Green Microfinance in Europe

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Abstract

Microfinance institutions (MFIs) are alternative financial providers offering financial services to people typically excluded from the standard banking sector. While most MFIs are active in developing countries, there is also a young and developing microfinance sector in Europe; however, very little literature exists on this MFI segment. In this paper, we analyze the environmental performance of 58 European MFIs. Our results suggest that the size of the MFI, investor concern for environmental performance and, to a lesser extent, donor interest, are closely related to the institution's environmental performance. Moreover, providing loans larger than microcredits is linked to better environmental performance. This could suggest that the additional revenues generated from these loans, also called cross-subsidies, could help MFIs to strengthen their environmental bottom line. Finally, no evidence suggests that profit status explains environmental

performance.

Keywords: Corporate Social Responsibility, Europe, Environment, Microcredit, Microfinance

1. Introduction

Microfinance has emerged as a tool to offer financial services to poor customers (Armendariz and Morduch, 2010; Hudon, 2009). While most microfinance institutions (MFIs) are active in developing countries, microfinance has also recently developed in Europe (Bendig et al., 2012). The European Union and some European governments promote microcredit as an important strategy to support small businesses and, at the same time, are also committed to protecting the environment. Environmental responsibility is regularly included as a key dimension of corporate social responsibility (CSR) for financial institutions, or as the environmental, social, and governance (ESG) dimensions of socially responsible investing (Cowton and Thompson, 1999; Chiu, Forthcoming; Carroll, 2008).

The emergence of microfinance with environmental responsibility underlies the concept of green microfinance (van Elteren, 2007; Rippey, 2009) and is a relatively new and developing field. While the management and ethics of MFIs or the environmental responsibility of traditional financial institutions has been frequently studied, the literature is mostly silent on green microfinance. There are a few exceptions, such as Allet (forthcoming) and Allet and Hudon (forthcoming), who analyse MFIs in developing countries, and the recent European Microfinance Network (EMN) research report (Forcella, 2013) discussing green microfinance in Europe.

This is therefore the first academic paper studying the environmental performance of European MFIs. More generally, little is known on European microfinance, contrary to the vast literature in the context of developing countries. Only a few European MFIs from Eastern Europe report on the MIX market, while Western Europe is not reported at all. Exceptions include the various reports published by the EMN and the Microfinance Centre (MFC), the two main European microfinance networks, Johnson (1998), who compares microfinance in developed and developing countries, Botti and Corsi (2010) and Botti and Corsi (2011), who analyse the social performance of Italian and European MFIs, or Cozarenco and Szafarz (2013), who study the impact of loan size ceilings

within a French MFI. However, microfinance in Europe is an important topic since access to finance is critical for the development of micro-enterprises and small and medium size enterprises (SMEs) (European Commission, 2005).

This paper attempts to fill these gaps. Its originality is essentially twofold. First, we contribute to the literature on environmental management by identifying the characteristics of European MFIs involved in environmental management. Using a unique dataset of European MFIs (Forcella, 2013), we provide further empirical evidence about the drivers of environmental responsibility and practices. We use the Microfinance Environmental Performance Index (MEPI) methodology (Allet, 2012) to assess environmental performance, a methodology previously used by Allet and Hudon (forthcoming) to analyse the drivers of environmental performance of MFIs active in developing countries. Second, we compare our results with the performance of traditional institutions active in Europe or America and MFIs operating in developing countries.

Our results suggest that larger and more mature MFIs are more often engaged in environmental responsibility. This is in line with the results found by Allet and Hudon (forthcoming) for developing countries as well as those frequently found for banks active in developed countries (Elsayed and Patton, 2007; Lefebvre et al., 2003). Moreover, rather than subsidies, it is mainly the interests of investors, and to a lesser extent donors, in environmental performance that significantly influence the environmental engagement of MFIs. Providing loans larger than microcredits is also linked to better environmental performance, which could suggest that the additional revenues generated from these loans, also called cross-subsidies, could help MFIs to strengthen their environmental bottom line. The environmental performance of for-profit organisations does not differ from that of their non-profit counterparts. Finally MFIs seem to respond to the perceived danger of environmental degradation affecting their clients. The level of environmental performance of European MFIs is relatively similar to that found by Allet and Hudon (forthcoming) for developing countries. One difference, however, is that the "bank" status positively correlates to environmental performance in the Allet and Hudon paper whereas for-profit and non-profit

organisations do not differ in Europe. Geographical location seems to have a certain importance, as Eastern European MFIs, maybe surprisingly, perform slightly better than their Western European counterparts.

The rest of the paper is structured as follows. Section II reviews the literature on environmental responsibility and management of companies, including the specificities of banks and MFIs. We end this section with some hypotheses. Section III introduces the database and methodology. The main results are discussed in Section IV. Finally, Section V draws some conclusions.

2. Environmental responsibility and management of financial institutions: a literature review

While social performance has long been analyzed, empirical evidence on corporate environmental performance (CEP) is a more recent development. Historically, the business community considered that social responsibility encompassed both social and environmental performance (Willums 1999). Therefore, earlier studies frequently used environmental performance as a proxy for social responsibility (McGuire et al., 1988). Moreover, comparing companies' environmental performance is notoriously complicated, partly because of the complexity and the variety of measures and indicators used for measurement. Scholtens (2009) also highlights that most data are self-reported since no standard procedure exists for environmental or sustainable reporting and auditing.

A large part of the literature analyses the link between the environmental performance of a company and its financial performance or market value. Based on data from Egypt, Wahba (2008) assesses the link between the environmental responsibility of firms and their market value. Her results suggest that the market compensates firms that perform best on the environment. Using data from the Standard & Poor's 500, Cohen (2001) analyses the link between a company's market value and its environmental performance. The results show that bad environmental performance is negatively correlated with the intangible asset value of a company. The impact is significant since a 10% improvement in environmental performance is related to an additional USD 34 million in market value. The precise impact differs across industries but, unfortunately for this paper, the financial

industry is not included as one of the sectors. Stanwick and Stanwick (1998) find that the amount of pollution emissions released by the firm is related to its corporate social performance, as well as with the size of the firm and its level of profitability.

