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Review

Microfinance literature: A sustainability level perspective survey

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ABSTRACT

Since the early microcredit programs up to the present, microfinance has grown exponentially, as it has the academic interest on it as a research subject. Considering that this sector has impact in terms of sustainability, any research in the field requires an analysis with wide criteria, which should include the economic, environmental, social, and governance dimensions (EESG), as well as their interrelationships. The objectives of this survey are, to investigate the contributions of microfinance sectoral scholarly research to sustainability, through a systematic literature review using content analysis method, contextualizing the scientific production and studying its terminology according to the EESG criteria and under Global Reporting Initiative framework, and finally, to identify research gaps and to propose future research paths.

Contents

1. Introduction and state of the art

Since the first modern microcredit programs, the microfinance sector has risen constantly; as much as has the mounting growth of the academic work that has microfinance as a subject.

Abbreviations: EESG, Economic, Environment, Social, Governance; GRI, Global Reporting Initiative; MFI, Micro-Finance Institution; SLR, Systematic Literature Review; TTR, Type Token Ratio.

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The term microfinance refers to the provision of financial services to low-income clients through various services that usually evolve into microcredit, micro-insurance, micro-savings and money transfers (van Rooyen et al., 2012). Microfinance programmes have potential for equitable and sustainable development (Rahman, 1999; Stevens and Morris, 2001).

In this paper, we focus on the microfinance industry, which is one of the most dynamic industries in the world of development cooperation (Ledgerwood, 1999) and poverty alleviation (Yunus, 1999; Robinson, 2001). These organizations follow a relatively uniform business practice across different institutional settings (Beisland et al., 2015). Microfinance is a high-growth industry poised to become the world's largest banking market in terms of customers served (Mersland et al., 2013). Unlike the traditional and commercial banking market, microfinance offers a broader geographical coverage, including developing and emerging markets.

Microfinance has attracted considerable public attention (Beisland et al., 2015) as an important contributor to the strengthening and expansion of the formal financial system (Ledgerwood, 1999), this system, affects sustainable development both directly and indirectly (Scholtens, 2008; Busch et al., 2016).

The definition of sustainability is complex and its interpretation is multidimensional. The term sustainability inter-relates economic performance with the needs and welfare, of both society and individuals (Brundtland, 1987), to protect and respect environmental limits (Brown et al., 1987; van Marrewijk, 2003) thus facilitating economic prosperity by internalising and reducing negative environmental and social externalities, creating a positive society within planetary boundaries (Boons and Lüdeke-Freund, 2013). Thereby, the concept of sustainable development embraces three dimensions of welfare—economic, environmental and social—and strikes an appropriate balance among them (Gladwin et al., 1995; Starik and Kanashiro, 2013).

Other definitions of sustainability incorporate the governance sphere as an extension of the triple bottom line accounting framework. In this sense, when assessing a firm's sustainability, it is important to find the best structures and mechanisms for achieving optimal transparency, participation and accountability in its governance systems (Kolk, 2008; Bakker et al., 2014).

With this final inclusion, measures of sustainability are considered from an economic, environmental, social and governance (EESG) perspective, giving equal attention to the various spheres.

It is a major challenge to render the sustainable management concept operational. The election of which framework or indicator to choose is not a simple matter, as the universe of rating systems, reporting guidelines, normative frameworks, management systems and their indicators is vast (Rahdari and Rostamy, 2015). To achieve this goal, both academics and practitioners have proposed the use of various sustainability frameworks and indicators that provide specified levels of (either direct or indirect) information (Braat, 1991); simplify, quantify and summarize immense flows of data (Ciegis et al., 2009); and communicate complex information (Singh et al., 2012). As a framework, sustainability reporting has been widely used in sectoral analysis (Muñoz-Torres et al., 2008) and enables organizations to consider their impacts. Consistent with prior research, this paper regards the use of Global Reporting Initiative (GRI) guidelines as a summary variable of sustainability assessment as its guidelines are the unofficially accepted standard used by companies to prepare sustainability reports (Azapagic, 2004; Kaspereit and Lopatta, 2016) among others.

In this work, we have opted for a systematic literature review (SLR) according to EESG criteria and under the GRI framework to illustrate how the microfinance sector scholarly research is tackling the sustainability concept.

There is growing interest in the inclusion of each of the EESG criteria in microfinance and this is reflected clearly in the literature, which includes studies on every dimension. Economic: where among other topics, there are addressed the different MFIs' structures and the two opposing approaches that consider that financial self-sufficiency of these organizations is necessary against those who believe that receiving subsidies facilitates social work by allowing charging lower interest rates (Morduch, 1999; Armendáriz de Aghion and Morduch, 2005) and studies that evaluate the different group lending models and their influence in reducing default risk (Feigenberg et al., 2013).

Environmental: linking the management of environmental issues to the contribution of sustainable development (Hall et al., 2008), measuring the environmental performance of MFIs based on management performance indicators that have been adapted to the specificities of the microfinance sector (Allet, 2011), identifying the characteristics of the MFIs in terms of legal status, age, and profitability related to their better perform in environmental policy and environmental risk assessment (Allet and Hudon, 2015) and pointing out the main environmental issues faced in the sector, which are: pollution, use of chemicals and pesticides, use of energy, destruction of forest (van Elteren, 2007).

Social: research in this area is to provide information about the impact of microfinance on poverty, considering methodological options for the impact assessment (Hulme, 2000), examining the income asset holdings and diversity and various measures of vulnerability in order to determine the effectiveness of microfinance programs in comparison with other anti-poverty measures (Mosley, 2001) and searching for empirical evidence on the impact of microfinance with respect the combination poverty reduction and empowerment of poor women (Kabeer, 2005).

Governance: tracing the relationship between firm performance and corporate governance in MFIs and evaluating the effectiveness of several governance mechanisms as the board characteristics (Rock et al., 1998), competition and regulation and ownership type (Mersland and Strøm, 2009; Hartarska and Mersland, 2012).

Previous SLRs in this field have already been offered, as the one suggested by Brau and Woller (2004) and Granados et al. (2011) with the purpose of introducing microfinance to the academic finance community and determining the maturity of the field; the study by Moro Visconti (2012) which revolves around the concept of social responsibility; the work of Milana and Ashta (2012) where the evolution of the main facts and visions of microfinance over the time was gathered, or the studies by Khawari (2004), Hermes and Lensink (2007), or Sharma and Puri (2013) that regarded microfinance as a tool to alleviate poverty, and the impacts on income, health or education, among others (van Rooyen et al., 2012).

Nevertheless, to the best of the authors' knowledge, this is the first study that attempts to integrate a sustainability outlook, where every EESG criterion is included, based on a recognized sustainability framework with a business model as reference that includes both emerging and developing countries.

