



# **A meta-analysis examining the nature of trade-offs in microfinance**

**Patrick Reichert**

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Keywords: Microfinance, Performance, Outreach, Efficiency, Meta-analysis

JEL Classifications: C12, G21, L25, L31

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# A meta-analysis examining the nature of trade-offs in microfinance

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## Abstract

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# 1 Introduction

Over the past twenty years, microfinance has become one of the most widely used financial tools to address poverty reduction. The number of microfinance clients worldwide has risen from 16.5 million in December 1997 to more than 204 million by December 2012 (Reed, 2014). Although well-known examples such as Grameen Bank, ASA and BRAC of Bangladesh, BancoSol of Bolivia and BRI of Indonesia were initially replicated in developing nations as a simple, collateral-free ‘credit delivery system’, today’s microfinance sector includes a wide range of institutional profiles with varying mission statements, methodologies and product offerings (Armendáriz and Morduch, 2010).

Microfinance provides financial services (credit, savings, insurance, etc.) to low-income populations excluded from the formal financial sector (Hermes et al., 2011)<sup>1</sup>. Originally a non-profit initiative, microfinance has taken an increasingly commercial approach over the past two decades characterized by profitability, competition and regulation (Christen, 2001). Aiming to achieve rapid growth, increase their client base, improve portfolio quality and become financially sustainable, MFIs must also ensure they are meeting their development goals of poverty reduction, financial inclusion and female empowerment (social performance/outreach). Often, these development goals put pressure on MFIs’ financial performance, and many MFIs worry that a social focus may deteriorate operational efficiency, portfolio quality or (Gutiérrez-Nieto et al., 2009; Gonzales, 2010). Although academics and practitioners have stressed the importance of both profitability and outreach for the long-term sustainability of the sector, the ability to achieve these ‘dual missions’ simultaneously remains a highly debated point of contention, creating a so-called ‘schism’ within the industry (Conning, 1999; Woller, 2007; Morduch, 2000).

The schism alludes to an inherent trade-off between the social and financial goals of microfinance given that unit transaction costs are higher for smaller loan amounts (Conning,

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<sup>1</sup> Churchill and Frankiewicz (2006, p21-22) further expand on the most common microfinance products, which include: income-generating loans, emergency and consumption loans (in case of natural catastrophes or family deaths), housing loans, leasing (new forms of micro leasing e.g. cattle), savings, insurance, payment services and nonfinancial services such as social intermediation, business development, social service and consulting or technical assistance.

1999; Lapenu and Zeller, 2002). The prioritization of financial goals has raised concern over whether the need to pacify the interests of donors, private investors and other actors comes at the expense of breadth (number of clients) and/or depth (socio-economic level) of microfinance outreach (Armendáriz and Szafarz, 2011; Hermes and Lensink, 2011).

In order to address this controversy, a proliferating body of empirical work has emerged, investigating the potential trade-offs between the financial and social aims of microfinance. Surprisingly, while some studies have confirmed the existence of trade-offs (Olivares-Polanco, 2005; Cull et al., 2007; Hermes et al., 2011), others have rejected the presence of trade-offs (Paxton, 2007; Kipasha and Zhang, 2013) and still more studies report synergies between financial sustainability and social outreach indicators (Gutierrez-Nieto et al., 2009; Mersland and Strøm, 2010; Louis et al., 2013). Overall, the current lack of conclusive empirical evidence permits the possibility of a meta-analysis to synthesize the current state of the literature and attempt to identify characteristics that may bias studies towards either confirmation or rejection of trade-offs between financial and social performance.

Given the current knowledge gaps in the trade-off debate, this paper aims to contribute to the literature in the following ways. First, I synthesize articles relating to trade-offs in microfinance across development, economics and management publication outlets. Second, I present evidence about the performance indicators, the time-period and the data sources used to investigate microfinance trade-offs based on a meta-analysis of the existing literature. Where contradictory results exist, a meta-analysis is an established and powerful method to systematically synthesize the empirical findings (Orlitzky et al., 2003). From an initial search of 3,299 articles, I screened the articles to conduct a meta-analysis on 274 observations stemming from 61 empirical studies.

Overall, our findings indicate that the use of the Mix Market database is less likely to confirm the existence of social-financial performance trade-offs as compared to ratings data or self-collected datasets while the use of efficiency indicators increases the likelihood of trade-off confirmation. Additionally, we find weaker evidence to suggest that studies using microfinance profit indicators (OSS/FSS), using an economic frontier analysis methodology or that are published in development journals are more likely to report evidence of trade-offs.

The remainder of the paper proceeds as follows: section 2 describes traces the development of the microfinance sector and details the theoretical context for the social and

financial performance trade-off debate. Section 3 provides an overview of the systematic review and meta-analysis methodology. Section 4 presents the results while section 5 provides a brief discussion and some directions for future research. Section 6 concludes.

## **2 Theoretical Framework**

### **2.1 Evolution of the microfinance sector**

The conceptual grounding for sustainable microfinance grew out of the failed, subsidized microcredit programs of the 1960's-1970s (Adams, Graham and Von Pischke, 1984) often plagued by “political interference, haphazard governance, poor and often corrupt management, untrained and unmotivated staff, unwanted products, low repayments, high costs, and high losses” (Robinson, 2001, p.147). Until the late 1980s, microfinance institutions (MFIs) were primarily non-profit, non-governmental organizations (NGOs) focused on poverty alleviation that required substantial subsidies to accomplish their social objectives (Armendáriz and Labie, 2011; Hudon and Traca, 2011).

However, since the 1992 transformation of the Bolivian NGO PRODEM into BancoSol, a shareholder firm, the industry has experienced a movement out of donor-supported initiatives and embraced a more commercialized approach where MFIs adopt market-based principles and manage on a business basis as part of the regulated financial system (Armendáriz and Morduch, 2010; Christen and Drake, 2002).

Encouraged by the success of the microfinance model, commercial banks have also “downscaled” activities, creating profit-oriented microfinance programs (Assefa et al., 2013). This commercialization of microfinance has also expanded the products and services offered by microfinance institutions. Microcredit has given way to the umbrella term of ‘microfinance’, which incorporates savings, insurance, remittances, cash transfers and in some cases business development services and value chain finance to consumers. More than 10,000 MFIs are thought to be in existence worldwide, operating through a wide range of institutional profiles including cooperatives, credit unions, NGOs, government agencies, private and public banks and permutations of these forms (Brau and Woller, 2004; Hartarska, 2005). The microfinance market now represents a competitive sector including both nonprofit and for-profit microfinance institutions (Servin et al., 2012).

Given the increased commercialization of the microfinance industry, another faction of literature has begun to contextualize microfinance within the broader macroeconomic environment (Galema et al., 2011; Ahlin et al., 2011; Brière and Szafarz, 2015). As the majority of non-profit institutions are often legally restricted from taking public deposits and since domestic capital markets are often underdeveloped, international capital markets play an important role for the future funding of MFIs (Galema et al., 2011). Using a sample of 373 MFIs from 1996-2007, Ahlin et al. (2011) find evidence that MFIs are better able to cover their costs in strong economic environments. Brière and Szafarz (2015), using the full universe of publicly traded MFIs, show convergence with mainstream finance indices but also suggest that increased market correlation could reduce the number of female borrowers. Vanroose and D’Espallier (2013) explore the relationship between outreach and the performance of MFIs and the traditional financial sector and find that MFIs serve more clients and obtain higher profits in countries where access to the traditional financial sector is low. The authors also find that MFIs move downstream and serve poorer clients in well-developed financial markets, indicating that higher competition with the traditional banking sector makes mission drift less likely for microfinance institutions (Vanroose and D’Espallier, 2013).

Understanding the recent financial crisis’ impact on microfinance has also attracted the attention of academics (Lensink, 2011; Wagner and Winkler, 2013; Daher and Le Saout, 2015). Lensink (2011) provides evidence that the financial crisis has had negative consequences on MFIs’ performance related to profitability, growth and portfolio quality. Wagner and Winkler (2013) confirm the findings of Lensink (2011), adding that credit growth was even more severe for MFIs receiving funds from domestic and international financial markets. Finally, the article of Daher and Le Saout (2015) finds that the financial crisis has had a negative impact in terms of MFI profitability while noting that the more profitable MFIs have less outreach post-crisis. Taken together, I hypothesize:

**Hypothesis 1:** Trade-offs between financial and social performance are less likely to be observed in pre-crisis observations.

