Concepts And Measures of Outreach and Sustainability in Microfinance Institutions: A comprehensive literature review

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Abstract
The terms outreach and sustainability are used in many fields of study. The terms are among the most commonly raised concepts in microfinance literature as well. The purpose of this article is therefore, to introduce the terms and their application to the academic community of the finance discipline. The article emphasizes the concepts, the measures and existing schools of taught with regard to outreach and sustainability in microfinance institutions.

Keywords: Outreach, sustainability, concept, measures, and school of taught

1. Concept and Measures of Outreach in Microfinance Institutions

Outreach is the depth and width of the major services of microfinance institutions such as: credit provision, savings mobilization, micro insurance, money transfer, and payment services. It is a hybrid measure that assesses the extent to which a Rural Financial Institution (RFI) has succeeded in reaching its target clients and the degree to which the RFI has met the clients' demand for financial services Yaron (1997).

(Anne-Lucie et.al, 2005); Yaron, (1997); (Okumu, 2007), describe outreach as efforts to extend microfinance services to the people who are underserved by financial institutions. They further describe that outreach can be measured in terms of *breadth* — number of clients served and volume of services (i.e., total savings on deposit and total outstanding portfolio) — or *depth* — the socioeconomic level of clients that MFIs reach.

According to Rhyne, (1998), the two most usual aspects of outreach – of reaching out to the poor –in the literature are its depth and breadth. *Depth* of outreach refers to the poverty level of clients served, whereas *breadth* of outreach refers to the scale of operations of an MFI.

The concept of depth and width of outreach is still widely used in microfinance literature as a measure of performance of the institutions in terms of outreach. However, Schreiner, (2001), cited in Woller and Schreiner, (p. 20); argue that outreach should be measured in terms of depth, worth to users, cost to users, width, length, and scope. The author proposes this six dimension approach of outreach measures in attempt to fit the outreach vs. sustainability debate within the traditional economic cost- benefit framework. The author further argues that the six dimensions are the components of the social value that is supposed to be created by MFIs. The author defines the six dimensions as follows:

- **Depth of outreach:** the average loan size broken down by size dimensions. Average loan size by itself is a blunt and possibly inaccurate measure of depth. A more useful way to use average loan size is to break it down into its seven distinct dimensions, each of which, as Schreiner demonstrates, can be measured: dollars disbursed, average balance, term to maturity, dollars per installment, time between installments, number of installments, and dollar years of borrowed resources. Smaller values along each dimension generally mean smaller loans and poorer borrowers.
- **Worth to users:** the clients' willingness to pay which can be measured by dropout rate. Repeated purchases are the best and straightforward way of measuring worth.
- **Cost to users:** Cost of outreach: the interest rate charged on loans and client transaction costs. In lieu of actual interest rates, the portfolio yield is a simple and widely available proxy. In lieu of actual transaction costs (admittedly very difficult to estimate), proxies may be used, such as the average time spent in meetings per week, the average time and distance required to travel to conduct financial transactions, the average time spent completing the loan application, or the average time elapsed between the loan application and loan disbursement.
- **Width of outreach:** The number and percentage change of clients served. For a more complete understanding of breadth, the number and percentage change of clients served should be broken down by major products lines or product types, such as enterprise loans, consumption loans, savings, and

insurance.

- **Length of outreach:** Financial self-sufficiency or some other indicator of financial performance, such as return on equity, profit margin, or return on assets, in addition to indicators that suggest institutional sustainability, such as operational self-sufficiency, number of years of operation, average yearly change in equity (regardless of source), average yearly cash flow, portfolio-at-risk, loan write-offs, or customer satisfaction indices. Additional indicators explicitly recognize that financial self-sufficiency is neither necessary nor sufficient for institutional sustainability, and they give other relevant factors weight in assessing length of outreach.
- **Scope of outreach:** The number of different types of loan, savings, insurance and other products offered broken down by product lines or product types.

Yaron (1992); (Babandi 2011), suggest that seven different measures could be used to measure outreach of an MFI: i) the value of outstanding loan portfolio and average value of loans extended; ii) the amount of savings and average value of savings accounts; iii) the variety of financial services offered; iv) the number of branches and village posts/units; v) percentage of the total rural population served; vi) the annual growth of MFI assets over recent years in real terms; and vii) women's participation. This approach of outreach measure is almost similar with the one proposed by Schreiner (2001), above in that number (i) and (ii) are almost the same to mean width and depth of outreach; number (iii) mean scope of outreach; number (iv), (v), (vii) are talking about the depth of outreach; and number (vi) is almost the same concept with length and width of outreach.