Using a meta-analysis methodology, Orlitz et al. (2003) find that corporate virtue in the form of environmental responsibility is likely to pay off and lead to higher financial performance. Their findings suggest, however, that CEP has a less significant relationship with financial performance than with measures of social performance, such as managerial principles and corporate reputations for minority hiring. While most of the literature suggests a positive correlation between environmental and financial performances, there is a debate on the strength of the correlation and its genesis, which are still unclear in most sectors (Weber et al., 2009).

The literature suggests various motivations for environmental commitment. The first is to improve environmental performance to enhance the reputation of the company. For instance, Miles and Govin (2000) argue that environmental performance became an increasingly important component of a company's reputation in the 1990s due to the changing social, economic and global environment. Companies had to adjust to their changing environment, otherwise they would lose part of their reputation.

The second motivation is related to the competition that organizations may face. As suggested by the resource-based theory, environmental strategy or marketing bring a comparative advantage to companies in competitive environments. Innovative companies that develop environmental programs eventually get higher profits thanks to higher consumer satisfaction (Russo and Fouts, 1997). Environmental performance is therefore a sign of "good management" and is instrumental in achieving better financial performance and shareholder value (Miles and Covin, 2000). This second motivation may also be related to the first, since improving environmental policies could also build a corporation's reputation advantage (Waddock and Graves, 1997).

The third motivation is related to external actors. Some empirical evidence suggests that

organizations could be pushed to enhance their environmental performance not only by competition but also by influential stakeholders. Analyzing a dataset of 750 large firms in Canada, Henriques and Sadorsky (1996) found that the main motives for enhancing environmental responsiveness were determined largely by "pressures" from stakeholders including: (1) customers; (2) shareholders; (3) government; and (4) community groups. A few recent empirical research papers try to compare these various motivations. Babiak and Trendafilova (2011) find that strategic motives prevail for adopting an environmental focus. Institutional pressure was a lesser motivation.

Fourth, alongside the motivations related to external elements or actors, CEP could also be influenced by some human resource management and governance issues. It is, for instance, well known that the motivation and leadership of top management could influence CEP. The presence of an environmental champion within the institution also plays a role (D'Amato & Roome, 2009). Meng et al. (2013) analyze a sample of 782 manufacturing companies active in China. Their findings show that involuntary and negative turnover (i.e., dismissal, health and death, and forced resignation) is negatively related to corporate environmental responsibility, while better corporate governance is positively associated with environmental performance. Religious or philosophical elements may also be a factor, as suggested by Du et al. (2013), who study a sample of listed Chinese firms in polluting industries and find that Buddhist organizations have better CEP.

Finally, the funding structure may also play a role. McGuire et al. 1988 suggest that the availability of excess funds could explain environmental performance. The likely reason is that environmental and social policies would often represent an area of relatively high managerial discretion. These findings could be related to the slack resource theory, which suggests that organizations obtaining superior financial returns tend to have discretionary resources that can be used for socially or environmentally appropriate projects, (Graves and Waddock, 1997, p. 306).

Environmental performance in banks and microfinance institutions

The impact of the financial sector on environmental issues has been increasingly challenged since

the 1990s (Thompson, 1998). Many financial institutions have therefore improved their environmental policies. Analyzing a sample of 32 American banks, Scholtens (2009) notes that while less than 50% of them had an explicit environmental policy in 2001, nowadays almost all banks have one. Weber et al. (2008) accordingly argue that environmental risk management started at the beginning of the 1990s. Their analysis of a dataset of 50 European banks suggests that environmental risk assessments are mainly integrated at the early stages of rating but not in every phase of the credit management process. More specifically, most banks perform some kind of environmental risk assessment with their lending policies and report their environmental performance on a quantitative basis. A large part of the environmental policy of banks comes from web-based financial and CSR reports (Coupland, 2006). International codes of conduct or guidelines, such as the UNEP financial service initiative, have also flourished and have impacted banks' performance. Weber et al. (2008) found that engagement in the UNEP financial service initiative significantly influences management strategy and operations in this field.

While microfinance emerged in the late 1970s, environmental awareness is also more recent in this sector. However, it has rapidly increased and many MFIs have started some environmental projects (Allet, forthcoming). The best-known green microfinance organization is Grameen Shakti, which offers solar energy to hundreds of thousands of households in rural Bangladesh through microcredit (Komatsu et al., 2011). Most of the literature on MFIs' environmental performance comes from the grey literature and is based on case studies of MFIs or on market analysis (Schuite & Pater, 2008). For instance, GreenMicrofinance (2007) suggests that competition in some microfinance markets has forced MFIs to innovate and design new products, including "green" microcredits. Wenner (2002) highlights the operational challenges involved in implementing green microfinance projects. Empirical surveys on green microfinance are scarce and concentrate solely on microfinance in developing countries. Based on qualitative and quantitative data, Allet (forthcoming) studies the motivations for engaging in environmental management. According to her findings, the MFIs that

are the most proactive in environmental management are primarily motivated by social responsibility, additionally by competitiveness (strategic and economic benefits), and to a lesser extent by legitimation (stakeholder pressure). Allet and Hudon (forthcoming) analyze a sample of 160 microfinance institutions active in developing countries. The results show no significant relationship between financial and environmental performances. Moreover, larger and more mature MFIs and MFIs registered as banks tend to do better in terms of environmental performance. After having analyzed European MFIs, we will be able to determine whether the characteristics of MFIs differ in developed and developing countries. There are many reasons why microfinance differs significantly between developed and developing countries (Johnson, 1996). Here we will cite only three obvious differences. First, while financial exclusion prevails in most developing countries, it remains rarer in Europe. Demand, and hence potential markets, for MFIs are therefore much smaller in Europe than in developing countries. Second, welfare states provide social security to unemployed citizens, which probably decreases the percentage of entrepreneurs "by necessity". Third, Johnson (1996) considers that financial exclusion results not from the excesses of market forces in Europe or the USA, but from underdevelopment of the financial sector in developing countries. European microfinance is still young and small, but the sector is evolving and consolidating (Bendig et al., 2012), and the present financial crisis in Europe could partially challenge the first two differences.