Thus, the paper offers a SLR of the scientific microfinance sectoral literature. The main goals of this study are as follows:

- To investigate the contributions of microfinance sectoral literature according to the EESG criteria and the GRI as framework.
- To put in context the scientific production on microfinance, to study its terminology, and to provide a comprehensive analysis of this literature, considering the relation between and among the financial, environmental, social, and governance dimensions.

- To light up new pathways for future studies to achieve sustainability, promoting an integrative approach to research.

The results of this paper will allow us to identify and clarify the main terms and concepts associated with microfinance to facilitate an inclusive understanding among practitioners and academics. The outcomes of the analysis from the perspective of sustainability will reveal that when researching microfinance, there is no balance among the various spheres—economic, social, environmental and governance—.

The paper has the following structure: Section 2 describes the research scheme methodology, the material collection and the analysis process, Section 3 presents the contextualization of the microfinance sector scientific production, Section 4 shows the results of a comprehensive analysis of the articles' keywords, Section 5 discusses the contributions of microfinance sectoral literature to sustainability and Section 6 concludes the paper.

2. Sample and methodology

In this paper, from a methodological standpoint, to provide a SLR we have opted to use content analysis (Seuring and Müller, 2008; Krippendorff, 2013) that considers both quantitative and qualitative methods to make inferences about the antecedents of communication (Holsti, 1969).

Starting with the material collection that will be explained in this section, we will continue with a description of the methodology process followed in the survey. We will present a descriptive analysis of the input data and after a clustering process, on the one hand, we will contextualize and characterize the microfinance sector by studying the most frequently appearing keywords in the articles applying the co-occurrence method, and on the other hand, we will assess the microfinance industry from a sustainability approach, coding the keywords according to the EESG criteria and the GRI framework categories. Fig. 1 describes this survey's methodological process.

To achieve the categorization that allow us to determine the sustainability approach in the various papers, the organization and classification is based on the papers' keywords, however, the discussions presented in the following sections are based on the whole text of the paper.

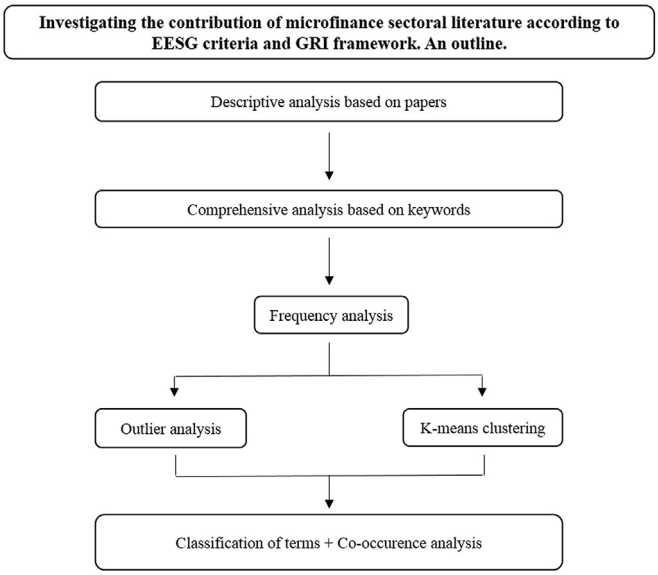

Fig. 1. Research methodology process.

2.1. Material collection

To provide a comprehensive analysis of the microfinance concept from an inclusive perspective, the review of the microfinance sectoral literature has focused on selecting a rigorous and reliable resource for the research. The Web of Science database was chosen for this purpose because it is a quality scientific reference and is one of the most comprehensive databases chosen by peer-reviewed journals in the social sciences (Falagas et al., 2008; Crossan and Apaydin, 2010). It is multidisciplinary, suitable to provide uniform data quality, and built on defined and measurable criteria (Garfield, 1975; Vos et al., 2013) that allow analysts to properly identify their research subjects (Okubo, 1997).

Given that this paper's purpose is to investigate the contribution of microfinance sector literature, we have explored the term microfinance in its maximum amplitude. We have opted for an inductive approach, with no previous expectations or fixed categories (Zhang and Wildemuth, 2009).

Following other authors' method, the word microfinance has been entered into Thomson Reuters' Web of Science search engine, returning every article in which this term appears in the topic (Plümper and Radaelli, 2004; Crossan and Apaydin, 2010), this is, the word *microfinance* appears in the title, keywords or abstract and subsequently, there has been a thorough analysis of keywords added by the Web of Science database indexers (Cambrosio et al., 1993; Ding et al., 2001; Emrouznejad et al., 2008).

In 1976, Grameen Bank began to offer its first microfinance programmes to selected villages in India, a project that has become more active since 1983, when the bank became independent. Nevertheless, it was not until 1993 that the first microfinance-related article was registered in the Web of Science database. To contextualize the microfinance theme we base our results on a population of 996 articles found from 1993 to June 2016 in which the word *microfinance* appears in the topic, which means that appears in the title, abstract, or keywords.

However, in order to have a smaller and more precise paper sample and because the keywords represent topics of significance that describe the content of a body of text, to appraise the studied concept we will examine the 475 articles that contained the term *microfinance* specifically as a keyword and not only in the title and/or abstract.

Therefore, we will frame the topic contextualizing the microfinance sector literature surveying its scientific production based on a larger sample and then we will carry out an analysis of the terminology and the relationship between concepts through a more accurate sample, based on articles that contain the word *microfinance* specifically as a keyword.

All of the keywords that accompany the keyword *microfinance* were coded to establish a relation between these expressions in terms of an EESG classification. As a result, 2534 words were coded (1105 excluding repetitions). At this point, we select the characteristic terminology and thereby we have considered from the total of registered keywords those whose frequency of appearance is equal to or above average, resulting in a total of 201 of different keywords. See Fig. 2 for the schematic representation of the selection process of the analysis units.

Keywords have been treated as written in the papers in the database; therefore, if a collocation appears, it has been considered as a unique term or concept. In other words, if a sequence of words often co-occurs, e.g., *impact evaluation*, *poverty alleviation* or *microfinance institutions*, as frequently appearing concepts reveal a text's idiosyncrasy the bi-gram is analysed as one term.