## **2.2 Information disclosure in microfinance**

Although data on the performance of MFIs is critical to the advancement of policy initiatives, data collection has been a slow process due to the relative infancy of the sector (Bauchet and

Morduch, 2010). The topic of information disclosure has become increasingly important as microfinance institutions tap capital markets for additional funding. In the traditional finance literature, high-quality disclosure practices have been shown to increase liquidity and investor confidence in financial markets (Diamond and Verrecchia, 1991), but can also help to legitimize a company (Patten, 1992).

In recent years, a growing number of MFIs have started reporting their performance data to international databases. Although multiple data collection initiatives exist, the most popular source for academic studies to date has been the Mix Market database.<sup>2</sup> Originally created as a United Nations Conference on Trade and Development (UNCTAD) project, the Mix Market was subsequently supported by the Consultative Group to Assist the Poor (CGAP) and allows a wide range of information to be accessed by researchers, investors and other microfinance stakeholders (Gutiérrez-Goiria and Goitisoló, 2011). Mix Market stresses transparency and has implemented a diamond rating system to indicate the reliability of submitted data; the system is a cumulative score from one to five diamonds. The first diamond is earned by having a visible profile; the second diamond is given to MFIs who provide some data related to their products and clients. The third diamond is awarded to those MFIs who provide some financial data. Four diamond ratings are reserved for MFIs who furnish audited financial statements while five diamond MFIs also present a rating/due diligence report in addition to the previous requirements.<sup>3</sup>

However, because reporting information to these microfinance databases is voluntary, analysis based on these databases can be subject to self-selection bias. Bauchet and Morduch (2010) identify three manifestations of self-selection bias: (1) institutions reporting to any source are likely to be different than those who do not submit any data; (2) MFIs select which database they report to which may cause the institutions reporting to one database to be materially different than those reporting to an alternative database; (3) MFIs may report some indicators (or years) but not others which may reflect poorly upon the institution (Bauchet and Morduch, 2010).

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<sup>2</sup> Another large microfinance database is The Microcredit Summit (MCS) Database, which contains limited information on a large number of MFIs. In the most recent update for data corresponding to December 2012, 3,718 MFIs provided their number of borrowers (totaling nearly 204 million), number of “poorest” borrowers, and their profitability. The report summary is published annually and the annual reports can be found at <http://www.microcreditsummit.org>.

<sup>3</sup> More information about the Mix Market methodology can be found at [www.mixmarket.org](http://www.mixmarket.org)

In addition, over the past fifteen years, a number of firms have started to specialize in rating assessments for microfinance institutions. These rating reports help microfinance stakeholders such as lenders, investors, owners, donors and managers to make informed decisions (Beisland and Mersland, 2012). CGAP and the Inter-American Development Bank (IDB) launched the first international rating fund to offer cofunding of microfinance ratings in 2001 and two new initiatives were in place by 2008 to promote the use of microfinance rating assessments (see [www.ratinginitiative.org](http://www.ratinginitiative.org) and [www.ratingfund2.org](http://www.ratingfund2.org)). Rating agencies take into account a number of factors while assessing institutional performance such as management, capital adequacy, portfolio quality, growth prospects, efficiency, risk, rates of return and social performance (Beisland and Mersland, 2012). Current evidence finds that better ratings are associated with larger, more profitable, more efficient and less risky MFIs (Gutiérrez-Nieto and Serrano-Cinca, 2007; Beisland and Mersland, 2012).

Few empirical studies exist on the financial and social disclosure practices of MFIs. However, Gutiérrez-Nieto et al. (2008) employ legitimacy theory to examine the influences of MFI information disclosure. The authors find that MFIs generally have low levels of disclosure for both financial and social performance, although for-profit MFIs generally disclose more financial information while NGOs disclose more social indicators. Bauchet and Morduch (2010) identify differences between the MCS and the Mix Market databases. Restricting their Mix Market sample to institutions with 3+ diamonds, the authors find that the Mix Market sample was more likely to identify trade-offs between the outreach variable, percentage of women borrowers, and the sustainability variable, operational self-sufficiency. In summary, the authors find that more rigorous reporting processes are more likely to confirm evidence of financial-social performance trade-offs. Similarly, I make the following hypothesis related to information disclosure sources and financial-social performance trade-offs:

**Hypothesis 2:** Self-reported data will be less likely to confirm the existence of financial-social performance trade-offs than data reported through ratings reports.

### **2.3 Performance of Microfinance Institutions**

Microfinance has been traditionally viewed as pursuing a double bottom line approach with both financial and social objectives. However, the managerial capacity, as well as the technical feasibility, to achieve both goals simultaneously has been called into question (Copestake, 2007). Under this context, two schools of thought initially emerged regarding the objectives of microfinance organizations.

The first approach, or Welfarist school, tends to favor depth of outreach (or the ability to reach the poorest clients who are costly to serve) over breadth of outreach (number of clients served) and gauges institutional success more so by social metrics than by financial results (Brau and Woller, 2004). They believe that while self-sustainability is desirable, it is not viewed as necessary (Omri and Chkoundali, 2011). Brau and Woller (2004) suggest that Welfarists envision a microfinance industry with multiple institutional types, both for-profit and non-profit entities, targeting different markets with diverse sets of funding and various levels of commitment to financial and social returns.

On the other hand, the Institutionalist approach employs two measurements of success: outreach and sustainability. Institutionalists favor the ability to cover the operating and financing costs of microfinance institutions (Olivares-Polanco, 2005). Emphasis on financial self-sustainability stems from the notion that donors are fickle and will withdraw funds given a shift in the political environment and, as a result, MFIs would collapse (Schreiner, 2000). Without profits, MFIs will be unable to attract private capital and therefore be unable to saturate the market for microfinance services (Rosenberg, 1994). Consequently, organizational success emphasizes breadth of outreach over depth of outreach and tends to prioritize financial metrics that measure institutional progression towards self-sufficiency.

Early consensus suggested an inherent trade-off between financial self-sustainability and depth of outreach (e.g. von Pischke, 1996), but there is significant debate about the nature, extent and implications of the trade-off (Brau and Woller, 2004). Some authors assert that the relationship between sustainability and outreach can work in harmony if the financial emphasis results in efficiency gains, attracts commercial funds (and voluntary deposits) that can help expand outreach (Rosengard, 2004; Frank, 2008). Other authors suggest that a financial focus shifts the focus towards efficiency, which can crowd out the small loans

demanded by the poorest as they are more costly to serve (Mosley and Hulme, 1998; Weiss and Montgomery, 2005; Galema and Lensink, 2009).

To understand the outcomes of commercialization, both social and financial performance need to be well defined. Given their multi-faceted nature (Mersland and Strøm, 2008; Tchakoute-Thugoua, 2010), analysis of social and financial performance must be performed across multiple dimensions. Table 1 highlights standard measures of both financial and social performance. Broadly, social performance seeks to understand the level of poverty of microfinance clients, the type of products being delivered and the cost of financial services while financial performance is concerned with whether an institution earns enough revenue to cover its full costs without subsidies (Zeller and Meyer, 2002).

[INSERT TABLE 1 ABOUT HERE]

Outreach is typically measured across two dimensions: breadth, or the number of clients served; and depth, the poverty level of clients. Depth of outreach is often proxied by average loan size and taken as a ratio over per capita GNI for international comparisons (Olivares-Polanco, 2005). Both indicators are subject to certain shortcomings. First, in countries with high income inequality, per capita GNI exceeds both median and poverty-income levels. As a result, cross-country comparisons with a wide range of income inequalities may not lead to meaningful results (Schreiner, 2001). The primary limitation of loan size as a proxy for depth of outreach is when the basic assumption does not hold – i.e. the smaller the loan size, the poorer the client (Olivares-Polanco, 2005). Where access to credit is limited, richer clients will be willing to assume high opportunity costs to borrow small amounts of money (Dunford, 2002; Hatch and Frederick, 1998). Finally, average loan size (as with other depth measures such as percentage of female or rural clients) is simply a single average for the entire institution. These average measures can be misleading, not only because they fail to provide information about the income distribution of clients but also because average loan size does not incorporate the loan term, loan type or lending methodology of the institution (Paxton, 2007). Despite these limitations, average loan size is often used as an indicator due to its low cost and easy extraction from existing data infrastructure (Hatch and Frederick, 1998).