Yaron et al. (1997), proposed the condensed approach for outreach measure as follows: (i) clients and staff outreach; (ii) loan outreach; and (iii) savings outreach. Almost similar but more detail concept of depth of outreach, as discussed above, are pinpointed by Schreiner, (2002); (Paxton, 2001), as cited in Degefe (2007), as follows:

- The extent of gender composition (more women participation means deeper outreach)
- The urban – rural composition of clients (the more rural, the deeper the outreach)
- Household characteristics (female headed, large household size, high dependency ratio, and older population represent vulnerable groups and if reached indicates depth of outreach)
- Educational status (illiteracy and low level of education indicate vulnerability)

The Two Schools of Taught Regarding Depth and Width of Outreach

The objective of almost all microfinance institutions is improving the wellbeing of the poor through their services; however, there is some disagreement in the literature with regard to the best way of achieving this objective and relative benefits of depth and breadth of outreach. In this connection, (Letenah 2009 p. 288) states, "The different perspective on which the MF performance is measured has created two opposing but having the same goals schools of taught about the microfinance industry. The first one is called welfarists and the second one is institutionalist." Robinson (2001:22); states that microfinance in 1990s was marked by the major debate between the leading views, the financial systems approach and the poverty lending approach. The two major concepts in this definition, the financial systems approach and the poverty lending approach, are equivalent to width and depth of outreach, respectively.

The pro-poor[1] microfinance approach would rather reach out to the poorest individuals of the society, advocating thus that depth of outreach is more important for achieving the social objective of microfinance. The proponents of the depth of outreach approach suggest that the increased transaction cost due to providing small loans to very poor should be covered by subsidies. That means, the very poor should get credit at very low interest rate or even interest free loans just in almost similar way as relief work. To this end, Robinson (2001), argues that credit is to be supplied to the poor mainly targeting the poorest of the poor at below market interest rate. (Letenah 2009 p. 289), describes the views of welfarists as that sustainability can be achieved without financial self – sufficiency. He further points out that the welfarists assume donors as social investors who don't expect monetary return as opposed to those of private investors in commercial firms. The financial systems approach emphasis large - scale outreach to the economically active poor who can repay loans and interest from their earnings, and thereby become self – sufficient. Regarding the views of the two comps, (Schreiner. 1999, 1), describes as follows:

> *The poverty approach targets very poor clients who are very costly to serve. Like relief efforts, it measures success by how well it fulfils the needs of the poorest in the short term. In the poverty approach, donations cover the shortfall between revenue from clients and the cost of supply. The self-sustainability approach targets less-poor clients on the fringes of the formal financial system. Like development efforts, it measures success by how well it expands the frontier of the mainstream economy in the long term (Von Pischke, 1991). In the self-sustainability approach, donations cover start-up costs*

[1] In most literature and in this paper as well, the terms poverty lending or poverty approach, pro – poor and welfarists are all to mean the same thing and used interchangeably and raised in relation to depth of outreach; whereas, institutionalists, sustainability advocators and Self - sustainability approach are the same and raised in relation to the width of outreach.

> *and fund experiments meant to find innovations that reduce the cost of supply so much that revenue from clients can cover costs in the long term.*

Therefore, the proponents of sustainable microfinance are more interested in opening access to a wide range of un-served or underserved clients. The concern of this school of taught is on the extent of coverage either in terms of dollar value and/or the number of clients. The question of who should be covered or reached is not the primary area of interest for this group. Navajas et.al. (2000), states, "Breadth matters since the poor are many but the aid dollars are few. According to the breadth logic, the microfinance industry should have large-scale outreach in order to make a difference in the world's poverty levels. Some argue that shallow depth can be compensated by the breadth of outreach or that it is even more important than depth." To this end, (Degefe, 2009), describes the two approaches as follows:

> *Both camps have a lot in common, including the core belief in poverty reduction as the ultimate objective. The difference between the two camps starts with the definition of the poor ... while the institutionalists take the poor as the economically active poor (Robinson, 2001) or diverse group of vulnerable households (Matin et.al. 1999), the welfarists understand the poor as those who struggle on the margin of survival (Woller et.al 1999), the poorest of the poor, in other words, those at or below the 50th percentile of the national poverty line of a country.*