Hypotheses

There are many characteristics that could explain the CEP of European MFIs. First, the size of the organization may influence its environmental performance. There are a few reasons to assume that a larger organization may have better environmental performance. The most obvious reason is financial: larger MFIs can benefit from economies of scale. Thanks to these savings, they generate a surplus that can be re-invested in new and innovative activities such as environmental performance. Moreover, size and leadership frequently brings exposure and visibility, pushing larger companies to improve their environmental management (Erlandsson & Tillman, 2009; Allet and Hudon,

forthcoming). The financial sector is no exception. International agreements or codes including environmental dimensions, such as the Equator Principles, are most often adopted by larger companies (Scholtens and Dam, 2007).

H1: The size of the MFI is positively related to its environmental performance.

Second, the mission or profit motive of the organization could explain its environmental management. We have suggested that the motivations for improving environmental management differ. On the one hand, for-profit MFIs may be active in more competitive markets where they need to differentiate themselves. One may argue that the for-profit organization could engage in environmental management as a differentiation strategy. As suggested by the resource-based theory, environmental management would give an MFI a comparative advantage. On the other hand, it is well known that most European for-profit organizations receive large amounts of subsidies and donations to achieve their mission. The same reasoning can be applied to microfinance. Cull et al. (2009) also showed that the funding structure impacts the performance of MFIs. More precisely, the empirical work showed that subsidies may allow MFIs to offer smaller loans and therefore increase their social performance. Similarly, cheaper funds could help them design environmentally friendly products or, more generally, improve their environmental performance. While most MFIs have built expertise in financial or social performance management, additional resources may be needed to include the environmental bottom line. Moreover, it is well-known that non-profit MFIs tend to put more emphasis than their for-profit counterparts on social performance. Similarly to for-profit organizations, non-profit actors may also need to differentiate themselves from other organizations active in the same market and looking for additional funding. We could therefore assume that NGOs or, more generally, non-profit organizations will take a greater interested in environmental performance as they would consider it a dimension of their social responsibility.

H2: Non-profit variable is positively related to environmental performance.

Third, subsidies are not the only source of financing to fund the cost of innovation and environmental management. Hybrid organizations, such as MFIs, that combine multiple objectives could also adopt cross-subsidization policies. Cross-subsidies are additional revenues generated from a product or clientele that allow organizations to fulfill their mission. In microfinance, cross-subsidies are often an additional income stream obtained from wealthier clients (by giving them larger loans) to finance a larger number of poor clients (Armendàriz and Szafarz, 2011). MFIs would be able to use the margin generated by their services to the relatively better-off in order to serve the very poor and most disadvantaged. Alternatively they could use this margin to improve their environmental performance, for instance by investing in new green microcredits or energy-friendly activities.

H3: The complementary offer of non-microfinance loans is positively related to environmental performance.

Fourth, donors and investors may also play a decisive role through the influence they have on management. Managers favor stakeholders on whom they depend for resources that are critical to organizational survival (Jawahar and McLaughlin, 2001). Since MFIs have few resources and therefore depend on this funding, they would tend to adapt their behavior and targets to donors' objectives. The influence of donors could be limited to providing access to cheaper funds, but in some cases they can also directly encourage the supported organization to advance its environmental activities (Williamson et al., 2006). A few donors and socially-related investors receive a mandate from the state or their customers to pursue a triple bottom line of social, environmental and financial objectives. In the case of MFIs, many donors and socially-responsible investors may be more demanding or concerned by environmental performance than private funders or traditional shareholders are.

H4: Donors' interest in environmental performance is positively related to MFIs' environmental performance.

H5: Investors' interest in environmental performance is positively related to MFIs' environmental

performance.

3. Methodology and Dataset

The methodology used for data collection employs a mixed-method approach with both quantitative and qualitative analyses. The original dataset has been constructed in the 2013 EMN research report (Forcella, 2013), and contains: web research on 415 European MFIs, and an on-line survey with 58 MFI respondents. We consider the environmental performance of an MFI as the set of all the policies, procedures, products and projects aiming to manage its direct or indirect environmental outcomes. Similarly to Allet (2012) or Allet and Hudon (forthcoming), we will use the MEPI framework to measure environmental performance. The environmental performance of the European MFIs is therefore assessed along five main dimensions: *Environmental policy*: namely the existence of a written environmental mission or policy, or employees with environmental responsibilities; *Ecological footprint reduction*: the existence of objectives to reduce the institution's waste production, energy consumption, use of water, etc., environmental reporting, or audits, and training in environmental responsibility for employees; *Environmental risk assessment*: use of exclusion lists for environmentally dangerous activities, tools to assess the environmental risk of clients' activities, training in environmental risks for loan officers; *Green microcredits*: existence of micro-credits aiming to finance renewable energies, improvements in energy efficiency, recycling, waste management, organic production, agroforestry, ecotourism, etc.; and, *Environmental non-financial services*: existence of an environmental chart for client training and technical assistance to clients that want to develop environmentally friendly practices, environmental awareness-raising initiatives, or support environmentally friendly microenterprises.

As in the case of social audits and social ratings for MFIs, our assessment for the environmental performance of MFIs is performed at the level of procedures and operations implemented by the institution to improve its environmental performance. We do not directly assess its environmental outcomes. This choice is due to the kind of data available and to its effectiveness. Moreover, it is

supported by the idea that an institution that wants to improve its environmental performance should implement a set of processes and strategies to attain this objective (Lapenu et. al., 2009; Allet, 2012). However we should be conscious of this limitation.

Data collection

The sample of 415 MFIs is, to the best of our knowledge, the most comprehensive list of known MFIs in Europe. It was obtained by completing the list used by EMN for its last sectorial Overview Survey (Bendig et al., 2012), with information from the European Commission (EC), the EMN, MFC, the MIX Market, and other sources. The sample contains institutions known to provide microfinance services in European countries and in European candidate and potential candidate countries: a total of 36 countries[1].