Nevertheless, some qualitative normalization of the keywords database has been performed, unifying the plural and the singular (e.g., child labour, children work), removing hyphens (e.g., micro-

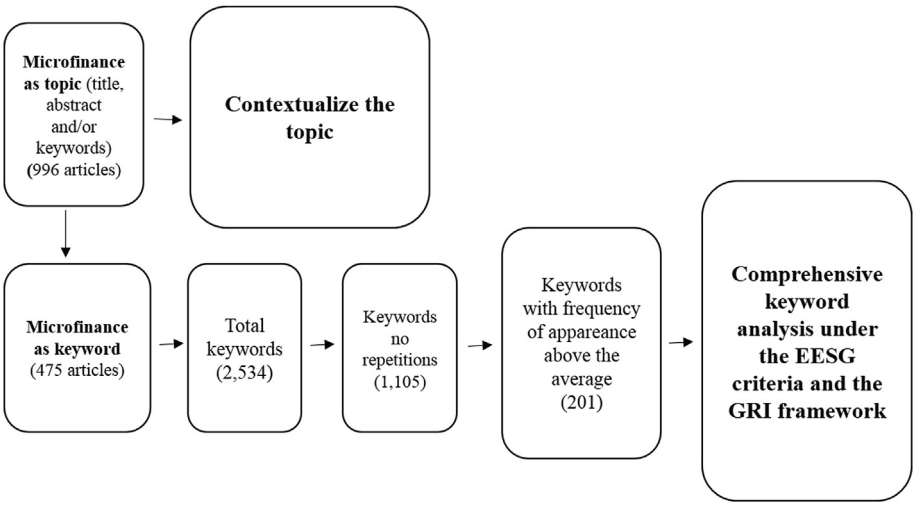

Fig. 2. Diagram of the selection process of the analysis units.

credit, microcredit), abbreviations relating to its expressions (e.g., SHG, Self-Help Groups), and grouping synonyms or terms that indicate a relationship that is so close that the two terms could be considered to represent a single concept (e.g., HIV, AIDS).

2.2. Analysis process of the academic literature, methods and indicators

The analysis process followed to determine the contributions of microfinance sector literature according to EESG criteria and under the GRI framework begins with the contextualization of the topic through different bibliometric indicators. Bibliometric analysis method allows us to explore the impact of a field in academic literature using both mathematical and statistical methods (Pritchard, 1969). Such quantitative measures of production of scientific literature are an excellent guide to achieve understanding (Garfield et al., 1978; van Raan, 2005; Granados et al., 2011) in particular levels of specialization (Okubo, 1997) dissemination, and use.

To study the obsolescence of the subject we use the Price and the Half-life indexes, which are designed to measure aging of subject fields and journal literature and also help to discern between slow and fast reception of scientific information (Glänzel and Moed, 2002). Both indicators use citation analysis to investigate the time when the literature in a particular knowledge area begins to decline and becomes rarely used.

The Price Index is an index of obsolescence that varies depending on the area of knowledge (Price, 1965) and is calculated the percentage of references less than 5 years old of total references. The Half-life Index is 'the time during which one-half of all the currently active literature was published' (Burton and Kebler, 1960, p. 19) and is calculated by 'subtracting the publication year of the source documents from the median publication year of the documents that cite de source documents' (Diodato and Gellatly, 2013, p. 77), this is, the Half-life is the year that accumulates the half of the total citations.

After analysing the scientific production at a microfinance topic level, we perform a comprehensive analysis of the keywords to determine to what extent the EESG criteria are reflected in the scholar literature. To do this, first we study the linguistic richness of the microfinance concept and define whether it demands a considerable knowledge of the language to fully understand a text using the type-token ratio (ttr), which is the relation between the number of different words (types) and the total number of words (token) and then, we organize and summarize the data using a data clustering method that maximizes homogeneity within groups and heterogeneity between them.

Before proceeding with the grouping, it is necessary to detect whether there are outliers (Fraley and Raftery, 1998). Webster dictionary defines outlier as a 'statistical observation that is markedly different in value from the others of the sample' and according to Kaufman and Rousseeuw (2009) outliers should be removed before running the clustering method to avoid distortion. In this case, as keywords are grouped based on their frequency of appearance, when terms stand out as outliers due to an extremely high frequency of occurrence they will be isolated as they hinder the proper formation of the rest of the groups but should be studied independently as they constitute the group of most characteristic words or expressions when researching about microfinance.

The cluster analysis was obtained by using IBM SPSS Statistics v.22.0 software package (IBM Corp., Armonk, NY, USA) and the method we choose was the K-means clustering. This method has the objective of clustering a set of n observations into k clusters. This hierarchical algorithm iteratively estimates the cluster means and assigns each case to the cluster with the smallest distance to the cluster mean, grouping objects with high similarity between them in the same group and with low similarity with respect to other groups.

As the k-value is an input parameter, (this is, the number of clusters should be pre-assigned) to obtain good results is very important a proper determination of this value. That is why we consider run a diagnostic check for determining the number of clusters in the data set. To find the number of groups (k) that minimize the objective function, we used the Elbow method (Thorndike, 1953), that looks at the percentage of variance explained as a function of the number of clusters. Percentage of variance explained is the ratio of the between-group variance to the total variance, also known as an F-test which is the ratio of two scaled sums of squares reflecting different sources of variability.

Therefore, once we had defined the groups, to learn more about the terminology in use and to map the relationship between concepts, we applied both word co-occurrence analysis and co-occurrence network methodologies.

Word co-occurrence analysis measures the strength of the relationship between two codes, where the presence of many co-occurrences around the same keyword drifts to a locus of

strategic alliance (Ding et al., 2001), revealing patterns and trends in a specific discipline (Cambrosio et al., 1993), retaining the essential information and enabling the conversion of data into a specific visual representation (Krippendorff, 2013).

To quantify the intensity of this relationship, we have used the correlation coefficient using ATLAS.ti Scientific Software v.6.2 (GmbH, Berlin, Germany) and applying the following formula:

$$c = n_{12}/(n_1 + n_2) - n_{12}$$

where n is the frequency of appearance and n_{12} is the co-occurrence frequency of the codes c_1 and c_2, whereas n_1 and n_2 are each code occurrence frequency. This c-coefficient should vary between zero (when codes do not co-occur) and unity (when two codes always co-occur).

To improve the abstraction of themes in our interpretation of the results, once the c-coefficient of the co-occurrence frequency table had been calculated, the researcher created a data representation, called a co-occurrence network or co-link map. The co-occurrence network shows a map of the collective interconnection of terms based on their paired presence, providing a graphic visualization of both the conceptual framework and the relationships among the concepts.

Co-word analysis and its representation have been used as a relevant method to explore intellectual structures in various fields, including medicine (Rikken et al., 1995; Jensen et al., 2001), politics (Zhou et al., 2005), physics (Bhattacharya and Basu, 1998; Rafols and Meyer, 2010), and scientometrics (Callon et al., 1991; Courtial, 1994) among others.

The methodology used to systematically assign and categorize the keywords to each dimension will lead us to four sets based on the meaning and sense of the keywords in terms of their relationship with the economic, environmental, social and governance spheres.

This assignment of keywords to a particular dimension has been carried out under specific selection criteria (Hackston and Milne, 1996), considering its repercussion within a scholarly system of ideas (Aiken and Williams, 1975) and through a systematic and objective identification of specific categories (Holsti, 1969; Zhang and Wildemuth, 2009).