Depth of outreach is also frequently represented by the gender distribution of the portfolio (Bhatt and Tang, 2001). Olivares-Polanco (2005, p. 57) claims that “studies on women and development show that women are relatively poorer than men; therefore, any institution

engaged in reaching mostly women should provide smaller loans.” Percentage of women borrowers is the primary gender indicator used in microfinance. D'espallier et al. (2013) find that a higher percentage of female clients is associated with lower portfolio risk, fewer write-offs and fewer provisions. The article of Conning (1999) illustrates that MFIs that target poorer borrowers must charge higher interest rates and have higher personnel costs per dollar loaned.

**Hypothesis 3a:** Increased transactions costs of small loans result in lower operational efficiency; the use of depth of outreach indicators will be more likely to induce trade-offs with financial performance.

**Hypothesis 3b:** Female borrowers could reduce costs related to portfolio risk; the use of depth of outreach indicators will be less likely to induce trade-offs with financial performance.

A mixture of profitability, portfolio quality and efficiency indicators are generally used to measure financial performance. Profitability or sustainability of an MFI is typically measured by financial self-sufficiency (FSS), operational self-sufficiency (OSS), return on assets (ROA) and/or return on equity (ROE). The self-sufficiency indicators measure an MFIs' ability to cover its costs through financial and operating revenues. ROA and ROE measure how well the MFI uses its total assets and equity capital to generate returns (Hartarska 2005; Kar, 2012). While common finance measures such as ROE and ROA are frequently used, they fail to capture the impact of subsidies on the income statement, and ROE may also be distorted by differences in the financing structure between NGOs, non-banking financial institutions (NBFIs) and banks (Olivares-Polanco, 2005). As a result, additional measures such as the Subsidy Dependency Index (SDI), suggested by Yaron (1992), or Financial Self-Sufficiency (FSS) used by the Microfinance Information eXchange (MIX), a non-profit organization concerned with supporting the MFI industry, have been developed to capture the sustainability of MFIs (Yaron and Manos, 2007).

Given the social nature of the microfinance industry, sector participants have long preferred the term sustainability to profitability. OSS refers to an MFI's ability to cover all of its costs through its financial revenue. FSS measures the extent to which an MFI covers adjusted operating expenses with adjusted operating income; adjustments are typically made to account for 'soft loans' (a loan, typically from a donor or government, with a lower interest

rate than a MFI could have obtained from commercial sources), donated equity, grants for technical assistance and adjustments for inflation (CGAP, 2003; Ledgerwood, 1999).

From a comparative perspective, the use of OSS has one distinct advantage: it does not penalize MFIs that have accessed commercial financial markets. As MFIs have different capital structures, two institutions with similar performance as measured in ROA, could have greatly varying OSS if one funded its portfolio mostly from equity and the other from debt. Unlike other indicators, such as ROA, which compare income statement accounts to balance sheet accounts, the calculation of OSS does not require period averages in the denominator as both the numerator and the denominator come from the year-end income statement.

**Hypothesis 4:** Microfinance specific indicators will be better able to capture trade-offs between financial performance and social performance.

Along with the increased focus on financial sustainability, rising competition, the interest of commercial banks, the entrance of private investors, technological change and increased financial liberalization and regulation policies have also encouraged academics to undertake efficiency studies of microfinance institutions (Rhyne and Otero, 2006). Balkenhol (2007) reports that efficiency is a more robust and reliable indicator than other financial performance measures. The most commonly used efficiency indicator for MFIs is the operating expense ratio and measures by dividing the operating expense over gross loan portfolio or total assets, although other measures such as cost per borrower and additional expense ratios for personnel, administrative and financial expenses are commonplace (Quayes and Khalily, 2014).

**Hypothesis 5:** Efficiency indicators are more likely to confirm evidence of trade-offs between financial and social performance.

## **2.4 Economic frontier methodologies and microfinance performance**

An increasing number of empirical studies measure the performance of MFIs in terms of an economic frontier, i.e. how well an individual MFI performs (financially and/or socially) in relation to the maximum performance given available resources. Firms are efficient if they maximize the quantity of an output for given quantity of inputs, i.e. operate at the lowest cost of inputs for a given quantity of output (Quayes and Khalily, 2014). These studies employ more sophisticated techniques to calculate this frontier such as data envelopment analysis (DEA) or stochastic frontier analysis (SFA) (Lebovics et. al, 2015). Both SFA and DEA

measure the efficiency of an individual MFI by comparing its distance to an optimal frontier defined by the best performing MFIs within the sample (Hartarska et al., 2013).

Efficiency gains could result in improved profitability, increased market penetration and/or the facilitation of social objectives from cost savings in the form of lower interest rates to customers (Brand, 2000). Because economic frontier methodologies estimate the maximum possible production given a minimum set of cost inputs rather than investigating the mean estimates (as in OLS regressions) I hypothesize that:

**Hypothesis 6:** Economic frontier methodologies are more likely to confirm evidence of trade-offs between financial and social performance.

## **2.5 Dominant logics in publication outlets**

Research on trade-offs in microfinance draws upon a strong multidisciplinary approach. Researchers working in a variety of disciplines are committed to understanding and analyzing the role of institutional performance trade-offs. As a result, organizational researchers must understand how these sub disciplines, often based on different institutional logics, tend to conceptualize the same topic. In contested areas of research, the interrelated activities of researchers, reviewers, and editors may promote the advancement of different institutional logics across different disciplines (Orlitzky, 2011).

The academic literature related to the institutional performance of MFIs primarily appears in the fields of economics, management and development journals. The article of Orlitzky (2011) presents a meta-analysis on the relationship between corporate social performance (CSP) and corporate financial performance (CFP), critically investigating the trade-off between these two objectives across the publication outlet in which the evidence appears. Segmenting the literature by articles that appear in economics, management and social issues journals, the author provides an excellent theoretical overview of the expected logics for each publication outlet, drawing expectations that social issues journals would yield positive relationships between financial and social aims while economics would be more likely to find negative relationships between CSP and CFP (Orlitzky, 2011). Given the similar publication outlets for microfinance articles, I hypothesize:

**Hypothesis 6:** In development journals, findings regarding the social-financial performance tradeoff relationship are expected to be negative, rejecting the existence of trade-offs.

### **3 Methodology**

#### **3.1 Search for relevant studies**

In order to collect a representative sample of studies to meta-analyze, I conducted a three-step systematic search as described by Denyer and Tranfield (2009) and as applied by other scholars (Pinz and Helmig, 2014; Chliova et al., 2015). First, I conducted structured searches of academic databases of EBSCO, EconLit, Scopus and Science Direct, during the period of June to November 2015. I used combinations of keywords containing two or three of the following: “microfinance”, “microcredit”, “performance”, “social performance”, “financial performance”, and “efficiency”, and searched the databases in the fields of title, abstract and article keywords. I also searched manually for articles in a number of respected development, management and economics journals, in addition to identifying grey literature through Google Scholar with the same search terms. Finally, I reviewed the reference sections of articles that had already been deemed relevant through the initial database search, as well reference sections from other reviews on microfinance (Duvendack et al., 2011; Goldberg, 2005; Roy and Goswami, 2013; Chliova et al., 2015; Van Rooyen et al., 2012; Brau and Woller, 2004).

The search of systematic review sources revealed 47 documents. A total of 3,088 publications were identified through online bibliographic databases. Including the unstructured searches, a total of 3,299 records were identified for screening. The full search log can be found in Appendix A.