The analysis in this paper is based on the online survey sent to this sample of 415 MFIs. The survey was written in English and submitted on June 23rd, 2013 to 401 institutions for which reliable e-mail address were available. Four reminders followed. On September 27th, 2013 the survey was closed. The number of responses was 75. However a careful analysis of the completeness of the responses and their consistency allowed to keep only 58 questionnaires for the statistical analysis, i.e., 14% of the known MFIs in Europe. Various limitations exist. The survey is based on the self-assessment of the respondents, which may tend to overestimate the environmental performance of their institution. The survey may be biased towards institutions with better environmental performance that could be more interested in completing the questionnaire. However 15% of the respondents did not report any environmentally friendly initiatives in any of the five dimensions. Moreover we decided to introduce some control questions to partially offset the potential bias due to self-reporting. Two additional limitations are the youth of the European microfinance industry, which is sometimes unused to reporting its data, and the novelty of the environmental performance criterion in microfinance, for which a common dictionary has yet to be drawn up.

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1 Austria, Belgium, Bulgaria, Cyprus, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom; Iceland, Montenegro, Republic of Macedonia, Serbia and Turkey; Albania, Bosnia and Herzegovina, Kosovo.

The heterogeneity of the European microfinance sector is another source of limitation. Indeed, microfinance is not the only or main activity of various institutions. This sometimes makes it difficult to understand whether the reported environmental initiatives are specific to the microfinance sector, or whether they are more broadly implemented in the institution. Various checks on the answers have been introduced to reduce these potential limitations.

Part of the survey contains exactly the same questions as those used in Allet and Hudon (2013) to obtain the MEPI for MFIs in developing countries, thus making the two studies comparable. The MEPI assigns a numerical value to all five of the environmental dimensions mentioned above Allet (2012). Each dimension receives a score between 0 and 4, and the global MEPI is computed by summing the scores for each dimension. The global MEPI scale runs from 0 to 20.

Using the global MEPI to assess an MFI's environmental performance has the advantage of being efficient and allowing us to easily compare the environmental performance of various institutions and assess their main drivers. However it has some obvious limitations, notably the kind of environmental initiatives assessed, the scores assigned to each dimensions, and the weights used to obtain the global MEPI.

We tried to partially offset some of these drawbacks by considering the MEPI for all five dimensions during our data analysis and giving the same weight to each dimension when building the global MEPI.

Sample representativeness

Table 1 reports the main characteristics for our sample. In all, 43% of the respondent institutions are from Eastern Europe, while 57% are from Western Europe, comparable to the geographical distribution of known European MFIs (Forcella, 2013): 38% from Eastern and 62% from Western Europe. The average age of foundation of the sample is 1995, which seems to represent slightly more mature MFIs compared with those in the microfinance industry with an average foundation date of 2002, as reported in (Bendig et al., 2012). The institutions in the sample seem to be larger

than the average European MFI, with an average of 4,283 credits disbursed in 2012 per MFI, compared with an average of 1,890 disbursed in 2011 for the European microfinance industry (Bendig et al., 2012). The sample is too small to be subdivided into various legal statuses, so we split it into for-profit and not-for profit institutions only; however, we do not have enough data to compare these institutions with the European industry. To sum up, the sample seems to be not too different from the average European MFI, with the MFIs in the sample slightly older and larger on average. Difficulties in obtaining detailed and comparable data unfortunately rule out a more careful comparison. Other interesting data concerning the sample are: 57% receive some donations, of which 27% have donors interested in environmental performance; 41% of the institutions are for-profit while the remainder are non-profit; 33% have investors interested in environmental performance; and 27% of the institutions also provide credits of more than EUR 25,000 and are hence not classified as micro-credits (European Commission, 2003).

Descriptive statistics for the environmental performance of European MFIs

Table 1 reports the environmental performance of MFIs in our sample and compare it with the one for developing countries and the European industry.

The overall level of environmental performance of European MFIs is estimated by the value of the global MEPI that results, on average, in 4.03 for our sample with some quite significant dispersion. Such a small value could be explained by the overall low engagement of MFIs in environmental protection or by the youth of the sector. However we should also consider that the MEPI is not something that should be maximized by an MFI, but instead provides a picture of the environmental engagement of the institutions in the various environmental dimensions. Different institutions, according to their legal status, objectives etc. could pursue different aspects of environmental preservation, without the need to pursue all of them at the same time, similarly to social performance (Doligez & Lapenu, 2006). Moreover it should be considered that the MEPI is a measure of the sum of all the environmental initiatives of an institution in all five dimensions and it

does not directly measure the strength of the environmental initiative pursued by the institutions, such as the percentage of the portfolio in green activities.

To obtain a better picture of the environmental engagement of the European MFIs it is worth looking at the distribution of the MEPI score over the sample and comparing it with the MEPI for the various dimensions for MFIs in developing countries, as obtained in Allet and Hudon (forthcoming). While the average score for European institutions is 4.03 with a standard error of 3.89, it is 4.14 for MFIs active in developing countries, with a standard error of 3.89. The maximum score of the MEPI in Europe is 15, compared with 18 in developing countries, while the minimum value is 0 for both regions. Only 12% of the respondents in the European sample have a global MEPI higher than 10, compared with 9% for the sample in developing countries. The percentage of the institutions with a score of 0 is 15% in Europe and developing countries. The institutions scoring less than 5 are also similar since they are 65% in the European sample, and 66% in developing countries.

This comparison shows that the overall environmental performance for MFIs in Europe and in developing countries is quite similar. This conclusion is supported by an analysis for the various environmental dimensions. It does indeed appear that the environmental engagement of European microfinance institutions is fairly equally distributed among the various dimensions. European microfinance institutions perform slightly better in environmental risk assessment (0.89) and green microcredits (0.88) compared with developing countries that score respectively at 0.81 and 0.75. However, European institutions perform slightly worse in terms of environmental policy, with a score of 0.72 compared with 1.02 for developing countries. In terms of ecological footprint reduction and non-financial environmental services, MFIs in Europe perform similarly to those in the developing world, with respectively 0.84 and 0.70 for Europe and 0.84 and 0.72 for developing countries.

In Table 1 the results for our sample are compared with what is known for the population of 415 MFIs, (Forcella 2013), in which it was found that the 27.7% of the institutions had some

environmental initiatives.

