Microfinance Investment Vehicles and Social Performance: Moving forward with the MACBETH Approach[1]

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Abstract

In a context where MIVs face several bottlenecks regarding their future role in the microfinance industry, this paper suggests a brand new way of reviewing their commitment to double bottom line returns. We suggest using the MACBETH (Measuring Attractiveness by a Categorical Based Evaluation TecHnique) approach as an investment screening method which, combined to existing social performance tools such as the Social Performance Indicators, can ensure that investment decisions are taken in accordance with socially responsible investors' values. This approach could contribute to the emergence of the transparency MIVs need in ensuring the whole sector that their commitment to double bottom line returns is real.

Keywords

Microfinance, Social performance, Microfinance Investment Vehicles, Investment screening, Multicriteria assessment.

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1. Introduction

Over the last ten years, Microfinance Investment Vehicles (MIVs) have developed tremendously. This trend translated into more funds being established (there are now over 100), a higher diversity of structures - moving from the original Goodman (2003) categorization into three fundamental types into a more elaborated six categories framework established by CGAP and much more assets under management: 8 billion USD in 2011 (Reille *et al.,* 2011). Altogether, MIVs are now perceived as key players in microfinance providing mainly loans but also – to a lesser extent – equity and guarantee funds.

Nevertheless, however impressive has been the development of MIVs, it has also brought up some questions for the future, notably about the relevance of this means of financing for Microfinance Institutions (MFIs). Indeed, as already observed in many different countries, in the long run, MFIs tend to favor local funding over the use of MIVs, either through the establishment of their own savings products or through contracting local debt from the traditional banking sector (Portocarrero Maisch *et al.,* 2006). So the question of which are the MFIs that should be the target for this type of funding is being asked. Theoretically, there should be two basic answers to that. First, MFIs operating in environment where local debt from regular commercial banks may not be available; second, MFIs from what is often called "second and third tiers", i.e. MFIs that have not reached a level of development allowing them to connect directly through the banking and financial markets. Unfortunately, at present time, the ability of MIVs to focus on those segments has proved quite limited and we observe a market where too many funds are actually fishing for the same fish, therefore resulting into a certain crowding out effect where supply is characterized by too many funds fighting for too little demand. The market is thus experiencing bottlenecks and questions are being asked on how future developments should take place.

Different evolutions could take place. A first (logical) one would be to assist to a major consolidation trend among funds in order to offer a better match between the number of funded organizations and the number of funding operators. However, it does not seem that the operators are already willing to consider this option. Another possible evolution would be to have a more mature segmentation of the market, where different MIVs would try to specialize in certain niches in order to develop business models that would protect them from the "all

chase the same" game. Some MIVs have already taken some steps in that direction but the number of "niches" appears quite limited so far. In fact, considering the present evolution of microfinance, the strategic options seem mainly related either to a better focus to rural development or to a deeper social commitment. This last option is particularly studied. The reason is simple. At the beginning, any investment in microfinance was considered as socially responsible, microfinance being perceived as social per se (Urgeghe, 2012; Mersland and Urgeghe, forthcoming). However, as time passed by, there has been more and more concern about the heterogeneity of the industry, and socially responsible investors (SRI) – who represent a major stake of the funders of MIVs – have expressed more and more interest in being confirmed that the investment they were making in the MIVs did indeed result ultimately into financing for really socially oriented MFIs. Therefore, when reviewing MIVs strategies and policies, the search for good procedures to assess social performance of MFIs has become an increasingly high priority goal.

In parallel to these developments, many initiatives have taken place to create tools to assess MFIs' social performance. While these initiatives have taken the microfinance sector a huge step forward in the definition of the multiple dimensions that compose social performance, we argue that they are still not sufficient as proper investments selection tools, mainly for two reasons. First, these methods are not tailored to the investors' specific values and second, they suffer greatly from technical issues related to performance measurement.

In this context, our paper suggests a brand new way for MIVs of reviewing social performance of MFIs and presents a first application of this new method, based on the MACBETH (Measuring Attractiveness by a Categorical Based Evaluation Technique) approach (Bana e Costa *et al.,* 2005*)*, a decision supporting method already highly used for public and private sector investments and whose application to microfinance could deeply improve the way double (or even triple) bottom line objectives are aggregated in microfinance.

The paper is made of five sections.

In the first one, we review the development of MIVs, stress the major trends that characterized it, and explain why the "double bottom line debate" that has been so strong for

MFIs is now being passed to the MIVs industry, resulting into much more attention devoted to how MIVs make sure that their investments are "socially responsible".

In the second section, we present various methodologies that have so far been used in order to assess the level of social performance in microfinance. We then try to identify the strengths but also the limits of these approaches, stressing mainly the mathematical limits of most of the techniques used to aggregate social data.

The third section introduces an alternative approach that could allow MIVs to correctly express their social values in a set of criteria, and aggregate the information they collect on financial and social performance in a mathematically relevant way. It is based on the application of the MACBETH approach.

The fourth section then presents a first empirical case where the MACBETH procedure has been used in microfinance. It has been developed through a partnership with a major microfinance funds manager and has been designed for the case of debt investments, this case being the most frequent in the MIV industry. This section presents not only the results of this application but also some consideration of the advantages and limits of such a procedure for MIVs.

Finally, the fifth section concludes and establishes an agenda for further research.

2. MIVs development: financial development and double bottom line goals

Having been created with the idea of connecting MFIs to capital markets, MIVs have a relatively short history but they have experienced a great deal of developments over the last ten years. At the very beginning, the first established funds where mainly working with equity investment, trying to show that it was possible to invest in microfinance. The story of PROFUND is illustrative of the origins. It was created in the early 1990s by a set of main players in the microfinance industry in order to invest in Latin American MFIs and establish the fact that "investing in microfinance" was a real possibility. It was very rapidly followed by other initiatives but in a slightly different way. The typical pattern is the following: one (or a few) known player(s) in the US or in Europe establish a fund with the technical

collaboration of some major actors of the finance and banking industry (usually involved in such deals as part of their own social responsibility involvements). The fund receives a starting capital coming either from donors (very often already involved in microfinance projects) or from the partner bank itself. The fund is capitalized over time through calls for investments, most of the time from the Socially Responsible Investment (SRI) community. The funds are then provided to MFIs at most of the time short or medium term, resulting ultimately in the establishment of a new type of SRI in Europe and/or the US and a new source of funding for MFIs in developing countries.

Over the last ten years, the growth of such funds has been impressive in terms of number of MIVs and in terms of assets under management. Today, more than 100 MIVs do finance MFIs all around the world; mainly through debt and to a lesser extent equity investment. Based on a study by MicroRate, for 2010, 82% of the investments were made through loans and 18% through equity (MicroRate, 2011). For some, these funds play a crucial role in the growth of MFIs as they are the only ones capable of coping with the potential growth of MFIs in the future (Daley-Harris, 2009; Swanson, 2008).

The origins of those funds are multiple: in 2010, the mix was the following: 42% of institutional investors, 34% of individuals, 21% of DFIs and 3% from others (MicroRate, 2011). Besides, as already mentioned, growth has been impressive. Between 2004 and 2011, the total assets under management were multiplied by eight, reaching USD 8 billion (Reille *et al*, 2011).

As time passed by the types of MIVs have also evolved and there is now a higher heterogeneity in the commercial strategies and in the instruments used. The first study on MIVs did identify three types of investment funds: the development funds, the semi-commercial funds and the commercial ones, the difference being mainly made by the differences in expected returns for the investors (Goodman 2003). CGAP has later on actualized this typology (Reille and Forster, 2008) and the classification usually used nowadays is made of six categories based on the types of financial instruments used (loans or equity investments) and on the complexity of their structures and legal forms (Mutual funds, holdings, socially responsible fund, and so on.).

Last but not least, the MIVs market is highly concentrated as the total assets under management of the ten largest players amount to 58% of the total while geographically

speaking, 73% of the MIVs investments are made in Eastern Europe, Central Asia and Latin America (MicroRate, 2011)[6].

Of course, if the development of MIV industry has been impressive, the challenges it faces are also of some importance. We identify three major ones: mismatches between supply and demand, product development and last but not least social and financial return expectations.