#### **3.2 Criteria for relevance**

The following screening criteria were applied to identify relevant articles. Adhering to the central theme of this article, only papers related to the topics of microfinance performance and efficiency were included. Papers focusing on other microfinance topics (e.g. mobile payments, impact studies, community-led savings groups, informal microfinance, etc.) were judged irrelevant. Thus, only articles that investigated the performance of microfinance institutions

were included (supply-side focused); client-focused studies were excluded. I also constrained the final sample to articles that empirically test trade-offs between the financial or social objectives of MFIs, although it is possible that some studies use financial (or social) indicators merely as control variables.

With respect to time criteria, searches were limited to articles since 1990. Brau and Woller (2004) argue that academic journals published very little on microfinance before the mid-1990s. Only sources in English were considered and no geographical restrictions were taken into account. Regarding source type, only newspaper and web articles were excluded. I included peer-reviewed studies, practitioner reports and unpublished materials from the grey literature that I judged reliable to extend the scope of the analysis. The issue of paper quality and publication bias is addressed in later stages of the systematic review framework.

The application of these criteria resulted in 857 studies from the title and abstract, of which I was able to retrieve 529 full text articles. Unfortunately, a number of studies, even though quantitative, do not report the necessary statistics, although many of the retrieved articles were helpful to frame the trade-off debate and provide background information. After reviewing the full text articles, a total of 61 empirical studies remained to quantitatively assess the relationship between financial and social performance.

### **3.3 Problems with search identification and screening**

I would like to briefly draw attention to the differences between systematic reviews in development studies and those found in health and/or natural sciences. Similar to Duvendack et al. (2011), I note the difficulty searching through the academic databases as a great number of abstracts are not structured and often do not mention the main question under investigation or the methodology employed. It was not always possible to tell from the abstract whether the article was a review or primary research. Due to the opaqueness in the abstracts (and indexing terms), specific and sensitive searches were difficult to execute. Consequently, I attempted to under-parameterize the search queries.

### 3.3 Characteristics of primary studies

The final empirical sample consisted of 61 studies.<sup>4</sup> Table 2 provides the descriptive statistics for the articles included in the meta-analysis. On average, studies were published in 2012 with a standard deviation of roughly 3 years. Approximately 74% of the trade-off articles use the Mix Market database; data collected from The Rating Fund<sup>5</sup> was the only other source with a sizeable user base (11.5% of studies); the remaining datasets were typically self-collected through various government and microfinance support networks. Articles published in development journals composed half of the sample; other articles were primarily published in economics (26.2%) or management (14.8%) journals while another 8.2% of the sample consisted of high quality working papers.

[INSERT TABLE 2 ABOUT HERE]

Regarding dataset characteristics, on average, articles captured 320.18 MFIs from 45.56 countries over a time period of 5 years. Median values report 208 MFIs from 56 countries over a period of 5 years. With respect to the variables used in the trade-off articles, only institutional variables (2.92 variables), financial performance (1.16 variables) and outreach (2.57 variables) were found to be present more than once in a given study on average. This makes some intuitive sense as most studies report zero for the other variable categories depending on the lens of the article; this also helps to validate the sample as our systematic searches aimed to provide evidence on the trade-off between financial and social performance. Finally, we note that not all authors classify variables in the same categories. As a workaround, variables are categorized according to the MixMarket Indicator Definitions<sup>6</sup> and cite a number of studies for additional variables when necessary.

### 3.5 Measures

#### *Dependent Variable*

To identify trade-offs, we first searched each article for regressions or correlations with both financial and social variables and then observed the relationship between social performance

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<sup>4</sup> The full list of articles included in the final sample can be found in Appendix B.

<sup>5</sup> The Rating Fund consists of all available risk assessment reports conducted by five major rating agencies (MicroRate, Microfinanza, Planet Rating, Crisil, and M-Cril). ([www.ratingfund.org](http://www.ratingfund.org))

<sup>6</sup> Mix Market indicator benchmarks can be retrieved from the following link (accessed on July 29, 2015): [www.themix.org/publications/microbanking-bulletin/2010/10/2009-mfi-benchmarks](http://www.themix.org/publications/microbanking-bulletin/2010/10/2009-mfi-benchmarks)

variables and other variable categories (financial performance, revenue, expense, risk, productivity and efficiency). To quantify the trade-off evidence, we take a simple sum of all trade-offs within a given regression and divide by the total number of possible trade-offs (trade-offs + synergies + non-significant findings). For example, if a study finds a trade-off between average loan size and ROE, a non-significant finding between percentage of women borrowers and ROE and synergy between number of active borrowers and ROE, we calculate a score of 33% and suggest mixed trade-off evidence, although any score above zero is coded as a 1 for the probit regressions described in the following section.

### *Statistical Conventions Used in the Meta-analysis*

This section discusses the model and the estimation procedure used for our meta-analysis on the statistical significance of estimates from primary studies on financial-social performance trade-offs. We use a probit model for which we distinguish between two estimate categories as described in the previous section. Using a probit model is standard practice for meta-analyses examining the direction and statistical significance of the effect under investigation, (e.g. Mulatu et al., 2003; Van der Sluis et al., 2005). Koetse et al. (2006) note that when information on the magnitude of the estimated effect is absent, or in which estimates are simply incomparable in magnitude, most meta-analyses create a categorical variable to account for the direction and the statistical significance of the estimated effect. The model suited for analyzing the variation in a categorical variable with two categories is the probit model. This model assumes that there is a latent variable  $y^*$  that can be explained by a set of explanatory variables  $x_i$ , which may include a constant, such that:

$$y^* = \sum_i \beta_i x_i + \varepsilon_i \quad (1)$$

where  $\varepsilon$  is an error term assumed to be normally and independent and identically distributed. What we actually observe is information on the binary variable  $y$ . In our case  $y$  consists of the two categories discussed above; with  $y = 0$  implying that an observation does not confirm any trade-offs,  $y = 1$  for an observation that has at least one confirmed trade-off. The observed variable  $y$  has the following structure:

$$\begin{aligned} y &= 0 \quad \text{if } y^* \leq 0 \\ y &= 1 \quad \text{if } y^* > 0 \end{aligned} \quad (2)$$

To analyze the direction and statistical significance of the financial-social performance relationship we use a meta-model specification with dummy variables in order to identify potential sources of estimate variation. Common to meta-analyses in economics, we also need to reconcile the fact that a single study produces multiple estimates. As shown in Bijmolt and Pieters (2001), estimating a hierarchical level model serves as a good way to deal with the issue of multiple sampling. However, similar to the paper of Koetse et al. (2006), we note that this model deals specifically with meta-analyses on the size of the effect, and is not applicable to the present meta-analysis that investigates only direction and statistical significance. We therefore take a different approach and estimate baseline regressions using the multiple estimates as studies with multiple effects may be more reliable, but we also include a robustness check giving equal weight to each article as suggested by Koetse et al. (2006).

#### *Independent Variables*

Trade-offs in microfinance performance are measured in a variety of ways in the literature. Based on prior theorizing, we were particularly interested in measures that represented the following categories of outcomes: database characteristics and time period of the sample, financial and social indicators used to investigate trade-offs, the methodology used to evaluate performance trade-offs, and the publication outlet. Definitions for these variables can be found in Table 3. The full correlation matrix between the independent variables can be found in Appendix C.

[INSERT TABLE 3 ABOUT HERE]

## **4 Results**

From the final sample of 61 articles, 274 quantitative, empirical observations were identified. Each observation corresponds to a regression equation or correlation between a financial performance indicator and social outreach indicator from the initial article. As some observations contain multiple financial-social performance trade-off indicators, a total of 554 potential trade-offs are analyzed. The following sub-sections provide descriptive results, attempting to identify trends by the indicators used, the data source and the time period under study.

## 4.1 Descriptive results

### *Database and time trends*

Three data sources (MIX, ratings data and self-collected datasets) were identified from the met-analysis observations. Table 4 provides an overview of the evidence of trade-offs by data source. Of the 274 observations, 96 (35%) confirm evidence of trade-offs between financial and social performance. Of the 191 potential trade-offs from the Mix Market dataset, 133 (69.6%) found no evidence of trade-offs. Moreover, the average percentage of trade-offs found in Mix Market observations (18.5%) was distinctly lower than those found in the ratings data (29%) or the self-collected data sources (42.9%).