To achieve this categorization we have relied on the GRI Sustainability Reporting Guidelines, which offers a frame for preparing sustainability reports by organizations regardless of their size, sector or location (Bouten et al., 2011), where economic, environmental and social issues are included in the specific standard disclosure and governance issues are included in the general standard disclosure. To our knowledge, this is the first attempt to systematise the literature review in this field using a tool that allow us to categorize the literature contributions following a consensual structure.

Following the structure proposed by GRI, the future allocation of keywords will be performed in one of four categories. The economic category includes aspects such as economic performance, market presence, indirect economic impacts or procurement practices. The environmental sphere has information about; inter alia, the use of resources, emissions and environmental grievance mechanisms. The social area is about labour practices, human rights, societal and product responsibility and the governance dimension considering not only the board's structure and composition but also various aspects of its role. For more details, see Fig. 3, which describes the various items contained in each area.

Two experts in the field have reviewed every keyword. Academic experts in sustainability, corporate social responsibility, and microfinance assigned each term to a category. When in doubt, the title and abstract of the articles from which keywords had been extracted were examined to contextualize them. In the event of any discrepancy in the classification of a word, a third expert reviewed the relevant keyword (Roman et al., 1999; Moneva et al., 2007). As in other studies of this nature, this paper sought an interpretative analysis to identify meaningful clusters of keywords (Seale et al., 2006) that would describe the economic, environmental, social, and governance dimensions.

3. Contextualizing the scientific production on microfinance sector

The strings used in the Web of Science search engine give us the result of 996 articles that contain the term microfinance in the title, abstract or keywords. This sample allows us to describe the scientific microfinance sectoral literature at a topic level.[1]

In terms of production, microfinance publications have risen at an increasing rate since 1997, but were in 2005—the year proclaimed by the United Nations Economic and Social Council as the International Year of Microcredit— and Professor Yunus' Nobel Prize in 2006 when growth augmented noticeably. Fig. 4 shows the curve of number of papers increase over the years.

Fig. 5 shows the total number of cited references for each year of all articles found with microfinance as topic. As in the case of the number of publications it has an increasing rate since 1997 and with an exponential growth since 2007, with a slight delay in relation to the growth in terms of production.

Price's index of obsolescence for 2015 indicates that 50% of the references are less than five years old. A high index indicates that the references correspond to recent documents and therefore is a dynamic subject. In the case of microfinance, this percentage coincides with obsolescence indicated by Price (1965) for the social sciences. Furthermore, its half-life is four years, showing that microfinance is a new subject.

The papers belong to different field research areas. According to the classification used in the source database, the main areas in which microfinance-related studies are published are Business and Economics (54%) and Public Administration (31%), whereas the remainder are dispersed among various fields as Social Sciences or Public Environmental Occupational Health. As far as language is concerned 97% of the papers are written in English and the main contributing countries are USA (38%), England (14%) and India (6%).

4. Results: comprehensive analysis of the microfinance sector articles' keywords

Once described the scientific production at a topic level, we will deepen through a comprehensive analysis of keywords to determine the extent of the contributions of the microfinance sectoral academic research in accordance with the EESG criteria and GRI framework.

Considering the articles where the keyword microfinance is present, almost 33% of the terms appear once or twice, and the average frequency of appearance is 2.4 times. The type-token ratio (ttr) from 1993 to 2014, date on which a change in trend is observed (see Fig. 4), was 53% and including until June 2016 is 44%. This shows us that there is a considerable dispersion of terminology and that it demands a considerable knowledge of the language to fully understand a text, but the decrease of the ttr including the last year and a half research, indicates that the new additions do not introduce large variations and the terms used are very similar. That is,

[1] In this section we have considered complete years to make them comparable (until December 2015). The rest of the study includes articles published up to June 2016.

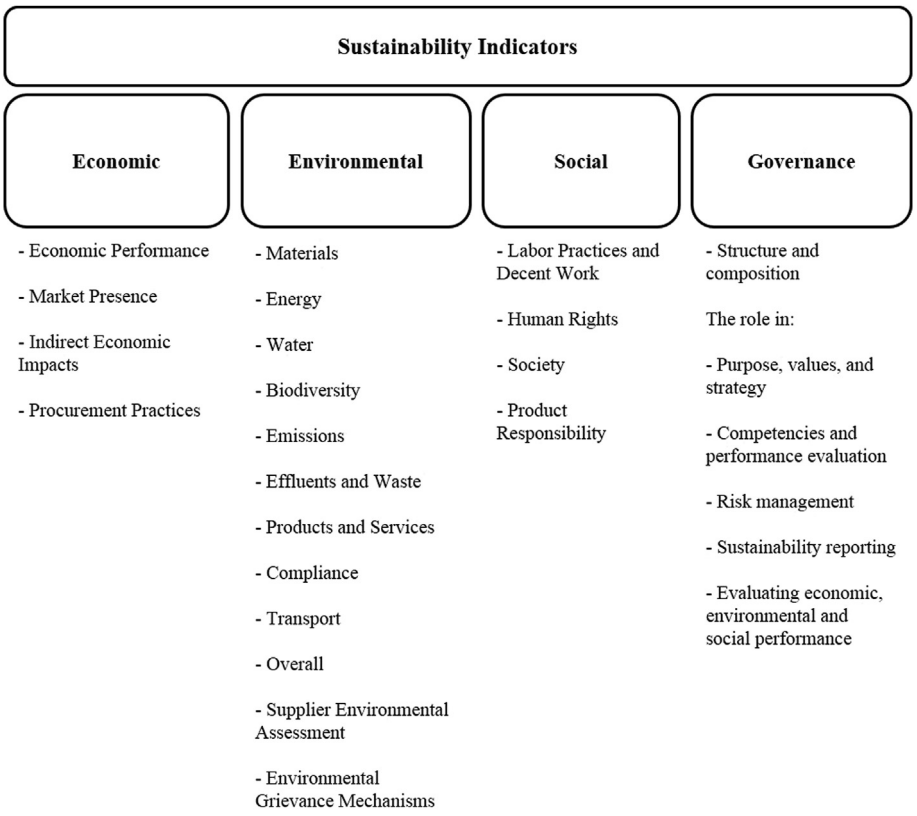

Fig. 3. Items contained in the Economic, Environmental, Social and Governance dimensions according to the GRI guidelines.
Source: adapted from the G4, GRI Sustainability Reporting Guidelines.

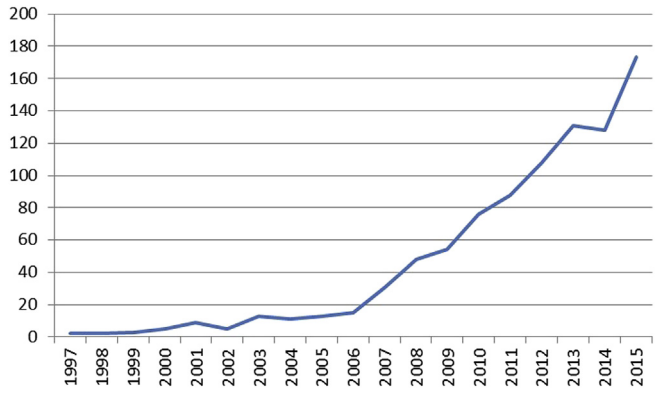

Fig. 4. The evolution of number of publications per year on microfinance topic (1997–2015).
Source: data from the Web of Science Results Analysis section (11/07/2016).

