \quad (1)$$

However, MBB policy makes only small adjustments to revenue, so the adjustments primarily affect the denominator of this indicator. If we separate the adjustments from the unadjusted expenses, we have the following approximation:

$$FSS \cong \text{Revenue} / (\text{Adjustments} + \text{Expenses}) \quad (2)$$

A similarly schematic definition of SDI is:

$$SDI = \text{Subsidy} / \text{Loan Revenue} \quad (3)$$

¹ Primary resources on SDI used for this note are the following:

Schreiner, M. and Yaron, J. (2001), Development Finance Institutions. Measuring their Subsidy, Washington, DC: World Bank.

Yaron, J. and R. Manos, (2007), Is the microfinance industry misleading the public regarding its subsidy dependence?, Savings and Development, 2.

² Yaron and Manos, 2007, 13.

³ For a more detailed version of the following, please see forthcoming MIX paper on SDI and FSS.

Where the level of subsidy is equal to:

$$\text{Subsidy} = \text{Adjustments} + \text{Donations (incl. in kind donations)} \\ + \text{Net Income (4)}$$

Separating the Net Income term into its components, and dividing by loan revenue yields:

$$\text{SDI} = \frac{(\text{Adjustments} + \text{Donation} - (\text{Revenue} - \text{Expense}))}{\text{Loan Revenue}} \quad (5)$$

$$\text{SDI} = \frac{(\text{Adjustments} + \text{Expense} + \text{Donations})}{\text{Loan Revenue} - \frac{\text{Revenue}}{\text{Loan Revenue}}} \quad (6)$$

$$\text{SDI} = \frac{(\text{Adjustments} + \text{Expense})}{\text{Loan Revenue}} + \frac{\text{Donations}}{\text{Loan Revenue}} - \frac{\text{Revenue}}{\text{Loan Revenue}} \quad (7)$$

If we assume that total Revenue for an MFI is 'close' to Loan Revenue⁴, then this can be rewritten as:

And this reduces finally to:

$$\text{SDI} \cong \frac{(\text{Adjustments} + \text{Expense})}{\text{Revenue}} + \frac{\text{Donations}}{\text{Revenue}} - \frac{\text{Revenue}}{\text{Revenue}} \quad (7)$$

$$\text{SDI} \cong (1/\text{FSS} - 1) + \text{Donations}/\text{Revenue} \quad (9)$$

While this approximation oversimplifies both models, it preserves the main insights. The approximation also holds up when we apply this to actual MFI data. The formula (9) from above has a 96 percent correlation with the full SDI, when we calculate both formulas on the MBB sample from 2003 – 2007.

From the breakdown of the formulas, we can already learn some things about the relationship between FSS and SDI:

- FSS and SDI are closely related — we can approximate either one well in terms of the other.
- FSS and SDI are inversely related; as FSS goes up, SDI goes down.
- SDI is centered around 0, while FSS is centered around 1 (Institutions with FSS > 1 are 'financially self-sufficient'; institutions with SDI < 0 are 'subsidy independent'.)

- SDI differs from FSS through the inclusion of donations inflows.
- FSS differs from SDI through the inclusion of non-loan revenues.

The differences in the formulas also reveal some of the underlying differences between the models. Donation income is treated as a 'below the line' revenue item in the MBB. In this view of the world, donation income is not a result of the institution's core operations, and therefore is not included in the main ratios for self-sufficiency or returns. In a sense, donations are 'exogenous' or not determined directly by the institution's operations. An MFI could operate in a country where the government subsidizes microfinance providers. Or an MFI could operate in a country that prohibits foreign donors and investors. These factors are (largely) outside the control of the MFI's staff.⁵ FSS attempts to isolate subsidies that can be most directly influenced by an MFI's operations.

The fact that SDI includes these types of 'exogenous' factors, like donations (or as we will see later, reserve requirements), indicates a different view of the world. SDI views donations as having a social cost — money that could be reallocated elsewhere — and thus it includes donations in evaluating MFI performance.

Consequently SDI may be more appropriate for those concerned with the aggregate flow of donations in a country or the allocation of capital between many competing MFIs. In other words, it may be a more appropriate model of MFI performance when donations are viewed as an 'endogenous' variable — when the level of donations is determined by the other variables in the model. It may be less appropriate for MFI managers or others who could view donations as essentially outside their control.