[INSERT TABLE 4 ABOUT HERE]

Ratings data are slightly more likely to find evidence of trade-offs than Mix Market observations (34% compared to 30.4%) and find a larger percentage of performance trade-offs per observation (29% compared to 18.5%). The self-collected observations are nearly twice as likely as Mix Market observations to confirm the existence of trade-offs (63.6%) and find, on average, 42.9% trade-offs per observation.

A dummy variable was created for observations that took place before the 2008 financial crisis. Using 2008 as a cut-off year, we find that pre-2008 observations confirm trade-offs 30.7% on average while post-2008 observations find trade-offs 41.4% of the time. These initial findings suggest that the recent financial crisis may have forced MFIs to make choices between their financial objectives and social goals. Table 5 presents the trade-off observations by time period.

[INSERT TABLE 5 ABOUT HERE]

### *Trends by performance indicators*

Table 6 provides an overview of trade-off evidence by our indicator categories. Of the 554 trade-off relationships identified, 118 confirmed the existence of performance trade-offs (21.3%).

With respect to the financial performance indicator categories, expense indicators are more likely to confirm the existence of trade-offs (71.4% confirmation rate) than other financial

indicator categories; the next highest financial performance category is efficiency indicators, which confirm trade-offs roughly a 31% confirmation rate. Of particular note are the findings related to the depth of outreach indicators and the expense indicators where results indicate that nearly 93% of the time these indicators interact, trade-offs are confirmed. Interestingly, the relationship between depth of outreach and risk indicators is much lower than other financial categories, perhaps stressing the credit worthiness and/or demand of the poorest MFI customers.

[INSERT TABLE 6 ABOUT HERE]

Regarding the social performance indicator categories, depth of outreach indicators are more likely to find evidence of trade-offs than either outreach to women or breadth of outreach. Breadth of outreach appears to be comparatively more likely to find trade-offs when efficiency indicators are used while depth of outreach appears to be much more likely to experience trade-offs with profit indicators (both for traditional profit indicators ROA/ROE as well as the microfinance specific indicators of OSS/FSS).

#### *Trends by methodology and publication outlet*

With respect to methodology, we use a dummy for observations that employ the use of DEA or SFA to assess performance trade-offs. Of the 274 observations, 34 stem from articles using an economic frontier methodology and 25 (73.5%) of them confirm the existence of trade-offs. Results by publication outlet are presented in Table 7. Surprisingly, observations found in economics journals are far more likely to reject the existence of performance trade-offs as compared to those observations coming from management or development journals. Observations coming from development journals account for more than half of the total observations and confirm the existence of trade-offs in 56.9% of cases compared to economics journal observations that confirm trade-offs at a rate of 80.7%.

[INSERT TABLE 7 ABOUT HERE]

## **4.2 Regression analysis**

### *Baseline regressions*

Baseline regressions are presented in Table 8. We first assess the likelihood of finding financial-social performance trade-offs by looking at characteristics of the data sample. From

the first regression, we find that observations that use Mix Market as the data source and articles that study time periods before the financial crisis of 2008 are significantly less likely to confirm trade-offs than observations using other data sources or examining more recent time periods.

[INSERT TABLE 8 ABOUT HERE]

The second specification adds variables to account for the presence of depth of outreach, portfolio risk, institutional efficiency and microfinance profit indicators. The use of microfinance indicators (OSS/FSS) and efficiency indicators are found to significantly increase the likelihood of confirming performance trade-offs. Surprisingly, the presence of depth of outreach indicators within an observation is found to lower the likelihood of performance trade-offs, although in unreported regressions the decomposition of female indicators and loan size indicators eliminates the significance levels. MixMarket remains significantly negative while the pre-financial crisis variable remains of the same sign but loses significance.

The third specification includes a dummy variable for economic frontier methodology observations (either SFA or DEA). Results indicate that the use of an economic frontier methodology significantly increase the likelihood of finding a trade-off between social and financial performance. Of the tested performance indicators, the microfinance profit and efficiency indicators retain the same signs and levels of significance while the indicator for depth of outreach drops significance but retains its sign. Again, the use of Mix Market remains negative and statistically significant while the pre-financial crisis dummy is non-significant.

The final baseline regression adds a dummy variable for observations published in development journals. The results show significant, although only at the 10% significance level, evidence that development journals are more likely to confirm evidence of performance trade-offs as compared to management or economics journals, rejecting our initial hypothesis that development journals would be less likely to report negative relationships between the financial and social performance of MFIs. The results from the previous baseline regressions remain significant and of the same sign with the exception of the Mix Market dummy, which retains its sign but drops its significance in the final regression equation.

*Robustness checks*

Robustness checks are presented in Table 9. We perform the robustness checks at the article level, thereby giving each article equal weight. We use the same dependent variable, a dummy that takes a value of 1 if the article contains an observation that confirms the existence of trade-offs and a value of 0 if the article's observations do not confirm trade-offs. As a result, the sample size for the robustness check regressions is reduced to 61 empirical articles.

[INSERT TABLE 9 ABOUT HERE]

By and large, the findings remain similar to those in the baseline regressions, although the significance levels drop out for a number of variables. The Mix Market coefficient remains negative and significant across all specifications, confirming the earlier evidence that Mix Market data samples are less likely to predict trade-offs than the ratings data and self-collected datasets. The findings for efficiency indicators also remain statistically significant and of the same sign as the baseline regressions, indicating that trade-offs are more likely to be confirmed when looking at the expense and efficiency indicators of microfinance institutions.

Somewhat surprisingly, the results for the economic frontier methodology drop their significance levels during the robustness checks. This could be the result of the smaller sample size and the corresponding change in the percentage of economic frontier methodology observations. Indeed, for the baseline regressions, economic frontier observations are present for 12.4% of the sample but account for 27.9% of the articles included in the robustness checks. The next section provides a brief discussion of the results, some directions for additional research and addresses some weaknesses related to the study.

## **5 Discussion**

Before 2007, the majority of evidence related to the possible trade-off between social and financial objectives consisted primarily of theoretical arguments and anecdotal support, with a small amount of limited empirical evidence (Hermes et al, 2011). This assertion seems to be upheld by our results as the earliest article in our sample appears in 2005 and articles, on average were published in 2012. Our most robust findings are the negative impact of the Mix Market database and the positive impact of efficiency variables in the confirmation of performance trade-offs for microfinance institutions.

The results of the present research suggest that the use of Mix Market data is less likely to confirm trade-offs than observations coming from self-collected or ratings data sets.<sup>7</sup> One possible explanation for this finding could relate to the information disclosure practices of MFIs reporting to these databases. A common concern that many researchers have with the use of the Mix Market dataset is a possible risk of sample selection bias, or that perhaps MFIs only begin reporting to the Mix Market once they have achieved sustainability or reach sufficient scale (Kar and Swain, 2014; Olivares-Polanco, 2005).

Of the 45 Mix Market articles in our data sample, only 23 provide information regarding the Mix Market diamond ratings. As a result, it is not always possible to identify whether a study uses high quality, audited financials or whether the data is self-reported to the Mix Market. Conversely, the ratings database consists of uniform, high-quality audited reports, although some evidence has been proposed indicating that not all microfinance ratings reporting agencies carry the same weight (Beisland and Mersland, 2012). As such, one fruitful avenue of future research could aim to provide a comparison of these two widely used microfinance datasets to identify potential institutional reporting biases, similar to the initial paper comparing the Mix Market and MBB datasets by Bauchet and Morduch (2010). Additionally, understanding how trade-offs differ across information disclosure practices as called for by Gutiérrez-Nieto et al. (2008) could be of interest, perhaps by analyzing performance trade-offs through a segmentation of the Mix Market database by diamond rating. We also recommend that future Mix Market studies provide more descriptive details related to the institutional profiles and associated diamond ratings.