According to Hulme and Mosley (1996), cited in (Meyer, Nagarajan and Dunn, 2000), serving heterogeneous clientele has advantage over homogeneous or only the very poor. By serving different groups of clients, microfinance institutions can withstand adverse shocks and diversify risks related to the credit. On top of that, the costs and expenses incurred by reaching the very poor via tiny loans can be covered by the profits obtained from reaching the wealthier clients. Furthermore, whenever microfinance institutions become eager to attain self – sufficiency and work towards that end, their sustainability become apparent and as a result they tend to reach wide variety of clients including the very poor in the long run than those who serve solely the very poor through uncertain subsidised loans. They further argue that reaching the non – poor clients enable them to participate in various programs and even job creating investment opportunities for the very poor.

Having clear demarcation between width and depth of outreach is somewhat difficult. On top of that, it may not be as such easy to exactly identify who is the poor to be served as a measure of depth of outreach. In this regard, (Okumu 2007), in his study of "Microfinance Industry in Uganda: Sustainability, Outreach, and Regulation" states:

> *The concept of outreach is vague as it has proven to be difficult to assess, because it includes quantitative as well as qualitative aspects. In addition, the clients that are the subject of assessment are difficult to identify and to obtain their status. For example when assessing outreach, should it be measured in terms of the number of clients who access the financial services in general or only the number of the poor accessing the financial services? If only the poor accessing the financial services should be considered, how can they be identified?*

A given microfinance institution may increase the width of outreach by maintaining its depth or it can also increase depth by maintaining its width given that there is availability of loanable funds and efficiency in resources utilization. Woller and Schreiner (p. 12), argue that the two concepts, financial self- sufficiency (width of outreach) and depth of outreach, are not mutually exclusive, only that achieving the later makes it harder, all else equal, achieving the former. The findings of their study suggest that the two are jointly obtainable given that there is adoption of appropriate strategy such as use of high lending rate, making productive use of loan officers, paying appropriate salaries, and keeping administrative costs low, together with institutional commitment, management leadership, creation of appropriate performance incentives, effective targeting, product and technologic innovation, effective training, or plain hard work. By doing so, it can be possible to compensate the costs and expenses incurred in reaching the dispersed very poor particularly in rural area by the increased width.

The authors of this article believe in reaching only the active poor (the poor with already started small business or objectively proven willingness to run a small business and able to provide feasible business plan but does not have financial capacity) via microfinance services. If the destitute that does not have even proper residential location and worry about his/her daily basic needs is provided with the credit service, he/she may use it for daily consumption; not for productive purpose as his/her ultimate goal is daily subsistence.

This group of poor need to be assisted by other means of welfare programs rather than microfinance services particularly credit. The belief here is that it may need a sort of trade-off between the depth and width of outreach; that means, on one hand, not going further down to the destitute that does not have the knowhow of carrying out a business, living subsistence life, and needs aid for basic needs. On the other hand, disregarding those with certain assets that can be used as a collateral and who can be able to borrow from regular banks. Therefore, the middle portion would be feasible for microfinance credit.

Here it does not mean that the very poor should continue with food aid and other welfare programs, rather this group should be given various trainings on how to carryout business, how to spend their time on productive activities, identifying and indicating certain job items that match their context (what to do individually and in group as a business.) They may be provided with small loans gradually looking at their ability and willingness to be engaged in business activity. In this connection, Schreiner (1999, p. 9), raises the two views of outreach as, "The poverty approach places a very high weight on the poorest and little or no weight on anyone else. In contrast, the self-sustainability approach is more willing to make trade-offs between the poorest and the less-poor."

2. The Concept and Measures of Sustainability

2.1. The Concept of Sustainability

The term sustainability is commonly used in many other fields such as environmental science, development economics, and agricultural sector development particularly in the developing world where agriculture is the major economic sector or covers the vast share of the GDP of the countries. It is also common term in the microfinance industry. In the context of microfinance, it is used interchangeably with self – sufficiency, financial self - sufficiency, profitability, financial sustainability, viability, financial efficiency, Ledgerwood, (1999); Johnson and Rogley, (1997); Hulme and Mosley (1996); Christen et.al, (1995); Yaron (1992).

Bell and Morse, (1999), cited in (Degefe, 2007), defined the term in the context of microfinance as; "Sustainability of institutions refers to the long – term availability of the means required for the long – term achievement of goals." In this definition sustainability refers to the institution's ability to continue as a going concern by providing financial services to a wide range of clients who are disregarded by the regular financial institutions. The goal achievement in this case does mean attaining the major objective for which the institutions are established, poverty alleviation.