First, mismatch issues. MIVs managers usually wish to put in their portfolio prime MFIs known in the industry as "first tier" MFIs, as these institutions offer excellent track records and a profile which is easy to market as they appear to be of a lesser risk. The problem is that these "top of the class" institutions are usually not those who most need MIVs funds. Indeed, when a MFI is leader on its market, has been operating for some time and is perceived as relatively "low risk", it usually has access to other (cheaper) sources of funding either through the local banking sector or through direct emissions of bonds or certificates on financial markets. So for top tier MFIs, it seems that maintaining a contact with MIVs is much more a source of funds diversification ("keeping a window opened in case extra funding would become urgently necessary") than a vital source of funding. There is therefore a first mismatch as MIVs tend to focus on MFIs that are not those which most need them, when focusing on "tomorrow stars" (fast growing but sound second and third tier MFIs) would probably be more adequate (but of course harder to do as identifying tomorrow stars is much harder than spotting those of today). Besides, in terms of supply and demand, there is also a mismatch at the institutional level. Indeed, as it has been already mentioned, there are presently a little bit more than one hundred MIVs; but at the same time, the number of MFIs providing the type of profile that MIVs are looking for is probably limited to a few hundred. No exact figure is available but as an approximation, a study showed that for 2009, the top 7 MIVs were financing 574 MFIs, among which 85.35% from tier one[7] (Wiesner and Quien, 2010). In addition, a more recent study conducted by the rating agency MicroRate and the Microfinance Information Exchange (the MIX) platform (Viada and Gaul, 2011) showed that in 2010, 90,04% of total MIV funds was allocated to 200 MFIs. Compared to the over 2000 MFIs reported by the Mix Market (www.mixmarket.org) this would mean that demand is quite limited where supply is actually very diversified and so, one could ask if this should not

[6] Based on total assets under management in December 2009, the five largest MIVs were (CGAP, 2010b): *European Fund for Southeast Europe* (836 mio EUR), *Oikocredit* (770 mio EUR), *Dexia Microcredit Fund* (541,7 mio USD), *ResponsAbility Global Microfinance Fund* (489.4 mio USD), et *SNS Institutional Microfinance Fund I* (261.2 mio EUR).

[7] Wiesner and Quien (2010) consider Tier 1 as MFIs with total assets of over 30 million USD, Tier 2 as MFIs with total assets between 30 million and 10 million USD, and Tier 3 as MFIs with total assets below 10 million USD.

lead to some consolidation trend within MIVs, even more so, when it seems that some funds are clearly very small in order to support all the costs normally associated with their activity. This being said, we must acknowledge that so far, such a trend has not really started yet.

Another way of looking at mismatch is to compare supply and demand in terms of products. Indeed, MIVs have so far focused on senior debt and to a lesser extent on equity investment. For debt, it is usually made in hard currencies (even though local currency funding initiatives have been developed over the last few years), for a short or medium term (1 to 3 years most often). But demand is different as MFIs would usually like to have longer term loans without having to take a foreign exchange risk. Besides, in a context of interest rates decreases, the interest charged by MIVs are sometimes perceived as too high (Labie *et al.*, 2010).

Last but not least, the double bottom line focus. The expected returns for MIVs are also to be linked with social performance. For MIVs focusing on debt, the issue is reasonably simple as it means assuring that MIVs do finance MFIs that are themselves considered "socially responsible". So far, as microfinance was often considered "social per se", there was little pressure to justify it. However, there is good ground to believe that this may evolve in the coming months and years and MIVs should get ready to justify it as ultimately, they may have to prove that the reason why MFIs investment can be considered as SRI is the fact that they offer a good financial/social mix. For MIVs focusing on equity, the question may turn to be even more urgent as they are developing quite rapidly with a variety of philosophies. Some do consider themselves as patient capital acting as true partners with a double bottom line approach. Others, on the contrary seem more interested in the ability of microfinance to generate some profits within a fast growing industry; it is therefore an investment which is closer to "risk capital". In such cases, the chances of mission drift may increase and it should not be excluded that some MFIs be led into focusing primarily on the creation of value for their shareholders as it has quite often happened in mainstream finance, forgetting at the same time the improvement of services to clients and the original goal of providing efficient financial services at the lowest possible cost.

In sum, considering the mismatch and the heterogeneity of the industry, MIVs willing to prove that they belong to the "socially responsible investment" category should make their policies and procedures clearly reflect their commitment to social returns.

The next section builds on the debate of the measure of social returns by MIVs, and discusses the main flaws of the currently used methods.

3. Assessing social performance: a challenge for MIVs

The very origin of socially responsible investments is the concept of Corporate Social Responsibility (CSR). Indeed Penalva (2009, p. 41) defines SRI as the "*financial translation of corporate social responsibility"*. The idea behind CSR is that firms, beyond their economic objective, have also ethical obligations and must respond adequately to pressures from society (Sethi, 1975; Carroll, 1979). At the beginning, CSR was limited to corporate philanthropy (Cochran, 2007). The concept then evolved into the idea that real social responsibility is not just giving away money to charities, but investing in projects yielding social and economic benefits (Porter and Kramer, 2002). Therefore, the "double bottom line" mission of MIVs is at the core of corporate social responsibility, which reinforces even more the need for them to justify their positioning as Socially Responsible Investors. One step further, Schepers and Sethi (2003) argue that SRI fund managers have a double mission: screening the investments that best fit the values of the investors they represent, and influence corporate behavior through the application of CSR practices.

If we try to make the comparison with SRI practices, one can say that MIVs have to choose between two approaches for the screening of their investments: the negative one or the positive one (O'Rourke, 2003, Renneboog *et al*., 2008). In the negative approach, a filter of exclusion criteria is applied: those investments which don't match the criteria are considered "bad" and are excluded from the investment horizon while the other ones are considered as valid and go through a classical financial analysis. Typical negative criteria in SRI screen tobacco, gambling or weapons companies out of the investment possibilities. In the positive approach, investments are selected because they meet higher performance levels on the desired criteria. This approach requires being able to measure the performance on the selected screening criteria (e.g. social or environmental performance) and compare potential investments to benchmarks.

So far, in microfinance, it seems that most commercial investment strategies have been developed following the negative screening approach: the first issue was to exclude anything

that is not microfinance and then consider that any remaining investment is potentially valid without any further consideration for its social impact (Mersland and Urgeghe, forthcoming). Nowadays, it does not seem to be enough any more. More and more often, the public is asking for deeper justification and frequent reporting (CGAP, 2010). Therefore, it seems that the positive approach is increasingly expected from MIVs, and in order to do so, they need to be able to measure the social returns of their investments.

Two categories of tools are usually discussed: first, social performance indicators based on quantitative and standardized measures, such as "percentage of women clients" or "average loan size" of the investee MFIs. These indicators, although easy and inexpensive to obtain, are particularly biased mainly because of two reasons: they don't take the social and cultural context into consideration and more importantly, the concept of "average" can be strongly criticized from a qualitative point of view, which reveals the weaknesses of these indicators for international comparisons of potential investments (Urgeghe, 2010). Second, the social performance tools matching the "new vision" of social performance, defined as "*The effective translation of an institution's social mission into practice in line with accepted social values such as serving larger numbers of poor and excluded people; improving the quality and appropriateness of financial services; creating benefits for clients; and improving social responsibility of an MFI*" (www.sptf.info). This new vision is a qualitative and contextual approach. Social audits, social ratings, and social performance management are the current tools developed and used by microfinance practitioners. These relatively new approaches embrace better the nature of social performance, but suffer from biases originating from the aggregation of the many dimensions of social performance (Van den Bossche *et al*., 2010; Chatterji and Toffel, 2010). And finally, new tools have been designed to assess social performance at the level of the MIV, such as the Social Audit tool for MIVs (SAM) from CERISE (Lapenu, 2010) and the first initiative for an MIV rating of M-CRIL (Sinha & Sinha, 2010). Such initiatives intend to assess the level of Corporate Social Responsibility (CSR) of MIVs, which is a whole new field that won't be discussed in this paper. We focus on the tools used by MIVs to reach their dual objective of financial and social returns.

More specifically, we discuss the methodological difficulties that lie into the measurement and the aggregation of multiple criteria such as in social performance assessments. From a technical point of view, the assessment of MFIs social performance is part of the debate on how to aggregate the performance of different properties that are all measured in a different

manner. Whatever the property concerned, the key issue is always the same: you need to have a unit of measure in order to measure it. But so far, such a unit does not exist for social performance in microfinance.

To illustrate this argument, we take the example of the social performance tool that we believe has the best potential to be used by MIVs to select and monitor their investments: the SPI - Social Performance Indicators – developed by CERISE[8]. The SPI, following the above-mentioned definition of social performance of the Social Performance Task Force, is a tool designed to help microfinance institutions evaluate their intentions, systems and actions to determine whether they have the capacity to attain their social objectives. The tool is based on a questionnaire divided in four dimensions (CERISE, 2008): 1) "targeting and outreach" where the specific mission of the MFI is defined along with the corresponding target population; 2) "products and services" where the fit between the MFI's products and services and the needs of its clients is assessed; 3) "benefits to clients" which examines the empowerment of clients; and 4) "social responsibility" where the degree of responsibility of the MFI towards its staff, its clients, the community and the environment is evaluated. Each of the four dimensions is composed of three sub-dimensions containing the criteria on which the MFI is assessed, making a total of 71 criteria.