The second primary finding of this article lead to the suggestion that the use of efficiency and expense variables are more likely to confirm the existence of SP-FP trade-offs. Most articles from our sample look at ROA, ROE, OSS or FSS, and costs in relation to outreach. Return figures are influenced by costs and yield simultaneously, and both increase with higher depth of outreach (Meyer, 2015). If outreach has a positive impact on yield (Conning, 1999) and a negative impact on costs (Hermes et al., 2011; Cull et al., 2007), the resulting effect may have a very weak consequence on return measures. This could explain why we see weak

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<sup>7</sup> Self-collected datasets from our sample were collected in collaboration with a government or apex institution.

evidence for profitability measures but stronger support for the efficiency indicators used in our regression analysis.

As with all literature reviews, the analysis presented in this article is subject to limitations. First, due to the search methodology and inclusion/exclusion criteria, this article is biased towards articles published in academic journals. Grey literature and book chapters were occasionally cited, but only if picked up through unstructured searches via Google Scholar or the bibliographies of articles used within the paper. Nevertheless, we are confident that the search methods generated a sufficient body of articles for a thorough analysis. However, we also note the risk of publication bias common to the meta-analysis methodology. Rothstein et al. (2005, p. 1) define publication bias as, “what occurs whenever the research that appears in the published literature is systematically unrepresentative of the population of completed.” In the present study, authors are likely to report only those regressions with significant results, thereby providing a possible upward bias in the detection of trade-offs or synergies between social and financial performance. Finally, the regression outputs from the present study obtain relatively low pseudo R-squared values. Although this indicates our explanatory power is quite low, we note that these figures are in line with other meta-analyses across the social science fields (Doucouliagos and Paldam, 2008; Koetse et al., 2006). Additional meta-analysis investigating the nature of trade-offs in microfinance could seek to find additional parameters to increase the explanatory power with additional variables related to the articles or the institutional characteristics of the underlying MFIs.

## **6 Conclusion**

The objectives of this meta-analysis were two-fold. First, I aimed to synthesize the current state of the literature with respect to articles investigating performance trade-offs in the microfinance sector. To this end, more than 3,000 articles were screened, producing a final sample of 61 quantitative, empirical trade-off articles. Summary statistics of the study artifacts were produced to identify article attributes that influence the nature of trade-offs in microfinance, the second objective of the meta-analysis.

Along these lines, the use of the Mix Market data and a focus on efficiency indicators were found to be the main determinants of trade-off confirmation. Studies that use the Mix Market dataset were found to be less likely to confirm evidence of performance trade-offs. On the

other hand, articles that use an economic frontier methodology and use efficiency indicators are more likely to confirm trade-offs between the financial and social objectives of MFIs.

Future research could aim to address the issue of information disclosure and the nature of performance trade-offs, perhaps by segmenting the Mix Market database by diamond ratings to understand how trade-offs differ across various levels of information disclosure. At the organizational level, fruitful areas of research may target the role of institutional efficiency, and correspondingly, how MFIs internally monitor potential performance trade-offs. Finally, questions remain as to what extent social investors are willing to accept a decrease on returns (or an increase in the riskiness of returns) to achieve higher outreach.

The shifting landscape of microfinance from a non-profit orientation to a more formal, commercial and profit-oriented marketplace is challenging MFIs to address issues such as institutional transformation, product diversification, and rapid portfolio growth. Commercialization offers MFIs the possibility to diversify their funding base, scale funding sources and widen their product range (Hartarska et al., 2013). However, the social mission of microfinance is under pressure. Identifying and measuring the extent to which social goals must be sacrificed is of interest to the wider microfinance stakeholder universe. It is relevant for policy makers when deciding on whether or not to subsidize microfinance; it is relevant for microfinance practitioners for their decisions to further improve the efficiency of their operations; and it is relevant for commercial investors, especially those who aim for socially responsible investments.

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## Tables

TABLE 1: MICROFINANCE PERFORMANCE INDICATORS

Financial Performance	Profitability: return on assets, return on equity, profit Sustainability: operational self-sufficiency, financial self-sufficiency, subsidy dependence index Portfolio quality: repayment rates, portfolio at risk, loan-loss ratio Productivity: # clients per loan officer, # loans per staff member, # staff per branch Efficiency: cost per borrower, operating expense ratio, total expense ratio Financial structure: debt-to-equity ratio, portfolio-to-assets ratio, debt-to-asset ratio
Social Performance	Breadth of outreach: # of clients reached; number of female clients Depth of outreach: poverty level of clients, proxied by average loan size, % female clients Scope of outreach: # of financial services offered by MFI Length of outreach: time frame during which MFI provides financial services Cost to Clients: captures interest rate charged to clients and transaction costs to client (transport/documentation, etc.) Worth to Clients: customer willingness to pay for microfinance services

Note. – This table is sourced from Ledgerwood (1999), Schreiner (2002) and Cull et al. (2009)

TABLE 2: DESCRIPTIVE STATISTICS FOR EMPIRICAL SAMPLE

<b>Variable (N=61)</b>	<b>Mean</b>	<b>Std.</b>	<b>Min</b>	<b>Max</b>
<b><u>Dataset Characteristics</u></b>				
<i>Data source</i>				
Database, MIX Market	73.8%	-	0	1
Database, Ratings Data	11.5%	-	0	1
Database, Self-collected	14.8%	-	0	1
<i>Data sample characteristics</i>				
# of MFIs (under study)	320.18	339.90	5	1499
# of countries (under study)	45.56	35.70	1	109
# of years (under study)	4.97	3.56	1	14
<b><u>Indicators</u></b>				
# of outreach variables	2.57	1.00	1	5
# of financial performance variables	1.16	1.07	0	4
# of efficiency variables	0.82	0.90	0	4
# of revenue variables	0.49	0.56	0	2
# of expense variables	0.54	0.90	0	4
# of productivity variables	0.38	0.58	0	2
# of risk and liquidity variables	0.59	0.64	0	2
# of institutional variables	2.92	1.78	0	8
# of financing structure variables	0.43	0.69	0	3
# of macroeconomic variables	0.57	1.03	0	4
# of governance variables	0.28	0.96	0	5
<b><u>Methodology</u></b>				
Economic frontier methodology	27.9%	-	0	1
<b><u>Article Characteristics</u></b>				
Year published	2011.90	2.73	2005	2015
<i>Outlet</i>				
Development	47.5%	-	0	1
Economics	29.5%	-	0	1
Management	14.8%	-	0	1
Working Paper	8.2%	-	0	1

Note. – A table of the variable categories and specific indicators is available upon request.

TABLE 3: INDEPENDENT VARIABLE DESCRIPTIONS

Variable	Definition
Dataset Characteristics	
Mix Market	MixMarket is a dummy variable that takes a value of 1 if the observation uses Mix Market database and 0 otherwise.
Pre-financial crisis	Pre_financial_crisis is a dummy that takes a value of 1 if the complete timeframe under study is before 2008 and 0 otherwise.
Performance Indicators	
SP_Depth of Outreach	SP_Depth of Outreach is a dummy that takes a value of 1 if depth of outreach indicators are present in the observation (ALS, ALS/GNIpc, %Fem) and 0 otherwise.
FP_OSS/FSS	FP_MF Profit Indicators is a dummy that takes a value of 1 if microfinance profitability indicators are present in an observation (OSS, FSS) and 0 otherwise.
FP_Risk	FP_Risk is a dummy that takes a value of 1 if risk indicators are present (PaR30, Write-off ratio) and 0 otherwise.
FP_Efficiency	FP_Efficiency is a dummy that takes a value of 1 if efficiency or expense indicators are present (Op expense ratio, Total expense ratio, Cost per borrower, total expenses) and 0 otherwise.
Methodology	
Economic frontier	Economic Frontier is a dummy that takes a value of 1 if an observation is based on Data envelopment analysis or Stochastic frontier analysis and 0 otherwise.
Publication Outlet	
Development journal	Development_journal is a dummy that takes a value of 1 if an observation is published in a Development journal and 0 otherwise.

Note. – This table provides a description and a number of summary statistics for the main variables used throughout this study. Variables are categorized into dataset characteristics, social performance-financial performance indicators, methodological variables and publication outlet.