Testing SDI and FSS on MFI Data

We know from the breakdown above that SDI and FSS differ in some respects — inclusion of donations, inclusion of non-loan revenue. But how significant are these when looking at real MFI data? Would we draw different conclusions about the state of the world in microfinance using one indicator or the other? To test the models, we have calculated FSS and SDI on the entire MBB sample from 2003 to 2007, covering more than 2800 distinct observations. To

⁴ Results from the 2007 MBB benchmarks indicate that loan revenue is typically over 94 percent of MFI financial revenue, so this should be a reasonable approximation.

⁵ Of course, an MFI's staff can also influence the level of subsidy by deciding whether to target subsidized sources of funds, although this is partially captured through the subsidized cost of funds adjustment applied to both models.

keep the parameters constant, we have used the same macroeconomic factors as in the MBB for calculating both SDI and FSS.⁶

Tables 1 – 3 display the total numbers of MFIs, borrowers and savers covered by self-sufficient (FSS > 1) or subsidy-independent (SDI < 0) institutions in this period. The rightmost column gives the level of ‘FSS generosity’ — the amount by which FSS is more generous than SDI at a global level.

As we can see, SDI and FSS give us fairly similar pictures of the global MFI landscape over time. The indicators never differ by more than 14 percent in

Table 1 Percentage of Borrowers					
Year	FSS > 1	FSS < 1	SDI < 0	SDI > 0	FSS ‘generosity’
2003	87%	13%	79%	21%	8%
2004	87%	13%	82%	18%	5%
2005	86%	14%	82%	18%	4%
2006	75%	25%	70%	30%	5%
2007	51%	49%	48%	52%	3%

Table 2 Percentage of Savers*					
Year	FSS > 1	FSS < 1	SDI < 0	SDI > 0	FSS ‘generosity’
2003	79%	21%	73%	27%	6%
2004	87%	13%	86%	14%	1%
2005	82%	18%	80%	20%	1%
2006	85%	15%	80%	20%	5%
2007	78%	22%	77%	23%	1%

*BRI excluded to avoid skewing results

Table 3 Number of Total MFIs					
Year	FSS > 1	FSS < 1	SDI < 0	SDI > 0	FSS ‘generosity’
2003	59%	41%	44%	56%	14%
2004	67%	33%	51%	49%	16%
2005	61%	39%	51%	49%	10%
2006	57%	43%	50%	50%	7%
2007	61%	39%	53%	47%	8%

their classification of the global microfinance sector. In general, we see that FSS is more ‘generous’ than SDI as it classifies a higher percentage of MFIs as self-sufficient, although this is not always the case. This should not be surprising given the formula breakdown earlier. Whenever the level of donations is significant, FSS will be more generous than SDI.⁷ In addition, from the tables, we can see that SDI and FSS are also generally converging in their view of global microfinance over time. The largest differences occur furthest in the past; for 2007, the maximum difference is 8 percent. This corresponds with changes in the microfinance world where donations are (at a global level) declining in importance as more institutions commercialize, especially many of the largest providers.⁸

Parameters and Adjustments

A key part of the discussions around SDI and FSS has been the choice of parameters for the models. So far, we have compared the models using the typical set of parameters and adjustments applied in the MBB. For instance, since MBB uses the deposit rate for the cost-of-funds adjustment, we have also used the deposit rate in calculating SDI. This allows us to compare apples-to-apples when looking at the models. However, we can also vary the parameters used for the models, and much of the discussion around SDI has centered on this choice of parameters.

One change that we could make is to how MFI results are adjusted for subsidized funds. In both SDI and FSS, the model determines a ‘market’ cost of funds and compares that to the level of subsidized financing. MBB uses deposit rates for the ‘market’ cost of funds, but Yaron and Manos and others have suggested using lending rates instead.

Lending rates would reflect the cost of funds for an MFI in an environment where MFIs have to borrow money for financing. Deposit rates would reflect the cost of funds in an environment where mobilizing (voluntary) deposits represents the market cost of funds.⁹ Lending rates should be generally higher than deposit rates. Applying the lending rate for the cost-of-funds adjustment should thus lower institutional self-sufficiency by raising the baseline cost of funds.