Empirical methodology

The first objective of this paper is to assess the main characteristics of European MFIs that engage in environmental protection and establish the main drivers that influence their environmental performance. To reach this objective we have conducted some statistical and econometric analyses. Due to the relative small size of the sample we primarily rely on the means difference test. An ordinary least squares (OLS) regression is used as a robustness check. We decide to compare the global MEPI and its dimensions along nine categories. First, we analyse the size of the organization using the number of credits as proxy. We define a small MFI as an organization with less than 1,000 credits disbursed in 2012, and a large one as an institution with more than 1,000 credits. This definition seems reasonable due to the median in the sample (1,000), and the average number of credits disbursed per year per institution in the European industry, as found in Bendig et al. (2012): 1,890 in 2011. Second, we differentiate MFIs according to their status, with a difference between for-profit and not-for profit organizations. Third, we analyse environmental performance according to the availability of non-microcredit. Due to quality of the data, we also use the provision of credits bigger than EUR 25,000 as a simple proxy for the category (European Commission, 2003). Fourth and fifth, MFIs with donors interested in the environmental performance of the institution or its clients, and MFIs with donors not interested in this factor; and MFIs with investors interested in environmental performance of the institution or of its clients and MFIs with investors not interested in this factor.

Sixth, the age of the institution is included to analyse the impact of the maturity. Young organizations are aged under 15 and old ones are more than 15. This choice seems to be reasonable in terms of the average foundation date of the sample (1995), its median (1998), and the average for

the European industry (Bendig et al., 2012). Seventh, we divide MFIs according to their geographical location, from Eastern Europe and Western Europe. Eighth, we look at the role of client perception. A first group included the MFIs that perceived environmental degradation as a concern for the clients of the institutions and a second group was made up of MFIs that did not. To do so, we defined an index with five values (from 0 to 4) and we defined MFIs not concerned with environmental degradation as those that indicated the values 0 or 1, and the MFIs concerned with environmental degradation as those that chose a value between 2 and 4. Finally, we also addressed the subsidies granted by donors: MFIs with and without donations. The data for these nine categories are summarized in Table 1.

For all nine categories we performed a two side t-test on the scores of the MEPI for each one of the five dimensions and the score of the global MEPI, without assuming equal variance of the two populations. However the t-test for difference of means uses the hypothesis that the two samples belong to populations that are normally distributed. Due to the fairly small size of our sample and to relative low scores for each dimension in the MEPI, the hypotheses of normality is often not satisfied, in particular for the MEPI for the various dimensions. We then apply the t-test to the square root of the MEPI since it is often normally distributed at a quite satisfactory level[2]. To support the validity of the t-test, we also performed a non-parametric test: the Mann–Whitney-Wilcoxon (MWW) test, for all our nine categories. The MWW does not require normality; it compares the ranks for the two samples and it tests if they could come from the same population. However the MWW is less efficient for normally distributed samples compared with the t-test. We use the MWW as a robustness check of the results provided by the t-test and we comment when the two tests give different results. We moreover verify that the significance for mean differences does not change if we exclude some of the observations that could be judged as potential outliers for some of the environmental dimensions and categories.

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2   To test the normality, we plot the distributions for the square root of the global MEPI and of the MEPIs for the five environmental dimensions, for the two populations for all the nine categories previously stated, against a normal distribution, we employ a Q-Q plot that compare the different quantile of the distributions and we perform a Shapiro-Wilk normality test. All these tests turned out to be satisfied at an adequate level of accuracy, for almost all the subsamples.

We use the results from the t-tests to build a multivariate regression to support the conclusions from means comparisons. We selected seven among the previous nine categories according to their level of significance in the t-test and tried to maximize the number of observation in the sample. We then performed an OLS regression with the square root of the global MEPI as an independent variable. The explanatory variables we use are: INVINT: with value 1 for investors interested in the environmental performance of the MFI or of its clients and 0 if investors are not interested; REGION: with value 1 for MFIs based in Eastern Europe, and 0 for those based in Western Europe; PROFIT: with values 1 for for-profit institutions, and value 0 for non-profit institutions; DONATIONS: with value 1 for institutions with donations, and 0 for those without donations; AGE: a continuous variable corresponding to the date of foundation of the institution; NONMF: with value 1 for institutions that also provide credits bigger than EUR 25,000, and 0 otherwise; ENVRISK that assumes value between 0 and 4 according to the level of perceived danger of environmental degradation for the clients of the institution. The regression is hence defined as follow:

$$sqrt(\textbf{MEPI\_i}) = \alpha\_i + \beta\_1 \times INVINT\_i + \beta\_2 \times REGION\_i + \beta\_3 \times PROFIT\_i + \beta\_4 \times DONATIONS\_i + \beta\_5 \times AGE\_i + \beta\_6 \times NONMF\_i + \beta\_7 \times ENVRISK\_i + \varepsilon\_i$$

Unfortunately the regression is done on a small number of observations (49), and the majority of the variables are dummies that assume only 0 or 1 value and thus reduce the sample even further. For this reason we interpret the regression result as a robustness check for the results obtained with the comparison of mean differences. We however perform various checks to verify that the assumptions for an OLS regression are satisfied. First we verified that none of the explanatory variables was highly correlated with the others (Table 4). We then checked for the presence of outliers both in term of residues and leverage[3].

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[3] We observed two potential outsiders and as robustness check we performed four regressions: one with both potential outsiders, two without one of the potential outsiders; and one without both outsiders; and we verify that the results for the level of

4. Findings

In this section we present the main results of our analysis to test our hypotheses. Tables 2 and 3 present the results for the test of mean differences, while Table 5 presents the results of a simple OLS regression.

Size

Our results for equality of means support the hypotheses that the size of the institution is positively correlated with environmental performance (H1). Indeed Table 2 shows a very significance difference in overall environmental performance between small and large institutions in terms of the number of credits disbursed per year. Larger MFIs have a score more than two times higher than smaller ones. This difference between large and small institutions is particularly strong for environmental policy and environmental risk assessment, while the apparent significance in the difference for ecological footprint reduction is not confirmed by a MWW test, and is hence weaker. The difference in environmental performance related to the provision of green credits and environmental non-financial services is, by contrast, non-significant. These results are quite similar to those found in Allet and Hudon (forthcoming) for MFIs in developing countries. The main exception is that in developing countries, larger MFIs perform better than smaller ones in the provision of environmental non-financial services.