TABLE 4: TRADE-OFF EVIDENCE BY DATA SOURCE

<b>Database</b>	<b>Mix Market</b>	<b>Ratings data</b>	<b>Self-collected</b>	<b>Total</b>
Evidence of trade-offs	58	17	21	96
No evidence of trade-offs	133	33	12	178
<b>Total</b>	<b>191</b>	<b>50</b>	<b>33</b>	<b>274</b>
% of trade-offs found per observation	18.5%	29.0%	42.9%	23%

Note. – This table reports the number of potential trade-off observations reported by data source and the corresponding percentage of trade-offs found per observation.

TABLE 5: TRADE-OFF EVIDENCE BY TIME PERIOD

<b>Database</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>Total</b>
Evidence of trade-offs	1	-	2	12	-	7	15	13	4	21	17	4	96
No evidence of trade-offs	-	11	2	14	8	24	10	44	17	29	19	-	178
<b>Total</b>	<b>1</b>	<b>11</b>	<b>4</b>	<b>26</b>	<b>8</b>	<b>31</b>	<b>25</b>	<b>57</b>	<b>21</b>	<b>50</b>	<b>36</b>	<b>4</b>	<b>274</b>

Note. – This table provides details on the time period of articles investigating the performance trade-offs. For multi-year observations, the year is the most recent year under investigation.

TABLE 6: TRADE-OFF EVIDENCE BY INDICATOR CATEGORY

By Indicator Category	Depth of Outreach	Outreach to Women	Breadth of Outreach	Scope of Outreach	Totals for FP Categories
Traditional Profit Indicators	54 (20.4 %)	34 (2.9 %)	34 (2.9 %)	1 (0 %)	123 (10.6 %)
MF Profit Indicators	55 (27.3 %)	32 (12.5 %)	20 (5 %)	2 (0 %)	109 (18.3 %)
Expense Indicators	14 (92.9 %)	10 (40 %)	11 (72.7 %)	-	35 (71.4 %)
Revenue Indicators	23 (17.4 %)	20 (20 %)	15 (0 %)	1 (0 %)	59 (13.6 %)
Efficiency Indicators	49 (26.5 %)	36 (25 %)	38 (42.1 %)	-	123 (30.9 %)
Productivity Indicators	16 (25 %)	15 (20 %)	4 (0 %)	-	35 (20 %)
Risk Indicators	30 (6.7 %)	18 (22.2 %)	22 (4.5 %)	-	70 (10 %)
Totals for SP Categories	241 (25.7 %)	165 (17.6 %)	144 (18.8 %)	4 (0 %)	554 (21.3 %)

Note. – Each cell reports the number of trade-offs investigated and the percentage of the trade-offs confirmed. For example, of the 54 observations between traditional profit indicators and depth of outreach, 20.4% confirmed trade-offs.

TABLE 7: TRADE-OFF EVIDENCE BY PUBLICATION OUTLET

<b>Publication Outlet</b>	<b>Economics</b>	<b>Management</b>	<b>Development</b>	<b>Working paper</b>	<b>Total</b>
Evidence of trade-offs	17	8	66	5	96
No evidence of trade-offs	71	9	87	11	178
<b>Total</b>	<b>88</b>	<b>17</b>	<b>153</b>	<b>16</b>	<b>274</b>

Note. – This table provides a summary of trade-off evidence by the publication outlet.

TABLE 8: BASELINE REGRESSIONS FOR SP-FP TRADE-OFFS

(Dependent Variable: SP-FP Dummy)	(1)	(2)	(3)	(4)
Data				
MixMarket	-0.397** (0.168)	-0.387** (0.184)	-0.396** (0.187)	-0.298 (0.195)
Pre-financial crisis	-0.275* (0.159)	-0.173 (0.173)	-0.199 (0.176)	-0.190 (0.178)
FP-SP Indicators				
SP_Depth of Outreach		-0.412* (0.245)	-0.333 (0.250)	-0.377 (0.251)
FP_MF Profit Indicators		0.384* (0.211)	0.392* (0.212)	0.408* (0.214)
FP_Risk		-0.242 (0.237)	-0.271 (0.243)	-0.290 (0.244)
FP_Efficiency		1.116*** (0.185)	0.978*** (0.192)	0.922*** (0.194)
Methodology				
Economic Frontier			0.806*** (0.260)	0.823*** (0.260)
Outlet				
Development_journal				0.319* (0.189)
Constant	0.046 (0.163)	-0.157 (0.328)	-0.257 (0.336)	-0.463 (0.356)
Observations	274	274	274	274
Pseudo R-squared	0.0252	0.165	0.1932	0.2014
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Note. – The dependent variable for all models is a dummy that takes a value of 1 if an observation confirms trade-offs between financial performance and social performance indicators.

TABLE 9: ROBUSTNESS CHECKS FOR SP-FP TRADE-OFFS

(Dependent Variable: SP-FP Dummy)	(1)	(2)	(3)	(4)
Data				
MixMarket	-0.853** (0.414)	-0.811* (0.431)	-0.803* (0.442)	-0.817* (0.447)
Pre-financial crisis	-0.240 (0.349)	-0.166 (0.372)	-0.158 (0.383)	-0.149 (0.385)
FP-SP Indicators				
SP_Depth of Outreach		0.246 (0.584)	0.267 (0.641)	0.247 (0.642)
FP_OSS/FSS		0.004 (0.365)	0.007 (0.366)	0.002 (0.367)
FP_Risk		-0.028 (0.397)	-0.019 (0.412)	-0.053 (0.426)
FP_Efficiency		0.729** (0.366)	0.719* (0.384)	0.729* (0.386)
Methodology				
Economic Frontier Methodology			0.038 (0.466)	0.031 (0.467)
Outlet				
Development journal				0.114 (0.362)
Constant	1.017** (0.409)	0.416 (0.734)	0.378 (0.869)	0.359 (0.872)
Observations	61	61	61	61
Pseudo R-squared	0.0565	0.1152	0.1153	0.1165
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Note. – The dependent variable for all models is a dummy that takes a value of 1 if an observation confirms trade-offs between financial performance and social performance indicators.

## Appendix A: Search Strategy

We conducted searches in the following ways:

- A. Sources for published systematic reviews, protocols for ongoing reviews, and trials:
  - (1) Cochrane Collaboration (2) Campbell Collaboration and (3) EPPI Centre
- B. We searched the following online bibliographic databases:
  - 1. Structured Search
    - a) JOLIS (the database of 14 World Bank and International Monetary Fund libraries)
    - b) British Library for Development Studies (BLDS)
    - c) ELDIS (an online library of development literature provided by the Institute of Development Studies, Sussex, UK)
    - d) Scopus
  - 2. Unstructured Search
    - a) ProQuest
    - b) ECONLIT (Database of economic literature)
    - c) CGAP
    - d) DFID
- C. We searched for grey literature via Google Scholar via unstructured searches.
- D. We checked the reference lists of included papers as they were identified

### Search Log:

Data Source	Date	Articles Found	Articles Retrieved	Included in meta-analysis	Keyword
<i>Systematic Review</i>					
Cochrane Library	17-Feb-15	1	0	0	microfinance
Campbell Library	17-Feb-15	22	0	0	microfinance
EPPI- Centre	17-Feb-15	24	0	0	microfinance
<i>Structure Search</i>					
JOLIS	17-Feb-15	41	0	0	microfinance
ELDIS	17-Feb-15	30	11	0	microfinance
BLDS	17-Feb-15	100	22	0	microfinance
Scopus1	03-Apr-15	2500	310	39	microfinance or microcredit
Scopus2	05-Nov-15	417	22	9	microfinance and performance or efficiency
<i>Unstructured</i>					
Unstructured Search	Multiple	126	126	5	microfinance and performance or efficiency
Article Citations	Multiple	38	38	8	n/a
<b>Totals</b>		<b>3,299</b>	<b>529</b>	<b>61</b>	