According to UNESCAP, (2006:15), cited in (Okumu, 2007), sustainability is defined as the ability of the organization to meet the cost of the operations and build enough reserves for capitalization. Navajas et.al (2000:335); Rhyne, (1998), relate sustainability with permanent existence and achieving the stated objective, poverty alleviation. They further describe sustainability as not an end by itself, rather a means to an end of improved social welfare. This means that, the sustainability of institutions enables them to provide the financial services for wide range of clients on a continuous basis and exert sustained effort on the poverty alleviation endeavour for which they are established.

Chaves and Gonzalez - Vega, (1996), assert that sustainability is the institution's ability to grow and provide financial services on continuous basis by the financial resources that they have or by borrowing from other financial or non – financial institutions based on market interest rate. Here again, the argument of these authors is that the institutions should provide the financial services particularly credit by being free from any subsidy. The concern here is that subsidies may not be continual but the institutions are supposed to be continual. Therefore, if there is subsidy injection to the financial system of the institutions, their ability to be sustainable become under question as subsidies may cease at some point in time.

Sustainability in simple terms refers to the long – term continuation of the microfinance program after the project activities have been discontinued. It entails that appropriate systems and processes have been put in place that will enable the microfinance services to be available on a continuous basis and the clients continue to benefit from these services in a routine manner. This also would mean that the program would meet the needs of the members through resources raised on their own strength, either from among themselves or external sources. In this connection, Rhyne (1998), states that sustainable institutions enable continuity of services with wider outreach to many people, which is the main objective of MFIs service. The new microfinance agenda increasingly emphasize on the need to achieve sustainability of microfinance institution.

Sustainable means repeatable. Sustainability has two faces: the sustainability of an institution and the sustainability of a transaction. Sustainable transactions are repeatable. Sustainable institutions have the structure and incentives to repeat transactions, Schreiner (1996)

Institutional Sustainability

According to Yaron (1997), institutional sustainability is necessary to attain a high level of financial sustainability and outreach. Institutional sustainability is possible where there is:

a. A responsive organizational structure which encourages participation;
b. A system and a procedure which are client focused, efficient flow of information, and sufficient transparency;
c. A management team capable of translating the organization's objective into action;
d. A system to secure appropriate human, financial and technical resources;
e. Motivated and skilled staff with the ability to efficiently execute and continuously refine and improve the operational methodology to better meet the organizational need.

Financial Sustainability

Financial sustainability means that the MFI is able to cover all its present costs and the costs incurred in growth, if it expands operations. It would mean that the MFI is able to meet its operating expenses, its financial costs adjusted for inflation and costs incurred in growth.

Financial sustainability is a tangible parameter and can be measured and monitored continually through a set of indicator such as return on performing assets, financial cost ratio, loan loss provision ratio, operating cost ratio, donation and grants ratio, operating self - sufficiency, financial self – sufficiency, and etc.

2.2. The Measures of Sustainability

According to Degefe (2009), a microfinance institution is financially viable if it can meet the cost per unit of the principal lent with the price it charges. In this definition, the author is emphasising on the ability of cost recovery of microfinance institutions from the interest they charge. Of course, the issue raised by the author is the basic issue for microfinance institution that strives for sustainability. All operating expenses and financial costs incurred by the institution during the accounting period for which the performance of the institution is evaluated should be recovered by the interest income it earns. From the institutionalists' point of view the cost and expenses recovery does not include any subsidies obtained from any source. The idea here is that if the costs and expenses are fully or partially recovered by subsidies from government or NGOs, that does not mean that the institutions are financially and operationally viable; that means, they are not self sustainable.

Steinwand, (2001) in his study of Credit Risk Management of Microfinance Institutions with reference to sustainability concluded that the key to financial sustainability is to charge an interest rate that is high enough to cover operating costs, loan losses and interest and adjustment expenses. Therefore, microfinance institutions must operate efficiently enough that reasonable, affordable and competitive interest rates can be charged to cover these costs. These costs and expenses become inflated whenever the microfinance institutions attempt to widen their scope of services to rural areas where the clients are scattered, with poor infrastructure, inadequate collateral that needs frequent follow – up. Such inflated administrative and other related costs and expense negatively affect the profitability of the institutions which in turn puts sustainability under question. To recover such costs and expenses by charging higher interest rate to the rural poor is unaffordable. This fact may enforce certain microfinance institutions that are concerned about sustainable services to move away from the rural poor and concentrate in the urban areas. The welfarists do not believe in such approach. The increased costs and expenses due to the nature of existence of the rural poor should be absorbed by some outsider; it can be government or donors, so that cheap loans can be provided to the rural poor. In this regard, Woller and Schreiner ( ), state as follows:

> *...but financial self-sufficiency has a potential downside. The oft-expressed fear is that focus on financial self-sufficiency will divert MFIs' attention and resources away from their core objective of poverty alleviation and away from their core poor market. This fear is based on several factors. The poor tends to be concentrated in harder-to-reach rural areas characterized by weak and fragmented markets for goods and services, dispersed populations, limited non-farm activities, and underdeveloped infrastructures. These factors imply both relatively high costs per dollar lent and relatively greater risk. Other factors implying relatively high administrative costs are the difficulties inherent in identifying and reaching poor persons and the heavy delegation and monitoring costs resulting from the lack of physical collateral (Conning 1999). The lack of physical collateral in turn implies higher credit risk. In short, delivering financial services to the poor is comparatively costly and difficult, and is fraught with risk, none of which bode well for long-term financial self-sufficiency. Hence the belief (or fear) that financial self-sufficiency and depth of outreach are inherently dichotomous*

According to Johnson (1997), most of the well-known programs have been operating in subsidies especially at the beginning of their operation. In general, studies show that it is possible to be financially self-sufficient, if institutions are able to charge a high interest rate (usually more than the market interest rate). When determining the interest rate, several factors must be considered. A balance between what clients can afford and what the lending organization needs to earn to cover full cost must be considered when fixing interest rate full cost interest rates are a pre-condition not only for sustainability but for exponential growth Ledgerwood, (1999).

According to Christen, (1995) successful Latin American MFIs, who were able to pay high interest loans, was because they were generating extremely high rates of return from extra liquidity represented by loan. Therefore, to reach financial sustainability, MFIs have to charge on effective interest rate that covers all costs incurred in providing financial services to the poor. Both saving outreach and the quality and volume of lending can benefit from positive real on lending rate that covers the true risk and full administrative costs associated with lending to target group. A positive interest rate will enable an MFI to pay competitive interest rates on deposits. Paying competitive interest rates can simultaneously stimulate both savings mobilization and the volume of lending; since additional deposits can be extended to credit Yaron (1997). Charging such a high interest rate to poor borrowers may not be easy and also may not be acceptable to all people. It needs appropriate policy environment and staff commitment.

Financial self-sufficiency in microfinance is possible through many factors such as, decrease in administrative costs, high rate of loan collection combined with increased loan size, and the encouragement of voluntary saving (saving mobilization).

Reducing transaction (administrative) cost

Innovative microfinance institutions have been able to reduce their transaction costs to some extent. This has been possible by bringing about rapid approval and disbursement. In most cases, information required for loan approval is reduced and group (in Group based microfinance) or local agents are delegated to make client selection (Otero and Rehyne, 1994).

MFIs shall be able to reduce their transaction costs to a level that keeps their sustainability. It may become possible to minimize the administrative cost significantly, if financial institutions (FIs) can rely on NGOs or SHOs (self help organizations) as intermediaries between the FIs and the groups or members Levitisky, (1998).

Loan recovery rate

Loan repayment delinquency is recognized as the major threat to maintain the value of fund. A high rate of non-repayment erodes the value of the loan portfolio and reduces income, which undermines the hope of achieving sustainability (Levistky, 1998). Most successful microfinance institutions have a good record of repayment rate. Gramean Bank for instance has loan recovery rate of 98% in 1994 (Sarah, 1997). Similarly in most best managed MFIs the loss amount 2-3% of the value of the portfolio. It is indicated that, for viable MFI losses shall not be more than 5% of the value of loan portfolio (Levitsky, 1998). Ibid

High repayment rate in some microfinance institutions has been associated with group formation, close monitoring and follow-up. Groups have largely been considered as a means of minimizing the risk of failure through peer pressure. The practical role of group in enhancing repayment however has not yet been clear. Jain, (1996) indicated that in many cases group members are not responsible for the repayment of unpaid loans in the group. Rather the purpose of group is more to do with the development of credit-responsive organizational culture by enabling routine repetition of identical behaviour by all members. During the weekly meeting, members have the obligation to do the same kind of pledge, which is meant to keep their commitment for timely repayment.