The SPI has been elaborated over the years through a collaborative process with MFIs and other actors in microfinance, and benefits of a great legitimacy in the sector. For instance, the tool is now integrated to the Mix Market[9] under the form of "Social Performance Standards" which are publicly available in a database of 415 MFIs evaluated between 2008 and 2009.

However, although it is a widely recognized tool, we believe that the way the SPI assesses social performance is much closer to a "definition of what is a social MFI", defined by the respect of 71 rules, than a true measurement instrument.

Let us take two examples of such rules to illustrate our point.

Example 1 (related to savings products):

[8] *CERISE (Comité d'Echanges de Réflexion et d'Information sur les Systèmes d'Epargne-crédit),* is a knowledge exchange network for microfinance practitioners. See www.cerise-microfinance.org.

[9] The Mix (Microfinance Information Exchange) is an online platform for information exchange on the microfinance sector at a global scale (www.themix.org)

2.6 Does the MFI propose voluntary savings products, directly or in partnership with other institutions, or actively promote savings?

☐ 0 = No voluntary savings products (or voluntary savings concerns either less than 5% of clients or less than 5% of the volume of the loan portfolio)
☐ 1 = Voluntary savings services are provided by the MFI, or through an operational partnership with another financial institution. Or, the MFI provides information or training sessions to promote savings (in conjunction with savings institutions).

(Source: CERISE, 2008, p.41)

This rule stipulates that to be social: *"Voluntary savings services are provided by the MFI, or through an operational partnership with another financial institution. Or, the MFI provides information or training sessions to promote savings (in conjunction with savings institutions)"*. Note that the rule also considers that there are no voluntary savings products if they concern less than 5% of the MFI clients or less than 5% of the loan portfolio.

Example 2 (related to the choice of priority places where the MFI is to work):

1.1 Does the MFI select operating areas based on criteria of poverty/exclusion?

☐ 0 = not a criteria
☐ 1 = one of the criteria but not the most important one
☐ 2 = one of the most important criteria, reflected in the strategic planning of the MFI

(Source: CERISE, 2008, p.17)

This rule stipulates that to be social, the MFI has to select operating areas based on criteria of poverty/exclusion as one of the most important criteria, and it should be reflected in the strategic planning of the MFI.

If all 71 rules are satisfied, the MFI gets 100 points, meaning it is considered to be "100% social". Otherwise, SPI suggests calculating a "percentage of social orientation" of the MFI by giving:

1% of satisfaction for each Boolean rule respected (a rule is Boolean when the choice is dual, between respected (+1%) or not (+0%), as in example 1)

or

2% when it relates to rules where non-satisfaction can be split into “partial non satisfaction” (+1%) and “total non satisfaction” (+0%) (as in example 2, where 2% is the maximum, 1% is attributed for “a selection criteria but the most important one” and 0% is given for “not a selection criteria”).

Ultimately, all the 71 rules are grouped in the four previously mentioned dimensions, each divided in three sub-groups. An MFI having the highest score on each of the 71 rules obtains 100 points (which can be understood as 100% social), and the score is then used for a graphical presentation as a spider web, which is often perceived as very easy to visualize.

This being said, we argue in this paper that this kind of aggregation is not rigorously valid when it comes to the screening of investments by socially responsible investors, who want their choices to clearly reflect their social values. We see two major problems in the SPI method: an inappropriate weighting system and the lack of a unit of measure. Regarding the weighting system, let us come back to the examples. In example 2, the fulfilment of the rule by the MFI provides twice the satisfaction (+ 2%) than the fulfilment of the rule in example 1 (+ 1%). Does that mean that having selection criteria based on poverty/exclusion (example 2) is *twice* as important as proposing voluntary savings products (example 1)? Unless this difference of satisfaction is clearly stated and justified by the decision maker, the numbers don’t make much sense. In other words, summing the numbers (0, 1 or 2) on each of the 71 rules and making a total out of 100 poses the problem of the sense of the numbers because there is an implicit weight given to some criteria due to the introduction of intermediary levels of performance (such as in example 2). We argue that in line with the missions of SRI (Renneboog *et al.*, 2008; Schepers and Sethi, 2003) this weighting system has to be decided by investors according to their values.

Then regarding the unit of measure, we observe that there is no unit of measures as such in the SPI, which is fundamental for any mathematical treatment to be allowed. The method is to our sense “summing apples with pears”. For instance in the above examples 1 and 2, we are summing a number measuring the range of products with another number measuring whether the MFI has poverty criteria to select where it is going to work. What is then the real meaning of summing these two scores?

Indeed, a number without a unit to refer to is an abstract concept that is not meaningful. For instance, measuring a property on a scale of 0 to 100 can only be done if, for the considered

property, it is clearly specified in which case a "0" will be attributed and in which case it will be "100". So, to aggregate various performance levels on various characteristics (in the present case, the social aspects of microfinance), we need to have a reference scale to refer to which will be common to all characteristics. In the following section of this paper, we introduce an approach – named MACBETH – that has been developed in order to measure the "attractiveness" of alternative courses of action (as MACBETH has been imagined as a decision-supporting tool) but that has the potential to rigorously measure any well defined characteristic (Bana e Costa, De Corte, Vansnick, 2011). We believe that this approach can be complementary to the existing social performance initiatives in microfinance such as the SPI. Indeed, SPI has contributed a lot to the identification and definition of the multiple dimensions of social performance, but to our belief, is more adapted to an internal rating system for the MFI itself than an international assessment tool for investment screening. In addition, the method falls into the technical problems linked to measurement. As will be presented in the next section, MACBETH resolves the methodological issues related to the measurement of a characteristic and, most importantly, its meaning for the decision maker. The issues related to the aggregation of several dimensions and sub-dimensions are also addressed in a mathematically relevant way.

4. A complementary approach: MACBETH

MACBETH (**M**easuring **A**ttractiveness by a **C**ategorical **B**ased **E**valuation **T**ec**H**nique) is an approach inspired by the Multiattribute Value Theory (Belton and Stewart, 2002). It was developed with two objectives: 1) from a social point of view, to facilitate the process of multicriteria assessments by minimizing the risk that conflictual interests among decision makers impede the assessment procedure; and 2) from a technical point of view, to ensure the consistence of decisions' outputs with the decision makers' system of values, on behalf of which the assessment is made. The method consists in a set of procedures which aim at helping the decision maker through each stage of a multicriteria assessment process.

The first step consists in making explicit all the aspects that the assessors wish to take into consideration, and constructing a set of criteria. A criterion is a focus point for the assessors (either a single aspect or a combination of aspects) that can be a basis for judging, which means that the people involved in the assessment are able to specify for each criteria a few

levels of performance that can be reached and to rank these performances by decreasing attractiveness, everything else being equal.

In the MACBETH approach, the assessors are invited to "operationalize" each criterion by specifying (at least) two levels of performance on this criterion, the first one being what they would consider "good to reach" ("good level") and the other one being the level below which they would not like to go (defined as "neutral level"). This identification has to be precise enough so that everyone understands the same thing by what is called "good" and "neutral" levels. Those two benchmarks not only provide a meaning to the criteria but also allow defining a "unit of measure". Indeed, the difference of attractiveness between the two levels can be taken as a unit of measure of the difference of attractiveness on the considered criteria.

This procedure is totally similar to the one Celsius has implemented in order to measure heat in the 18th century. He took boiling water and melting ice as benchmarks and from there, one has defined the "Celsius degree" as a hundredth of the difference of heat between those two references. Here, two comments should be made. First, even though people usually speak of measuring heat, the Celsius degree is really a unit measuring the heat variation and not the heat itself. Second, the temperature of an object (expressed in Celsius degrees) is defined as the difference of heat between this object and the melting ice.

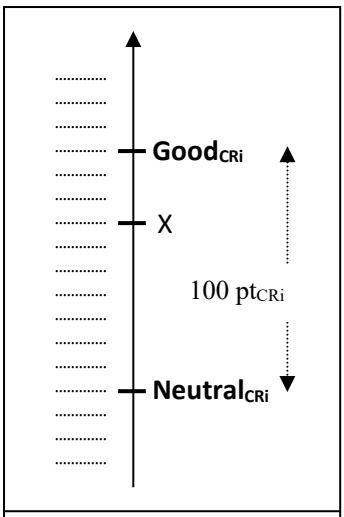


Figure 1

In order to measure the attractiveness of an element X on a criterion CRi we can, for example, define

✓ the measure unit of the difference of attractiveness on CRi (notation : pt$_{CRi}$) as a hundredth of the difference of attractiveness between Good$_{CRi}$ and Neutral$_{Cri}$,

✓ the attractiveness of an element as the measure of the attractiveness difference between this element and Neutral$_{Cri}$

To identify the attractiveness of X, we only need to know the position of this element respective to the levels Good$_{CRi}$ and Neutral$_{Cri}$: in figure 1, Att$_{CRi}$(X) = 70 pt$_{CRi}$. Besides, this definition immediatelly implies that: Att$_{CRi}$(Good$_{CRi}$) = 100 pt$_{CRi}$ and Att$_{CRi}$(Neutral$_{CRi}$) = 0 pt$_{CRi}$..