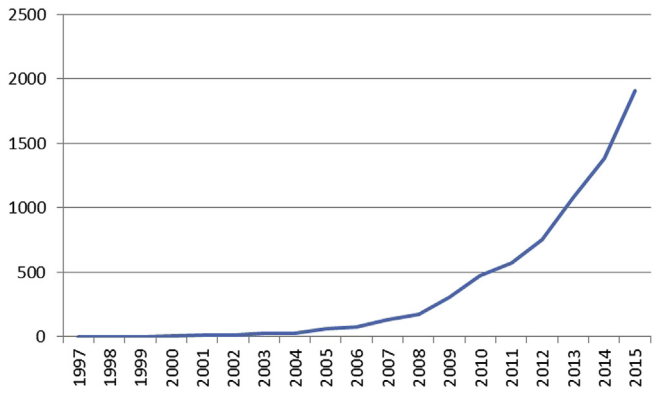

Fig. 5. The evolution of number of citations per year on microfinance topic.
Source: data from the Web of Science Citation Report (11/07/2016).

the total number of keywords raise but no the variety.

4.1. Analysis of keywords groupings

As explained in Section 2.2. In order to organize the data we have use k-means clustering method. First, to avoid distortion, is necessary to detect whether there are outliers and once isolated, determine the optimum k-value, which is the one that maximizes the percentage of variance explained. In the case of our sample, the Elbow method indicates that the appropriate number of groups is 3. Table 1 shows the change in the F-value depending on the number of groups (k) and that $k = 3$ has the highest percentage of variance explained.

Thus, the result after our clustering process provides us four groups. The first one, the group of keywords with extremely frequency that was isolated to avoid misrepresentation in the cluster analysis and the three groups proposed by the k-means clustering algorithm. Table 2 shows the methods for forming each group, the final distribution of the groups in relation to their frequency of appearance and the subsequent analysis method applied in the treatment of the keywords.

4.1.1. Terms with extremely high appearance frequency

This group contains the terms associated with the microfinance concept in the scientific literature whose frequency is well above

Table 1
Percentage of variance explained as a function of the number of clusters.

K-value	2	**3**	4	5	6
F-value	64.699	**70.272**	61.887	47.257	37.870

Bold text shows the maximun variance explained.

average, with a rate between 96 and 27. This means that in a paper about microfinance, the terms that most frequently appeared are as follows: *poverty*, *microcredit*, *microfinance institutions* or *MFIs*, *impact evaluation*, and *poverty alleviation*.

Fig. 6 shows the relationship between these concepts. The larger the size of the word, the higher the frequency of occurrence; whereas through the correlation coefficient, the thickness of the line states the strength of the connection.

An inter-related group with its centre in *microcredit* is generated, with the most powerful ramifications for *poverty*, *MFI*, and *impact evaluation*.

Sometimes the terms microfinance and microcredit are treated as synonymous, generating confusion. This situation is partly attributable to the high thrust and popularization of the sector that can be credited to Professor Muhammad Yunus, who first associated the terms microcredit and poverty (Yunus, 1999) and his work had a remarkable impact after he won the Nobel Peace Prize in 2006.

As the map shows and the above confirms, *poverty* and *microcredit* are the key terms associated with microfinance, and both terms have the highest correlation in the group. The papers in which the co-occurrence of these terms appear address microfinance from two perspectives. One view focuses on both the effect of loan provision in households and the purpose of obtaining conclusions supported by empirical evidence (Morduch, 1999; Mills, 2007; Joakim and Wismer, 2015); whereas the other focuses on an economic and political standpoint in which microfinance schemes provide a method for effecting global liberalization of the financial sector consistent with neoliberal visions of development (Weber, 2004, 2014).

Throughout these years, significant resources have been devoted to encouraging micro-credits, including the provision of donor funds and grants (Srnec et al., 2011). According to the OECD (2014) database, in 2010 the total net amount of official development aid (ODA) disbursement from all donors to developing countries reached its highest real level ever, increasing to USD 129 billion, and totalling USD 2.5 trillion over 50 years. It is unsurprising that the scientific literature not only portrays a growing interest in MFIs that commercialize their products and services but also attempts to measure assessments of their impact (Agha et al., 2004; Larrú, 2008; Kono and Takahashi, 2010; Takahashi et al., 2010; Kiiza and Pederson, 2012; Banerjee, 2013: Deininger and Liu, 2013; Duflo et al., 2013; Liket et al., 2014).

Here, we must specify there is a caveat to the above observation: this group of terms is composed of the terms that are most immediately related to microfinance and have achieved the status of identity signs. Nevertheless, although these terms are the most often referenced, they relate to concepts that are too broad to provide any specific and detailed information from a sustainability standpoint and it is difficult to categorize them in a single EESG dimension.

4.1.2. Terms with very high appearance frequency

Two terms—*outreach* and *gender*—define this group. They have an appearance frequency of 26. Although these terms' appearance frequency is the same, the relationship between them is weak. These two words do not often appear together. To confirm the weakness in the relationship between these terms, the term *women* was added to *gender* to check whether new relationships were established. The result was that no new relationship appeared between the terms.

The most frequent co-occurrence with *gender* is that of *development*; i.e., when research on *microfinance* and *gender* is undertaken, it explores the potential effect of microfinance on the development of gender (Johnson, 2005; Rohatynskyj, 2011; Maclean, 2012; Warnecke, 2014) or the opposite case, the effect of refusing microfinance loans (Chaudhry, 2016).

The term that most frequently co-occurs with *outreach* is *sustainability* and to a lesser extent, *mission drift*. When the bi-gram *outreach-sustainability* is established, we researched whether there was a trade-off between sustainability and outreach and how the two concepts were important to MFI funders when interrelated (Bassem, 2009; Gutiérrez-Nieto and Serrano-Cinca, 2009; Hermes et al., 2011; Hermes, 2014). It should be noted that in this case, sustainability refers to financial sustainability because it addresses whether MFIs were profitable enough to maintain and expand their services in the absence of subsidies (Rosenberg, 2009).

When there is a relationship between *outreach* and *mission drift*, the research focuses on establishing which environment is the most successful in avoiding mission drift (Vanroose and D'Espallier, 2013; Kar and Swain, 2014; Serrano-Cinca and Gutiérrez-Nieto, 2014).