⁶ While this differs from the treatment recommended by Yaron and Manos, it is done to preserve comparability at this stage. In the full MIX research paper, more adjustments and parameters are evaluated for FSS and SDI, and both indices are re-calculated using different parameters.

⁷ Because of formula (9), one could also consider ‘FSS generosity’ to be an index of the level of donation inflows to MFIs globally.

⁸ It is worth noting that the sample used here is an unbalanced panel data set. It reflects the rapid growth of the MBB sample over time (from less than 250 in 2003 to almost 900 in 2007), generally to include smaller or newer institutions. Consequently, we should expect the differences between the indicators to be more apparent as the sample increases non-randomly over time in scope. (Or alternatively, we would expect the indicators to be more similar on a balanced panel data set that tracks the same institutions for all years.)

⁹ We might expect that there would be similar market premiums in both cases for lending to or saving with an MFI.

To test the impact of this change in parameters, we have recalculated SDI and FSS using the lending rate in place of the deposit rate. **Table 4** contains the results. Again, we can see that both indicators give roughly similar pictures of global microfinance — less than 5 percent difference in each year. For both SDI and FSS, the new levels indicate that more MFIs are not self-sufficient or subsidy-independent. Perhaps surprisingly, FSS appears to be a bit more sensitive to use of the lending rate than SDI is — the average drop in FSS is greater than the average drop in SDI.

A range of other adjustments to SDI have been proposed to remove other potential sources of subsidy. These subsidies are covered in more detail in a separate paper. The choice of lending rate or deposit rate for cost-of-funds adjustment has the most impact among these though.

Year	FSS > 1	FSS < 1	SDI < 0	SDI > 0	FSS 'generosity'
2003	84%	16%	78%	22%	5%
2004	59%	41%	56%	44%	4%
2005	79%	21%	80%	20%	-1%
2006	64%	36%	64%	36%	0%
2007	42%	58%	43%	57%	-1%

When to Use SDI or FSS

The distinction between the two models in many ways boils down to the question 'where is your bottom line?' The 'bottom line' may differ for policy-makers and MFI management and staff. Each set of actors may be most concerned with the bottom line that incorporates the factors that they can most directly influence. The SEEP guidelines for performance measurement provide an example of this distinction in defining two income statement measures for the 'bottom line':

(I21) Net Operating Income. The microfinance industry has traditionally considered revenue from operations less expenses from operations to be the bottom line. This excludes all non-operating items that are considered separate from the core business of providing financial services. Because donations are not included in net operating income, it clearly is a "before donations" measure of profitability. This measure, however, can also be presented on a "before tax" or "after tax" basis.

(I31) Net Income After Taxes and Donations. From a regulator's perspective, the bottom line might be total revenue less total expenses. Although donations and other non-operating items may not be related to the MFI's core business, they may a normal part of the MFI's activity (such as training revenue or expenses) that increase or decrease and MFI's net profit.¹¹

A 'before donations' view (as used in FSS), may be more appropriate for MFI staff since it is restricted to the core business of providing financial services. An 'after donations' view (as used in SDI) may more accurately reflect the perspectives of regulators or other policy-makers. If an institution would like to raise its FSS level, the FSS formula tells it to increase revenues or decrease expenses. If an institution would like to raise its SDI level, the SDI formula tells it to increase (loan) revenues or decrease donations. An analyst should consider which of these factors are the most relevant for their use when selecting models and comparing indicators. From the quick outline here, we can see that FSS and SDI contain a good deal of similar information, and their respective formulas are closely related. The core difference between the models is one of perspective, as seen in the different treatment of the financial 'bottom line'. While SDI has been proposed to be used with a different set of parameters and adjustments than those used typically in the MBB results, consistent application of these adjustments across both the SDI and FSS models does not lead to any greater divergence between the models.

¹⁰ Results for numbers of savers and MFIs are similar, but have been excluded for space.

¹¹ Barres, I., Bruett, T., Curran, L., Escalona, A., Nelson, E., Norell, D., Porter, B., Stephens, B. & Stephens, M. Measuring Performance of Microfinance Institutions: A Framework for Reporting, Analysis and Monitoring (Manual); SEEP, 2005. <http://www.microfinancegateway.org/content/article/detail/34713>