Let's note that the attractiveness of an element can be negative (if the performance of CRi does not reach $Neutral_{CRi}$) or higher than 100 pt_{CRi} (if the performance of CRi is better than $Good_{CRi}$).

When the assessors must assess various elements simultaneously on a criterion CRi, MACBETH can help them to do so by asking them qualitative opinions on the differences of attractiveness between these elements (as well as $Good_{CRi}$ and $Neutral_{CRi}$), testing at the same time the consistency of all the judgements already expressed.

In order to make these opinions easier to express, six categories of difference of attractiveness are introduced: very weak, weak, moderate, strong, very strong, extreme. It is this specific procedure that gives its name to the methodology (Bana e Costa, De Corte, Vansnick, 2003).

When, for each criteria CRi, the attractiveness of an element X [notation: $Att_{CRi}(X)$], has been identified, the MACBETH approach uses a weighted average to aggregate these local information and obtain the overall attractiveness of X [notation: $Att_G(X)$].

In the case of three criteria CR1, CR2 and CR3, this model takes the following presentation: $Att_G(X) = p_1 . Att_{CR1}(X) + p_2 . Att_{CR2}(X) + p_3 . Att_{CR3}(X)$.

In this formula, p_1, p_2 and p_3 are technical parameters whose function is to convert the various units of measure pt_{CRi} in a single unit of measure (of the difference of global attractiveness). If it was not the case, we would not be allowed to sum those three local attractiveness as they are expressed in different units (and it is well-known that you cannot add apples and pears!). Contradicting what many people believe, the parameters that are part of a weighted sum do not characterize the relative importance of these criteria. As expressed by a famous American consultant: « *It's the most common critical mistake in decision making* » (Keeney, 1996, p. 147).

In order to set the value of each technical parameters p_i, we can rely on different methods. One of them (used in MACBETH) consists in asking to the assessors to determine the overall attractiveness of some very simple hypothetical elements, each being defined by its performance on each criterion.

In the case of N criteria, these hypothetical elements are N+1 ; they are written [Neutral] and [CRi], i being able to take the values 1,2, …, N. [Neutral] is an hypothetical element whose

performance on each criteria CRi is $Neutral_{CRi}$. Whatever is $i \in \{1,2, \ldots, N\}$, [CRi] is an hypothetical element whose performance on CRi is $Good_{CRi}$ and whose performance on any other criterion CRk is $Neutral_{CRk}$. In the case of the three criteria, the hypothetical actions are therefore

$$[\ CR1\ ] \equiv (\ Good_{CR1}\ ,\ Neutral_{CR2}, Neutral_{CR3}\ )$$
$$[\ CR2\ ] \equiv (\ Neutral_{CR1}, Good_{CR2}\ , Neutral_{CR3}\ )$$
$$[\ CR3\ ] \equiv (\ Neutral_{CR1}, Neutral_{CR2}, Good_{CR3}\ )$$
$$[Neutral] \equiv (\ Neutral_{CR1}, Neutral_{CR2}, Neutral_{CR3}\ )$$

As two hypothetical elements may only differ on two criteria (at a maximum), it is quite easy for assessors to compare them two by two, to rank them by decreasing attractiveness and to express qualitative opinions on the differences of global attractiveness that they perceive between these elements; the MACBETH procedure then allows to position the hypothetical elements on an axis, so that the relative distances between these elements translate the relative attractiveness differences perceived by the assessors. For the aggregation model to be perfectly adapted to the perception of the assessors (notably on the « respective roles » they intend to attribute to each criteria at the time of the assessment), it can be shown that the relative values of parameters p_i ($i \in \{1,\ldots, N\}$) must be proportionate to the relative distances between [CRi] and [Neutral] ($i \in \{1,\ldots, N\}$).

Figure 2 illustrates, for the case of 3 criteria, how it is proceeded in the MACBETH approach

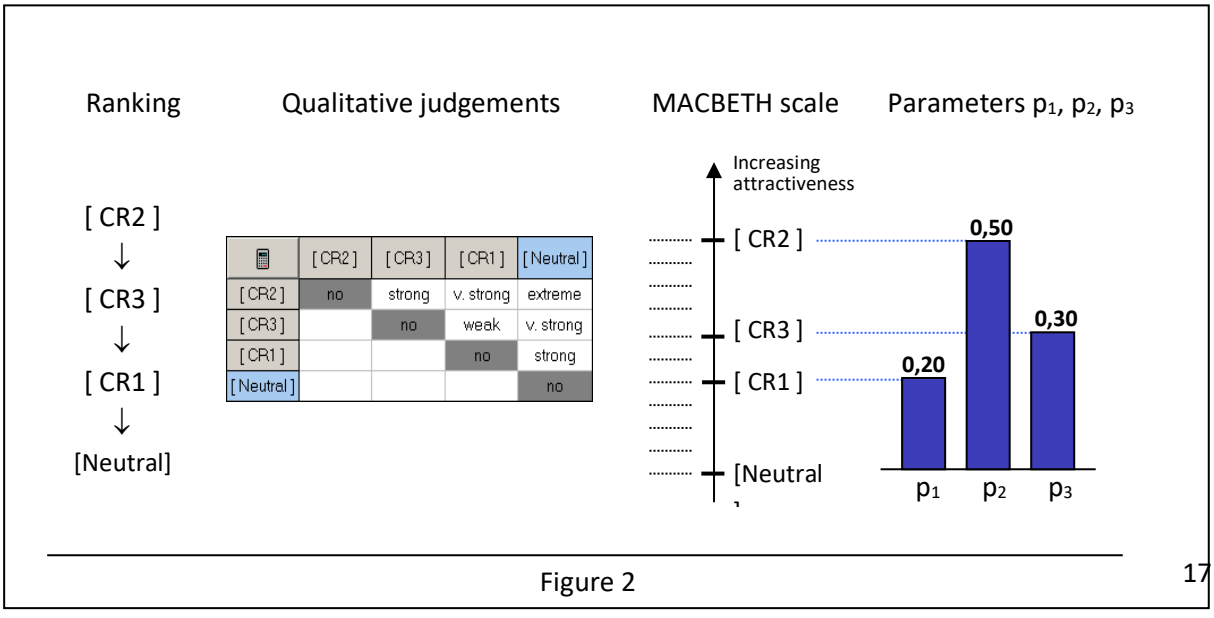


Figure 2

to determine the values of parameters p_1, p_2 and p_3.

The application of MACBETH is made much easier thanks to a software that has been designed for this sole purpose (see m-macbeth.com). This software allows making some sensibility and robustness checks while being able to present most results in easy to grasp graphic ways. So far, it has been widely used for many decision processes, notably in the field of public investments. It has also been used twice in Finance (Bana e Costa, C.A., Lourenço, J.C., Soares, J.O. [2007], Bana e Costa, C.A., Barroso, L.A., Soares, J.O. [2002],). The following section tries to see how it can also be useful to grasp the "double bottom line of microfinance" in the case of MIVs.

5. First lessons of a practical application

We hereafter present a first empirical case where the MACBETH procedure has been used in microfinance. It has been developed through a partnership with a major microfinance funds manager and has been designed for the case of debt investments, this case being the most frequent in the MIV industry.

5.1 Context of the case study

Our partner MIV for this study will remain anonymous for confidentiality reasons. The MIV has, like many other MIVs in the industry, a mission statement declaring the objective of double bottom line returns for its investors, and has the clear intention of translating this mission into practice when it comes to selecting investment projects.

So far, the investment decision-making process at the MIV takes place as follows: the team in charge of investments is composed of investment officers who make the first screening of MFIs. After having selected the MFIs according to the eligibility criteria of the MIV, they proceed to the "pre-due diligence" analysis, by using two distinct in-house tools: a financial risk tool, and a social performance assessment tool, initially inspired by the CERISE SPI (as many MIVs do). Each pre-selected MFI is assessed with these tools and gets two separate scores: one for the financial side and one for the social side. Each tool is divided into several

dimensions, which are in turn composed of several sub-dimensions, and each sub-dimension contains the decision criteria on which the assessment is made by investment officers. Figure 3 gives an idea of the existing social performance tool used by investment officers. Taking into account all criteria to be assessed for both financial and social assessments, a total of 116 assessments have to be made for each potential investment. Then, the performance on each criterion is aggregated at each level using a weighted sum to provide the final score. The weights used in the aggregation formula have been set by the MIV team itself and have the purpose to reflect its strategic priorities regarding the investment policy. The final scores are percentages, very often ranging between 60 and 80 percent. Investment officers then suggest the files to the investment committee, which makes the final decision.