These results could be explained by the need for larger institutions to be mindful of their public image or respond to local regulations by developing environmental policy or taking care of environmental risk. By contrast, economy of scale, which seems to be a reasonable mechanism for developing green credits or environmental non-financial services, does not seem to be used as a strategy by larger institutions. The latter seem to prefer a passive approach to a proactive one.

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significance of the various coefficients are robust. We then proceed to check the normality of the residuals. We observed that the residuals for the regression using the global MEPI as independent variable do not have normal distribution. We then decided to use the square root of the MEPI as independent variable. We then verified that these residues follow a normal distribution by drawing a Q-Q plot and doing a Shapiro-Wilk test that turned out significant. We then checked the absence of heteroscedasticity using the White's test and the Breusch-Pagan test. The Variance Inflation Test checked the absence problems related to multicollinearity. We then performed a couple of simple tests to check the absence of problems related to omitted variables. We also checked that the residues has zero expectation value.

Unfortunately such a conclusion could not be tested by a regression analysis because the sample was too small.

Status

Our results are not able to support our hypothesis concerning the importance of status for environmental performance (H2). Indeed Table 2 does not show any significance in the mean difference between for-profit and not-for-profit institutions for any of the environmental dimensions. This result could be explained by the fact that the reasonably more socially oriented mission of not-for-profit institutions is offset by the environmental regulation requirements that use to have to be fulfilled by for-profits. Moreover, the necessity or not for differentiation in competitive markets could be similar for both for-profit and not-for profit institutions. These results seems to differ from those found in developing countries (Allet and Hudon, forthcoming), where institutions registered as banks have a better environmental performance overall than other institutions. The absence of correlation between environmental performance and status is further confirmed by the OLS regression (Table 5).

Non-microfinance loans

Our results for means comparison support the hypothesis that MFIs also providing non-microcredits have better environmental performances (H3). Indeed t-tests show that the difference in overall environmental performance is very significant, with institutions providing non-microcredits scoring more than twice as high as institutions providing only credits smaller than EUR 25,000. This difference is particularly important in environmental policy, ecological footprint reduction, and environmental risk reduction, while it is a little weaker – though still significant – for the provision of green micro-credits. By contrast, the difference between the two categories in the provision of environmental non-financial services is non-significant. Such results could be due to a cross-subsidization strategy that would allow institutions also providing larger credits to use the profit

generated by these operations to finance environmentally friendly initiatives. Institutions providing larger credits may also be more exposed to regulations, public opinion, and stakeholder pressure, which pushes them to adopt environmental policies, reduce their environmental footprint, and manage their environmental risk for non-microfinance operations. Implementing such strategies would then trickle down to microfinance operations. The econometric regression supports the hypothesis that also providing non-microfinance loans is a significant variable that positively influences the overall environmental performance of the institution (Table 5).

The role of the stakeholders

Institutions with investors interested in environmental performance scored almost three times higher in overall environmental performance compared with those without investors taking such an interest (H5). Moreover the difference in all environmental dimensions is highly significant. MFIs with interested investors score between two and three-and-a-half times more than MFIs without interested investors in the various dimensions. This result is confirmed by the OLS regression (Table5) and the MWW test. It suggests identification of investors' interests as one of the main factors driving European MFIs to engage in environmental initiatives. The importance of investors in environmental performance was unfortunately not tested for MFIs in developing countries in (Allet and Hudon, forthcoming). However in Allet (forthcoming) it was argued that MFIs in developing countries that implement environmental initiatives due to stakeholder pressure seem to do so in a minimal way. For example they adopt exclusion lists. Conversely, MFIs that implement initiatives that are more proactive, such as green microcredits or environmental training, said they did so because of their social responsibility. Similarly to developing countries, the European MFIs declared that their main motivation for engaging in environmental protection was social responsibility (Forcella, 2013). However, our results show that institutions with interested investors seem to score better in all dimensions, which partially contradicts the result for MFIs in developing countries. This result could be due to the important role played by investors in Europe to stimulate

environmental initiatives.

The role of donors is, by contrast, less clear. Indeed from t-test mean comparisons the presence of donations does not seem to have a significant influence on the overall environmental performance of the institution; it appears instead to have a negative effect on the implementation of environmental policies and the provision of green credits. MWW tests support this negative correlation between donations and environmental performance also for the overall environmental engagement and for environmental risk management. We can therefore only partly confirm our fourth hypothesis that donors' interests influence the environmental performance of MFIs (H4). This result could be explained by the fact that the donations are not associated with any environmental programs but instead address other social dimensions (Forcella, 2013). Moreover it could also be argued that the presence of donations reduces the need for innovations and development of new products, or the need to look for funding from environmentally oriented investors. For MFIs with donations, however, our results support the hypothesis that the interest of donors in environmental performance has a positive influence on the institutions. Table 2 shows that the overall environmental performance of a European MFI is positively influenced by the interest of donors, albeit at lower level compared with investor interest. The MWW test provides a higher level of significance. Moreover our results concerning donors' interest support the analysis done in Allet (forthcoming), showing that institutions with motivated donors do indeed score better in environmental risk assessment and hence tend to engage in a minimal way.

Other significant variables

During our analysis we also performed t-tests for other variables not related to the previous hypothesis, which turn out to have a significant influence on the environmental performance of the institutions. Table 3 shows that MFIs from Eastern Europe have a better overall environmental performance compared with those from Western Europe. This difference is very significant for the dimension concerning environmental risk assessment, while a MWW test supports the conclusion

that Eastern European institutions also perform better in the provision of green microcredits compared with their Western counterparts. These results could be explained by the fact that institutions from Eastern Europe, which were less subsidized than their Western counterparts, need to take care of their public image to receive funds. Another possible explanation could be that MFIs in Eastern Europe operate in a more competitive market which pushes them to diversify their offer and hence develop environmentally friendly initiatives. The importance of geographical location is supported also by the OLS regression (Table 5).