## Appendix B: Full list of articles included in systematic review

Author (Year)	Title	Meta-analysis observations
Abate, Borzaga & Getnet (2014)	Cost-efficiency and outreach of microfinance institutions: Trade-offs and the role of ownership	4
Anduanbessa (2009)	Statistical analysis of the performance of microfinance institutions: The Ethiopian case	2
Annim (2012)	Targeting the poor versus financial sustainability and external funding: Evidence of microfinance institutions in Ghana	5
Annim (2012)	Microfinance efficiency: Trade-offs and complementarities between the objectives of microfinance institutions and their performance perspectives	4
Bassem (2012)	Social and financial performance of microfinance institutions: Is there a trade-off?	12
Bolli & Vo Thi (2014)	Regional differences in the production processes of financial and social outputs of microfinance institutions	2
Bos & Millone (2015)	Practice What You Preach: Microfinance Business Models and Operational Efficiency	1
Burzynska & Berggren (2015)	The Impact of Social Beliefs on Microfinance Performance	2
Campbell & Rogers (2012)	Microfinance institutions: A profitable investment alternative	2
Chahine & Tannir (2010)	On the Social and Financial Effects of the Transformation of Microfinance NGOs	4
Chakravarty & Pylypiv (2015)	The Role of Subsidization and Organizational Status on Microfinance Borrower Repayment Rates	2
Crabb (2008)	Economic freedom and the success of microfinance institutions	1
Crawford et al. (2011)	Are profitable microfinance programs less efficient at reaching the poor	1
Cull et al. (2015)	Benchmarking the financial performance, growth, and outreach of greenfield MFIs in Africa	16
Cull, Demirguc-Kunt & Morduch (2011)	Does Regulatory Supervision Curtail Microfinance Profitability and Outreach?	4

Cull, Demirguc-Kunt & Morduch (2007)	Financial performance and outreach: A global analysis of leading microbanks	10
D'espallier, Guerin & Mersland (2013)	Focus on women in microfinance institutions	30
Daher & Le Saout (2015)	The Determinants of the Financial Performance of Microfinance Institutions: Impact of the Global Financial Crisis	4
De Crombrugghe, Tenikue & Sureda (2008)	Performance analysis for a sample of microfinance institutions in India	16
Estape-Dubreui & Torreguitart-Mirada (2015)	Governance mechanisms, social performance disclosure and performance in microfinance: does legal status matter?	3
Ferro-Luzzi & Weber (2006)	Measuring the performance of microfinance institutions	2
Galema, Lensink & Mersland (2012)	Do Powerful CEOs Determine Microfinance Performance?	2
Gohar & Batool (2015)	Effect of Corporate Governance on Performance of Microfinance Institutions: A Case from Pakistan	2
Gonzales (2008)	Microfinance Synergies and Trade-offs: Social versus Financial Outcomes	5
Gregoire & Ramirez Tuya (2006)	Cost efficiency of microfinance institutions in Peru: A stochastic frontier approach	1
Gutiérrez-Goiria & Goitisoló (2011)	Profitability and social performance of Microfinance Institutions: empirical evidence of relations between different types of variables.	1
Gutierrez-Nieto, Serrano-Cinca & Mar Molinero (2009)	Social efficiency in microfinance institutions	1
Hartarska & Mersland (2012)	Which Governance Mechanisms Promote Efficiency in Reaching Poor Clients? Evidence from Rated Microfinance Institutions	3
Hartarska & Nadolnyak (2007)	Do regulated microfinance institutions achieve better sustainability and outreach? Cross-country evidence	1
Hartarska, Shen & Mersland (2013)	Scale economies and input price elasticities in microfinance institutions	1
Hermes, Lensink & Meesters (2011)	Outreach and Efficiency of Microfinance Institutions	8
Hudon & Traca (2011)	On the Efficiency Effects of Subsidies in Microfinance: An Empirical Inquiry	6
Im & Sun (2015)	Profits and outreach to the poor: The institutional logics of microfinance institutions	2
Janda & Turbat (2013)	Determinants of the financial performance of microfinance institutions in Central Asia	2

Kai (2009)	Competition and wide outreach of Microfinance institutions	1
Kar (2013)	Mission drift in microfinance: Are the concerns really worrying? Recent cross-country results	12
Kar (2012)	Does capital and financing structure have any relevance to the performance of microfinance institutions?	8
Kar & Swain (2014)	Interest rates and financial performance of microfinance institutions: Recent global evidence	10
Kipasha & Zhang (2013)	Sustainability, Profitability and Outreach Tradeoffs: Evidences from Microfinance Institutions in East Africa	5
Lebovics, Hermes & Hudon (2015)	Are financial and social efficiency mutually exclusive? A case study of Vietnamese Microfinance Institutions	1
Louis, Seret & Baesens (2013)	Financial Efficiency and Social Impact of Microfinance Institutions Using Self-Organizing Maps	1
Makame & Murinde (2006)	Empirical findings on cognitive dissonance around microfinance outreach and sustainability	2
Marr & Awaworyi (2012)	Microfinance social performance: A global empirical study	2
Marr, Leon & Ponce (2014)	Financial inclusion of the poor in Peru: Explanatory factors and determinants	1
Masood & Ahmad (2010)	Technical efficiency of microfinance institutions in India-a stochastic frontier approach	1
Mersland & Strøm (2012)	The Past and Future Innovations of Microfinance	2
Mersland & Strøm (2010)	Microfinance Mission Drift?	6
Meyer (2015)	Social versus financial return in microfinance	10
Nwachukwu (2014)	Interest Rates, Target Markets and Sustainability in Microfinance	2
Olivares-Polanco (2005)	Commercializing microfinance and deepening outreach? Empirical evidence from Latin America	1
Omri & Chkoundali (2011)	The Convergence Between Outreach and Financial Performance in Mediterranean MFIs: A Panel Data Analysis	14
Piot-Lepetit & Nzongang (2013)	Financial sustainability and poverty outreach within a network of village banks in Cameroon: A multi-DEA approach	1

Quayes (2015)	Outreach and performance of microfinance institutions: a panel analysis	20
Quayes (2012)	Depth of outreach and financial sustainability of microfinance institutions	4
Quayes & Khalily (2014)	Efficiency of microfinance institutions in Bangladesh	1
Rahman & Mazlan (2014)	Determinants of operational efficiency of microfinance institutions in Bangladesh	1
Roberts (2013)	The Profit Orientation of Microfinance Institutions and Effective Interest Rates	1
Segun & Anjugam (2013)	Measuring the efficiency of sub-Saharan Africa's microfinance institutions and its drivers	2
Widiarto & Emrouznejad (2015)	Social and financial efficiency of Islamic microfinance institutions: A Data Envelopment Analysis application	1
Wijesiri, Vigano & Meoli (2015)	Efficiency of microfinance institutions in Sri Lanka: A two-stage double bootstrap DEA approach	1
Zerai & Rani (2012)	Is there a tradeoff between outreach and sustainability of micro finance institutions? evidence from Indian microfinance institutions (MFIs)	1

## Appendix C: Correlation Matrix of Independent Variables

Correlation Matrix	MixMarket	Pre-financial crisis	SP_Depth of Outreach	FP_MF Profit Indicators	FP_Risk	FP_Efficiency	Economic Frontier	Development_journal
MixMarket	1.0000							
Pre-financial crisis	0.0546	1.0000						
SP_Depth of Outreach	0.3678		1.0000					
FP_MF Profit Indicators	-0.0619	0.0628	0.3072	1.0000				
FP_Risk	0.1113*	0.1693*	0.0110	0.0658	1.0000			
FP_Efficiency	-0.1195*	-0.0100	-0.1448*	0.0481	-0.1894*	1.0000		
Economic Frontier	-0.1265*	-0.1664*	-0.1283*	0.0364	-0.2385*	-0.1500*	1.0000	
Development_journal	0.0364	0.0058	0.0338	-0.0410	0.0001	0.0129	0.3001*	1.0000
	0.4994	0.6486	0.0449	-0.3623*	0.1729	0.7900	0.0000	0.0449
	0.0000	0.2151	0.5753	0.0000	0.0255	0.0000	0.2434*	0.4591

Note. – Significance levels are given by the following: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1