Although there is a weak relationship between the high co-occurrence bi-gram of *outreach-gender* and the terms could be vague to categorize them according to the EESG criteria, taking into account their strongest relationships we can consider that the economic dimension is present when the research is about *outreach* and *financial sustainability*, social aspects when *gender* and *development* appear together and socio-economic issues when the investigation is about the mission drift when 'social performance assessment and management have failed to achieve the same clarity, consistency, and level of acceptance as financial performance assessment and management' (Copestake, 2007, p. 1722).

4.1.3. Terms with a high appearance frequency

In this group, the terms with greater frequency are *development* and *microenterprise*, followed by *social capital* and *women*. Fig. 7 shows the inter-relationship between these terms.

Development is the most strongly related to *self-help groups*. In the papers in which this co-occurrence appears, the researched topic focuses both on the implementation of socio-economic development programmes and on the evaluation of the impact of such projects on their intended result of empowering poor, rural women (De' and Ratan, 2009; Rohatynskyj, 2011; Antoniello, 2015;

Table 2
Distribution of terms according to their group constitution, frequency of appearance and treatment applied.

	Constitution method	Groups	Number of terms	Frequency of appearance	Method for analysis
201 keywords	Outlier analysis	Extremely high frequency	5	96–27	EESG + Co-occurrence
	K-means cluster (K = 3)	Very high frequency	2	26	EESG + Co-occurrence
		High frequency	12	25–15	EESG + Co-occurrence
		Moderate frequency	182	14–3	EESG and GRI category assignment + Co-occurrence

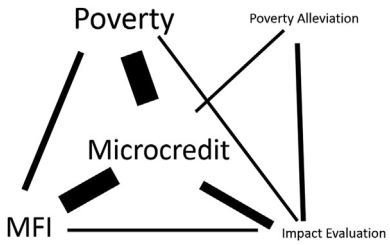

Fig. 6. Map of the terms with an extremely high appearance frequency.

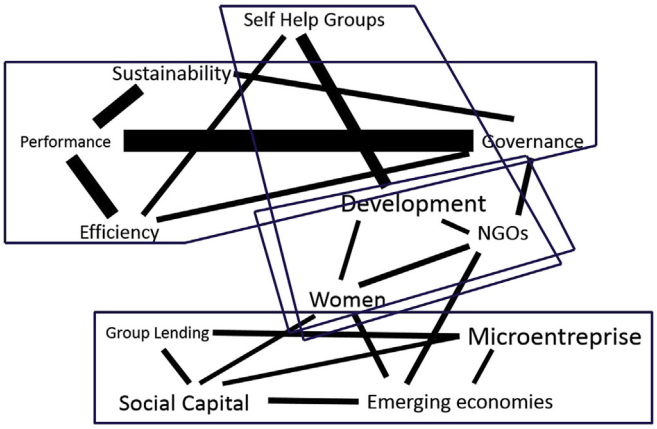

Fig. 7. Map of terms with a high frequency of appearance.

Sahu, 2015).

Accordingly, although there is a relationship between the two terms, *self-help groups* is a transversal concept. The direct relationship is between microfinance projects and the study of their impact; there, the term *self-help groups* emerges as a type of programme designed for village-based financial intermediary committees.

Development is also related to *NGOs* and *women*, creating an inter-related group that is found in papers that study microfinance as a development instrument, aspire to appraise the adequacy of NGOs' structure and activities related to microfinance programs, and drafting papers on the role of women as economic instruments, i.e., members of peer group lending schemes. That is, *development* is not associated with *gender*, but with microfinance as a tool for progress (Srnec et al., 2011; Smith, 2012; Schuster, 2014).

In addition to the fact that *social capital* and *microenterprise* interact with each other, these terms share co-occurrence with *emerging economies* and *lending group*. In the cases that we examined, two research lines using this group of concepts were observed: (1) those that treated debt repayment; and (2) those that aspired to explain how the provision of microfinance can result in both new venture creation and the growth of the existing business base (Heino, 2006; Boehe and Cruz, 2013; Giné and Karlan, 2014; Newman et al., 2014).

The term *performance*, although not noted for its frequency, provides strong co-occurrence relations when it is visible. When it appears, it therefore relates very directly to *governance*, *efficiency*, and *sustainability*. The highest correlation coefficient in this group is obtained by the bi-gram formed by the keywords *performance* and *governance*. Overall, the scientific literature that addresses these two aspects seeks to establish a relationship between governance-mechanisms and MFI performance through its board size and composition, the regulatory environment, and competition (Hartarska and Mersland, 2012; Kim, 2014); outreach that stems from the lending methodology (Bassem, 2009; Mersland and Strøm, 2009); the influence of the lender's level of transparency, and standards of good practices (Augustine, 2012; Waweru and Spraakman, 2012; Barry and Tacneng, 2014).

When related to *efficiency*, the studies normally examine the relationship between the firm's performance and the increase in its efficiency or financial results (Barry and Tacneng, 2014; Bos and Millone, 2015; Azad et al., 2016); as in the previous bi-gram, attention is devoted to the governance mechanisms, the board size and composition, and the effect of competition and regulatory environments (Hartarska and Mersland, 2009); the MFI's goal definition (Amersdorffer et al., 2014); and even the effect of religion (Mersland et al., 2013; Tower, 2016).

Sustainability emerges as a goal or objective. In previous studies, the study of the performance, the application of governance mechanisms, and the evaluation of efficiency suggested the need to find ways and tools that ensure sustainability. Although recent incorporations begin to conceptualize sustainability in a holistic manner (Bhanot and Bapat, 2015), the term sustainability is used from a strictly financial point of view, linking MFIs' sustainability with both their profit and their long-term existence.

At this point, it is observed that the main line of research relates to the economic dimension but also the governance sphere emerges as the mechanisms to achieve the efficiency in performance that could ensure MFIs' financial sustainability.

5. Discussion: contributions of microfinance sectoral literature to sustainability

Thus far, we have contextualized the scientific production on microfinance and explored the most common terminology to discover which issues are the most recurrently researched. We have observed that those keywords with an extremely high appearance frequency are too broad and imprecise concepts to categorize them in a particular EESG dimension. Keywords with a very high frequency relate to economic and social issues and the group with high frequency of appearance concern mainly to economic subjects and to a lesser degree governance.

To determine to what extent microfinance sectoral scientific literature is contributing to sustainability from an inclusive perspective that involves the EESG dimensions, we have assign the 182 keywords with a moderate frequency of appearance (between 14 and 3) to a particular EESG dimension following the method explained in Section 2.2. And then we have study the relations of both intragroup and intergroup for each dimension using the GRI Sustainability Reporting Guidelines as reference pointing out the matters that are researched as well as those that have not yet so far been approached.