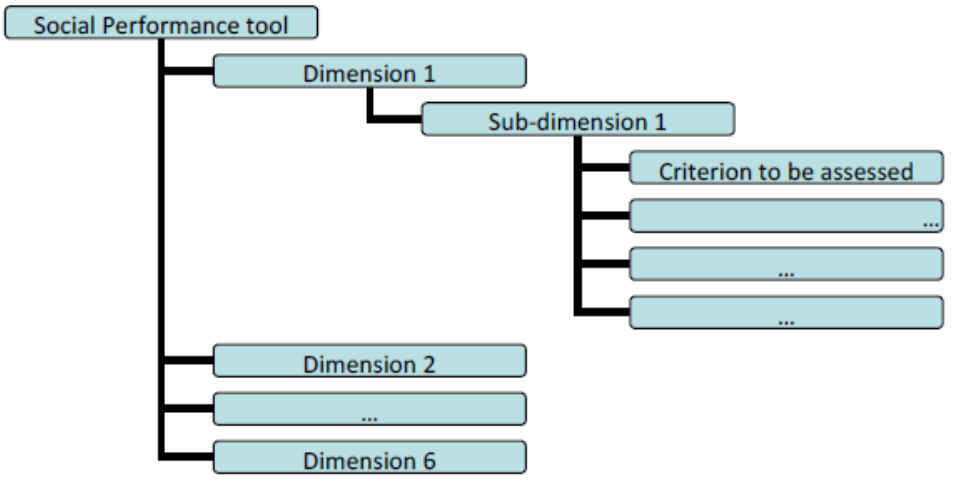


Figure 3: the social performance tool

During our first meeting, the investment team expressed the following problems: the investment committee of this MIV had often complained to the investment team about their "apparent subjectivity" regarding the scores provided. Indeed, the committee had difficulties to understand that a 70 percent score provided by an investment officer didn't mean the same (in terms of financial and social characteristics of the underlying MFI) than a 70 percent score provided by another investment officer. The investment team explained that as the final score is an aggregation of many different dimensions, very different MFIs happen to reach the same score, as figure 4 shows: both MFI A and MFI B have an average score of 25, but their performance on each of the four dimensions is very different.

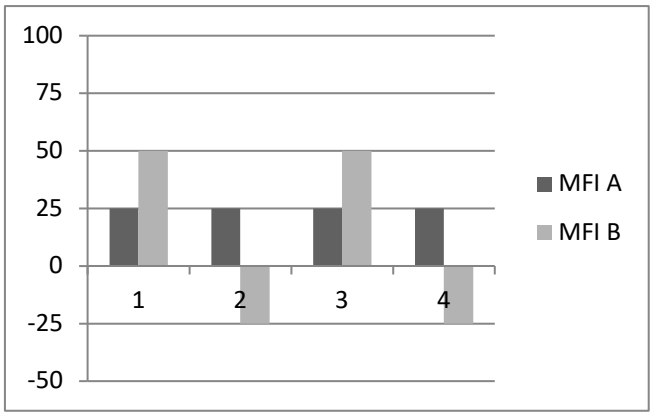


Figure 4 – Different profiles lead to same scores

In addition, the committee wanted to understand why the scores always ranged between 60 and 80 percent, and was worried about the fact that assessments could be biased in some way by the "assessment style" of each investment officer. The team therefore needed to be able to present the detailed profile of each MFI to the committee so that it better understands the origin of the scores, and was also in search of a way to prove the consistency of their assessments with respect to the double bottom line mission of the MIV.

5.2 Application of the MACBETH methodology

This case study was carried out in four phases, corresponding to the different steps of the MACBETH procedure:

Step 1. The first phase consisted in understanding the decision-makers' system of values through discussions and analysis of internal documents, as well as understanding the decision-making process of the organization.

Step 2. The second phase consisted in extensive discussions with the investment team, which took several full work days. The objective was to review all existing decision criteria one by one and to make them operational for the MACBETH procedure. In practice, the investment team had to agree on two performance levels (Neutral and Good) for each of the 116 criteria that made up their performance assessment tools (73 criteria for financial performance and 43 for social performance). The MIV had already a functioning tool, and had set a range of

possible values for each criterion and their corresponding score (see the example of the OSS below). After the MACBETH process, each criterion had a new performance scale simplified to two levels, neutral and good, of which the difference of attractiveness will be used as a unit of measure to compare an MFI to another. Of course, the MACBETH approach also allows as many intermediary performance levels as the decision makers wish, but it is very important to understand that all the numerical treatment is based on the difference of attractiveness between the Good and the Neutral levels and most importantly, that these two levels correspond to the values of the investment team.

As an example, the initial criterion regarding Operational Self-Sustainability (OSS) was:

Is the operational self-sustainability:	5	x > 130%
	4	120% ≥ x ≥ 130%
	3	110% ≥ x > 120%
	2	100% ≥ x > 110%
	1	90% ≥ x > 100%
	0	x < 90%

The column in grey shows the score scale used by the MIV for this criterion. The score obtained by the MFI on this criterion is determined by one of six performance levels, and is then aggregated with the score on all the other criteria. After the review with the MACBETH approach, the criterion for OSS has evolved to:

OSS		
Reference levels		**Attractiveness**
Good	115 %	100
Neutral	100 %	0

During the procedure, the team discussed and agreed on an acceptable (Neutral) and desirable (Good) level of performance. Note that the attractiveness of the Neutral and Good levels are respectively 0 and 100. As the only thing that matters in the MACBETH approach is the *difference of attractiveness* between Neutral and Good and the positioning of options regarding these levels, the numbers 0 and 100 are not important as such. Good references are

levels of performance that decision makers "feel" the difference between a good one and a "just acceptable" (neutral) one. For instance, we initially suggested 60 (as a "satisfactory grade" at university) and 90 (for "the highest honors") but the investment team decided to adopt 0 and 100 as a norm, as it was easier for them to visualize. These two reference numbers have for only purpose to make sense to the decision makers.

Now in our example of the OSS, the neutral level is situated at 100% and the good level is at 115%, which expresses that an MFI with a performance higher than 115% doesn't provide much additional satisfaction to the assessors. In the former criterion, a 115% performance level was situated at the middle of the scale, and the satisfaction was allowed to improve by almost twice as much (5 points for the highest level compared to 3 points for the "110% $\geq$ x > 120%" level).

As illustrated in figure 5, in the new definition of the OSS criterion, the scale has been adjusted to fit the actual preferences of the decision makers. While the satisfaction increases significantly from 100% to 115% (the passage from neutral to good), the additional satisfaction provided by an OSS beyond 115% is gradually decreasing, and for an OSS beyond 140% the attractiveness even declines to reflect the preferences of the MIV: an MFI with an OSS higher than 140% will be penalized in the final score, which could eventually lead to reject the option to finance it. The value added of the MACBETH approach at this stage is to be able to take into consideration the fact that the satisfaction of decision makers regarding performance is in most cases *non linear*. Therefore, the new criterion reflects the system of values of the assessors in a more accurate way than before. In the exact same idea, we also show the MACBETH scale of the criterion "client desertion rate" from the social performance side. With such a scale, the MIV team expressed their values through the fact that their satisfaction increases as the client dropout becomes lower, but under 20% the satisfaction increases less and less and stops increasing under 5%.