The maturity of the institutions is another characteristic that seems to positively influence the overall environmental performance of the institution. This is particularly true for the environmental policy dimension, with mature institutions scoring better than young ones. These results are in line with what Allet and Hudon (forthcoming) found for developing countries concerning overall environmental performance. However, maturity seems to influence different environmental dimensions in developing countries compared with Europe, with mature institutions performing better in the provision of green microcredits and non-financial services in developing countries, while in Europe they perform better in environmental policy. This fact supports the hypothesis that older institutions have the time to formalize their environmental processes. However the influence of the date of foundation on the overall environmental performance is not confirmed by the OLS regression (Table 5).

Table 3 supports also the hypothesis that institutions perceiving environmental degradation as a danger for their clients' wellbeing have better environmental performances. This is particularly the case for the environmental policy and for the provision of non-financial environmental services. This result could be explained by the fact that MFIs that perceive environmental degradation as a danger would then try to introduce the environment into their values and develop formal policy for environmental responsibility. They could moreover try to sensitize their clients with awareness-raising campaigns or training in environmental responsibility. These results agree with the findings of Allet and Hudon (Forthcoming) that MFIs with a higher percentage of their portfolio in rural

areas are more engaged in non-financial environmental services (where the percentage of rural producers is used as a proxy for perceived environmental degradation). The positive influence of perceived environmental degradation for the European sample is also observed in the OLS regression (Table 5).

5. Conclusion

The environment management of financial providers, including alternative financial institutions such as MFIs, is increasingly under scrutiny. While environmental performance has been frequently studied for traditional financial providers, the literature is silent on the performance of European MFIs. In this paper, we study the characteristics of European MFIs affecting their environmental bottom line.

Green microfinance is an emerging phenomenon. A web search (Forcella, 2013) shows that 115 MFIs in Europe (27.7% of all known European MFIs found on the internet) have engaged or still engage in initiatives associated with environmental protection. The analysis of our sample of 58 MFIs paints a mixed picture on their environmental performance. For MFIs, environmental performance is still at an early stage compared with traditional companies, even if 36% of the institutions in the sample have developed some sort of environmental policy, 38% have specific objectives to reduce their ecological footprint, 40% are implementing environmental exclusion lists, 31% propose credits for environmentally friendly initiatives, and 26% are providing training or technical assistance to support clients that want to implement environmentally friendly activities. Similarly to Allet and Hudon (forthcoming), we use the MEPI scale to measure environmental performance. This allows us to compare performances in Europe with a benchmark of MFIs active in developing countries.

The results suggest that the overall environmental performance of MFIs in Europe is comparable to that of MFIs operating in developing counties, with European MFIs scoring slightly better in green

credits and environmental risk management and worse in environmental policy. Eastern European MFIs have better environmental performances than their Western European counterparts. These two results indicate that the MFIs that have a better environmental performance are not solely found in richer countries.

Contrary to our assumptions, the objective or status of the MFI does not seem to matter: non-profit or for-profit status does not influence environmental performance. Nevertheless, the interests of investors and donors, to a lesser extent, significantly influence the level of the institutions' environmental performance. This result echoes findings in the manufacturing sector (Bansal and Roth, 2000), but differs from those for MFIs in developing countries (Allet, forthcoming).

Financial aspects may also play a role. MFIs that provide larger credits, i.e., more than the maximum of EUR 25,000 that defines microfinance in Europe, achieve better environmental performance. Nevertheless, we also find that donations do not explain environmental performance. This suggests that cross-subsidies obtained inside the organisation play a role, in contrast to donors' direct subsidies.

We also find that the size of the organization matters for environmental performance. In the survey, larger institutions seem to perform better in this regard. This confirms what is suggested in the literature on traditional companies in terms of size and maturity (Lefebvre et al., 2003; Elsayed and Patton, 2007). The survey also supports the hypothesis that, on average, institutions that are more mature seem to have a better environmental performance than younger ones, similarly to the findings of (Allet and Hudon, forthcoming) for MFIs operating in developing countries.

In conclusion, our results show that green microfinance in Europe is a young but also promising sector in terms of socially responsible banking. Their environmental performance seems to be comparable, on average, to the performance of institutions in developing countries. Various drivers influence the environmental performance of European MFIs. The interest of investors in the environment and the provision of also non-microfinance loans are key drivers of environmental

performance of European MFIs. Similarly to traditional companies active in developed countries, the size and maturity of MFIs are important drivers of environmental performance.

Further research could analyse the relationship between MFIs' environmental and financial performance. While the objective of the paper was to perform an exploratory study of green microfinance in Europe, the dataset could be broadened to include more MFIs and add control variables to the econometric framework. Two of the paper's limitations are the lack of sufficient data to control for all potential dimensions that influence CEP, and the small scale of the sample. Regression results should therefore be viewed carefully, even if they confirm what the t-tests for means differences suggest. Qualitative research could also complement our quantitative endeavour to better understand why some European MFIs decide to manage their environmental bottom line. Finally, more research is needed to grasp the concrete impact of green microfinance in Europe and compare it with other policies that similarly aim to improve the environment.

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Table 1. Profiles of respondent MFIs and their representativeness of the microfinance industry

Descriptive statistics

	Number of observations	Min	Max	Standard error	Mean	EU Industry	Developing countries
Global MEPI	**58**	**0**	**15**	**3.89**	**4.03**	**27.70%** a	**4.14** c
Dim 1. Environmental policy	58	0	4	1.06	0.72	7.90% a	1.02 c
Dim 2. Ecological footprint	58	0	4	0.97	0.84	2.90% a	0.84 c
Dime 3. Environmental risk assessment	58	0	4	1.07	0.89	6.50% a	0.81 c
Dim 4. Green microcredit	58	0	4	1.34	0.88	7.50% a	0.75 c
Dim 5. Environmental non-financial services	58	0	4	1.03	0.7	14.00% a	0.72 c
Date of foundation	53	1818	2012	26.32	1995	2002 b	
Number of credits disbursed in 2012	37	4	36,263	7,835	4,283	1890 b	
Level of environmental risk (0-4)	55	0	4	1.07	1.58		
Investors interested in environmental performance	58	0	1	0.47	0.33		
MFIs with donations	58	0	1	0.5	0.57		
Donors interested in environmental performance	33	0	1	0.45	0.27		
East Europe	58	0	1	0.5	0.43	0.38 a	
West Europe	58	0	1	0.5	0.57	0.62 a	
For-profit	54	0	1	0.5	0.41		
Not-for profit	54	0	1	0.5	0.59		
Also Credit bigger than EUR 25,000	52	0	1	0.45	0.27		

a % of MFIs with initiatives in this dimension. From a web search on a sample of 415 MFIs, data for 2013 (Forcella, 2013).

b From the EMN survey 2012, sample of 153 MFIs, data related to 2011, (Bendig et al., 2012).

c Means from an online survey of a sample of 160 MFIs, data for 2011 (Allet and Hudon, forthcoming).