When the scientific community investigates microfinance, it does so primarily in economic terms: 51% of the terms used as keywords correspond to this area, followed by 33% of the terms of a social nature and to a lesser extent, keywords related to corporate governance and environmental issues, both with an 8% of presence. In addition to considering the amount of papers, the analysis takes into account the strength or weakness of the relationships established between concepts, considering the correlation coefficient calculated as indicated in Section 2.2. Table 3 offers the percentage of papers inter-relating dimensions and the intensity of the correlation between concepts.

The most common relationship is given in papers of economic terms that relate to others of the same category (35%), followed by those articles that relate social with economic aspects (28%). In both cases the relationship between concepts is very strong. In 15% of the papers the relationship is established between concepts of the social sphere with a strong relationship. The percentage of

Table 3
Percentage of papers of each EESG pair combination of dimensions and the intensity of the relationships established.

EESG inter-relationship (sorted by % of papers)	%
Economic-Economic	35%
Economic-Social	28%
Social-Social	15%
Economic-Environmental	7%
Economic-Governance	6%
Social-Environmental	2,5%
Governance-Governance	2,5%
Social-Governance	2%
Governance-Environmental	2%
Environmental-Environmental	1%

Color coding	
	Very strong relation
	Strong relation
	Moderate relation
	Weak relation
	Very weak relation

papers where economic terms are related to environmental or governance aspects is very similar (7% and 6% respectively); however the intensity of the relation differs: in the first case the relation is weak and in the second is moderate. When it comes to social matters, these are related to environmental issues in a 2.5% with a very weak relationship between expressions, and in 2% with governance with weak correlation. The concepts of governance relate to others of the same category in a scant 2.5% of the time, but with a moderate correlation. Lower co-occurrences are given between environmental terms (1%) and environmental terms combined with governance (2%) and also with very weak and weak correlation respectively.

To integrate the EESG dimensions and the scientific literature, according to Lozano (2012), we have code the different GRI categories with respect to the microfinance sectoral academic research and its contribution to sustainability. Table 4 shows which issues are addressed and which topics are missing.

Then the results obtained from the analysis of the literature and using the GRI framework as a reference are presented. It will be shown that the economic and social dimensions feature a high production of texts that discuss a relatively wide variety of issues. The environmental dimension features both a very small number of papers and very generic information processing. The governance dimension features a variety of topics but very low production and that there is no balance among economic, social, environmental and governance dimensions in the academic literature on the microfinance sector. The results also will highlight the main missing areas in which to date has been investigated little or nothing.

5.1. The economic dimension and their inter-relationships

It is noted that in the economic dimension, *economic performance* and *indirect economic impacts* are the two most developed sections in the literature on the microfinance sector. *Economic performance* addresses issues such as investment performance, operational costs, interest rates, subsidies, donations, financial assistance received from governments, and financial sustainability.

Table 4
Analysis of the contributions of microfinance sectoral literature to sustainability under the GRI framework considering the issues addressed.

GRI framework categories for each sustainability dimension		Sustainability in the microfinance sectoral literature			
		Economic	Environmental	Social	Governance
Economic	Economic Performance	✓	–	✓	✓
	Market Presence	–	–	✓	✓
	Indirect Economic Impacts	✓	✓	✓	–
	Procurement Practices	–	–	–	–
Environmental	Materials	–	–	–	–
	Energy	–	–	–	–
	Water	–	–	–	–
	Biodiversity	–	–	–	–
	Emissions	–	✓	✓	–
	Effluents and Waste	–	✓	✓	–
	Products and Services	–	–	–	–
	Compliance	–	–	–	–
	Transport	–	–	–	–
	Overall	–	–	–	–
	Supplier Environmental Assessment	–	–	–	–
	Environmental Grievance Mechanisms	–	–	–	–
Social	Labor Practices and Decent Work	–	–	–	–
	Human Rights	–	✓	✓	–
	Society	✓	–	✓	–
	Product Responsibility	✓	✓	✓	✓
Governance	Structure and composition	✓	–	–	✓
	Purpose, values, and strategy	✓	–	✓	✓
	Competencies and performance evaluation	–	–	✓	✓
	Risk management	✓	–	–	✓
	Sustainability reporting	–	–	–	–
	Evaluating economic, environmental and social performance	–	–	–	–

Code: ✓Presence; – Absence.

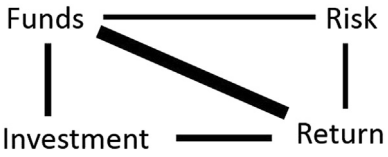

Fig. 8. The most closely related economic terms.

Indirect economic impacts include the impact evaluation of the products and services of the various microfinance programmes in development and poverty alleviation. Although this impact assessment is categorized in the economic section, it is closely related mainly to the results of the social area.

The connection of concepts with a higher correlation coefficient when the relationship is intragroup is shown in Fig. 8.

These papers investigate the investment performance of microfinance investment funds, their global risk, and their returns (Augsburg, 2009; Janda and Svárovská, 2010), along with the correlation of the dependence of these funds' returns on the performance of stock and fixed income markets when compared to benchmark market indices (Janda and Svárovská, 2013).

The other economic terms that show a strong correspondence are as follows: *informal finance*, which is present in the research on the reasons for the persistence of informal finance despite governmental attempts to increase credit availability and eliminate reliance on usurious financing (Tsai, 2004); and *rural finance*, *informal finance* and *interest rates,* all of which are found in the search for the relationship between formal and informal markets and the impact of microfinance programmes on the interest rates charged by moneylenders (Harper, 2012; Mallick, 2012). A third bigram—*correspondent banking* and *branchless banking*—has been found in a study of financial inclusion and how this type of banking is helping downscale financial services, resulting in the establishment of successful partnerships with local MFIs (Diniz et al., 2014).

In these three cases, even considering that the correlation is between strictly financial concepts, the spirit of the articles has a strong social vocation that considers, among other objectives, the relationship between the characteristics of the microfinance system and financial inclusion.

In the articles analysed, there is no reference to procurements practices or market presence, which is defined in the GRI guide as ratios of standard entry-level wage by gender or proportion of senior management. In the various investigations, market presence is related to corporate structure, outreach and the IMF target market. The most noticeable absence occurs in the lack of connection between the papers of economic content with respect to environmental impacts.

5.2. The environmental dimension and its inter-relationships

Although environmental issues are increasing their presence, especially in recent years that has raise from 1% in 2014 to 8% in 2016, is still one of the least often addressed dimensions in the microfinance sectoral literature. It presents the lowest frequencies of appearance and correlation coefficients both intra-group level and in connection with the other areas.

The very sparse presence of environmental concepts is especially remarkable considering that the environmental field has been one of the major drivers of the sustainability term (Tilbury, 1995; Dovers, 2005) as an essential third axis (along with the social and economic axes). Whereas in other sectors, sustainability is usually related to environmental aspects, in the case of the microfinance sector, it is virtually impossible to find a paper in which the term sustainability does not refer to financial sustainability.