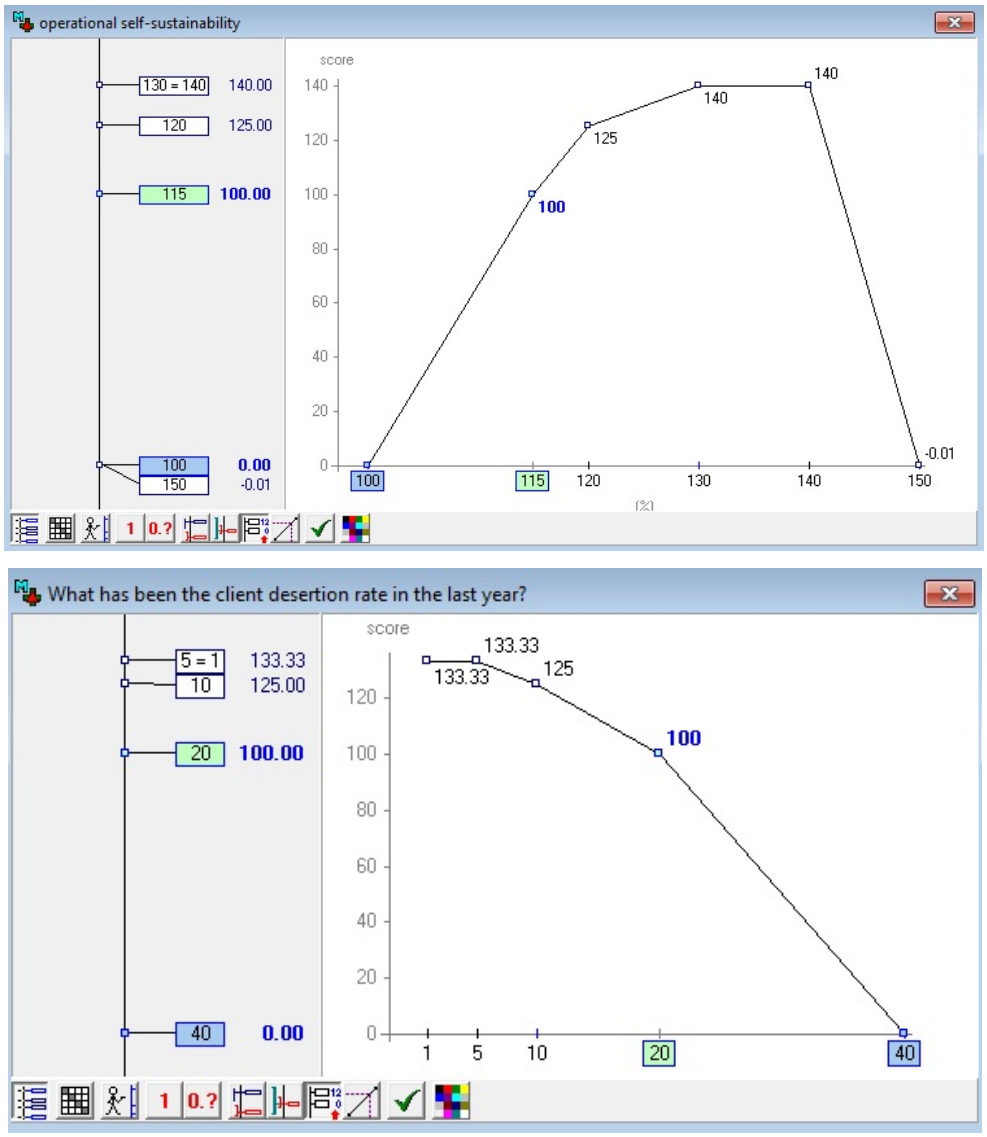


Figure 5 – Fitting the performance levels to the decision makers' satisfaction

These in-depth discussions made the team clarify many definitions of criteria, and made them also agree on many issues that, for some of them, had never been discussed before (e.g. the minimum acceptable age of MFIs, the requirements in terms of regulation, the importance of trainings, etc…).

The team also decided to change some criteria after realizing that they were not operational in terms of available information or simply because the meaning of the criteria needed to be clarified. For example, the team realized that for the two governance criteria "*Does the MFI*

have reputable shareholders with experience in microfinance/banking and financial backbone?" and "*Quality and support from shareholders and promoters"*, they were not able to objectively measure these aspects and decided to replace them both by a new criterion "*Percentage of equity in hands of professional shareholders*" which can be measured more accurately.

Here are the former criteria regarding the quality of support and the experience of shareholders:

Does the MFI have reputable shareholders with experience in microfinance/banking and financial backbone?	5	Yes
	2,5	Partly
	0	No

Quality and support from shareholders and promoters: Does the MFI receive significant financial, strategic, and/or technical support from its shareholders and/or promoters?	5	Yes
	2,5	Partly
	0	No

The new MACBETH criterion:

Percentage of equity in hands of professional shareholders		
Reference levels		**Attractiveness**
Good	More than 50%	100
	Between 25% and 50%	
Neutral	Between 5% and 25%	0
	Below 5%	

With this new criterion, the team expressed their preferences in terms of acceptable and desirable levels of professional shareholding in an MFI's equity. This criterion is qualitative, and can therefore not be illustrated with a curvilinear graph, but is illustrated in a "thermometer" graph where the relative distances between the qualitative performance levels represent the differences of attractiveness of these levels compared to the neutral level. Figure 6 shows two criteria: the equity criterion from the financial side and the trainings criterion

from the social side. The main value added here is that the decision makers can actually see the distances between the different levels on the scale, and can therefore adjust them according to what they feel corresponds best to their expectations.

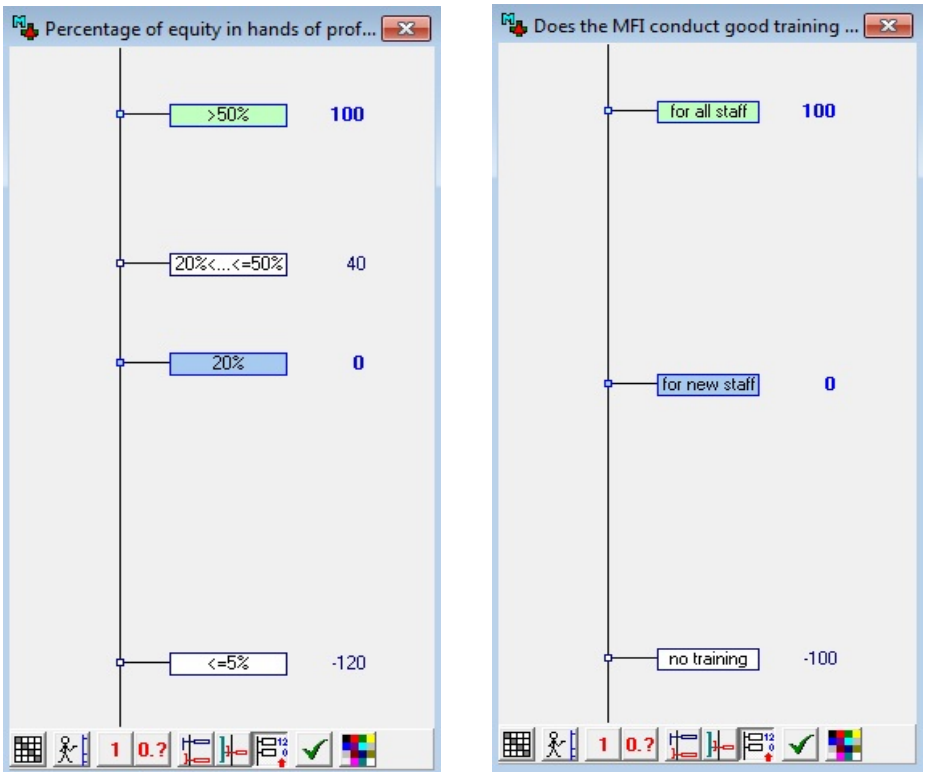


Figure 6 – Relative distances between performance levels

This second phase also allowed the team to consider dropping some criteria, or merging them if it made sense. Indeed, the first striking observation we were able to make is the tremendous number of criteria that the team had to assess for each potential investment file. As suggested on Figure 3, there are a lot of different levels and any weighting allocated to one of the 116 criteria at the end of the tree will be extremely low, making the relative importance of the criteria very difficult to grasp.

In that respect, we tried to understand at which level of the tree the decision was actually taken by investment officers for each dimension and sub-dimension, and when considered pertinent, we encouraged them to assess the performance of the MFI at a higher level of abstraction, for example directly at the level of the sub-dimension instead of assessing each small criteria into it. The team has been able to do that for some cases, for example for the

assessment of the country risk: they now use only one indicator, which summarizes the information contained in the five indicators that they were previously using.

Step 3. During the third phase, the "weights" of the criteria were determined by adjusting an additive aggregation model to the decision makers' system of values on the basis of the comparison of some hypothetical options. In practice, we brought together the team to discuss the weightings between each category of criteria, by asking them their preferences between a number of fictitious MFIs, each one being "good" at a certain dimension and "neutral" at all the others.

This allowed the team to discuss and agree on their preferences between each dimension of their assessing tool. For instance for their social performance assessments, they agreed that they preferred an MFI being "good" at the sub-dimension "Outreach and access" and "neutral" on all the other criteria than an MFI being "good" at the sub-dimension "Human resources" and "neutral" on all the other criteria. In the same idea, the sub-dimension "Quality of customer services" was ranked higher than the sub-dimension "Social mission and vision". Following this procedure, the team was able to express her system of values through the statement of preferences between the different dimensions and sub-dimensions. From these qualitative judgments, the MACBETH procedure then derived the weights to be allocated to each criterion.