Further to the group formation, higher repayment has been possible through client centred system of credit operation. The high repayment rate in some institution shows that poor people are credit worthy and capable of paying their debt if the credits are based on their need and if the system of operation considers their business type. The time and patterns of repayment and time and seasons for loan disbursement should consider the client's situation and business. For instance, if the client needs the loan for animal rearing, the repayment schedule should not be designed to be in a weekly basis.

Savings

Studies indicate that savings were the "forgotten half" of rural finances Robinson (2001). Policy makers and bankers in many parts of developing world have been taught to believe that the poor don't save, cannot save, and do not trust financial institutions, and prefer non-financial forms of savings. In the earlier period, micro finance programs were not effective in mobilizing saving deposits and showed little interest in this regard. Ledgerwood, (1999) mentioned two major reasons for these. The first one is the mistaken belief that the poor cannot save, and the second one is due to regulatory constraint of license to mobilize deposits. Recent microfinance experience shows that even poor households would deposit their surplus in MFIs provided that they get attractive interest rate, convenience /location (priority and accessibility), security (the safety of the saving option), and ease of withdrawal.

To summarize the key to sustainability financially is to charge an interest rate that is high enough to cover operating costs, loan losses, and interest and adjustment expenses. However, MFIs must operate efficiently enough that reasonable, affordable and competitive interest rates can be charged to cover these costs. Therefore, long – term sustainability requires MFIs to manage delinquency, keep their cost of capital low (by mobilizing savings), rotate their portfolio efficiently, keep their operating costs to a minimum and most importantly, set interest rates to cover all these costs.

The most commonly used methods of measuring financial sustainability are:

a. Sustainability Index (SI): is expressed as a percent of total cost covered by income in a given period. This measure depicts the extent to which an MFI is able to cover all its operating and financial costs by its operating income more stringently by its net income (income after tax). Okumu (2007) presents this measure of sustainability as:

$$OSS = [[(NL \times AvLz \times i)\ (1\text{-}y)] + Z] \div [FINCO + OPCO + LLP]$$

Where OSS is Operating Self – sustainability; NL is the number of loans disbursed by the MFI during defined period; AvLz is average Loan Size disbursed during the same period; i is nominal lending rate charged by the

MFI; ý is rate of default; Z is other income; FINCO is financial cost; OPCO is operating cost; LLP is loan loss provision.

The above equation of OSS presented by Okumu describes the ratio of all income (income from operation and other income other than operation) adjusted for default to all costs and expenses. The author further extended the above equation by substituting the NL by NSB + NRB * ANT. Where NSB stands for number of single borrowers (those who borrowed once during the specified time), NRB stands for number of repeated borrows and ANT stands for average number of times that repeated borrower take loans in a defined period and presents the new equation as follows:

$$OSS = [[(NSB + NRB * ANT \times AvLz \times i)\ (1-\acute{y})] + Z] / [FINCO + OPCO + LLP]$$

b. **Subsidy Dependency Index (SDI):** focuses on the degree to which the program relies on external support for its operation Chavers (1996).

The sustainability index focuses on the amount of cost covered by revenue, and doesn't show how much the program is dependent on external fund, whereas subsidy dependence index shows the extent of self sufficiency or dependency of the program. Financial self-sustainability is achieved when return on equity, net of any subsidy received equals or exceeds the opportunity cost of the equity fund. Subsidy dependency is the inverse of self-sustainability Yaron (1994).

A credit program or institution is self-sustaining when income exceeds expenditures. When an institution providing credit receives a subsidy, it may be profitable but unable to sustain that profitability.

Subsidies to credit institutions can take several forms:

- below-market interest rates;
- losses absorbed by the government instead of the institution;
- reimbursements of operating costs;
- exemptions from reserve requirements or forced investments

The Subsidy Dependence Index (SDI) is a financial tool developed to measure the reliance of an institution on subsidies. The index measures how much the average lending interest rate would have to be increased to compensate for complete and immediate subsidy elimination. The lower the SDI, the more sustainable the institution. According to Yaron (1992a), the following formula is used to determine SDI:

$$SDI = \frac{\text{Subsidies}}{\text{Revenues from lending}} = \frac{[E \times m + A(m-c) + K-P]}{(LP \times i)}$$

Where: E = average annual equity; m = market interest rate; A = average public debt; c = interest debt paid on public debt; p = reported annual accounting profit; k = other subsidies; revenue grant and discount on expenses; LP = average annual outstanding loan portfolio; i = lending interest rate

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