It is possible that few authors have addressed microfinance from an environmental perspective because an MFI's activity does not directly generate a high environmental impact in terms of resource use, energy consumption, transport or emissions. However, activities financed by MFIs can have a high impact on biodiversity, pollution and waste generation (Allet, 2011) because MFI-financed businesses are often developed outside the regulatory framework (Nishat, 2004; van Elteren, 2007; Hall et al., 2008).

Organizations such as Microfinance Information Exchange, Inc (MIXMarket) consider this feature when evaluating MFIs, which distinguishes whether an MFI considers the environmental impact of the activity to be developed when granting a loan and whether their customers are penalized for developing activities that damage the environment. However, this type of valuation is not reflected in the scientific literature and research on this issue is included in a very small number of papers that usually refer to very broad and generic aspects such as *ecological responsiveness*, *environmental motivation* or *green* and do not address specific actions and consequences.

5.3. The social dimension and their inter-relationships

In the GRI framework, the social dimension includes *labour practices* and *decent work* and concerns aspects such as *employment conditions*, *health and safety*, *occupational training and education*, and *diversity and equal opportunity*, among others. The academic research focuses more on the social consequences of microfinance than on the direct effect on the MFI itself. Therefore, there is research on training and education, health and safety, and equal opportunities resulting from the implementation of microcredit programmes (Ssewamala et al., 2010; Bahng, 2013; Bairagi and Azzam, 2014).

In the *product responsibility* section, we must consider the type of business that the IMF operates. Accordingly, when GRI mentions *product and service labelling*, we must consider it as the quality of information about a product or service that is provided to customers, for example, interest rates and the method used for their calculation, the establishment of self-help groups and repayment conditions and loan recovery practices, among others. The literature shows the debate about the suitability of the application of a particular calculation method (González, 2010) and above all, over-indebtedness (Rahman, 1999; Hudon, 2009) as one of the primary issues associated with product responsibility in this sector.

Papers that address *human rights* are primarily focused on child labour (Landmann and Frölich, 2015; Chakrabarty, 2015), non-discrimination and more specifically, on women's empowerment. These papers dwell on the impact of microfinance programmes on women's economic well-being and empowerment, relating on the one hand to gender violence and HIV prevention and on the other hand to children's nutrition and health. These studies conclude that interventions that address women's economic and social vulnerability could contribute to reductions in HIV risk behaviour (Pronyk et al., 2008; Dworkin and Blankenship, 2009) and that the presence of MFIs in communities significantly improves children's health and nutrition (DeLoach and Lamanna, 2011) and establish a connection between MFI interventions and the generation of positive ethical strength in negative contexts such as high-level poverty and women's powerlessness (De' and Ratan, 2009; Rohatynskyj, 2011; Chakrabarty and Bass, 2014) to determine repayment capacity (D'Espallier et al., 2011).

Society section is primarily reflected in the literature by research that treats the impact of programmes on *local communities* (Schreiner and Woller, 2003; Smets, 2006; Parvin and Shaw, 2013) and *indigenous rights* (Fomba, 2008; Ferguson, 2010).

Although the social sphere is widely investigated in microfinance, there are still areas with little information as are the implications of Human Rights with regard to governance, as well as the implications of microfinance in the society from the environmental and governance point of view.

5.4. The governance dimension and its inter-relationships

In this area, must be considered that the number of articles is very limited but that the literature on governance issues is diverse and the co-occurrence correlation shows a moderate connexion intra-group and a strong link with economic matters.

Structure and composition, *purpose, values and strategy*, *competencies and performance evaluation* and *risk management* are discussed, generally, in studies that aim to improve financial performance and outreach. On the one hand, studies that address the governance dimension attempting to establish the relationship between the performance and governances mechanisms (e.g., board characteristics, CEO compensation, or various types of firm ownership) (Hartarska and Nadolnyak, 2007; Hartarska and Mersland, 2012; Mersland et al., 2013; Saj, 2013; Amersdorffer et al., 2014), considering either the cost of such mechanisms (Mersland, 2009) or how institutions allocate surplus to stakeholders (Périlleux et al., 2012). And on the other hand, but to a lesser extent, papers that examine the effect of MFI competition and regulations on their outreach and financial performance (Cull et al., 2011).

The scientific community has not dwelt upon the corporate governance-microfinance pairing holistically. Its foremost objective has been to improve MFIs' financial performance, typically reaching conclusions that involve the need to implement both good governance practices (Rock et al., 1998; Helms, 2006; Mersland and Strøm, 2009) and better regulation for MFIs (Christen et al., 2003; Hartarska and Nadolnyak, 2007). The current sectoral literature on microfinance does not reflect the role of governance in the *triple bottom line evaluation* or *sustainability reporting*.

Once the findings of the studies were presented, we found that there is no balance among the EESG dimensions in the academic literature on the microfinance sector. This unbalanced among the different areas, it is not exclusive of the microfinance literature. As Crifo and Forget (2015) point out, in the case of Corporate Social Responsibility financial analysis prevails over social or how the environmental dimension has led the concept of sustainability in most areas (Tilbury, 1995; Dovers, 2005). That is, the four EESG criteria are important, but the context in which they operate determines their relevance and grants different weights to each one.

In this sense, although it can be considered that microfinance industry is established at the bottom of the pyramid and the main goals could be related to social and economic aspects, in our opinion, further research should be done in those areas where it has been detected major gaps in the literature. Consistent with prior research, more empirical evidence on MFIs' environmental performing is demanded (Hall et al., 2008; Allet and Hudon, 2015; Serrano-Cinca et al., 2016), also greater attention to governance mechanisms (Hartarska, 2009; Beisland et al., 2015; Mori et al., 2015) and a holistic approach in the study of sustainability, once some minimal favourable social conditions are achieved (Haughton, 1999; Moran et al., 2008; Saint-Supéry et al., 2014).

6. Conclusions

This paper contemplated an inclusive framework to analyse the contribution of microfinance sectoral scholarly research according to the EESG criteria and the GRI structure, relied on a systematic review of an extensive and growing literature of high academic impact journals. First, regarding terminology, we surveyed how the main concepts discussed, primarily link microfinance to microcredit, MFIs, and the evaluation of their impact, especially in relation to their effect on poverty alleviation, development, and financial inclusion. These investigations seek to improve the performance of the microfinance projects and its welfare impact. Second, there is a clear asymmetry among various areas of study; economic and social fields tend to have more of a presence (described in Table 3) and consider a greater variety of issues. Third, studies on environmental and governance matters have been most often set aside and the interrelation with other areas are lacking (identified in Table 4). This study furthers the undertaking of investigation in a comprehensive fashion and proposes the scientific research production as the beacons of change to lead this the challenging process of implementing a sustainability analytical framework, in order to promote synergies and trade-offs among economic agents, policymakers, and academics that encourage the development of sustainability management in microfinance sector.

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