One comment should be made at this step. The perceptions and opinions regarding the ways criteria should be assessed are changing with people: the problem we encountered during this phase is the staff turnover at the MIV. Indeed, as the research project spread in time, some people from the investment team had quit the company and some newcomers had arrived, and it was very difficult to have a "generally agreed" opinion at step 3 because the new investment officers didn't agree on some of the criteria already discussed with the former team at the previous steps of the methodology. This shows the difficulty to structure a decision-making methodology that will be followed by everyone inside an organization, and encourages the implementation of methodologies such as MACBETH, thanks to which the very system of values of the organization is integrated at the core of the decision making and is then made transparent to everyone.

Step 4. The last phase consists in assessing real investment cases with the "new" weightings that have been set through the MACBETH procedure. The objective here is to re-assess past investment files with the new investment approach, and find out whether the decision would have been different : would the investment be rejected instead of accepted, or would the score be lower or higher, even if accepted? For this empirical test, we obtained 45 investment files from 2008 to 2010, with all the necessary information to assess the financial and social performance on each criterion with the MACBETH methodology. All 45 MFIs have been selected and have been financed by the MIV. We now discuss the findings of our analysis.

Figure 7 shows the financial scores obtained by the MFIs with the previous assessment tool and the scores for the same MFIs obtained with the MACBETH approach. The graph represents MFIs sorted from the best financial score (MFI 1, score 80) to the worst (MFI 45, score 53).

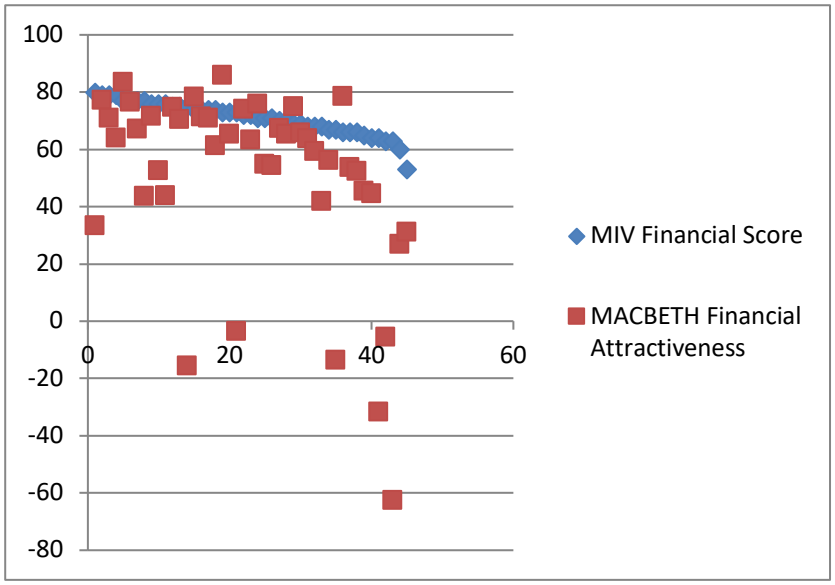


Figure 7 – Financial scores: MIV's in-house tool Versus MACBETH

Figure 8 shows the social scores of the MFIs, presented in the same order (from MFI 1 to MFI 45), obtained with the previous tool and with the MACBETH approach.

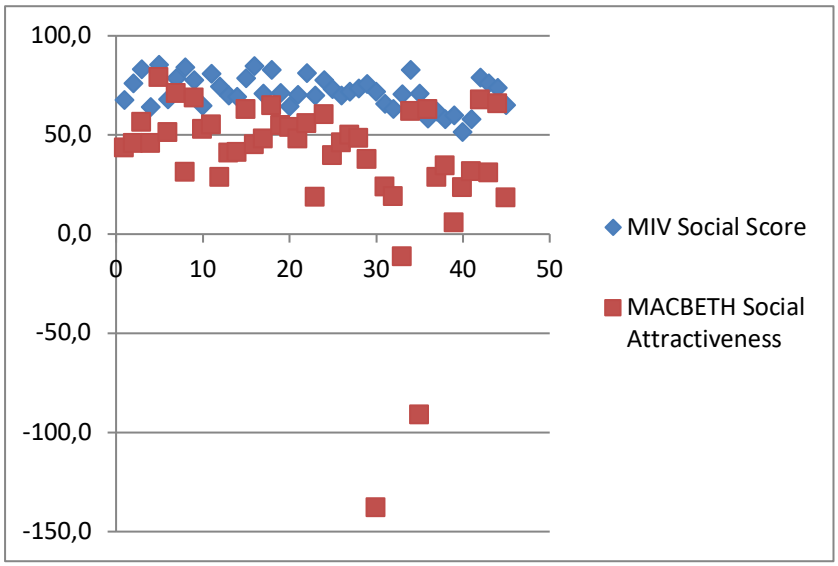


Figure 8 – Financial and Social Attractiveness with MACBETH

First, we observe a greater dispersion in both financial and social scores with the MACBETH approach than with the previous tools, and the ranking of MFIs has also completely changed (see the Appendix for the ranking before and after MACBETH). This outcome was expected as the whole decision making system is now more "sensitive" to the MIV values, which have been coded into each single performance criterion. Indeed, through the expression of the MIV's values via the new weighting system and the adjustments to the non linear satisfaction of the MIV, potential investments are more penalized when they do not meet expectations, and more rewarded when meeting them.

Second, we now clearly see that for both assessments, 9 MFIs are now ranked below the neutral level of performance (0 on the graph), which means that taking all the MIV preferences into account, those 9 do not reach the minimal expectations of the MIV in terms of financial or social performance. Note that only one MFI is below Neutral on financial and social performance at the same time (MFI 35). Figure 9 puts the MACBETH financial and social attractiveness of all 45 MFIs on the same graph.

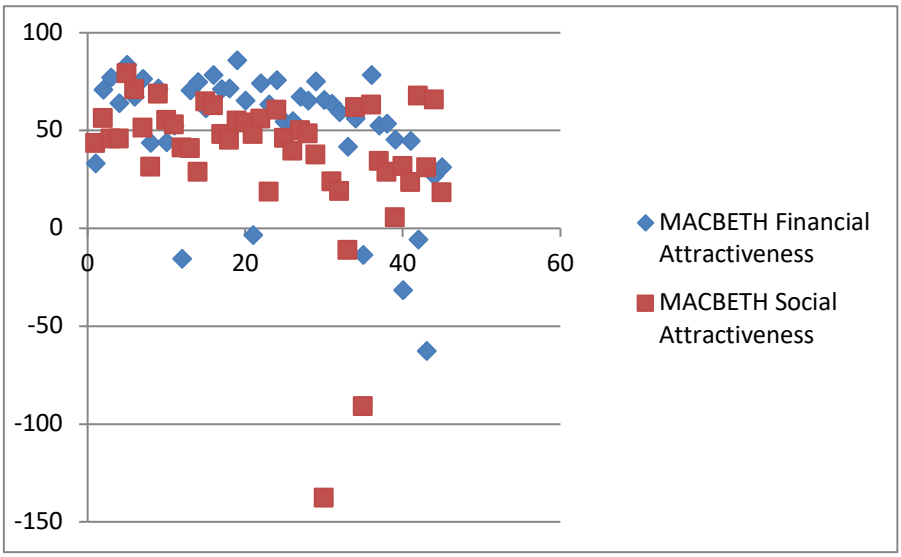
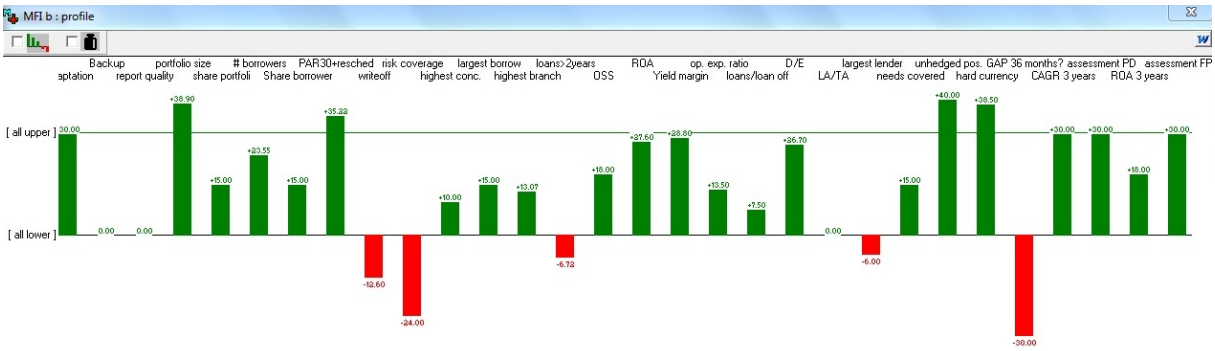


Figure 9 – Financial and Social scores with the MACBETH approach

It is an improvement in terms of decision making, as the investment committee is now able to immediately spot the options that fail to reach the neutral level of performance, which represents their minimal expectations from an investment. The MACBETH software also allows displaying the profile of each MFI, to see in detail the performance on each criterion.