Table 2. Equality of means tests per Global MEPI, and per each environmental dimension

Test of hypothesis: MEPI mean scores per size, status, non-MF credits, role of stakeholders.

		Observations	Global MEPI	Dimension 1. Environmental policy	Dimension 2. Ecological footprint	Dimension 3. Environmental risk assessment	Dimension 4. Green microcredit	Dimension 5. Environmental non-financial services
Number of Credits (disbursed in 2012)								
Means	SMALL (< 1000 Cr)	19	2.38	0.24	0.57	0.34	0.76	0.47
	LARGE (>1000 Cr)	18	5.64	1.03	0.97	1.78	1.07	0.79
T-test			-3.8***	-3.43***	1.71*	-5.88***	-0.66	-1.09
Status								
Means	For Profit	22	4.4	0.6	0.97	0.99	1.08	0.76
	Non for Profit	32	3.71	0.78	0.66	0.83	0.76	0.69
T-test			1	-0.69	1.24	1.38	0.97	1.21
Provision of also Non-MF Credits								
Means	Also Cr>25000 EUR	14	6.64	1.43	1.38	1.34	1.61	0.89
	Only Cr<25000 EUR	38	3.09	0.47	0.61	0.75	0.62	0.64
T-test			4.0***	2.52**	3.04***	2.93***	1.83*	1.29
Role of Investors								
Means	Investor interested in environmental performance	19	6.93	1.38	1.21	1.76	1.34	1.24
	Investor **NOT** interested in environmental performance	39	2.61	0.4	0.66	0.47	0.65	0.44
T-test			5.09***	3.99***	2.32**	4.83***	2.23**	2.56**
Role of Donations								
Means	Donations	33	3.1	0.48	0.79	0.65	0.59	0.59
	No Donations	25	5.26	1.05	0.91	1.21	1.25	0.84
T-test			-1.61	-2.27**	-0.48	-1.63	-1.92*	-1.31
Means	Donors interested in Environmental performance	9	5.47	0.94	1.17	1.28	0.97	1.11
	Donors **NOT** interested in environmental performance	24	2.21	0.3	0.65	0.42	0.45	0.4
T-test			2.03*	1.14	0.97	2.2**	1.29	1.5

T-test: *p<0.10; **p<0.05; ***p<0.01

Table 3. Equality of means tests per Global MEPI, and per each environmental dimension

Other significative variables: MEPI mean scores per geographical location, maturity, environmental degradation.

		Observations	Global MEPI	Dimension 1. Environmental policy	Dimension 2. Ecological footprint	Dimension 3. Environmental risk assessment	Dimension 4. Green microcredit	Dimension 5. Environmental non-financial services
Geographical Location								
Means	East Europe	25	4.89	0.73	0.75	1.34	1.18	0.89
	West Europe	33	3.38	0.72	0.91	0.55	0.64	0.55
T-test			**1.71***	0.38	0.04	**3.17*****	1.64	1.38
MATURITY								
Means	YOUNG (<15 yrs)	27	2.77	0.35	0.59	0.65	0.64	0.54
	MATURE (>15 yrs)	26	4.95	0.99	0.89	1.18	1.03	0.86
T-test			**-1.92***	**-2.41****	-1.6	-1.42	-0.84	-1.21
Environmental Degradation								
Means	Environmental degradation as a concern for clients	29	4.97	1.07	0.97	1.1	0.83	1
	Environmental degradation in **NOT** a concern for clients	26	2.76	0.3	0.61	0.69	0.88	0.29
T-test			**1.85***	**3.09*****	1.35	1.27	0.15	**3.28*****

T-test: *p<0.10; **p<0.05; ***p<0.01

Table 4. Correlation matrix of explanatory variables for OLS regression.

Pearson correlation coefficient

	INVINT	REGION	PROFIT	DONATIONS	AGE	NONMF	ENVRISK
INVINT	1						
REGION	0.35	1					
PROFIT	0.12	0.45	1				
DONATIONS	-0.32	-0.46	-0.16	1			
AGE	-0.2	-0.13	-0.09	0.15	1		
NONMF	0.18	0.11	0.23	-0.27	-0.27	1	
ENVRISK	0.11	8.00E-004	-0.02	-0.09	-0.06	0.11	1

Table 5. Regression results for Global MEPI

(OLS regression)

		Coefficients	t-test	p-value
Investors Interest in the Environment	**INVINT**	**0.99***	3.69	1.00E-003
Geographical Location East-West	**REGION**	**0.62***	1.97	5.60E-002
Status For-profit Vs non for-profit	**PROFIT**	-0.34	-1.28	0.21
Donations	**DONATIONS**	0.26	0.94	0.35
Date of foundation	**AGE**	5.30E-003	-1.15	0.26
Also credit bigger than 25000 EUR	**NONMF**	**0.88***	3.06	4.00E-003
Environmental degradation	**ENVRISK**	**0.18***	1.7	9.60E-002

R^2: 0.5478, F(7,41)=7.10, Prob>F=0.0000, Number observations = 49
*p<0.10; **p<0.05; ***p<0.01

Dependent variable: Sqrt (Global MEPI)

Explanatory variables: INVINT, REGION, PROFIT, DONATIONS, AGE, NONMF, ENVRISK .