As an illustration, here is a part of the financial profile of an MFI:



By using these profiles, investment officers can show to the investment committee why the MFI has obtained a certain score, and in which areas of the performance the strengths and the weaknesses are.

5.3 Lessons learnt from the application of MACBETH

The MACBETH approach has brought solutions to the two problems stated by the investment team at the beginning of the process. First, it tackled the apparent subjectivity of their assessments. Indeed, the method gives assurance that the way performance is measured is consistent with what the whole team agreed for every decision criterion; and most importantly, the satisfaction provided by a certain level of performance has become "more objective" because it is now clearly reflected in the Neutral and Good reference levels, and moreover in the adjusted curve (if the criterion is quantitative) or the relative distances between the performance levels (if the criterion is qualitative). In other words, the organizational values regarding the desired performance are embedded in the tool, and the decisions that will be taken with it are assured to reflect these values. Second, the investment committee can now understand the meaning of the scores provided thanks to the meaning of the Neutral and the Good performance levels. The investment team can now justify what exactly a 70% score is, and where the strengths and weaknesses of the MFI are.

The approach has also brought a clearer vision of their daily decisions to the investment team. They have been obliged to deeply think about the meaning of each decision criteria present in their assessment tool, and realized that some of them were not easy to use, or that there were no consensus on the way they should be evaluated on the field, or that some of them were completely useless, because they were unable to express a "neutral" and a "good" level of performance for them.

Most importantly, the value-added of the MACBETH approach lies in the sense-making that it allows. Indeed, the investment team can now clearly define what a "neutral" level of performance is, and what a good level is, in terms of performance on each single criterion of their decision making tool.

We also observed that values of an organization as stated in the mission are very difficult to incorporate into everyone's behavior and decision-making. Indeed, we often observed a strong discrepancy of opinion among team members regarding the level of performance which is acceptable or not on some criteria (ex: minimum age of MFI, regulated or not, the

added value of training, etc…). This exercise has therefore been very beneficial to the team, because they have been able to spot where the strongest divergences were in order to fix them.

6. Conclusion

In a context where MIVs face several bottlenecks regarding their future role in the microfinance industry, this paper suggests a brand new way of reviewing their commitment to double bottom line returns.

Indeed, MIVs have a difficult objective when it comes to measure and aggregate data on financial and social performance of MFIs, and are often criticized for their lack of transparency regarding their methods. Existing initiatives to develop social performance assessment tools have been extremely beneficial to the microfinance industry, but unfortunately suffer from mathematical flaws that undermine their usefulness for investors, in search of robust methods.

The MACBETH (**M**easuring **A**ttractiveness by a **C**ategorical **B**ased **E**valuation **T**ec**H**nique) approach has been implemented for the first time in microfinance in partnership with a major microfinance fund manager, for the selection of debt investments. Starting with deep discussions with decision makers, the MACBETH approach allows to effectively translating the double bottom line mission of an MIV into operational decision criteria, which are weighted through an innovative and rigorous methodology based on qualitative judgments.

This methodology creates a meaningful unit of measure of performance for any criterion, financial or social: the difference of attractiveness between two reference levels, the acceptable (Neutral) and the desirable (Good). Indeed, to assess an option, the decision makers first need to define a lower and an upper level of performance; the MACBETH approach provides exactly this, by only asking them to make qualitative judgments. Moreover, by being able to calibrate accurately the satisfaction provided by a given performance on any criterion, the assessment of the potential investments is precisely reflecting the values and the expectations of the decision makers.

This approach also requires the whole decision making team to agree on two major questions for each criterion: “How do we measure it?” and “What performance do we want?” Therefore, each decision that is taken with the MACBETH approach is assured to reflect the organization objectives and values. As a consequence, an MIV implementing such a tool will be able to show in a transparent way that its investments perfectly match the interests of its investors. We therefore believe that combined with existing tools such as the SPI, which has taken the sector a huge step forward regarding the definition of social performance, the MACBETH approach can bring the transparency MIVs need in ensuring the whole sector that their commitment to double bottom line returns is real. Moreover, there are different types of MIVs with varying degrees of profit motivation. The MACBETH approach could allow for more transparency regarding this diversity, simply by adjusting the performance scales to the different profit expectations of the MIVs.

This approach also has some limitations. First, the MACBETH approach allows for only one system of values at the same time to calibrate and weight the decision criteria. For instance, a fund manager in charge of several funds with very different objectives will have to use a different MACBETH application for each fund. Second, this first application was tested for debt investments only. Equity investments follow a different logic: the focus is more on the development prospects of the MFI rather than the current performance (financial or social); the MACBETH tool should therefore be adapted in order to take this difference into account.
Depending on the availability of data, future research can investigate the subsequent performance of investments screened with the MACBETH approach in comparison with those screened classical techniques.

7. Appendix

Financial and social performance rankings before and after MACBETH

Financial Performance			
MFI	Financial Score (before)	MACBETH Financial Attractiveness	Ranking (MACBETH)
MFI 1	80	33.35	19th
MFI 2	79	77.14	37th
MFI 3	79	70.89	5th
MFI 4	79	64.02	17th
MFI 5	77	83.56	3rd
MFI 6	77	76.61	29th
MFI 7	77	67.27	24th
MFI 8	77	43.63	8th
MFI 9	76	71.59	10th
MFI 10	76	52.65	12th
MFI 11	76	43.91	22nd
MFI 12	75	74.78	15th
MFI 13	75	70.53	18th
MFI 14	75	-15.64	2nd
MFI 15	74	78.29	28th
MFI 16	74	71.51	30th
MFI 17	74	71.06	13th
MFI 18	74	61.33	7th
MFI 19	73	85.97	27th
MFI 20	73	65.29	4th
MFI 21	73	-3.45	21st
MFI 22	72	74.22	32nd
MFI 23	72	63.36	23rd
MFI 24	71	75.84	16th
MFI 25	71	54.86	33rd
MFI 26	71	54.43	34th
MFI 27	70	67.31	26th
MFI 28	70	65.35	25th
MFI 29	69	75	36th
MFI 30	69	65.8	11th
MFI 31	68	63.84	41st
MFI 32	68	59.33	38th
MFI 33	68	41.86	39th
MFI 34	67	56.24	9th
MFI 35	67	-13.63	6th
MFI 36	66	78.56	1st
MFI 37	66	53.69	31st
MFI 38	66	52.43	45th
MFI 39	65	45.5	44th
MFI 40	64	44.57	42nd
MFI 41	64	-31.59	20th
MFI 42	63	-5.59	35th
MFI 43	63	-62.55	14th
MFI 44	60	26.89	40th
MFI 45	53	31.24	43rd

Social Performance			
MFI	Social Score (before)	MACBETH Social Attractiveness	Ranking (MACBETH)
MFI 1	85.4	78.96	1st
MFI 2	84.9	45.07	10th
MFI 3	84.2	31.33	13th
MFI 4	83.1	56.26	9th
MFI 5	83.0	64.73	18th
MFI 6	83.0	61.74	5th
MFI 7	81.3	55.67	42nd
MFI 8	80.8	55.19	11th
MFI 9	79.0	67.67	6th
MFI 10	78.8	70.9	12th
MFI 11	78.6	62.71	4th
MFI 12	77.6	60.27	7th
MFI 13	77.5	68.48	8th
MFI 14	76.0	45.65	23rd
MFI 15	76.0	31	37th
MFI 16	75.7	37.48	36th
MFI 17	74.3	28.52	32nd
MFI 18	73.9	65.62	21st
MFI 19	73.3	48.42	19th
MFI 20	73.0	39.51	27th
MFI 21	72.0	50.04	24th
MFI 22	72.0	-137.84	29th
MFI 23	71.1	54.83	14th
MFI 24	71.0	48.03	38th
MFI 25	71.0	-91.04	2nd
MFI 26	70.5	-11.32	33rd
MFI 27	70.3	48.13	31st
MFI 28	70.0	40.84	28th
MFI 29	69.9	46.12	20th
MFI 30	69.8	18.67	16th
MFI 31	69.4	41.08	44th
MFI 32	68.0	51.3	43rd
MFI 33	67.6	43.4	3rd
MFI 34	65.7	23.9	15th
MFI 35	65.0	18.11	17th
MFI 36	64.8	52.85	40th
MFI 37	64.4	53.82	34th
MFI 38	64.0	45.6	45th
MFI 39	63.0	18.96	39th
MFI 40	62.0	28.52	30th
MFI 41	60.0	5.55	35th
MFI 42	58.2	62.88	41st
MFI 43	58.0	31.48	26th
MFI 44	57.9	34.39	25th
MFI 45	51.6	23.52	22nd

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